



*A report prepared for the project*

## Lessons Learnt on Sustainable Forest Management in Africa

# RAIN FOREST MANAGEMENT FOR WOOD PRODUCTION IN WEST AND CENTRAL AFRICA

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March 2004



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# **Rain forest management for wood production in West and Central Africa**

by

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## LIST OF ABBREVIATIONS

AAC	Annual Allowable Cut
ADB	African Development Bank
AFD	French Development Agency
AFORNET	African Forest Research Network
APN	<i>Amelioration des peuplements naturels</i>
ATO	African Timber Organization
CAR	Central African Republic
CARPE	Central African Regional Programme for Environment
CEFDHAC	<i>Conférence sur les Ecosystèmes de Forêts Denses et Humides d'Afrique Centrale</i>
CIB	<i>Congolaise Industrielle des Bois</i>
CIDA	Canadian International Development Agency
CIFOR	Centre for International Forestry Research
COMIFAC	<i>Conférence des Ministres en charge des Forêts d'Afrique Centrale</i>
CPF	Collaborative Partnership for Forests
Dbh	Diameter at Breast Height
DFID	Department for International Development (UK)
ECOFAC	<i>Conservation et utilisation rationnelle des écosystèmes forestiers d'Afrique Centrale</i>
FAO	Food and Agriculture Organisation of the United Nations
FCSM	Forest Concession under Sustainable Management
FDA	Forest Development Authority
FDF	Federal Department of Forestry (Nigeria)
FMP	Forest Management Plan
FMU	Forest Management Unit
FoB	Free on Board
FORAFRI	<i>Projet de capitalisation et transfert des résultats des recherches sur les écosystèmes forestiers denses humides d'Afrique</i>
FOSA	Forestry Outlook Study for Africa
FSC	Forest Stewardship Council
FSD	Forest Services Division (Ghana)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFW	Global Forest Watch
GTZ	<i>Gesellschaft für Technische Zusammenarbeit (Germany)</i>
HMP	Harvesting Management Permit
ICRAF	World Agroforestry Centre
IFIA	Inter African Forest Industries Association
IIED	International Institute for Environment and Development

IITA	International Institute of Tropical Agriculture
IPGRI	International Plant Genetic Resources Institute
ITTC	International Tropical Timber Council
ITTO	International Tropical Timber Organisation
IUCN	World Conservation Union
KSLA	Royal Swedish Academy of Agriculture and Forestry
MINEF	Ministry of Environment and Forestry (Cameroon)
NEPAD	New Partnership for Africa's Development
NRMP	Natural Resources Management Programme
NTFP	Non-Timber Forest Product
NWFP	Non-Wood Forest Product
ODA	Overseas Development Administration (UK, now DFID)
RFC	Rural Forest Committee
RIFFEAC	Central African Forestry and Environment Training Institutions Network
SAFORGEN	Sub-Saharan African Forest Genetic Resources Programme
SFM	Sustainable Forest Management
SODEFOR	<i>Société de Développement des Forêts</i> (Côte d'Ivoire)
SSA	Sub-Saharan Africa
TEDB	Timber Export Development Board
TFAP	Tropical Forestry Action Plan/Programme
TIDD	Timber Industries Development Division
TOU	Technical Operational Unit
TSS	Tropical Shelterwood System
TUC	Timber Utilisation Contract
UFA	<i>Unité Forestière d'Aménagement</i>
UK	United Kingdom
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNFF	United Nations Forum on Forests
USAID	United States Agency for International Development
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

## 1.0 INTRODUCTION

### 1.1 Background

This study focuses on countries in West and Central Africa in which rain forest exists and is under some form of management, primarily for industrial wood production. The term *rain forest* is used here broadly, to cover tropical evergreen forests at low elevations where the annual rainfall is greater than 2500 mm (true rain forests), and the much more extensive moist deciduous tropical forests, also at low altitudes, where the annual rainfall is 1000–2500 mm. Forests of the latter type were recorded by *FAO (1998)* as being far more extensive in Africa, covering about 251 million ha, than the true rain forests, which cover only 87 million ha; they are also the main base for industrial wood production in the two sub-regions. Sustainable Forest Management (SFM) implies management that in an integrative way pays attention to the productive, protective, social and environmental aspects of forestry and, as explained in *FAO (1998)*, is monitored through a number of criteria by use of specific quantitative, qualitative and descriptive indicators. The productive function, and specifically industrial wood production, is the criterion of primary attention in this study.

Countries focused on in the study were:

*In West Africa:* Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria, Sierra Leone and Togo.

*In Central Africa:* Cameroon, Central African Republic (CAR), Democratic Republic of Congo (DRC), Equatorial Guinea, Gabon and Republic of Congo.

Land areas, population and relevant forest resources characteristics of these countries are summarised in *Table 1*.

**Table 1. Land area (000 ha), population (000) and forest resources (000 ha or %) data for the study countries.** Source: *FAO 2001a, Global Forest Resources Assessment*.

Country	Land area (1988)	Population (1999)	Closed forest area	Closed forest (% of land)	Forest in protected areas	Forest available for wood supply	Available for wood supply (% of land)
<b><i>West Africa</i></b>							
Benin	11063	5937	546	4.9	848	517	4.6
Côte d'Ivoire	31800	14526	3248	10.2	712	655	2.0
Ghana	22754	19678	1534	7.1	570	519	2.2
Guinea	24572	7360	1750	7.0	346	329	1.3
Liberia	11137	2430	4124	32.0	35	34	0.3
Nigeria	91077	108945	4456	4.8	946	889	0.9
Sierra Leone	7182	4717	725	10.1	53	52	0.7
Togo	5439	4512	272	5.0	71	61	1.1
<b>Mean %</b>				<b>10.8</b>			<b>1.6</b>
<b><i>Central Africa</i></b>							
Cameroon	46640	14693	19985	42.9	2624	2336	5.0
CAR	62297	3550	4826	7.7	3436	2749	4.4
Congo	34150	2864	22000	64.4	3088	2656	4.9
D.R. Congo	226205	50335	126236	55.6	12169	11195	6.1
Eq. Guinea	2805	442	1774	63.2	193	172	11.6
Gabon	25767	1197	21800	84.6	3492	2993	7.7
<b>Mean %</b>				<b>53.1</b>			<b>6.6</b>

The study was made in the context of the deep concern that the potential of Africa's forest resources to contribute to general economic development, poverty reduction and environmental stability are not being realised. In particular, because of its low level of participation, Africa, which depends greatly on its natural resources for its economic development, appears not to be contributing to, or benefiting from, the general debate on how to achieve SFM. Available information on forest management in Africa itself is not sufficiently analytical to reveal when, how and why particular combinations of factors lead to success or failure, so that lessons can be learnt on how to pursue SFM. The urgency of these concerns is heightened by the rapidity with which political, economic and social changes are now taking place in Africa, under such initiatives as the New Partnership for Africa's Development (NEPAD), which are mapping out new approaches for the development of the continent. With the heavy dependence of the continent on natural resources for its development, forestry is expected to play a key role in achieving the objectives of these initiatives. Yet, assessments show continued and increasing loss of forest cover throughout Africa (e.g. *Table 2*).

**Table 2. Forest cover loss in Africa, 1990 – 2000 (FAO, 2003a)**

Sub-region	1990	2000	Annual change
	(million ha)		(%)
North Africa	77.5	68.1	-0.94
East Africa	90.8	85.6	-0.51
Southern Africa	199.4	183.1	-1.62
Central Africa	250.1	240.7	-0.93
West Africa	84.7	72.2	-1.26
<b>Total Africa</b>	<b>702.5</b>	<b>649.9</b>	<b>-0.80</b>

The last few decades have seen substantial interventions in the forestry sector in Africa, much of it aiming at addressing forest degradation, and often with significant international support. Many of these interventions, in the form of projects and programmes, have taken place in the Central African sub-region where the scope and potential for attaining SFM remain greater. Within the sub-region, most activities have taken place in Cameroon and Gabon, because of civil unrest elsewhere (*Box 1*). Significant interventions have also taken place in West Africa.

**Box 1. Some interventions against forest degradation in Central Africa.**

**Gabon (Anon., 1998):**

- European Union project on afforestation and agroforestry.
- Management of coastal savannas; project supported by French cooperation.
- The Tropenbos Foundation (Dutch Foundation) sponsored biology and genetic studies of Okoumé.
- The World Bank support for forest and environment projects and for the development of a forest master plan in a project called *Stratification de la première zone forestière*.

**Cameroon:**

- ITTO sponsored projects oriented mainly to the development of sound forest management plans (1990s).
- Tropenbos Foundation and European Union sponsored research activities (the Tropenbos Cameroon Programme) gaps that constituted constraints for the development of forest management plans (*MINEF, 1993*).
- Canada, French Cooperation and GTZ supported policy activities - development of national forestry action plan, forest policy, laws and regulations, etc. (1990s – 2000s).
- Global Environment Facility (GEF) assistance for several projects (Campo Ma'an, Mt. Cameroon,

Wildlife Reserve in Benoue Province, Limbe Botanic Garden, etc.) to develop sustainable forest management plans (MINEF, 1990 and early 2000s).

**Other initiatives:**

- ECOFAC rural development programme in CAR, including Harvesting and Management Permit 169 for Ngotto forest (1996).
- In Congo, allocation of the Pokola-Kabo-Loundoungou concession to *Congolaise Industrielle des Bois* (CIB) to develop a forest management plan (June 1999).
- UNDP support, as part of the Collaborative Partnerships on Forests (CPF) programme of UNFF for the elaboration and formulation of Strategic Action Plan for the Management of Congo Basin Ecosystems; launched in 2001.
- Sub-regional initiatives such as the Conference on Moist Dense Forest Ecosystems in Central Africa (*Conférence sur les Ecosystèmes de Forêts Denses et Humides d'Afrique Centrale*, CEFDHAC), also called the Brazzaville Process, established in 1996 as an exchange and consultation forum for all stakeholders in the forestry sector with a view to establishing a fair and sustainable management of Central African forest ecosystems. Today acknowledged by the Ministers in charge of Central African forests as the body responsible for facilitating and organising sub-regional and national fora, and dedicated networks (*ITTC, 2003*).
- COMIFAC, *Conférence des Ministres en charge des Forêt d'Afrique Centrale* (Conference of the Ministers in charge of central African Forests), established 2000, as decision making body providing guidance and consultation responsible for the establishment and validation of a global Convergence Plan aimed at improving management and conservation in Central African forests.
- CARPE, the Central African Regional Programme for Environment, is a USAID regional initiative launched in 1995 for 20-year duration, aimed at fighting deforestation and biodiversity loss in Central Africa.
- IUCN, the World Conservation Union, support for the development of networks for co-management of Central African natural resources, for Central African forestry and environment training institutions (RIFFEAC), for indigenous and local communities, and for Members of Parliament for the conservation of Central African ecosystems.
- The FORAFRI Project financed by French Cooperation and completed in 2002, aimed at building on and transferring research results on moist dense tropical forests to the users, integrating issues at the regional level and identifying priority topics for future research (*ITTC, 2003*).

In the early 80s, with FAO support, many countries in the sub-region participated in preparing Tropical Forestry Action Programmes (TFAP), which were rarely implemented. The Forestry Department in Ghana received substantial support from ITTO, the UK Overseas Development Administration (ODA, now Department for International Development, DFID) and other donors in the early 90s in the search for approaches for making the transition from current practices to SFM. One such intervention was mediated by IED (*Mayers et al., 1996*) and examined in detail the nature and the role of incentives in SFM. ODA also spearheaded assistance to the Forestry Department of the Cross River State of Nigeria, to develop a Strategy for the Sustainable Development, Conservation and Management of forests of the State. This assistance began in 1991 and led to the production of a Strategic Plan in 1994. Planned support for the forestry sector of Cross River State, by the Canadian International Development Agency (CIDA), is likely aimed at updating or implementing this plan. In addition, the African Development Bank (ADB) made a grant to Nigeria in 1993 for a 'Forest Resources Study', covering an inventory of the wood resources in high forest and plantations in the country, and a number of studies, including a wood-based industrial sector review, a market and pricing policy assessment and silvicultural investigations of selected indigenous fruit trees in Nigeria.

Clearly, in-depth analyses of the vast amount of information generated from these projects and programmes should provide an opportunity for lessons to be learnt on the factors that led to the varied performances of these interventions. This in turn should indicate how successes could be replicated and failures avoided, in order to move closer towards achieving sustainable rain forest management. The analysis made by *Bjorkdahl & van Hensbergen (2002)* for West Africa predict undesirable development outcomes in the event of failure to institute SFM regimes in the sub-region. This should be true for Central Africa as well.

The present study is one of several commissioned by the project "*Lessons learnt on Sustainable Forest*

*Management in Africa*”, designed to address some of the above concerns and with the following main objectives:

- To analyse and establish what lessons have been learnt from positive and negative experiences of various initiatives, projects and programmes aiming at sustainable management, use and conservation of forests in sub-Saharan Africa;
- To analyse and establish what ecological, economic, social and other pre-requisites are necessary for extending positive lessons to wider use (to more people, larger areas, other countries, etc.); and
- Based on the outcome of the above analyses, to identify the most urgent issues and concerns for Africa to draw the attention of the various international processes.

## ***1.2 Management of African rain forests for wood production: some key questions***

For the purpose of this study, the significant features of management of African rain forests for wood production are:

- (a) the uneven distribution of forest cover, such that rain forest exists mainly in the sub-regions of West and Central Africa;
- (b) industrial wood production, mainly from these two sub-regions, has been the principal objective of rain forest management in SSA;
- (c) steps were taken early in the development of forest management in most countries of West Africa to secure productive forests (forests with the potential of supporting industrial wood production) by constituting them into forest reserves; the general objective was to achieve sustained yield management for timber, and to this end administrative structures and, in some countries, elaborate silvicultural regimes were developed;
- (d) institutions for forest management are not as developed in Central Africa as in West Africa; management in Central Africa has consisted mainly of organising and controlling exploitation by concessionaires, who control extensive allocations;
- (e) in both sub-regions, exploitation has been generally through allocation of concessions, felling licences or tree permits in which attempts are made to control yield by area, species and size of trees removed;
- (f) exploitation is based on management plans for an insignificant proportion (mainly within the reserved forests) of the area worked;
- (g) although in some countries local communities receive part of the revenue from exploitation as royalties, management of the reserved forests for timber production has largely been non-participatory, being conducted by government alone;
- (h) in spite of the efforts at reservation and management, rain forest degradation and loss have proceeded steadily in Africa (*Table 2*), and particularly in West Africa, mainly because of the ineffectiveness of the management regimes applied, competing demands for rain forest land, encroachment and outright excision or dereservation of forest reserves;
- (i) rain forest loss in West and Central Africa contributed greatly to the high rates of deforestation that made Africa to account for up to 56% of the world’s loss of forest cover between 1990 and 2000, even though Africa has only 16.8% of the world’s forest cover (*FAO, 2003a*);
- (j) evidently, political, economic and social forces have completely overwhelmed the efforts at sustained yield management, so that little if any rain forest in Africa now is managed sustainably at an operational level.

There is, thus, much experience in attempting to manage African rain forests on a sustained yield basis for industrial wood production. Together with the reports on the systematic interventions made more recently to overcome rain forest degradation there is altogether a wealth of material that can be analysed in-depth to derive positive and negative lessons and, from these, guidelines on how to achieve sustainable management of rain forest in Africa. Such analyses should address the following key questions:

- How have rain forests been managed and what have been the constraints to achieving sustainable management of rain forests for industrial wood production in Africa?
- What is being done to improve the situation?
- What more needs to be done to consolidate and ensure wider application of SFM in African rain forests?

### ***1.3 Objectives and scope of the study***

The main objectives of this study, as given in the terms of reference were to:

- collect, compile and synthesise information on management of rain forests in West and Central Africa for wood production and provide a historical perspective;
- assess the long term sustainability of industrial roundwood production, based on case studies, taking into account stability of land use, growing stock, annual allowable cut, harvesting intensity, systems of logging and investments in post-harvesting treatments;
- analyse the economic viability of implementation of SFM specifically taking into account the additional costs and benefits of SFM in West and Central Africa;
- examine the social aspects of rain forest management, especially how it is affecting the local communities in terms of their livelihood, and also to what extent the countries benefit;
- assess the overall institutional capability to enforce SFM and what hinders the adoption of SFM; and,
- prepare a draft report adopting a proposed outline, and subsequently revise the report based on comments from reviewers.

As earlier indicated, the study concentrated on countries in the West and Central African sub-regions where rain forest exists. It was accomplished mainly from existing literature, direct data collection being limited to case studies of current forest management arrangements in Ghana and Côte d'Ivoire.

### ***1.4 Structure of the report***

Disparities in forest development history and in the nature of available data for the two sub-regions covered in this study, as well as the need to retain clarity, make it necessary to present this report in a way that is slightly different from that proposed in the terms of reference. Following this general introduction (Chapter 1), the information on historical perspectives and the case studies (Items 2 & 3 of ToR), are presented separately for the sub-regions in Chapters 2 & 3 of the report. An integrated account of Lessons learnt from the case studies is then presented as Chapter 4, before the report is concluded with an integrated summary of the findings and recommendations in Chapter 5.

## **2.0 MANAGEMENT OF AFRICAN RAIN FORESTS FOR WOOD PRODUCTION - A HISTORICAL PERSPECTIVE**

### ***2.1 West Africa***

#### **2.1.1 General**

Export of timber from West Africa started early in the 19th Century (*Gillis, 1988*), but it was not until the beginning of the 20th Century that formal management and development of the forests began. Even as early as that, management was introduced in response to perceived threats of over-exploitation of the forests (*Mengin-Lecreux and Maitre, 1986*). Initially, management was mainly in terms of controlling the size of timber concessions and girths of exploited trees, and imposing forestry fees; then followed periods of creation and consolidation of forest reserves, establishment of forest services and formulation of legislation to administer the forest estate, introduction of silvicultural interventions to improve the stocking of desirable species, and disenchantment with natural forest management culminating in a switch to greater emphasis on plantation development than on natural forest management. Interest in natural forest management has been re-kindled with the rising profile of other forest values like biodiversity and ecological services.

The current situation of forest management in West Africa is variable among the countries. Political instability, social conflicts and, in some countries like Sierra Leone, Liberia and now Côte d'Ivoire, armed conflicts have intervened to impose their own dynamics on forestry. Nevertheless, we can distinguish three broad phases in the development of formal forest management in the sub-region: the initial phase of emphasis on natural forest management, the phase of great emphasis on plantation development, and the current phase of return to natural forest management stimulated by a greater acknowledgement of other forest values than wood yield, including the acknowledgement of values of forests to local communities, which is stimulating notions of decentralisation

and accommodation of communities in forest management. We illustrate these phases below, mainly with developments in Nigeria, Ghana and Côte d'Ivoire.

### 2.1.2 Nigeria

Formal forestry began in Nigeria in 1897, with the creation of a Department of Woods and Forests for the Colony and Protectorate of Lagos, which itself was proclaimed only a year earlier, in 1896 (Lowe, 1990). The first Forestry Ordinance (Law) was promulgated in 1901, to regulate the size of timber concessions and minimum exploitable girth limits (then 12 feet or 120 cm dbh, for mahoganies), to impose forestry fees and exact duties on exported logs, and to require concessionaires to plant 20 economic tree seedlings at each stump site (a practice later abandoned as being ineffective). The Forestry Ordinance of 1916, based on experience from Burma, became the foundation for all subsequent forestry laws in Nigeria (Rosevear, 1954; Kio et al., 1992). The principal activities of the forestry service at this time were the selection, demarcation and constitution of suitable sites as forest reserves, and the preparation of working plans. In the rain forest areas of southern Nigeria, forest reservation was virtually completed before 1930, although in the Niger Delta, additional reserves were created as late as the 1960s and 1970s. Much of the reservation of land for forestry in the northern savannas took place in the 1940s to the 1960s, so that today the total area of forest reserves in Nigeria is 96 000 km<sup>2</sup>: 20 700 km<sup>2</sup> in rain forest and 75 300 km<sup>2</sup> in savannas.

Timber exploitation, which began in the 1880s, became intensified during and after the Second World War, to meet wood shortages in Western Europe. Exploitation was very selective, taking mainly the mahoganies and of the best quality, resulting in wasteful creaming of the forest. Exploitation became intensified on attainment of independence in 1960, to meet both export and burgeoning local demand, as well as to earn much needed foreign exchange for development. Entry into the petroleum oil economy in the 70s further accelerated home demand for wood, culminating in the ban of log export from Nigeria in 1976. Initially, yield was controlled only by imposing a minimum size limit of 120 cm, later 100 cm, dbh for exploited trees; subsequently, control was by area allocation based on a 100 years, later reduced to 50 years, felling cycle and a minimum felling size of 60 cm dbh (Lowe, 1977). In unreserved forest, no area allocation was practised; contractors operated freely in these areas once they received a felling permit, but they were obliged to pay the necessary fees and adhere to the prescribed felling size limits. A formidable, uniformed forest guard service was in place to enforce the regulations.

Forest regeneration was addressed quite early in the development of formal forestry in Nigeria. As early as 1906, H. N. Thompson had introduced the 'timber rules', which obliged loggers to set up plantations, or ensure the releasing of natural regeneration patches. Forestry staff themselves, during their rounds, directly released mahogany seedlings when found in patches. At the same time, plantation trials were initiated with a large range of species, including *Chlorophora* (now *Milicia*) *excelsa*, *Azelia africana* and *Nauclea diderrichii* (Mengin-Lecreulx and Maitre, 1986). Several silvicultural techniques, including the Walsh system, the group system and line planting were tried, in attempts to regenerate the forest more or less naturally (Kennedy, 1935; Ogbe, 1966). Failure of these attempts led to the introduction in the 1940s of the Nigerian Tropical Shelterwood System (TSS), based on Malayan experience, and on experimental work in Nigeria (Kio et al., 1992).

TSS involved a series of pre-exploitation climber-cutting operations, frill-girdling and poisoning of undesirable trees with sodium arsenite to open up the canopy, induce regeneration and promote growth and development of existing saplings of favoured species (Nwoboshi, 1987). The operations were carried out over a period of five years and culminated with the harvest of the economic trees in the fifth year. Over 200 000 ha of forest was treated in this way between 1944 and 1966 before the system was abandoned, and with it further efforts in natural regeneration. Reasons for the abandonment included the increasing cost of the operations, the difficulty of controlling climbers following opening up of the canopy, inadequate regeneration of seedlings of desired species, and realisation that the poisoning operations were eliminating species, such as *Pycnanthus angolensis*, that turned out to be valuable (Okali, 1992). Kio et al. (1992), however, observed that abandonment of TSS and of natural regeneration had less to do with silvicultural failures, than with the fact that forest reserves had come under strong political pressure from other forms of land use, such as cocoa, oil palm, rubber and subsistence farming. Something more spectacular than natural regeneration had to be seen happening in the forest, if the land was to remain under forest. It was further calculated that economic returns from plantations raised through *taungya* practices were better than from natural regeneration by TSS (MacGregor, 1959). It seemed wiser for the Forestry Departments to spend their funds on the more visible artificial regeneration of the forests.

By 1960, when TSS began to be disused, 974 115 ha of Nigerian forest reserves were managed under working plans. Forestry staff, who also patrolled the reserves in beats, strictly supervised exploitation. The motivation to carry out fieldwork was high, as resources were made available to provide transport and pay due allowances. After 1960, there was a general decline in the adherence to working plans; the desire to encourage indigenous

entrepreneurs led to concessions being given to political clients who were not necessarily experienced in logging. Forestry Departments became severely under-resourced, so that the motivation to regulate exploitation dwindled and gradually gave way to impoverished staff that readily succumbed to corruption.

Disenchantment with natural regeneration approaches, for their failure to yield expected results and enable forestry to compete successfully with other land use options, swung forest management strongly towards raising plantations. In general, exploited natural forests were replaced by planted forest containing one or a controlled mixture of species, which were mostly fast-growing exotics for fuelwood (e.g. *Eucalyptus* spp., *Azadirachta indica*, *Dalbergia sisoo*) and industrial purposes (*Tectona grandis*, *Gmelina arborea*). Indigenous species (*Triplochiton scleroxylon*, *Terminalia* spp., *Khaya* spp., and *Nauclea diderrichii*) were planted to a limited extent. In the majority of cases in Nigeria, plantation establishment was combined with the growing of food crops in the *taungya* system of agroforestry, by which farmers were allowed to raise their food crops, exploiting the fertility of land in forest reserves, in return for generally assisting the forestry department in clearing the land, planting and tending trees till they closed canopy, when the farmer was re-allocated a fresh piece of land for another cycle of operations. Plantation establishment was greatly stepped up in the 70s and 80s in Nigeria, following a government decision that the country should become self-sufficient in supply of pulpwood. Direct government involvement in planting attracted the confidence and participation of international funding agencies, notably the World Bank and the African Development Bank.

By the mid-80s, systematic management of the Nigerian forest estate for wood production, other than by planting, had declined to its lowest level. The use of working plans had been virtually abandoned and resources were barely made available to control exploitation of the forest. Management was reduced to merely allocating blocks of forests to extractors and sitting at strategic positions on the roadside to monitor log removals for revenue collection. Even the *taungya* practice of developing plantations with the assistance of farmers became so grossly abused that it was suspended in many states. Supervision of farmers was not sustained by the forestry departments, giving the farmers room to plant up only the visible roadsides, leaving large tracts of their farms unplanted. Besides, the forestry departments could no longer sustain the supply of tree seedlings to farmers for planting; and forestry staff engaged in allocating land to farmers and failing to make full returns on the rent collected.

It also became clear that forest management by planting or otherwise by government alone was inadequate to meet present and projected demands for wood, or to address adequately the diffuse nature of forest degradation, which precedes such land degradation problems as desertification and soil erosion, and the many other conflicts of land use centred around forest reservation. About the same time too, there was increasing global concern for the role of forestry in addressing problems of the environment and development. Attention, therefore, turned increasingly to participation by other stakeholders, including the private sector and local communities, in production forestry, and also to managing natural forests for other values than timber production. Current emphasis on social forestry, joint management and community forestry reflect this new orientation, which is being embodied in a revised forest policy with its associated revised laws. The new orientation also represents the current phase of development of forest management in Nigeria.

### 2.1.3 Ghana

As in Nigeria, formal management of forests in Ghana dates back to the beginning of the last century. In response to concern for the effects of deforestation, a Timber Protection Ordinance was passed in 1907, and H.N. Thompson from Nigeria visited and assessed the forests of Ghana in 1908, resulting in the establishment of the Forestry Department in 1909. Selection, demarcation and reservation of forests in the 1920s and 1930s, mainly to check further forest conversion by the growing cocoa industry, led to the creation of the permanent forest estate, amounting to 252 forest reserves in the closed broadleaved forest zone, which in the early 90s totalled 17 000 km<sup>2</sup>, of which 12 000 km<sup>2</sup> are designated as productive and 5 000 km<sup>2</sup> as protective (TEDB, 1991; Sayer *et al.*, 1992). Development of forest management in Ghana was disrupted by the two world wars and the general depression of the 1930s, and it was not until the early 1950s that planned management of the reserves became established practice (Asabere, 1987).

Exploitation was highly selective and by long-term concessions (25 years) for areas exceeding 800 ha, or licences for periods of three years for areas less than 800 ha (FAO, 1981). Since the 1970s, however, the concession period has been reduced to 15 years, ostensibly to allow for salvaging of over-mature trees (Asabere, 1987) and speed up the development of a uniform forest stand enriched with economic species. The latter was aided by silvicultural measures, initially by enrichment (line) planting between the 1940s and 1950s. This was later discontinued mainly because the lines were difficult to maintain (Asabere, 1987). The Nigerian TSS technique was applied to up to 4 800 ha of forests between 1946 and 1966 before it was abandoned. The main regeneration technique used in Ghana between 1956 and 1970 was the Modified Selection System. This involved

combining pre-exploitation stock-mapping of favoured economic trees with improvement thinning by frill-girdling and poisoning with sodium arsenite. Logging was on a felling cycle of 25 years and yield was regulated by area and prescription of girth-limits (*Asabere, 1987; Nwoboshi, 1987*). Up to 259 000 ha of forest was treated in this way before the technique was also abandoned, partly because it caused considerable felling damage.

Between 1971 and the late 1980s, Ghana concentrated on salvage felling of over-mature trees on a 15-year cycle with no other management activity than pre-exploitation stock-mapping. About this time also, there was greater emphasis on plantation development than on natural regeneration; the latter was, however, never completely abandoned as in other countries of the sub-region.

Plantation development in Ghana had started at the beginning of the last century when German occupiers of the south-eastern part of the country established woodlands in the savanna. Plantation establishment was already well-organised, with established permanent nurseries, between 1948 and 1961. Then, following recommendations by FAO, planting was stepped up from 1960 so that by 1980 the total area of plantations in Ghana was about 75 000 ha, of which industrial wood plantations accounted for 26 350 ha (*FAO, 1981*). By 1992, industrial wood plantations were estimated at 52 000 ha (*Sayer et al., 1992*). Species commonly planted have been *Gmelina arborea*, *Pinus* spp., *Eucalyptus* spp., *Tectona grandis* and *Cedrela odorata* among the exotics, and *Triplochiton scleroxylon*, *Mansonia altissima*, *Terminalia* spp., *Khaya ivorensis*, *Anogeissus leiocarpus* and *Heriteria utilis* among indigenous species.

By the late 1980s, interest in natural forest management was renewed in Ghana and was quickly backed by a systematic expansion of the knowledge base for management, so that today, Ghana is well ahead of other countries in the sub-region in the systematic management of its productive forests. Every reserve is now divided into approximately 200 ha compartments, which have been surveyed and mapped in large scale to show every potentially loggable tree, applying the size limits of 105 cm dbh for very valuable trees or 65 cm dbh for other trees. By 1992, other initiatives being put in place towards sustainable yield management included rationalisation of working plans, closer control of logging activities and regular assessment of current and alternative exploitation practices (*Sayer et al., 1992*). The range of species logged has also expanded to include erstwhile lesser-known-species like *Ceiba* and *Bombax* spp.

A case study, described later in this report, was made of industrial wood production in Ghana, in search of lessons for sustainable forest management in West Africa, in view of the indications of a long unbroken history of natural forest management in the country.

#### 2.1.4 Côte d'Ivoire

By 1906, concern was already being expressed about the exhaustion of forests in Côte d'Ivoire as a result of logging for export, which had begun around 1885 (*Mengin-Lecreux and Maitre, 1986; Sayer et al., 1992*). This, combined with the threat from rapidly expanding slash and burn agriculture, led to the initiation of formal forest management. The first law on forest management was enacted in 1912 to regulate allocation of logging rights to private companies after payment of exploration and exploitation taxes. Forest legislation was based on the principle that any unoccupied land, for which no title deed could be produced, belonged to the state (*Mengin-Lecreux and Maitre, 1986*). Thus, most forest land became state-controlled and from the 1920s the forests were declared 'classified', the so-called '*Forêts Classées*' (forest reserves). By 1956, 6.8 million ha in 240 forest reserves had been 'classified', but local people paid little attention to this as the reserves lacked clearly marked boundaries and protection. Consequently, by 1987, the gazetted area had been reduced to only 2.9 million ha in 147 forest reserves due to agricultural expansion (*Sayer et al., 1992*).

Logging was controlled by allocating concessions in blocks of 2 500 ha, and usually for periods not exceeding 5 years (*Gillis, 1988*). By 1920, besides annual permit fees, stumpage and reforestation taxes were imposed on exploiters, the latter because of the reluctance of concessionaires to replant the required (*Mengin-Lecreux and Maitre, 1986*) 3-10 seedlings of exploited species at site. Reforestation, however, did not take place because of lack of knowledge of appropriate methods and species requirements (*Alba, 1956*). Early attempts at natural regeneration of the forest were also quickly given up in favour of artificial regeneration and enrichment (line) planting of the natural forest, which continued until 1950. Thereafter, the principal method adopted for regeneration of forests in Côte d'Ivoire was "*Amélioration des peuplements naturels*" (APN, or Improvement of Natural Populations), which was similar to the Nigerian TSS (*Okali, 1992*). It was applied to already exploited forests where the stocking with valuable species of average size was good, and involved climber cutting and canopy opening to stimulate rapid growth of the valuable species and promote regeneration through natural seeding. The results were soon deemed to be unsatisfactory, and the technique was abandoned in 1960. Attention was then concentrated on industrial plantation development, for which a state afforestation service, *Société de Développement des Forêts* (SODEFOR), was created (*Sayer et al., 1992*).

### 2.1.5 Other countries

Forest development and management in the remaining study countries in the sub-region followed essentially the same trend as already described for Nigeria, Ghana and Cote d'Ivoire, except for Liberia, which had not developed through a similar colonial experience. In Liberia, organised logging apparently did not begin before the 1950s, and then only for the local market (FAO, 1981). A Forest Act in 1953 provided for the creation of forest reserves, so that all but a small fraction of forest land is now under state ownership and subject to concession agreements with commercial logging companies. A Forest Development Authority (FDA) was created in 1976 for the management of the forest estate, which was previously the responsibility of the Bureau of Forests and Wildlife Conservation. Timber exploitation was based on an inventory carried out in the 1960s (Sayer *et al.*, 1992). Concession agreements for timber exploitation were separately negotiated with each contractor. Until 1973, there were no provisions for standard terms with respect to duration, harvest regulations, taxes and royalties or silvicultural treatments (Gillis, 1988). Since 1973, however, model concession terms with large areas averaging 81 000 ha, 25 years felling cycle, selective cutting plans approved by FDA, a minimum felling size limit of 40 cm dbh, and an obligation to pay a reforestation fee, have been instituted. Natural regeneration of the forest required a minimum felling cycle of 40 years, which is much longer than the 25 years generally adopted. An option to regenerate the forest by line planting was not widely adopted. Instead, the FDA preferred to regenerate the forest artificially through the establishment of plantations, sometimes following mechanical clearing of land (Gillis, 1988).

In Sierra Leone, forest exploitation began as early as 1816, but formal management of the forests did not begin until 1911 when a Forestry Department was set up, with a Chief Conservator of Forests, and the first forest reserve was constituted. By 1980, 2 850 km<sup>2</sup> of forest reserves had been created. Yield control is by area and prescribed cutting limits. A limited attempt has been made to sustain production through natural regeneration, applying such silvicultural treatments as cutting the undergrowth and climbers, or enrichment (line) planting. The area thus treated is, however, very localised, the Forestry Department preferring from very early times to regenerate the forest by artificial planting (FAO, 1981).

In Benin, the extensive forest reserves are managed by a Forest Department that controls local uses of the reserves. Permits for logging are given on an individual tree basis, and local uses include allocating the largely open broadleaved forest reserves for temporary cultivation on the condition that the land is allowed to revert to fallow after use. Togo's limited forest reserves are controlled also by a Forest Department. Both countries have concentrated on plantations to strengthen their forest resource base. In Guinea, management of the network of forest reserves, created largely before independence in 1960, together with wildlife conservation, is the responsibility of the *Direction Nationale des Forêts et Chasses* (DNFC). Exploitation was intensified after independence, concentrating in the evergreen forests, where silvicultural trials and experiments had been conducted for over fifty years aimed at natural regeneration of the mahoganies (FAO, 1981). Efforts were made in the late 1980s, through the Tropical Forestry Action Programme (TFAP), to resuscitate the forestry sector in Guinea, which had become moribund due to ineffective management for many years.

## 2.2 Current situation

Forestry for industrial wood production remains confined to the closed forests that occur to the south of the sub-region, where the protected forests, in different states of upkeep or degradation, exist as scattered islands in a matrix of unprotected farm/forest land. In Côte d'Ivoire the productive forest region in the south is legally demarcated from the northern part of the country by latitude 8°N. In other countries the limit is set by forest type such that industrial exploitation for wood is insignificant beyond the closed forest types.

Throughout the sub-region, management for timber production is concentrated in the protected closed forests, for which the statistics are mostly outdated or inconsistent among sources. Data in *Table 1* indicate that 10.8% of the land area of the study countries is closed forest. However, FAO (2001a) estimated that only 1.6% of the land area is actually available for wood supply. There is some variability among the countries in the percentage of land area available for wood production, such that the highest percentage (4.6) is in Benin, while the least (0.3) is in Liberia. In absolute terms, Nigeria, Côte d'Ivoire, Ghana and Benin, each has more than half a million hectares of closed forest available for wood supply.

The emphasis on protected forests arises because these generally contain the most intact tracts of rain forest, and even if forests in them are degraded, they can be restored under greater control by government than forests outside reserves. Stocking and hence production per hectare is greater in the protected, reserved forests than off the reserves. For example, a 1996/98 inventory in Nigeria (Beak International Inc., 1999) estimated the wood

stocking in reserves at 169 m<sup>3</sup> as against 94 m<sup>3</sup> per hectare outside. Forests outside forest reserves are under such intense pressure for farming that logging is quickly followed by conversion to farmland and other uses. There is much less potential for achieving SFM outside the reserves, except in a few places where intact tracts of forests can be brought under sustainable community forest management. In this regard, it should be mentioned that some of the most pristine forests in the sub-region can be found under community control, outside forest reserves, as in the Abung and Ekuri areas of the Oban forests of Cross River State of Nigeria. It is worth noting, however, that *Parren (2000)* in a report on trends in West African forest management aimed at timber production, thought that the Ghana practice of applying sustainable management concepts to control logging outside reserves was a unique and important step, as up to 50% of the national timber output at the time originated from 'unreserved forests' or farmland. Information from the present study, however, shows that there is little expectation that SFM for wood production can be supported outside the reserves.

Exploitation for timber occurs in both the reserved and unreserved closed forests, principally through concessions, contracts, licences and permits, in arrangements involving government, private entrepreneurs, farmers and communities to varying degrees in the different countries of the sub-region. As earlier indicated, there is currently a re-kindled interest in managing the closed forests, especially the reserves, as sustainable natural resources. This interest is engendered by the rising global concern for rain forests, and bolstered by external donor support. There is also an increased awareness by governments that various other functions of forests need not be sacrificed for timber production; hence, elaborate steps are being taken in most countries in the sub-region to review forestry policies and practices to conform with the new thinking. The most important feature of the new approach to forestry in the sub-region is the greater willingness to accommodate other stakeholders, especially local communities, in the management of forest resources, whether or not such resources are under government proprietorship. A general aim of the current trend is also to return to, or strengthen, the use of management and working plans for forest operations.

Ghana is ahead of most countries in the sub-region in the reformation of forestry towards sustainable forest management. Its advantages (*Mayers et al., 1996*) include:

- a network of managed forest reserves;
- progressive measures adopted to regulate logging and promote conservation;
- raised knowledge base on its forest resources and the demands being made on them;
- vibrant community institutions; and,
- traditional and modern local government structures providing good linkage and communication between national levels and local levels.

In spite of this, there are weaknesses in the demand side incentives, resource pricing, support for the forest service and the regulatory framework that have continued to receive attention, even though a major re-organisation took place in 1994, with the enunciation of a new forest and wildlife policy. Later in this report, the current Ghana model is taken up in greater detail as a case study, as it contains major elements that are applicable to the sub-region as a whole.

In Nigeria, except for the national effort at formulating programmes for reform, first under the Tropical Forestry Action Programme (TFAP) during 1990-1995, and now under the National Forest Programme (*FDF, 2002*), comprehensive action towards SFM has occurred only partly in Cross River State, one of Nigeria's 36 states. The process of revision of the national forest policy and promulgation of its associated forest law is, however, at an advanced stage. The main features of the revised policy and law will be to create a national Forestry Commission that can have executive powers over the management of a federal forest estate, to be created in order to secure biodiversity and environmentally sensitive forests. Notwithstanding the sectional nature of comprehensive action towards SFM in the country, lessons can still be learnt from the on-going attempt to implement the Strategy for Sustainable Development, Conservation and Management of the Forests of Cross River State, formulated in 1994.

In 1992, reformation of forestry towards SFM in Côte d'Ivoire resulted in the assignment to SODEFOR the responsibility for managing the national forest estate. This was followed by a new policy and forest law in 1994, which further re-organised forestry towards sustainable practices. Current exploitation of the productive forests is shared between SODEFOR and the Forestry Department, located in the Ministry of Water and Forestry, such that SODEFOR controls all exploitation from the reserved forest estate, while the Forestry Department controls exploitation outside forest reserves. Côte d'Ivoire was selected for a case study described in detail later in this study because it is a major producer that also has enough surplus to participate in the timber export trade.

Current wood production and utilisation in the sub-region should be considered against the background of the

reforms outlined above. The sub-region is making a transition from old practices that could not be sustained, which led to forest degradation, to new approaches that are still being put in place towards SFM. The informal sector still dominates wood production and consumption and this, compounded by illegal logging, makes it difficult to have reliable statistics on these features in the sub-region. Nevertheless, the main characteristics of industrial wood production and consumption in the sub-region, as summarised in the sub-regional report for FOSA, are as follows:

- industrial roundwood production in the sub-region comes mainly from natural forests, the contribution from plantations being small and unlikely to rise substantially because of low investment in plantation forestry;
- industrial roundwood production increased in the sub-region, between 1980 and 2000 (*Table 3*), at an annual rate of 0.4%, but this rate of growth is less than the population growth rate and slow in comparison with the rate of growth in other wood producing sub-regions;

**Table 3. Trends in Industrial roundwood production (000 m<sup>3</sup>) in the study countries.**

Country	1980	1990	2000
Benin	197	274	332
Cote d'Ivoire	5 361	3 548	3 416
Ghana	981	1 440	1 087
Guinea	491	541	651
Liberia	860	1 128	337
Nigeria	7 360	8 263	9 418
Sierra Leone	158	138	124
Togo	130	185	306
<b>Total</b>	<b>11 444</b>	<b>15 517</b>	<b>15 671</b>

Source: *FAO (2003b)*

- as a consequence of the above, the contribution of West Africa to African industrial wood production has declined steadily from 34% in 1980, to 31% in 1990 and 26% in 2000; the decline is also partly attributable to depleting resources;
- rising internal demand makes countries like Nigeria, which, with Ghana, Côte d'Ivoire and Liberia, are the major producers, to become net importers of industrial wood; this leaves Liberia and Côte d'Ivoire, in that order, as the major exporters of industrial roundwood from the sub-region in 2000;
- the wood processing industry in the sub-region is concentrated in Nigeria, Ghana and Côte d'Ivoire, which together produced 93% of the sawnwood in the sub-region in 2000;
- sawnwood production in the sub-region has declined from 3.9 million m<sup>3</sup> in 1980 to 3 million m<sup>3</sup> in 2000, largely because of reduced production from Nigeria; but export of sawnwood increased phenomenally from the sub-region from 398 000 m<sup>3</sup> in 1980 to 769 000 m<sup>3</sup> in 2000, largely due to export from Ghana and Cote d'Ivoire, which together account for 92% of the exports of the commodity from the sub-region;
- rapid expansion of the sawmilling industry, in response to local and export demand, may be a driving force for unsustainable logging; in addition, unless the sawmills are adapted to processing small logs from secondary forests and plantations, the industry may soon suffer from excess capacity;
- production of panel products, pulp and paper is not as developed as sawmilling in the sub-region (*Table 4*); almost all the countries depend on imports to meet local demand for paper products;
- in terms of industrial wood production and consumption the study countries can be divided broadly into major producers with high internal consumption due to a high population like Nigeria, and countries like Côte d'Ivoire, Ghana and Liberia, which are major exporters because they have substantial surplus production (*FAO, 2003b*).

**Table 4. Overview of the wood industry in West Africa.**

Product	Production	West Africa's share in SSA production (%)	Largest producers
Industrial round-wood (000 m <sup>3</sup> )	18 166	26	Nigeria, Côte d'Ivoire; Ghana, Senegal, Guinea
Sawnwood (000 m <sup>3</sup> )	3 057	40	Nigeria, Côte d'Ivoire, Ghana, Liberia
Plywood (000 m <sup>3</sup> )	230	33	Côte d'Ivoire, Nigeria, Ghana, Liberia
Newsprint (000 t)	31	8	Nigeria
Printing/writing paper (000 t)	1.0	0.2	Nigeria
Paper/paperboard (000 t)	19.0	0.6	Nigeria

Source: *FAO, 2003b*

The most notable feature of trade in forest products from the sub-region is the declining trade surplus particularly since 1996 (*Table 5*), due both to the declining value of exports and the increasing value of imports. Part of the explanation for this is the declining price paid for primary commodities, at the same time that globalisation with its associated trade liberalisation makes it difficult to diversify and break into the export market for high value products like pulp and paper. This has far-reaching implications for the pursuit of SFM in the sub-region.

**Table 5. Value (million US\$) of West African trade in forest products.**

	1980	1990	91	92	93	94	95	96	97	98	1999	2000
<b>Exports</b>	723	692	475	636	597	704	564	567	432	452	475	480
<b>Imports</b>	298	196	184	158	155	173	152	151	202	253	328	349
<b>Surplus</b>	425	496	291	478	442	531	412	416	230	199	147	131

Source: *FAO, 2003b*

### 2.3 Some key questions

The current state of forest management, production, consumption and trade in industrial wood in West Africa poses a number of challenges if the transition to SFM is to be made. The apparent positive indication of willingness to move towards SFM, which is evident in most countries of the sub-region, is occurring in an environment of increasing democratic tendencies in governance. Sustaining the momentum now generated in forestry reforms through succeeding regimes of governance is clearly the first challenge and, should that be overcome, the questions that remain relate to:

- the extent to which national policies can be adjusted in favour of forestry, in such key areas as population, land use, agriculture, settlements and infrastructure development, as well as energy and macro-economic management, that have been shown in the Forestry Outlook studies to be the main drivers of forestry development;
- the extent to which present economic recovery programmes succeed in reducing poverty and improving the economy of the sub-region, to lessen the pressure of the poor on forest resources and at the same time stimulate forest industries and employment;

- whether the commitment to reform will be reflected in adequate financial investment for (a) building the required knowledge base, (b) developing the needed human capacity, and (c) providing infrastructure such as transport for monitoring and facilities such as capital for credit schemes to attract large scale participation by small and medium entrepreneurs, all in support of the take-off phases of new forest management programmes;
- whether adequate and imaginative incentive schemes can be devised to attract all stakeholders, within and outside the forestry sector, to measures designed to promote and expand the area of forest under SFM for industrial wood production; and,
- which existing initiatives or measures of forest management, production, utilisation and trade should be consolidated and expanded to advance the movement towards SFM, and in what order and by what steps should this be done?

## ***2.4 Central Africa***

### **2.4.1 The early forest management systems and recent changes**

During the colonial period, forest management consisted mainly of selective logging of what was called “noble species”, and most forest studies focused on the botany of key timber species used by colonial countries. After the colonial period, with the increase in demand for forest products and several periods of severe drought, planting trees to replace natural forest ecosystems became a main of focus through various international meetings. In Cameroon, the advice was to plant two or three seedlings of the same species as was removed from any site. But it was difficult for the forestry administration to assess the effective implementation of such regulation, and the system was later abandoned (*Amsellem, 2002*). The 1970s and 1980s were characterised by growing international awareness of the importance of taking the interests and concerns of local people into account, when developing and implementing forest management plans.

Recent changes came with the *FAO (1993)* report on the annual cover change rates of the world forests, which created shock waves in the international community. FAO estimated an annual loss of tropical forest of about 11.3 million ha during the period 1980-1990. It led to a general mobilisation of the international community. Many hundreds of initiatives were launched to define and promote SFM. These efforts have ranged from conferences and workshops to international trade agreements and certification schemes of forest products, to on-the-ground projects in dozens of countries around the world.

One of the first large efforts was the Tropical Forestry Action Plan (TFAP). It was begun in 1985 by the World Bank, FAO, and others. The goal of TFAP was to combat deforestation by implementing detailed action plans in individual tropical countries. *Winterbottom (1990)* estimates that roughly \$28 million was spent in each of 11 TFAP countries surveyed. Despite this spending, the TFAP eventually came to be seen as a failure because it was not curbing deforestation; increasingly, the plan was viewed in many countries simply as a way of promoting more forest development. Shortly thereafter, in 1990, the International Tropical Timber Organization (ITTO) was created to administer a trade agreement between the major producers and consumers of tropical timber. Early on, ITTO adopted an objective of bringing all tropical timber production by member countries to sustainable levels by year 2000. Even now, after the decade has drawn to a close, this target is far from being met.

Since 1992, dozens of countries have been engaged in efforts to develop so-called “criteria and indicators” (C&I), or guidelines for evaluating progress in implementing programmes for SFM (*FAO, 2001*). Other initiatives have aimed to promote SFM through market mechanisms such as “buyers groups” for sustainably harvested timber products, through legislative actions to mandate such purchases, and through various approaches to certify timber production as sustainable. The Forest Stewardship Council (FSC), an organisation founded by a coalition of foresters, timber companies and environmental groups, has developed standards that have been widely used in certifying timber operations since 1993. Although certification has increased dramatically in recent years with 1.1 million hectares of natural tropical forests certified to date (*FSC, 2000*), these efforts have barely scratched the surface of the 1.7 billion hectares of tropical forest remaining in the world (*FAO, 1997*). The question is how to assess the sustainability of management? In other words, what does SFM mean? Given the level of support and funding for SFM, there is a surprising diversity of opinions about its definition. Most definitions include ensuring a constant or increased flow of wood from forest as a primary management objective. Many definitions, however, include a variety of other factors, such as protecting the rights of indigenous people and local communities, and maintaining biological diversity (*Table 6*).

**Table 6. Scope and agreement among 12 recent initiatives to assess the sustainability of forest management.**

<b>Issue addressed</b>	<b>Agreement among initiatives</b>
<b><i>1. Sustained yield of forest goods and services</i></b>	
Productive functions of the forests (e.g. sustained timber yields)	70 %
Protective functions of the forests (e.g. soil, watershed management)	90 %
Health and vitality of the forests (e.g. control of insects and fire)	60 %
Management for sustained yields (e.g. written management plans)	60 %
<b>Average</b>	<b>70 %</b>
<b><i>2. Socioeconomic impacts</i></b>	
Impact of indigenous people (e.g., protection of traditional rights)	50 %
Impact on local communities (consultation and involvement)	60 %
Impact on employees (e.g., adequate wages, safe working conditions)	48 %
Economic and financial (e.g., reinvestment to forestry sector)	71 %
<b>Average</b>	<b>57 %</b>
<b><i>3. Maintaining biological diversity</i></b>	
Environmental impact assessment	42 %
Maintenance of ecosystem diversity (e.g. system of reserves)	88 %
Maintenance of species diversity (e.g. monitoring programmes in place)	33 %
Maintenance of genetic diversity (e.g. seed banks of commercial species)	33 %
<b>Average</b>	<b>49 %</b>

Source: IIED, 1996 in: Rice *et al.*, 2001

But there is also much greater agreement about the central role of silviculture at the project level. Efforts to ensure future supply of wood, in fact, are one of the main characteristics that distinguish SFM from traditional timber mining. Continuous wood supply is also central to providing timber producers with an economic incentive to protect the forest from agricultural conversion. While in theory most silvicultural systems can ensure sustainable harvest, for a variety of reasons, they rarely have been put into practice. According to *FAO (2001)* the developments in forest management over the past decade have focused on progress towards SFM, an approach that balances environmental, socio-cultural and economic objectives of management in line with the Forest Principles agreed at the United Nations Conference on Environment and Development (UNCED) in 1992.

These efforts have stimulated changes in forest policy and legislation and in forest management practices in many countries. Public participation in forest management has increased in many countries. Broader approaches to forest management, such as ecosystem management and landscape management are becoming more widely accepted and implemented. These approaches recognise the dynamism of ecological and social systems, the benefits of adaptive management, and the importance of collaborative decision making. Integrated strategies for forest conservation, in which conservation of forest resources and biological diversity entails management both inside and outside protected forest areas, are increasingly being developed.

On the international level, efforts to encourage SFM include initiatives to achieve a common understanding of the concept through the development of C&I by which SFM can be assessed, monitored and reported at national and local levels. In some countries, model and demonstration forests have been established to demonstrate sustainable management in practice for a variety of forest types and management objectives. As regards production forests, countries are moving towards broader management objectives. Initiatives established in the past decade included the International Tropical Timber Organisation (ITTO) Year 2000 Objective, which promoted SFM in countries that produce and consume tropical timber. A number of regional and national forest harvesting codes were also developed. Certification of forest products, a market-based mechanism devised to

encourage SFM, has recently received considerable attention.

Despite these indications that there may be cause for cautious optimism, reliable information on status and trends in forest management worldwide is not readily available. Few attempts have been made in the past to estimate the extent of SFM in the world as a whole. Given the number of countries and the wide variety of forest types, local conditions and management objectives, this is not surprising. Previous attempts have, as a consequence, focused on specific regions and on specific management objectives and definitions of sustainable forest management. Past studies which provide useful points of reference include the FAO Forest Resources Assessments of 1980 and 1990 and a study undertaken by ITTO in 1998. A recent assessment of progress towards the ITTO Year 2000 Objective provides valuable qualitative information on the forest management status in all ITTO producer and consumer countries.

#### 2.4.2 Current situation of forest management in Central Africa

All Central African countries have adopted strategies and forest action plans that take into consideration their specific needs for sustainable management of forest resources. Some of these policies are very recent, e.g. Cameroon, CAR and Gabon. These countries have also modified their laws and regulations. But the implementation of these regulations and laws has been delayed in some countries because of political disturbances.

Currently, most Central African forests belong to the States; although some countries have partly maintained traditional land tenure rights (e.g. Gabon, Cameroon and CAR). Forest management is entrusted to public forestry departments and forests are classified as production, protection or nature reserves according to their characteristics. Generally, the forestry administration is charged with the execution of forest conservation, reforestation and exploitation activities as well as forest inventories and preparation and implementation of management plans. However, many forestry administrations in Central Africa lack resources needed to implement their functions effectively and administer large areas of forest at the national level (FAO, 2000; CARPE, 1996).

##### *Forest areas and production*

The Central Africa region is characterised by two major contrasted situations: the ecological contrast and the population density contrast. The ecological variations observed range from the more humid Gulf of Guinea (Congo Basin sub-region), with the second largest forested block of tropical rainforest in the world, to the drier northern part of the region with the emergence of savanna ecosystems. The Congo Basin, the most forested region is also the least populated area, while the most populated countries include Burundi, Rwanda and the islands of Sao Tome and Principe.

Up to 53 % of the area of the study countries in the sub-region are under closed forest cover (Table 1) but there are considerable variations among countries. DRC accounts for about 56% of the forests in the sub-region and 21% of the total forest cover in Africa. Forestry in the study countries is centred on harvesting natural forests. According to FAO (2003), Central African forest volume is estimated at 47 billion m<sup>3</sup> over bark, which corresponds to an average of 127 m<sup>3</sup>/ha. Forest wood volume in the sub-region is 29 billion m<sup>3</sup>, which represents 63% of all African wood, and the total of the wood biomass in the forests is 44 billion tonnes (Table 7).

**Table 7. Forest volume and biomass in Central Africa (FAO, 2003d).**

Country	Wood volume in forests		Wood biomass in forests	
	m <sup>3</sup> /ha	Million m <sup>3</sup>	Tonnes/ha	Total, mill tonnes
Burundi	110	10	187	18
Cameroon	135	3,211	131	3,129
CAR	85	1,937	113	2,583
Chad	11	134	16	205
Congo	132	2,916	213	4,699
DRC	133	17,932	225	30,403
Equatorial Guinea	93	163	158	277

Gabon	128	2,791	137	2,991
Rwanda	110	34	187	58
Sao Tomé/Príncipe	108	3	116	3
<b>Total</b>		<b>29,131</b>		<b>44,366</b>
<b>Average</b>	<b>105</b>		<b>148</b>	

Central African dense forests have important timber potential owing, in part, to high-value commercial species in the region, notably “redwood” species belonging mainly to the Meliaceae family. The main commercial species in Cameroon are ayous (*Triplochiton scleroxylon*), sapelli (*Entandrophragma cylindricum*), frake (*Terminalia superba*) and azobé (*Lophira alata*). In Equatorial Guinea and Gabon the main species extracted are okoumé (*Aucoumea klaineana*) and ozigo (*Dacryodes buettneri*). Nevertheless, removals are uniformly less than increment. In spite of their variety and the abundance of big trees, the forests contain only a limited number of commercially marketable species and the exploitable trees are scattered. Biodiversity is, however, exceptional in Central Africa and the level of endemism is high (FAO, 2001). The forests of DRC, for example, contain more than 11,000 plant species, of which more than 30% are endemic. Less than 30 % of the forest area is protected while timber harvesting activities are intensive and continues to grow (Table 8).

**Table 8. Management of forest resources in some forest countries in Central Africa.**

	Forest area 2000 (000 ha)	Protected forest areas (000 ha)	Protected forest (% of total forest)	Timber harvest area (000 ha)
Cameroon	23 858	4 128	17.3	4 054
CAR	22 907	6 761*	29.5	1 762
Congo	22 060	2 244*	10.2	(383)
DRC	135 207	22 655	16.7	(166)
Equatorial Guinea	1 752	-	-	(61)
Gabon	21 826	1 790	8.2	(398)

Sources: Forest area 2000 and area under timber harvesting (data under brackets are not representing the total area under harvesting scheme) (FAO, 2001); Protected areas (UNEP, CBD national biodiversity strategy action plan NSBAP) and data with \* (country forest genetic resources reports).

Central Africa is producing 12.73 million m<sup>3</sup> of industrial roundwood, 65% of which is consumed within the region (Table 9). Export of industrial roundwood is growing and has doubled from 2.314 million m<sup>3</sup> in 1980 to 4.688 million m<sup>3</sup> in 2000 (Table 10). Concerning trade and processing, Gabon is exporting its entire production while Congo and Equatorial Guinea are exporting more than their production, implying that part of the export is sourced from other countries. It could be noticed that the in-country wood processing (sawnwood, wood panels, pulp for paper, etc.) is very low (27% of industrial roundwood produced in Cameroon). A quick analysis of the data in Table 9 shows some contradicting figures, which probably means that forestry administrations are not able to properly control timber exportation.

#### **Who is logging?**

Three categories of stakeholders were unequally sharing logging activities in Cameroon in 1996: domestic, foreign and joint venture enterprises (Eba’*a* Atyi, 1998). Global Forest Watch (GFW, 2000) gives two examples from Cameroon and Gabon to illustrate the unequal allocation of concession areas. One third of Cameroon’s concession owners hold three quarters of the concession area, while in 1997 in Gabon 5% of the concession owners were holding half of the concession areas. The same source notes that ten parent groups (Table 11), including five partially or wholly financed by French assets, hold half of Cameroon’s logging concessions.

**Table 9. Central Africa: production, trade and consumption of forest products, 2000.**

Items	Countries	Burundi	Cameroon	CAR	Chad	Congo	DRC	Equatorial Guinea	Gabon	Rwanda
Woodfuel 000 m <sup>3</sup>	Production	5 420	9 111	2 000	5 885	1 153	64 903	447	515	7 500
	Imports	-	-	-	-	-	-	-	-	-
	Exports	-	-	-	-	-	0	-	-	-
	Consumption	5 420	9 111	2 000	5 885	1 153	64 903	447	515	7 500
Industrial roundwood 000 m <sup>3</sup>	Production	333	2 960	1 011	761	646	3727	364	2 584	336
	Imports	-	0	0	-	0	0	0	0	0
	Exports	0	575	250	-	757	19	504	2584	0
	Consumption	333	2385	761	761	0	3 708	0	0	336
Sawnwood 000 m <sup>3</sup>	Production	83	650	102	2	74	80	4	68	79
	Imports	0	0	0	17	0	0	0	0	0
	Exports	0	540	66	-	70	20	2	79	0
	Consumption	83	110	36	20	4	60	2	0	79
Woodbased panels 000m <sup>3</sup>	Production	-	145	2	-	22	21	15	122	0
	Imports	1	0	0	0	0	0	0	0	4
	Exports	0	75	0	0	4	1	11	169	-
	Consumption	1	70	2	0	18	20	4	0	4
Pulp 000 tonnes	Production	-	0	-	-	-	-	-	-	-
	Imports	0	0	-	0	0	0	0	0	-
	Exports	-	-	0	0	0	-	-	-	0
	Consumption	0	0	0	0	0	0	0	0	0
Paper and	Production	-	0	-	-	-	3	-	-	-

paperboard 000 tonnes	Imports	2	31	0	1	2	5	0	2	1
	Exports	0	0	0	0	0	0	0	0	0
	Consumption	2	31	0	1	2	8	0	2	1

Source: *FAO, 2003d*

**Table 10. Forest products export (000 m<sup>3</sup>) from Central Africa (*figures in parenthesis are the share of Central Africa in percentage of the exports from Africa*).**

<b>Product</b>	<b>1980</b>	<b>1985</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>
<b>Industrial roundwood</b>	2 314 (37.4)	2 392 (52.6)	2 897 (70.0)	3 549 (81.8)	4 688 (76.8)
<b>Sawnwood</b>	278.4 (31.1)	202.1 (22.8)	283.3 (21.0)	333.2 (23.5)	776.7 (41.4)
<b>Wood-based panels</b>	185.6 (55.9)	156.6 (50.3)	187.5 (42.7)	108.6 (29.3)	260.4 (37.3)

Foreign companies leased more than half of the concession area in 1998-1999. As regards private sector involvement, nearly all revenue-generating activities, particularly logging but also processing, are under the control of the private sector, especially large trans-national logging companies.

**Table 11. Logging companies and subsidiaries in Cameroon.**

<b>Companies and subsidiaries</b>	<b>Nationality</b>	<b>Concession area in 1998-99 (000 ha)</b>	<b>Percentage of total concession area in 1998-1999</b>
Thanry (CIBC, SAB, SEBC, CFC, Prenant)	French	650	16
Bollore (La Forestière de Campo, SIBAF)	French	412	10
Coron	French	212	5
Alpi (Alpicam, Grumcam)	Italian	204	5
Hazim (SFH)	Lebanese	157	4
Rougier (SFID)	French	132	3
Decovenaere (SOTREF, SFIL)	Belgian	75	2
Itallegno (ECAM)	Italian	69	2
Vasto-Legneault (SEFAC)	Italian	63	2
Pasquet (Pallisco)	French	61	1
Others		2,019	50
<b>Total</b>		<b>4,054</b>	<b>100</b>

Sources: *GFW, 2000a*.

***What role does the forestry administration play?***

In recent years there have been attempts to involve the indigenous private sector, but local logging concession-holders often have limited capacity and their concessions are therefore leased or sublet to large international companies. Despite government efforts to maintain control of forest exploitation, *GFW (2000)* reported that during the period 1997-1998, 29 of 52 (56%) active forest permits continued to operate in Cameroon even though the duration of their logging rights had expired. The same source also noted that “at least 21 of the 31 allocated UFAs (forest concessions) in Cameroon in 1997 did not go to the highest bidder and the government had forgone, during the bidding process, more than US\$2.5 million by not allocating 14 UFAs to the highest bidder. Allocations were temporarily stopped after 1997 in order for all parties (government and the World Bank mainly) to clarify the procedures. However, the logging sector was prosperous at that time, and people were eager to have logging titles. Unable to acquire UFAs, logging companies obtained an increasing number of other kinds of logging permits (*Ventes de coupe* and *autorisations de récupération*) which did not require the bidding process. Since that time the bidding process has been improved to be more transparent. But the question remains to know if forestry administrations in Central Africa, with very little investment in the forestry sector in terms of equipment (*Table 12*) and incentives to forestry staff, may have capacities to either control or implement SFM.

**Table 12. Summary of logistical capacity in 1998-1999 for Cameroon Ministry in charge of forests.**

Provinces	East	South	Central	Littoral	South-West
Concession area (ha)	2,419,600	759,950	640,800	51,150	5,000
Number of agents	116	115	232	167	163
Number of 4WD vehicles	1	1	1	1	1
Number of motorbikes	4	4	10	4	6
Concession area/agent (ha)	20,859	6,608	2,762	306	31

Source: Theophile Ndjodo, in *GFW, 2000a*

Except South Africa, no African country had a forest area certified up to 2000 (*FAO, 2001*). The whole continent is lagging behind in forest and timber certification. Since 1997, some initiatives have been taken to establish forest certification in the African tropics, particularly in African Timber Organisation (ATO) member countries. For example, in 1997 CIFOR undertook a process of developing a set of criteria and indicators for a forest management unit (FMU) in Cameroon. In 1999, the Inter-African Association of Forest Industries (IFIA) identified the promotion of forest certification as one of its main strategies. In October 2000, the ATO Ministerial Conference adopted an IFIA-proposed pan-African certification concept, as a policy for promoting the development of a regional approach to forest certification among member countries. But after the adoption of this certification concept and approach, governments in Central Africa were still considering developing country-driven processes, and they were wondering about the real objectives of testing C&I in their countries. The process was seen as an international conspiracy set up to maintain a close watch on logging activities. The timber certification process is therefore seen by governments as interference by foreigners in the forest management of timber producing countries. One of the conclusions made by the Cameroon National Working Group in its report on Forest Certification is that “the main problems faced by the Cameroonian Working Group were: convincing the national government of the importance of forest certification; convincing European logging operators of the importance of participating in the process of developing a national standard, and involving local communities”.

#### ***Involvement of local communities***

Provisions have often been made in most recent forestry laws in the Central African countries to involve local communities in the management of natural forests. For instance, in Cameroon forest areas have been allocated to local communities as community forests. The maximum area that can be so allocated to a particular community, according to law, is 5 000 ha. The village of Mbanda (Ngambè) in Cameroon is developing a simple management plan of its community forest to get the forest agreement with the ministry in charge of forest. The village is assisted by Cameroon Ecology, an NGO that is funded by SNV (Dutch NGO). The commune of Dimako in Cameroon is also preparing a management plan for its recently gazetted 15 000 ha of forest with the assistance of the “*Forêts et terroirs*” project supported by the French development aid. Even though the Cameroon government is making such efforts, it is still wondering if there is not some trick in it for logging companies to be behind local communities in order to get logging area. The attribution of community forests was therefore temporarily suspended in 2003.

#### ***Protection and management***

In most Central African countries forest resources are conserved within the framework of protected forests, which have different objectives (forest reserves, wildlife reserves, national parks, reforestation areas, communal forests, recreational forests, production forests, etc.). Laws and regulations in most Central Africa countries stipulate that all of these categories of protected forests must be managed through a forest management plan. For production forests, size limits for tree harvesting and concession permits have been the only conditions ruling forest exploitation. But now the development of forest management plans has become a prerequisite for concession-holders, in order to obtain long-term logging permits. Currently, studies are underway to facilitate implementation of SFM. For example, there are efforts to implement low-impact harvesting practices, but the lack of sufficient human and other capacities is a major constraint.

The key issue of long term sustainability of current logging practices has not been addressed adequately in most countries (FOSA, 2003). Most logging is still in primary old-growth forests and some logging companies have large concession areas yet to be harvested. There is still very little compulsion to consider the long-term sustainability of management systems. Although no reliable data are available, experience in other regions suggests declining productivity during successive cycles of harvesting. This is often seen as progressive degradation, especially when more easily accessible secondary forest is subjected to logging and smaller-dimension trees are harvested.

#### ***Recent major forestry research achievements***

The recent major forestry research achievements in the sub-region could be grouped in three categories: (1) collating, synthesising and generating basic information, (2) developing tools and methodologies, and (3) sharing and disseminating the information.

In 1996, when country research institutions were facing a lot of financial problems, it was decided through a FORAFRI project to collate and process available information on the humid forest. FORAFRI is a CIFOR and CIRAD-Forêt project, in collaboration with the governments of Cameroon, Gabon, CAR, Congo and Côte d'Ivoire. The project outcomes consist of a series of 20 useful documents of important data that can be used when developing SFM. For example, there are data on forest dynamics after logging in CAR, on growth and productivity in humid forests in Côte d'Ivoire, on the basis of silviculture in humid forests, on state of the art in forest experimental designs and on case studies of forest management in Cameroon and Guinea and permanent sample plots in humid forests. At the country level, a few other projects have also generated knowledge that will be useful in developing forest management plans. This includes the Tropenbos Cameroon Programme (growth and mortality before and after logging, biodiversity, etc.), and CIFOR studies of the impact of structural adjustment programmes and population migrations on timber exploitation. At the same time IPGRI and CIRAD-Forêt have been interested in genetic diversity and the impact of logging on genetic diversity of important timber species, Azobé (*Lophira alata*), Ayous (*Triplochiton scleroxylon*) and Sapelli (*Entandophragma cylindricum*).

## **3.0 CASE STUDIES ON MANAGEMENT OF FORESTS FOR WOOD PRODUCTION**

### ***3.1 West Africa***

#### **3.1.1 General**

In West Africa, the overriding influence on industrial wood production, processing and marketing is exerted by governments, which create the environment in which the private sector operates to dominate the scene. In selecting cases to study in detail for the purpose of identifying lessons that can be learnt towards SFM, it was decided that the study must begin with understanding government institutions and practices that govern industrial wood production before moving on to the exploiters. The case studies in West Africa were therefore made in terms of countries rather than concessions. Ghana and Côte d'Ivoire were chosen for the case studies because they are major producers and consumers with adequate wood surpluses to be leading players in the industrial wood export trade. Factors involved in the export trade industry, such as certification, can be important incentives for the progress towards SFM. For each country, details of roles and actions by governments in forest management for industrial wood production are first described, before reporting the findings with timber companies.

The case studies in Ghana and Côte d'Ivoire were based on visits and interviews with government operatives and private sector exploiters in these countries.

#### **3.1.2 Ghana case study**

##### **(a) Government roles**

##### ***Institutional and administrative framework***

The institutional framework for forestry in Ghana today is the 1994 Forest and Wildlife Policy encoded into law by the 1999 Forestry Act. The policy reflects the realities and aspirations of present day Ghana, and defines the principles and objectives of forest resources management and the strategies for achieving the objectives. Its core aim is stated as:

*“conservation and sustainable development of the nation’s forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society” (MLF, 1994).*

Among the major provisions of the policy, the following strategies are particularly relevant for the pursuit of SFM (Agyarko, 2000):

- Competitive procedures for allocation of forest utilisation contracts to ensure that only capable and properly equipped operators will have access to the resource; concession leases will be replaced by Timber Utilisation Contracts (TUCs);
- Effective felling controls and standards will be introduced on- and off-reserves, to ensure compliance with a sustainable annual allowable cut (AAC) derived from knowledge of forest growth rates and aligned with installed milling capacity;
- Market-led pricing of forest products to reflect the economic value of the resource, to ensure efficient resource utilisation, to provide adequate funds for resource management and an equitable share of revenue to the owners; stumpage will be linked to FOB price and significantly increased;
- Improvement of accounting and timely collection of resource utilisation revenues in order to augment the finances of institutions;
- Conversion of the timber industry into a low volume, high value industry; value added processing will be encouraged;
- Revision of resource management standards and prescriptions for sustainable forest management;
- Establishment of data bases and information linkages to facilitate decision making and policy analysis;
- Particular emphasis on people’s participation in the management of forest resources with rights to consultation, access and benefits;
- Promotion of public awareness and involvement of rural people in forestry and wildlife conservation; and,
- Institutional reform of forest administration and management to provide modern, business-like services with a rational corporate culture and a commitment to being cost-effective.

To guide the execution of the policy in the short, medium and long term, Government in 1996 launched a Forestry Development Master Plan, and to ensure that Ghana had the resources, action plans and necessary degree of coordination to implement the Master Plan, Government further prepared a ten-year sector investment programme known as the Natural Resources Management Programme (NRMP), as a framework for directing and coordinating donor inputs. It is noteworthy that considerable emphasis is placed on returning benefits to the rural communities in the NRMP, which has the goal to *‘protect, rehabilitate and sustainably manage national land, forest and wildlife resources through collaborative management and to sustainably increase the incomes of rural communities who own these resources’ (Agyarko, 2000).*

The 1999 Forestry Act provides for a reformed Forestry Commission in the Ministry of Lands and Forestry, in which a Lands Commission, a Stool Lands Secretariat and a Land Titles Secretariat exist as parallel units. The Forestry Commission is charged with implementing government policy on forestry and is the ultimate manager of the country’s forest resources. Within the Commission, the Forest Services Division (FSD), the Timber Industries Development Division (TIDD) and the Wildlife Division see to the day-to-day management and conservation of Ghana’s forest resources and the associated industry and trade. The Forest Services Division relying on data bases maintained at its Forest Management Support Unit maintains the forest estate and controls exploitation of all the forests of Ghana. FSD prepares management and operational working plans for the forest reserves, nowadays in conjunction with local communities and other civil society stakeholders. About 30% of Ghana’s forest reserves have such new management plans. TIDD is responsible for product and market development, standard setting and inspection, and trade

promotion.

### **Exploitation**

As at 1995, about 1.6 million ha of closed forest was described as intact in Ghana; the timber production area was estimated as 762 400 ha, and the standing volume of 60 species classified as being of commercial interest, based on demand at that time, was 188 million m<sup>3</sup>. Annual allowable cut was estimated at 0.5 million m<sup>3</sup> from forest reserves and the same level 'off-reserves' (*Agyarko, 2000*).

The new approach to forestry required the dismantling of the old system of logging, which concentrated too much power with the concessionaires, to the neglect of other stakeholders, especially local communities. To allow for a thorough review of the system, allocation for new exploitation was suspended between 1992 and 1997. By the Timber Resources Act of 1997 exploitation ceased to be based on concessions, being replaced by Timber Utilisation Contracts (TUCs), which require exploiters, among other conditions, to enter into a Social Responsibility Agreement with the local communities in their area of operation. By the agreement, the exploiter undertakes to invest at least 5% of the royalty payable on his operations for the development of the community. In the past all royalty was paid to government, which then made allocations to district assemblies and traditional rulers. Royalty is paid at the rate of 60% of the stumpage fee for off-reserves and 40 % for on-reserve allocations. In the past, stumpage fees did not bear any relationship to market realities. With the reforms, stumpage is now set at 20, 10 or 5% of the FOB price of the particular species, depending on resource scarcity (*Agyarko, 2000*).

Exploitation occurs both within and outside reserves, denoted, respectively, as on- and off-reserves. In the past, some concessions spanned over both types of area, and some small reserves were grouped together into Forest Management Units (FMUs) for the purpose of allocations. These practices are no longer in vogue. The Forest Services Division (FSD) carries out a 100% pre-exploitation inventory, marking all the trees to be exploited in forest reserves. When these are ready for exploitation they are then advertised in the newspapers for expression of interest. Applications are screened on such criteria as business registration status, validity of the property mark possessed, indebtedness to the Forestry Commission, infringement of rules in the preceding two years and operating capacity. Pre-qualified applicants then inspect the advertised area and submit a bid, which must include a statement of how much is to be paid as 'goodwill'. It was not possible to discover the degree of influence exerted by this last requirement on winning the allocation.

The successful bidder then develops a logging plan, including roads, skidding routes, sidings and gantries, for the approval of the FSD. The operation is rather elaborate, and actually contains the following elements: (a) the preparation of harvesting schedules to define the order in which compartments are harvested; (b) stock survey (100% enumeration) in each compartment to determine which trees are available for felling; (c) calculation and allocation of the actual yield, based on application of a yield formula, in order to keep within the AAC; and (d) issuance of felling permit. In off-reserve allocations the elements include (a) pre-felling inspection of trees by contractors with farmers and FSD; (b) issuance of felling permit (c) payment of compensation for crop damage; and (d) issuance of conveyance certificate for removal of logs (*Agyarko, 2000*). Exploitation is followed by a post-exploitation assessment to verify adherence to logging guidelines and manual, and to ascertain that any environmental damage has been rectified.

The Secretariat of the Forestry Commission, in collaboration with FSD, makes the technical preparations for the award of TUCs. Actual awards are confirmed by the Board of the Forestry Commission, which has members with competence in technical, social and political matters concerning forest resources. Contract areas are grouped into small (less than 5 000 ha), medium (5 000-12 500 ha) and large (more than 12 500 ha) sizes, and a single contractor can have several allocations of various sizes. In area terms, about 10% of the allocations, all outside forest reserves are of the small size, 60% of medium size and 30% of large size. In the revised scheme, allocations are generally made for 40 years. Before the present reforms, only a few but large multinational companies competed with local entrepreneurs in the logging industry. Nowadays, many more expatriate operators compete with Ghanaians in the industry. Evidently, except to the extent that land is under great pressure for farming, land tenure is not a constraint to forestry development. Anyone, irrespective of sex, can acquire land for settlement, farming or forestry.

### **(b) Views of a contractor – SUNSTEX Co. Ltd.**

Details of the interview with an individual "timber utilisation contractor", which largely corroborate the information from the government staff interviewed, are given below:

*“Nana Dwomoh, operating under the trade name of SUNSTEX Co. Ltd, is the contractor for a medium sized (10 100 ha) off-reserve allocation in the Drobo area of Brong Ahafo region of Ghana. His allocation was made as a 40-year concession in 1992 before the suspension of allocations during the revision of procedures from 1992-1997. Like most others in the same stead, he has regularised his allocation into a contract under the new dispensation. The Drobo allocation is one of two that he has. He processes his logs into kiln-dried lumber, mouldings, doors and furniture parts, and exports 60-70% of his product. He confirmed that each year, exploitation is preceded by a pre-exploitation inspection of his allocation by the FSD staff, in conjunction with farmers and chiefs of the local community to approve and mark the trees to be felled. He is allocated 60-100 trees annually, yielding 1000-2000 m<sup>3</sup> of wood, as his share of the 0.5 million m<sup>3</sup> AAC for off-reserves. Exploitation is followed by a post-exploitation assessment for conformity with the logging plan and manual, particularly the adherence to the marked trees in type and number, and damage to the environment, particularly water bodies and roads. Stumps are examined and measured and graded fines are paid for any defaulting. All due fees are paid before the issue, by FSD, of a conveyance certificate, without which the logs cannot be moved from site. Check points are strategically located along the routes and log movement is restricted to daylight hours between 6.00 am and 6.00 pm. A special permit is needed to move logs on public holidays and any use of FSD staff out of working hours is paid for by SUNSTEX Co. Ltd.*

*Mr. Dwomoh observed that the local communities exert a powerful influence over his operations. They readily report any muddying of their waters resulting from logging. He was particularly irked by the control they exert over the number of days he is allowed to work. No work may take place on days of traditional observances, known as taboo days, which according to him are getting too frequent these days, and because he engages some of the local people among his staff on a salaried basis, he loses many man-days that he pays for each year. Evidently, the labour union would not allow engagement on a daily basis. Mr. Dwomoh welcomed the more rigorous control of operations by FSD, though he would be happy to see the processes shortened to minimise the delays in getting logs out for processing. His most serious complaint was against the menace of illegal chain-saw operators who steal logs from his site. While applauding the local communities for their enlightened pursuit of their rights against loggers in their area, he felt that they could have been more helpful in controlling the activities of chain-saw poachers. He also thought government could have done more than it was doing by, for example, intensifying plantation development programmes, which would provide employment and help to reduce poverty. He was of the view that such a programme might help to reduce chain-saw poaching. He further thought that the whole question of chain-saw poaching should be raised as an issue for wide public debate as has happened with other issues of national importance in Ghana.”*

### **(c) Summary of findings for Ghana**

In the context of the pursuit of SFM for industrial wood production, the major findings from the Ghana case study may be summarised as follows:

- The potential for achieving SFM for industrial wood production is high in Ghana because of (a) the existence of a network of managed closed forest reserves for which considerable knowledge of their characteristics and the demands being made on them already exists; (b) the advance already made in reforming institutions and putting in place progressive measures for controlling logging to regulate yield, safeguard the environment and accommodate local communities; (c) the high level of sensitisation of the local communities who now serve as additional controls on loggers.
- There is evidence of a systematic effort to prepare revised management plans for the productive forest reserves, and a commitment to control logging to minimise environmental damage and promote ecological stability. The promotion of ecological stability is further supported by a practice by which forest reserves or portions of forest reserves with a high biodiversity value are totally excluded from logging.
- Local communities appear to be very enlightened on environmental and forest resource matters, evidently due to the efforts of the Environmental Protection Agency, in collaboration with a vibrant community of civil society organisations, in raising public awareness since 1995; institutions such as community forest committees are well established and widespread.
- There is a clear willingness on the part of government to re-establish local communities as the primary

clients of the Forestry Service, having the right to share in the responsibility for management and in the benefits accruing from management of forest resources. This should foster collaborative management initiatives and ultimately make forest management socially sustainable.

- From an interview with a former Technical Director of the Forestry Commission, and now a Technical Director with ATO (Dr. Emmanuel Sisi Wilson), and from the Ghana FOSA Country Report, it was evident that the logging industry in Ghana is amenable to forest certification as an instrument for promoting SFM. Already, with active stakeholder consultation and collaboration, a Ghana Forest Management Certification System Project has been initiated, with support from the European Union and the Netherlands Embassy. The aim is to develop forest management unit specific standards with active stakeholder support for SFM in Ghana.
- Calculations made in 1993 showed that the annual cost of the forest sector institutions was about US\$14 million, compared to the total revenue of US\$5.8 million collected by the sector because of a low level of recovery of official rent. The sector was evidently being maintained by the tax payer and donor subsidies for the cost of forest management and protection. The studies in 1993 also showed that sufficient revenue could be raised from the forest industry to cover the institutional costs of sustainable forest management in Ghana, provided there was courage to implement various institutional and incentive based reforms proposed for the sector. Some of these reforms as shown above are already in place, but it may be too early to assess their impact on the economic viability of SFM (*Mayers et al., 1996*).

### 3.1.3 Côte d'Ivoire case study

#### (a) Government roles

##### *Institutional and administrative framework*

The current National Forest Policy is under revision with assistance from FAO. Reform of the institutional framework for forest management already led, by 1992, to the assignment of the function of exploitation of the country's forest estate to the government agency, SODEFOR. However, faced with the continued degradation of the country's forest resources, government took further steps to address the situation by issuing a decree for the improvement of management of forest exploitation. Major elements of the 1994 decree include:

- a ban on forest exploitation for industrial wood production beyond latitude 8 N;
- suspension of forest exploitation for industrial wood production around forest communities and from the permanent forest estate;
- creation of a data base of legal timber exploiters;
- sensitisation of rural communities and communities near forest reserves as well as timber companies on the reforms in forest exploitation;
- intensification of control of forest exploitation by creating a Forest Police Force and improving patrolling facilities;
- continuing the management of state-owned forests; and,
- intensifying rural reforestation and forest regeneration.

At present, all the 290 or so forest reserves in the country are managed by SODEFOR, while the government Department of Production and Forest Industries (DPFI) in the Ministry of Water and Forestry manages the forest resources in the rest of the country. In area terms, while SODEFOR manages about 10% of the productive forests, DPFI manages 90%. This translates to production through SODEFOR of only 100 000 m<sup>3</sup> of the 2 million m<sup>3</sup> of wood produced in the country annually.

##### *Exploitation*

Exploitation from the **forest reserves**, under the control of SODEFOR, is based on an inventory and a

management plan prepared by SODEFOR for each reserve. These are allocated to loggers through an open competition, judged in terms of the reputation, financial and technical capacity, and proximity of the processing site of prospective exploiters. Currently, allocations are made for terms as short as six-month to one-year, or as long as it takes the exploiter to evacuate the wood cut, but logging must conform to an agreed logging plan, including measures to minimise environmental damage. Penalties are paid for defaulting on any of the concession terms and damaged roads must be repaired by exploiters. Concessionaires employ local people who, however, often resent the fact that exploiters have no obligation to them. SODEFOR maintained that they had adequate manpower to supervise exploitation by concessionaires.

SODEFOR is working towards SFM and is aware of the need for, and the consequences of, certification. They plan to introduce modifications shortly that will include longer term concessions and require exploiters to agree with the local people on some obligations to the people.

For the purpose of managing exploitation, the **rest of the productive forest** zone is demarcated into 292 compartments, ranging in size from 2 000 to 161 000 ha each. As at 2001, 199 of these compartments had been allocated to contractors, again based on an open competition decided on the criteria of financial and technical capacity and proximity of industry to allocation. Although a few concessionaires may receive more than one allocation, the general practice appears to be to involve as many concessionaires as possible in the production process. For example, the 2001 allocation record shows the 15 compartments in the Abengourou region shared among 12 concessionaires; only three of these had two compartments each. The concessionaires are categorised into three groups:

- (a) industrialists, who process logs into lumber, furniture parts, plywood and panel products, some of which is exported;
- (b) cooperatives, who sell to industry, and,
- (c) individuals and societies, usually in partnership with industrialists.

Since 1994, concessions have a duration of 10-20 years, which appears to be arbitrarily fixed; it was 5-10 years before 1994. Concessionaires prepare a pre-exploitation inventory and logging plans that are approved by the Forestry Department before operations start. It seems that yield is controlled arbitrarily by restricting concessionaires to exploiting only 20% of the estimated volume of wood in each allocated compartment. For each allocation, a local committee comprising local civil administration, villagers, forestry staff and the exploiter is set up to monitor operations. The exploiter enters into an agreement with the local community to accomplish some development tasks before exploitation commences. Forestry staff monitors operations and exploiters pay fines for defaulting in any of the terms of the concession. Exploiters pay fees for the area allocated, for a logging permit and as stumpage for the volume of wood exploited. From the revenue collected, returns are made to the local administration and the local community. Evidently the forestry service has adequate staff, but lacks adequate facilities, especially vehicles, to supervise exploitation. The idea of SFM outside the forest reserves was thought to be untenable in Côte d'Ivoire because of the population pressure and intense competition by other users for forest land. Indeed, many of the classified forests (forest reserves) are themselves known to be badly degraded from this pressure.

**(b) Views of a concessionaire – TRANCHIVOIRE SARL**

The interview with a concessionaire, Tranchivoire Sarl, is reported below:

*“Tranchivoire is a non-indigenous company exploiting, processing and exporting wood in Côte d'Ivoire since 1995. It processes up to 40 000 m<sup>3</sup> of wood into lumber and particle board and exports up to 30% of its production. Sometimes the company buys logs from other exploiters to raise its production level to 50 000 m<sup>3</sup>. It employs 400 people both in the field and in the factory. Tranchivoire has up to seven blocks of allocations, totalling 70 000 ha, in the Alepe region of the country, around which there are many settlements. The concessions are of 10-20 years duration, but are renewed annually. It was not possible to discover how the allocations were won. Contrary to the information from the Ministry, no pre-exploitation inventory, stratification of site or logging plan is made by Tranchivoire; felling coupes are simply fixed annually by the Ministry. Tranchivoire claimed that it paid fines in lieu of damages to site, or for failure to apply any post-exploitation treatment or any other defaults. Movement of logs is checked by Ministry*

*agents on the roads to see that all necessary documentation and payments are in order. There is no special obligation to employ labour from local communities, but an agreement is reached with them to fulfil an obligation in cash or kind. Perhaps because of its readiness to overcome difficulties by making payments, Tranchivoire had no cause to complain about administrative delays, and although village 'taboo days' were not a problem, relations with villagers sometimes were. Chain saw poaching was not rampant in Tranchivoire's area of operation. The company would not discuss its production costs or income from sales, but maintained it paid all the necessary taxes – for area, stumpage and for villagers. It claimed to be producing sustainably and therefore would welcome the introduction of certification.”*

**(c) Summary of findings for Côte d'Ivoire**

The major findings of the study in Côte d'Ivoire may be summarised as follows:

- The productive forest zone is legally demarcated in the country by latitude 8 N and there is a network of forest reserves (classified forests) within this zone that can potentially support industrial wood production through sustainable forest management;
- The current state of upkeep of the network of forest reserves is not certain, but concern for the general degradation of forest resources, including forest reserves, in the country was the reason for the reform initiatives taken by government in 1994;
- In spite of extensive silvicultural and growth studies on forests in Côte d'Ivoire (*Parren, 2000*), and in spite of the work of FORAFRI, it does not appear that knowledge on the characteristics of the forest reserves and the demands made on them was being applied in forest management; yield control appeared to be made by arbitrary allocation, across the board to concessionaires, of 20% of the estimated volume of wood in each allotted compartment; similarly, duration terms for concessions, which range from six months to 20 years, do not appear to be based on knowledge of forest regeneration cycles;
- Reforms initiated are indicative of government commitment to pursue SFM, but the necessary policy and institutional framework to back this commitment are not yet in place; the national forest policy is still being revised, and it is not clear how a government quasi-business agency responsible only for development of the forest reserves can control the pressure on the reserved forests when the timber resources are exhausted in the free areas outside the forest reserves now being managed unsustainably; measures taken to ensure ecological stability of exploited sites appear to be weak and are not being rigorously enforced; since payment of fines can substitute for requirements for damage repair or post-exploitation treatment of sites, and there is no indication that fines collected are applied for forest regeneration or environmental rehabilitation, ecological sustainability using present exploitation practices in Côte d'Ivoire is uncertain;
- The forest service does not appear to have the capacity, at least not transport facilities, to supervise forest exploitation operations in the country effectively, and it was evident that a concessionaire was not aware and never implemented the pre-logging inventory prescribed by the forest service;
- Although village committees participate in monitoring logging operations and, outside the reserves, concessionaires are obliged to accomplish some development task for local communities, local people are still not adequately integrated into the decision making process for forest management in Côte d'Ivoire; the extent to which SODEFOR allows participation of local community in its processes is a critical factor in determining the social sustainability of forest management; and,
- Critical data on yields, rotation lengths, production costs and incomes, from which the profitability of operations and the economic viability of present exploitation rates may be assessed, are lacking. The study could not discover whether there exists any active investigation of these issues, which are essential in formulating SFM programmes for industrial wood production.

## 3.2 Central Africa

### 3.2.1 General

For this study, four out of the 17 cases nominated in the study by *FAO (2003d)* were used. The following criteria were used to select the four cases studied:

- The terms of reference of this report is to address the issue of sustainable management of forest for timber production. Only cases targeted at timber production as the major objective were therefore selected.
- The geographic distribution of the concessions: Cases studied were selected to cover the geographical regions of the Congo Basin.
- Variety of forest ecosystems: Cases studied covered the variety of ecological systems in the Basin - from evergreen, through semi-deciduous to dry forest ecosystems (in CAR).
- Variations in the management systems: Cases were selected to reflect the variations in responsibilities among partners in developing and implementing forest management plans.
- Local people participation: Selected cases represent varying levels of involvement of local communities in operation of the concessions.

The four cases selected for this study are: (1) **Lokoundjé-Nyong Forest Concession, Cameroon**; (2) **Haut-Abanga Forest Concession, Gabon**; (3) **Ngotto Forest Concession, Central African Republic**, and (4) **Pokola-Kabo-Loundougou Forest Concession, Congo**. Most of the information used to assess the case studies have been extracted from the report on “*Conservation and sustainable management of tropical forest ecosystems in Central Africa*”, edited by Isabelle Amsallem *et al.* (*FAO, 2003d*). The authors of the case studies are mostly staff involved in the management of the concessions. The information provided can be classified into four categories: (1) a general presentation of the forest ecosystem, (2) country forest policy and rules and regulations of forest concessions, (3) technical aspect of the management plan and (4) the implementation issues of the management plan.

Some key details, which would have been useful in assessing the sustainability of management, are missing in most of the reports. These missing details include information on land-use and timber production series (the area, annual allowable cut, annual harvest, harvesting intensity, etc.), the processing capacity of the concession-holder, level of participation of local populations and the advantages they gain from the forest management, employee wages, level of implementation of silvicultural treatments anticipated by the forest management plan, etc. The missing information is essential for assessing the sustainability of industrial round wood production. It would therefore have been useful for this author to complement the literature review with field visits to the logging companies, but this field contact with the concession-holders could not take place.

### 3.2.2 Lokoundjé-Nyong Forest in Cameroon

#### *Presentation of the concession*

The concession is 125,568 ha in area, stretching over Cameroon’s South, Littoral and Centre Provinces. This reserved forest is a closed moist forest lying mainly in the Biafran Atlantic zone, with a small part in the coastal Atlantic zone. It suffers severe disruption because of large human presence. Moving from the interior towards the coast, the following succession of vegetation types is found: typical Biafran Caesalpinaceae forest in which Caesalpinaceae are still abundant, forest in which the family is relatively rare and lastly typical *Lophira alata* and *Sacoglottis gabonensis* coastal forest. The Bovideae, Cercopitheceae and Viverridae families predominate.

The Lokoundjé-Nyong Concession is under the Ministry of Environment and Forestry (MINEF) through a Technical Operational Unit (TOU) created in 1999. The TOU is a decentralised structure of the MINEF. The Unit headed by a warden falls administratively under the Provincial Delegate of MINEF for South Province and the MINEF Forestry Department. The warden receives field-level support from the heads of forest stations. The concession-holder, a Cameroonian-owned company called Mba Mba Georges Sarl, is

responsible for implementing management measures and also participates in socially oriented work by paying an annual forest fee and carrying out activities agreed with the local population.

The inhabitants of the 31 villages bordering the forest apply management measures in the buffer zone. Partnership with local population is established through rural forestry committees (RFCs), which were set up in all villages of the concession when the management plan was being prepared, in order to establish an interface between TOU, the local population, the concession-holder and other partners. But there is at present no operational partnership within the framework of the Lokoundjé-Nyong forest management plan. However, some measures in the buffer zone were supported by funding from the Canadian International Development Agency (CIDA). From time to time, NGOs such as WWF visit the forest. However, since the end of the project and hence of material and financial support, the RFCs ceased to be operational.

The Canadian technical and financial support was used by the TOU to develop an information and awareness campaign in all villages of the zone. Thereafter, the forest was closed off and declared a timber production forest in 1997, with a management plan being finalised in 1998. After a biophysical management inventory, stratification was carried out in terms of vegetation, morpho-pedology and density; and four main land-use types were defined for the concession: primary forest, secondary forest, forest on hydromorphic soils and crop and fallow land. Sectors not suitable for timber production were identified according to the following parameters: ecology, cartography, field observations and study outputs and/or information provided by local population. These sectors (or “allocations”) were mapped on a 1:50,000 scale.

The management plan is a combination of volume and capacity-based principles. The forest was divided into eight five-year management blocks and 40 felling coupes on the basis of volume to be extracted per period, with the potential level of extraction and growth being estimated for each species and with a 40-year rotation period. Silvicultural interventions are proposed in the management plan (clearing around the stems, liberation cutting, enrichment, etc.). To get a better idea of forest dynamics or stand reactions to different interventions, the management plan recommends setting up permanent monitoring plots for each type of intervention being used. However, logging activities are still being carried out under the provisional logging agreement, and silvicultural interventions and permanent monitoring plots have not yet been set up.

Reducing logging impact and improving forest management practices in Cameroon will be achieved by using intervention guidelines such as directional felling, creeper removal, the planning of the road networks, skid trails and stockyards, etc. Conservation and protection measures focus on sensitive zones or those at risk of soil degradation. Fishing and hunting are permitted in these zones, while collecting is restricted to fruits. Logging, the gathering of poles and agriculture are banned. Wildlife will be taken into consideration by establishing a wildlife protection allocation (4.6 % of the concession area) where wildlife habitats will be developed. Measures will be taken regarding hunting. However, there are as yet no guidelines or rules for an inventory or management of wildlife in a timber production forest. Rights of use or customary rights are recognised for local inhabitants for household use. It should be noted that illegal logging on the concession has practically ceased. Management and/or silvicultural measures to be established for non-wood forest products (NWFPs) will be examined in greater depth when preparing the five-year and annual plans, identifying their extraction areas and making an inventory of them. In addition, management measures for the buffer zone must harmonise the local people’s uses with the production systems that foster maintenance of forest vegetation. A land use plan must thus be developed for each village.

#### ***Comments on Lokoundjé-Nyong concession***

The information available is mostly focused on the history of the concession and on general information on the technical aspect of the development of the forest management plan. Additional information expected on how the concession-holder is implementing the management plan is missing. The five-year and annual working plans are not yet elaborated. It is not explicit either if a master plan has been developed according to different land-use types found in the area, or how many series compose the forest concession. There is no information about the worker status.

Prior to designing the forest management plan for the concession, biophysical inventories and socio-economic studies were conducted by the TOU. The rotation has been fixed to 40 years and 40 felling coupes designed and mapped. This rotation is a bit longer than the provision made for the rotation period

(30 years) by the ministerial guidelines on how to develop a forest management plan for production forests. A longer logging rotation period will improve the natural regeneration of the forest. But smaller areas of felling coupes could also jeopardise the economic viability of the concession-holder if its processing capacity is higher than the volume logged. The management plan of the concession was developed before allocating the concession to the logging company and there is no information whether the felling coupe areas have been re-adjusted afterwards according to the processing capacity. The economic sustainability of the processing tool of the company is therefore questionable.

The long rotation period, the silvicultural interventions and the logging practices proposed in the management plan, if implemented, could assure the ecological sustainability of the concession. But they have not been implemented by the contractor, while at the same time logging activities are still going on without either the five-year or (most important) the annual operational plans. It is navigation without instruments. The question is to which extent the contractor has respected the management plan?

In terms of the benefits that local people can get from the forest concession, the management plan has planned to manage the buffer zones and the management and silvicultural measures for NTFPs, which are of great interest for local the population. But these two important activities have not been implemented. At the same time, hunting and fishing are authorised in sensitive zones, which are under protection measures. Opening new roads without controlling these two activities can destroy these resources. The operational partnership composed of TOU, the local population, concession-holder and other partners developed for the concession has not been made operational. There is no real and full participation of local people in logging activities. The image projected by the organisational scheme of the management is three separate entities without any linkage: the administration represented by the TOU in charge to design the forest management plan and to control its implementation, a private company in charge to implement the management plan (restricted to logging activities) and local populations who have to sort out the management of the buffer zone and NTFPs. This will end with conflicts between logging company and local populations and the disrespect of the management rules mutually agreed upon. The TOU (government representative) seems not to be able to monitor the implementation of the forest management plan (FMP).

In conclusion, we have a good and replicable management plan with provision for long term regeneration of the forest ecosystem. The economic viability of the system is questionable because of the financial weakness of the logging company to properly implement the management. The result is a bad social environment where local people have been left out of the system and the promises made by other partners to villagers, in terms of their participation, have been broken.

### **3.2.3 Haut-Abanga forest concession in Gabon**

#### ***Presentation of the concession***

The Haut-Abanga “forest concession under sustainable management” (FCSM) awarded to Rougier Gabon Company is a state-owned natural closed moist forest with an area of 288,626 ha located in the north of Gabon. The forest is part of the regional centre of Guineo-Congolian endemism and has an exceptional high degree of species diversity. Over 99 % of the Haut-Abanga FCSM is at present covered by forest and the main formations are secondary closed moist forests of various ages, usually the result of agricultural clearing. Other plant ecosystems have been identified on the concession, such as those on mountains and steep slopes. The concession can be described as a forest of Burseraceae (18% of the trees), Myristicaceae (15%), Caesalpiniaceae (15%) and Euphorbiaceae (9%). The concession appears to be relatively rich in wildlife in terms of both diversity and quantity.

The concession has been developed in the Gabonese regulatory framework oriented very clearly towards sustainable management of the forest heritage by placing forest concessions under management. But the application decrees are still to be drafted in order to allow full application of the code. The country’s forests are divided into permanent state-owned forests and rural forests whose use is reserved to village communities. The rural forest system has not yet been formally established and regulations governing management procedures still have to be drawn up. The forest code defines several types of permit: FCSMs, covering an area of 50,000 to 200,000 ha; associated forest permits, covering areas of less than 50,000 ha; and mutual agreement permits, covering 50 trees. With regard to the social dimension, the law stipulates that the management plan for any FCSM must take into consideration the people living in the area affected

by the FCSM. Further, the FCSM permit-holders must make a financial contribution to support collective-interest development activities initiated by the village communities. The new forest Code sets the logging companies at the heart of the forest management of their concessions. The role of forest administration represented by the Ministry of Forest Economy through the Forest Inventory and Management and Regeneration Departments, is to ratify all development and management documents and then monitor the proper implementation of the management plan. The Wildlife and Hunting Department is more involved in managing wildlife and protected areas.

The management of the Haut-Abanga FCSM has been entrusted to a private company, Rougier Gabon, for timber production, biodiversity conservation, wildlife management and fragile ecosystem protection. The company is receiving technical support from the French consulting firm called “*Forêt Ressources Management*” and financial support in form of loans from the French Agency for Development (AFD), to help the company to prepare the management plans and acquire skills needed to accomplish their tasks.

The FCSM is relatively inaccessible. Moreover, it has contained no indigenous inhabitants since the 1950s, while the closest villages today are located nearly 5 km from its boundary and have no direct access to it. Social scientists who have conducted research in all these villages have recorded no claims to customary rights inside the concession area. Human pressure on the forest ecosystem therefore tends to be very low. Full integration of forest management activities into the company is vital if the measures advocated in the management plans are to be effectively implemented. At field level, a Gabonese forest specialist supervises the implementation of the management of each FCSM. He is working within the local management branch that falls under the logging supervision.

Ninety % of the Haut-Abanga FCSM has already been logged over by various companies since the 1960s. The management process started in 1996 with the feasibility study of the FCSM management project. A provisional management-logging-processing agreement was therefore signed, and the project was launched in 1998-1999 with the development of technical norms through on-site pilot activities and the establishment of a management unit within the company. An evaluation on the management approach was carried out at the end of year 2000. The forest management plan was then developed and approved in 2002. There were consultations throughout the process with two international NGOs: WWF and WCS.

The following concerns motivated the commitment of Rougier Gabon to the management process of its concessions: conformity with national legislation, stable integration into the local and national economy, conservation of the forest heritage, rationalisation of logging activities and increasing productivity. There was also a conditionality to fund its industry with its commitment to sustainable management. Last but not least, certification of its products was also agreed. A certification audit was in fact carried out in 2002.

Data collected prior to the development of the management plan included exhaustive management and harvest inventories, counting all species (300) with 10 cm dbh or more. Forest sample plots were also installed for post-harvest monitoring, while regeneration trials were implemented to get a better understanding of the ecosystem dynamics. Thanks to the use of GIS, the distribution of various elements recorded could then be studied. The timber potential was mapped, and also plant diversity, the abundance of various plant and animal species and the pressure on wildlife. The volume of available timber is precisely known and simulations of stand development can be made, which is helpful when planning harvesting and processing activities. The rotation was fixed at 25 years. The following management series were also decided: timber production series, biodiversity conservation series and two protection series. The conservation series was selected because of their high timber species diversity. The two protection series focused on one fragile mountain ecosystem and one on the banks of the Abanga River, which are rich in large wildlife. All extraction and introduction of machinery is banned on the conservation and protection series (about 10,000 ha). To satisfy employee needs, two sub-units were created within the production series: the agroforestry and hunting sub-units, where agricultural and hunting activities are authorised under certain conditions. Management parameters, rotation period, minimum harvest diameters and a list of target species were defined in order to ensure a satisfactory regeneration of forest stands.

At implementation level, a full-scale inventory of forest stands was carried out, which was accompanied by a detailed mapping of inventoried trees. After the inventory, few harvesting parameters were decided such as the annual allowable cut (AAC). Cutting was planned on two forest management units (FMU), which were in turn divided into forest harvesting units (FHU) so that the equal volume can be produced annually. The silvicultural approach adopted is an irregular coppicing with 25 year rotation.

### ***Comments on the Haut-Abanga concession***

A partnership has been created between the government of Gabon, a French private company, Rougier Gabon, and a funding agency, the French Agency for Development (AFD).

At policy level, the forest code is still waiting for its application decrees, which must be there to put the law into force. The forest law could therefore not yet be applied. This may be the reason why the concession area (288,626 ha) is bigger than what is stipulated in the law (200,000 ha maximum for FCSM). The rural forest system has not yet been formally established. This could explain the difficulty met by the concession-holder to involve local populations in the management process as there was no mention about local population participation either during the development or the implementation of the management plan.

By law and regulation, the forest administration approves the management plan and monitors its implementation, which will allow it to continuously keep tracking the implementation of its policy at field level. To be fully operational, the administration still need to improve its field monitoring system to enable its representatives in charge of supervising the implementation of the management plan to be fully independent of the concession-holder. Dependence on concession holders is unfortunately very common in Central Africa.

The concession-holder has used a private firm for assistance in developing the forest management plan. This close collaboration between the logging company and a technical consultant is advisable to get a sound management plan, because the capacity to develop forest management plans is not yet common among logging companies of the sub-region. This should therefore be seen as an opportunity for on-the-job training for the company workers and for forestry service staff. The development of the management plan process should be used as an opportunity not only to train staff but also to reinforce the collaboration and mutual trust among various stakeholders.

The management series are selected after a thorough management and harvest inventory. The management design is the same used in most countries in the sub-region. It could be technically replicated elsewhere when dealing with large concessions. But no mention has been made about the silvicultural treatments scheduled for the timber production series before and after logging activities. Twenty-five years for the rotation is too short. Thirty or forty years is the rotation period commonly used in the Congo Basin region.

It was a good innovation for a logging company to install a post-harvest monitoring plot, to monitor forest dynamics after logging. The same monitoring system with a control could be repeated elsewhere in the region if the logging company accepts to sustain monitoring the regeneration dynamics. Similar permanent sample plots were installed in the Ocean Division in Cameroon by Tropenbos Cameroon Programme.

The weak point of the management is the very low level of participation of the local population. There is also a very light involvement of Gabonese forest staff. Involving local people in all steps of the development and implementation of the management plan is in the interest of the concession-holder. Even if the nearest villages are situated 5 km from the concession, such involvement might prevent conflicts with villagers, some of whom are also the workers of the logging company.

The motivations/expectations that have brought Rougier Gabon to commit itself to the forest management are:

- Close collaboration among partners (Forestry Department, WWF and WCS);
- Conservation of forest heritage for future generations;
- Feasibility of the management;
- Profitability of the management;
- Incentives (bonus) for good pupils and elimination of national and international barriers;
- International recognition; and,
- Certification of its products.

The development and the implementation of the management plan were not possible without the financial support of the French Agency for Development (AFD).

In conclusion, a strong partnership has been established between the forestry administration, a private company (logger), a technical institution (management plan designer) and a financial organisation. All stakeholders are represented to develop and implement a good forest management plan, except local populations. The system still has imperfections, which could be corrected. These include:

- Short rotation period;
- Pre and post-harvest silvicultural treatments;
- Weakness of the administration to really play its supervising and facilitating role.

### **3. 2.4 Harvesting and Management Permit (HMP) for the Ngotto forest in Central African Republic**

#### ***Presentation of the concession***

The Ngotto forest is located in the southwest of the Central African Republic (CAR). The forest area is 195,000 ha. The harvesting and management permit (HMP) given by the government covers closed forest, which represents 60% of the total area, degraded forest (17%), temporarily flooded forest along the watercourses and the swamp forest along the Mbaéré river. There are also savanna lands bordering the permit area, crop fallow land, patchworks of savanna and single-species gallery forest. There are 115 typical forest mammal species in the area and other animals, birds and reptiles.

Until very recently, the forest sector received little attention from authorities and donors, and only in the past 15 years has special interest been directed to it. A new forest code was promulgated in 1990 and it aims at harmonising the need to make profitable the forest heritage with the conservation purposes through forest management. The code defines two forest types: the state forests and community and private forests.

Provision has been made in the new code to convert all concessions into HMPs. In that case, ownership becomes permanent if the concession-holder respects the management plan elaborated and also the regulation of in-site processing of the 60% of the logs. Only one out of nine companies concerned by this measure succeeded to fulfil this measure by developing the management and working plans. Three others have started the process, including the ECOFAC/Ngotto forest, the Salo forest management project and the Support Project for the preparation of forest management plans. The HMP 169 was awarded to the “*Industrie Forestière de Batalimo (IFB)*”, a private company.

The beneficiaries are the company, the government and the local populations, including Pygmies (17 villages involved). The partners involved in the management include a French research organisation (CIRAD-Forêt, through the ECOFAC Programme), the concession-holder in charge to implement the management plan, the ministry in charge of forests, and donors (African Timber Organisation and European Union). The role of ECOFAC is to provide the government with technical and methodological tools for developing the management plan and also means for governmental pressures on the logging company.

The Ngotto forest is the first pilot project of its kind conducted in CAR. It was allocated to IFB in 1996. The management and working plans were developed in 1998. The area is part of the broader ECOFAC Programme rural development area, which covers 800,000 ha with other components such as conservation and rural development. The main objectives of the management of HMP 169 are avoiding the destruction of the stand, improving the living conditions of local inhabitants and obtaining a certification for timber harvested in the concession. A management inventory at 1% was carried out by CIRAD-Forêt. Stems with minimum of 5 cm diameter were measured. Rapid ecological surveys of wildlife and plant species were also conducted. With this data, ECOFAC was able to develop the management plan of the concession. The following conditions led to that achievement:

- The full participation of the concession-holder in most of the various meetings organised for the forest management.

- The timber company undertakes to implement this plan because of the sustainable management of timber resources and also for the sustainable supply of its industry.
- Full support of the ministry in charge of forestry.
- The fact that the plan does not, so far, stipulate any silvicultural treatment other than harvesting and pre- and post-harvest monitoring of the dynamics of the stand on monitoring plots.

The annual allowable cut, the felling plots and other harvesting rules were agreed among the partners. A 30-year rotation was fixed. Thirty felling plots were delimited. The rate was agreed for progressively increasing the processing unit capacity. The implementation of the management is monitored by ECOFAC and the forest administration. Twenty post-harvest plots have been established in order to study the post-harvest regeneration and phenology of sapelli seed-trees (the main harvested species). Sociological studies were also conducted to take into consideration local population needs. The protection of the concession is effective with the patrols of eco-rangers. A pre-audit for timber certification was carried out in 2001.

#### ***Comments on Ngotto forest concession***

The conversion by the law of the previous temporary harvesting permits into permanent ones is an unprecedented measure taken by a country in the sub-region. The objective is to secure the forest ownership to allow the owners to develop long term management plans. This will end the criticism made by logging companies when the forest code was enacted in other countries in the region. But this measure, to be efficient and replicable, needs first of all that a management and harvesting plan should be elaborated and agreed upon by the forestry administration prior to the attribution of the concession. Secondly, the latter has to set up a lasting mechanism for monitoring harvests. The low number of companies which have received the new permit shows the difficulties faced by companies. Only projects with a financial support can afford it.

The Ngotto forest is also interesting because the main technical actor, ECOFAC, which is a sub-regional programme with similar forest management plans developed in other countries (e.g. in Cameroon). Forest management is only one component within a broader rural development agenda of the ECOFAC programme. The advantage to get ECOFAC as the technical actor is double. First, the comparative advantages provided by each country experience, where lessons learnt from one country can benefit others. The second advantage of ECOFAC is that it handles the whole rural development sector, which means that forest management activities are integrated within a global rural development plan.

The management plan developed with a 30 year-rotation period is sound and it is replicable elsewhere. The weakness of it is that, except the pre- and post-harvest monitoring of the forest dynamics, no other silvicultural treatment is scheduled. This can jeopardise the ecological sustainability of the forest ecosystem. Except carrying out some sociological studies, no mention has been made on the participation of local communities in the development of the management plan, as scheduled. The forestry administration needs to be more present in the field, not only as eco-rangers patrolling the area covered by the ECOFAC component, but also to monitor the harvesting and the implementation of silvicultural measures.

In conclusion, the identifiable actors are the forestry administration, an international programme funded by the European Union (ECOFAC), and the logging company. Local populations are still missing among principal stakeholders. Participation of local people at the early stages of the development process of the management plan would avoid later conflicts. Without silvicultural measures, monitoring the pre- and post-harvest forest dynamics could not alone guarantee the ecological sustainability of the forest ecosystem. Bringing the processing unit into service by gradually raising its capacity, allows the capacity to be adjusted with the harvesting volume. This helps in ensuring the viability of the management system. Certification of the company's concession was one of the key issues, which brought the company to take the decision to be involved in the management process.

### **3.2.5 Pokola-Kabo-Loundoungou concession in the Republic of Congo**

#### ***Presentation of the concession***

The concession is composed of three areas: Pokola, Kabo and Loundoungou that have been allocated to the “*Congolaise Industrielle des Bois* (CIB) company. The Pokola and Kabo areas are currently being harvested, while Loundoungou is as yet untouched and being kept for the near future. The three areas cover a total 1,150,000 ha. A little over half is on firm ground and is thus suitable for sustained logging. The forest adjoins the Nouabalé-Ndoki National Park. It includes several forest types: firm-ground forest, swamp forest along the watercourses and in temporary flooded areas, limbali forest, secondary forest in previously harvested areas and clearings.

The law enacted in January 1974 was partially revised in 1982 by the law regarding the forest code. The 1974 law is considered very modern because it mentions sustainable forest harvesting, particularly through the creation of forest management units (FMUs) and the specification of annual allowable cuts (AACs). The objective was to ensure sustainable forest activities by including some concepts such as rotation, regeneration of potential crop trees and on-site timber processing. In 1990, the country started developing its Tropical Forest Action Plan (TFAP) with the objective to privatise the sector with the withdrawal of the government from the production sector. The plan was completed in 1997. It was used as a reference when Congo was developing a new forest code in 2000. But the application decree is still awaited. The new code concerns conservation of forest ecosystem vegetation, while wildlife conservation is governed by another law signed in 1983.

The institutional framework for forest management in the country is represented by the Ministry of Forest Economy. The reforms are still going on with the creation of new structures such as the National Reforestation Service, the National Centre for Inventories and Forest Management being awaited. Logging rights are granted through an industrial processing agreement, a management and processing agreement, a felling permit for plantations, or a special permit. The industrial processing agreement covers 15 years and it is renewable. It guarantees annual quotas to log specified species from a FMU. The holder is obliged to process the logs in his own plant. The management and processing agreement has the same rules, but the logging company must also carry out specified silvicultural work. The agreement is for larger areas and longer periods to allow the holder to carry out the management programme agreed upon. Although it could not exceed 25 years, it is indefinitely renewable.

The CIB concession is made through an industrial logging agreement for the three FMUs (Pokola, Kabo and Loundoungou). The company has 1,350 employees and produced 280,000 m<sup>3</sup> of roundwood, of which 61% is processed, 19% is simply cut up as lumber and 16% is exported. CIB is responsible for harvesting and processing. The forest administration carries out and monitors the forest management plan, while the regeneration is entrusted to the National Regeneration Service through the Pilot Management, Reforestation and Agroforestry Unit. The partners in the process are the forest administration, CIB, WCS (for sustainable management of forest concessions) with the support of IITA. A memorandum of agreement exists since 1999 between the Ministry of Forest Economy and CIB, creating a favourable context for inception of the project. CIB with the support from both a French consultancy firm (feasibility study) and Tropical Wood Environment (TWE) has developed the social and environmental aspects as well as the strictly “forest” aspects of the management plans for three FMUs. WCS assisted the company on all wildlife management activities. The management inventories were made by TWE and funded by *Agence Française de Développement* (AFD).

The management plan was based on a number of parameters, including AAC, rotation length, annual growth in diameter, annual mortality and felling damage, etc. The lack of research and the nature of the anticipated harvesting method (reduced-impact logging) perforce require a less intensive type of silviculture. The silvicultural approach adopted consists of removal of non-commercial species around saplings of commercial species with the diameter of 10 to 40 cm, thinning of strips where seedlings of commercial species are planted and retaining seed-trees on the stand. Wildlife management in harvesting areas focuses on habitat conservation and hunting restrictions. A technical consultation committee meets once a year to monitor observance of the contract established among the partners. The forest law stipulates that harvesting permit holders must submit every year for approval an application for annual cut to the forestry administration. This application must include a map indicating count results and also existing and planned stockyards, roads and tracks. A production statement showing the species and purpose must be given to the forestry administration every three months.

***Comments on Pokola-Kabo-Loundoungou forest concession***

At policy and institutional levels, the simultaneous use of former and current laws could be confusing. If it were necessary, because of their specificity, to have different codes for forest ecosystems and wildlife, this could also be difficult to manage. The control of logging activities is mostly based on the application that the concession-holder needs to submit every year. The industrial processing agreement and the management and processing agreement seem to be similar in terms of logging activities but they are very different as far as responsibility to developing and implementing the forest management plan goes. The first one seems to have been established to bypass the management responsibility. The concession-holder has therefore no legal obligation to develop management plans for its concessions. Partners seem to have gathered sound scientific information to develop a sound forest management plan. The management plan to be developed is targeting not only timber species but also wildlife (with the contribution of WCS) and NWFPs. This will be the first time such a management plan is developed and implemented in the region. It would be difficult for a company holding an industrial processing agreement to implement such a management plan without a mandate of rural development of the whole concession area. It will also be difficult to manage wildlife and NWFPs without a real participation of local populations. It is unclear if local people participated in the development of the management plans and what their inputs were.

The silvicultural measures constitute a major gap for the proposed management plan. It wouldn't be enough to plant commercial trees or to reduce logging impacts to sustain the forest production, it is also necessary to set up sound permanent monitoring plots to study not only forest dynamics and functioning, but also the impact of logging on harvested species. Even if details of the management parameters (rotation length, AACs, mortality, minimum diameter, etc.) have not been spelt out, the administrative and technical key issues mentioned above would have to be taken into account to allow an appraisal of long term sustainability of wood production in the concession area.

In conclusion:

- This is a novel management system which includes not only timber species but also animal and NWFPs in the management plan.
- The administration is weak, without any management skill and has no technical control on the process. Everything has been left under the logging company's responsibility.
- The regeneration measures taken could not alone ensure the ecological sustainability of the forest management.
- Management: No monitoring system, such as permanent observation plots, has been established to guarantee the sustainability of the management.
- One of the gaps of the multipurpose management proposed is that the supposed principal beneficiaries of the management of wildlife and NWFPs, i.e. the local communities, were not involved in the development of the management plan.
- The economical viability of such management is questionable.

### **3.2.6 Main outcomes from the case studies**

Five major actors are interacting in forest management in these case studies. These are the government, the contractor (logging company), the forest planner (generally a scientific institution), the local community and a bilateral or multilateral donor. It was expected that these actors would constitute joint ventures, where everyone benefits from the forest management. However, the picture coming out from the four case studies is that of actors put together without a common vision and objective. They are afraid of losing their respective powers and roles during the engagement in what they often see as a "test of strength". There are lots of fears and suspicions among stakeholders. It will be useful to analyse stakeholders' concerns/fears in order to take them into consideration when dealing with each other during the development of management plans.

#### ***Stakeholders' roles and concerns***

- *The government:*

- Implementation of international undertakings (conventions, treaties, protocols, etc.);
- Loss of sovereignty over national forest ecosystems;
- Loss of forest resources;
- Loss of incomes generated by forest products;
- Loss of control over forest activities; and,
- Loss of control of forest exploiters (included local populations).
- *The logging company:*
  - Funding “expensive” SFM measures and how it affects profitability of management;
  - Long term regeneration of forest resources after logging (the length of the rotation period);
  - Coercion measures that can be taken against their products;
  - Environmental NGOs and “ecolabelling”; and,
  - Market prices and market demand.
- *The donor:*
  - Environmental impact of logging activities (e.g. deforestation, climate change, etc.);
  - Erosion of biodiversity; and,
  - The impact of the supported logging arrangements on poverty alleviation.
- *Local populations:*
  - Loss of their traditional sovereignty over the forest ecosystems;
  - Loss of ownership of forest products (forest species which are sources for food and medicines and other purposes);
  - Loss of incomes generated by logging activities; and,
  - Separate agreements between the government and logging company, where they are left out of the process.

#### ***How to handle the stakeholders’ concerns***

- *With the Government:* The four case studies have shown the central role of governments on timber harvesting. Provisions have been made in laws and regulations to allow the administration to continuously control forest exploitation in order to avoid subsequent illegal logging. Forest contractors often need several administrative signatures all along the allocating process of a forest concession. In Cameroon, any logging activity is subject for approval by the authority in charge of forests and can only be granted to residents of Cameroon or companies registered in Cameroon (*GFW, 2000*). This makes the allocation procedure complex and sometimes ineffective. The administration seems to protect itself against other stakeholders, which are the international and local communities and logging companies.
- *With logging companies:* The major concern of concession-holders is the profitability of their concession. The case studies did not provide enough information to assess the profitability of the concessions. Available information concerns harvesting series areas and the rotation period and general information on Central African forest ecosystem productivity (see *Box 4*) and timber market data. Combined with the annual felling coupe area, approximately 3,150 ha in Lokoundjé-Nyong, 11,148 in haut-Abanga, 6,500 in Ngotto forest and unknown in Pokola-Kabo-Loudoungou, this can give a gross picture of the annual incomes generated by the four case studies. The missing information is the cost of logging activities to bring out the profitability of the system. The bulk profitability is less interesting than having a clear picture of the weight of each expenditure component of the logging activities; and mainly the components (e.g. regeneration treatments, salaries, involvement of local communities, etc.)

which may have a positive impact on sustainable management of the concession. But even if timber harvesting is profitable, the political environment with civil wars (Congo, DRC & CAR) may not encourage concession-holders (and the biggest ones are foreign companies) to reinvest their profits in sustainable management practices.

**Box 4: Profitability of a forest concession in Central Africa**

The long term sustainability of logging activities depends on the annual volume of wood exploited and the costs of the activities. The potential number of trees harvested per ha in Central Africa depends on the richness of the ecosystem. This number is between two and three trees per ha in Cameroon and Gabon, and one to two trees per ha in Congo and CAR. The volume of wood per tree varies according to the state of the forest with a higher volume for primary forests. It is estimated that a hectare of primary forest in Cameroon can produce 15-20 m<sup>3</sup>, 8-15 in Congo and 10-15 in CAR and 10-20 in Gabon (Memento du Forestier in BFT). The international prices of the major species harvested by the four countries are (*Industry News & Markets, September 2003*): Assamela 350 euros/m<sup>3</sup>, Ayous 152, Sapelli 206, Azobé 122, Frake 107 and N'gollon 152.

- *With donors*: the major concern of the international donor community is to assist countries to set up mechanism to develop and implement SFM, monitor the process and ensure that SFM contributes to economic development, poverty alleviation and environmental stability. The tools developed to assess sustainability of forest management plans are “Criteria and Indicators” and forest certification. But certifying and patenting new drugs extracted from plants (forest plants) have created a lot of confusion and anxiety among the actors. And patenting is more fearing than certifying because it targets the ownership. The question raised is who can patent what? It is difficult to patent a plant species (because of easy access to genetic resources, according to CBD article 15.2), but at the same time an active molecule extracted from the same plant species can be and is patented. Such international arrangements, without clarifications and awareness have created anxiety at governmental level and reluctance for their implementation. When CIFOR organised workshops to develop sets of C&I for SFM in various regions in SSA, there was a lot of suspicion from forestry administrations. In 1997, for example, the Cameroon government wondered about the real objectives of testing C&I in the country. The process was seen as an international conspiracy set up to maintain a close watch and control on logging activities. The timber certification process is seen by many governments as an interference of foreigners in the countries’ sovereign rights to manage their natural resources. One of the conclusions made by the Cameroon National Working Group on Forest Certification is that “*the main problem faced by the Cameroonian Working Group was convincing the national government of the importance of forest certification; convincing European logging operators of the importance of participating in the process of developing a national standard, and involving local communities*”. But, in the four case studies above, it was obvious that donors and international and research organisations, such as ECOFAC, CIRAD-Forêt, ITTO, CIFOR, etc., have played and continue to play a tremendous role in assisting actors in the new process of developing and implementing SFM.
- *With local communities*: Because of the unsatisfactory results achieved by past forest management plans, donors and forest planners suggested to include local communities as full partners all along the process. However, incorporating local communities has turned out to be a very difficult issue, and it has been and still continues to be diversely interpreted by other stakeholders. The four case studies provide a clear and divers picture of the place of local communities within the forest management process. In the Lokoundje-Nyong concession (Cameroon) the buffer zone was managed in favour of the local population, while in Gabon local populations are nonexistent within the concession area and no specific management measures were therefore taken. Local communities are included by ECOFAC in the development project in CAR. If the law has made a provision for the participation of local populations in forest management process, it seems unclear on how to handle this participation and who is paying for it. The Lokoundjé-Nyong case study would be a good example of involving local populations in forest management through rural forest committees set up in each village of the concession. But this mechanism could not be sustained without developing another mechanism on how

to fund it. Of course, logging companies will be reluctant to fund this participation. This will decrease their benefit.

## 4.0 LESSONS LEARNT FROM THE CASE STUDIES

### 4.1 General

The lessons learnt from the case studies are articulated around the following four particular items:

- (1) necessary conditions for implementing SFM and the extent to which current practices satisfy these conditions,
- (2) factors that inhibit implementation,
- (3) what needs to be done by different actors, and,
- (4) replicability of success stories.

There is a discernible general change in the approach to forestry in the sub-regions, such that other values of forestry than wood production are increasingly being accommodated. New policies and forestry laws show the desire and concern of the governments of the sub-regions to revolutionise forest management by offering new alternative methods, collective assumption of responsibility, decentralisation, and placing people at the centre of forestry in the sense aptly described by the following passage from *Westoby (1972)*: “*contrary to what many outsiders believe, forestry is not in its essence about trees. It is about people. It is about trees only as far as they can serve the needs of people*”. With the emergence of such spheres of application as community forests, management for timber production with people’s participation and creation of community reserves, we are coming closer to Westoby’s vision. The new approach is more inclusive of other stakeholders, such that farmers, local communities, NGOs, the private sector, government technical services and sometimes donors are now involved. The recently concluded Forestry Outlook studies, which identify major drivers of forestry development in the countries, also help to expand and clarify the scope of stakeholders. Given this development, the necessary conditions for achieving SFM in African rain forests are outlined below.

### 4.2. Necessary conditions for implementing SFM

#### 4.2.1 The resource base

Since the focus is on industrial wood production, SFM in the context of this report must be considered first in terms of the forest resource base for the production of this commodity. Although quantitative data are inadequate, the case studies confirm that the forest resource base exists in both West and Central Africa to support SFM, if the above change in approach to forestry is sustained. In West Africa, despite the extensive loss of forest cover under high population pressure, the resource base exists in the form of a network of protected closed forests, lying in a matrix of farm/forestland, which also contributes to production. There is also a long history and experience of efforts at sustained yield management and use of forestry to support national development that can be drawn upon to pursue SFM. In Central Africa, which is the most forested sub-region in SSA, the potential for SFM is greater, with more than 50 % of the land area still under closed forest cover. Institutions and the capacity for forest management are, however, less developed than in West Africa, forestry in the sub-region being centred on harvesting by foreign corporations operating large concessions. Weak political and institutional structures further impair the ability of Central African countries to take advantage of the favourable resource situation to advance social and economic development.

Knowledge of the resource base through inventories and security of tenure of forest land based on instituted land use plans are pre-requisites for long-term planning and action towards SFM. Data on forest resources for the study countries are dated, obsolete and/or partial (*FAO, 2001*). In West Africa, only Benin and Nigeria carried out an evaluation of their forest resources during the 90s; assessments were made earlier for Sierra Leone (1986), Liberia (1981) and Togo (1975), and only partial assessments exist for Ghana and

Côte d'Ivoire. In Central Africa, inventories cover only part of the productive forested domain in Cameroon, Congo, Gabon and CAR; national level inventories exist only for the DRC (1982) and Equatorial Guinea (1992). Most of the data in the Global Forest Resources Assessment 2000 are based on national expert estimates (FAO, 2001).

Security of tenure of forest land in West Africa is at best weak, as evidenced by the rapid rate of deforestation in the sub-region, mostly from conversion of forest land to cash- and subsistence-crop agriculture, mining, and development of settlements and infrastructure, especially in Nigeria, Côte d'Ivoire and Ghana (FAO, 2003b). Weak land use policies and regulations, as in the Land Use Act of Nigeria (Aruofor, 2000), largely account for instability of land use and, therefore, insecurity of tenure of forest land in the sub-region. In the Central African sub-region, Congo, CAR and DRC have no land use plans, while the proposition to develop one is still being discussed in Gabon. Only Cameroon has a zoning plan developed in 1995 for the forested southern part of the country (ITTC, 2003). The absence of land use plans, and the resulting instability of land use, not only make the forest resource base insecure but also inhibit the institution of long term plans and actions towards SFM. Long-term security of operations is a prerequisite for SFM to take root.

#### 4.2.2 Political will, commitment and financial investment in forestry

Given that the resource base exists, the next necessary condition is the political will, expressed as government commitment and adequate financial investment in SFM for industrial wood production. This is reflected operationally by the priority accorded the activity in government policies, programmes and budget allocation, which itself is engendered by the perceived importance of forestry in the national economy. It is reflected also by the willingness of the governments to undertake reforms and participate in initiatives promoting SFM.

The case studies show that industrial wood production remains one of the leading economic activities in both West and Central Africa. In Ghana, the timber industry is recognised as the third most important foreign exchange earner and one of the fastest growing manufacturing activities, generating substantial employment and income to a sizeable fraction of the population. The whole of forestry, as a sub-sector of agriculture, accounts for 6% of the country's GDP and 11% of export earnings, and employs a labour force of up to 100 000 people (Agyarko, 2000). Similar statistics for Côte d'Ivoire were not readily available to this study, but industrial wood production most likely enjoys the same status as in Ghana. Agriculture, of which forestry is a sub-sector, is the base of the economy, contributing 30% of GDP between 1990-1997, 70% of export and employing up to two-thirds of the working population in Côte d'Ivoire (Kadja, 2001).

In both Ghana and Côte d'Ivoire, there seems to be awareness that the acknowledged contribution of the wood industry to the national economy is likely to be enhanced by SFM, which in ideal situations, while producing wood, will also conserve biodiversity and the forest environment and support poverty alleviation. Especially in Ghana, there appears to be a determination that wood production should not be conducted at the expense of other values of forests. Benefits to the local community are given a high ranking even in logging, and biodiversity sensitive areas are excluded from logging. In the Central African sub-region, the forest sector is one of the top ranked (second or third) contributors to the annual budgets of the countries, contributing 9.7% of GDP in CAR, 9% in Cameroon, 4.7% in Gabon, 1.1% in Congo and 1% in the DRC. It is envisaged that in these countries, forestry will play an increasingly important role in the production of goods and GDP development.

Strong evidence of commitment is given also by the fact that most countries in the sub-regions are currently undertaking widespread forest management reforms. Several initiatives, recounted in Section 1.1 of this report, confirm that the political will to undertake reforms towards SFM exists. In Central Africa there is consultation at the highest political level over these reforms (e.g. COMIFAC, see *Box 1*). But reforms are a long way yet from meeting the conditions necessary for achieving SFM. Commitment of governments to reform is as yet not being fully expressed in terms of financial investment in forestry. Consequently, current management practices are still far from the ideals enunciated in the reforms and are, as were past practices, clearly not sustainable. The general observation is that financial investment in forestry is not commensurate with the value of forests to the national economies. Consequently, forest departments in most countries in the sub-regions are under-resourced and scarcely able to effectively carry out their

functions of managing, maintaining and protecting forests. Forest staff sometimes rely on forest exploiters, whose excesses they are supposed to check, to assist them, e.g. with transport and materials, for doing their work, making the poorly paid and under-resourced staff vulnerable to corruption.

Unless the reforms now taking place are quickly fully implemented, there is a real danger that the resource base, the protection of which so far has been a notable success of forest management in the sub-regions, will be further depleted, and irretrievably so in West Africa. Under-funding was one of the main causes for the collapse in forest management in West Africa, contributing to the rapid loss in forest cover.

#### 4.2.3 Health of the national economy and financial environment for forestry

A healthy national economy and a favourable financial environment for forestry are required for SFM to succeed. The weak economies of most of the countries in the two sub-regions and the need to address such pressing problems as poverty probably contribute to the low investments in forestry. In a depressed economy, not only is the pressure on forests and forest land from an enlarged informal sector, who are mostly poor, greater in ways that do not support timber production to be viable, but public and private sector investments in forestry are also depressed. Poor funding weakens the ability of the forestry services to function effectively and low economic activity limits the chances of private sector investment in wood production to reduce the pressure on natural forests. The contribution of forestry to employment generation and hence poverty reduction is also diminished when forestry activity is low. Furthermore, in an attempt to boost the economy, governments fall back heavily on logging and on forest land for export crop production, making it more difficult to pursue SFM. The declining value of exports (see *Table 3*) and the low prospect (*Kishor and Constantino, 1993*) that prices might rise, as forest depletion induces scarcity in timber supplies, provide additional pressure on forest management.

It is pertinent to consider the question of the economic viability of SFM in situations where the principal operators are foreigners as in Central Africa. Several studies mentioned by *Contreras-Hermosilla (1999)* suggest that SFM is financially unattractive compared to “cut and run” or “cut and convert” options. The main reason is that SFM reduces profitability of logging by 35-67%. But this is true only in the short run, because a study in the Brazilian Amazon (*FAO, 1997*) shows that reduced impact logging and other more sustainable harvesting techniques increase costs only slightly and that future benefits may compensate for these costs in the long-run. *Contreras-Hermosilla (1999)* concluded as follows: “*SFM compared with ‘cut and run’ forest management options, tends to have fewer benefits in short-term but larger benefits in long-term. Given the strong time-preference for the present amongst most private individuals, the future benefits of sustainable forest management have little weight in today’s commercial decision*”. This is more valid when the private individuals are foreigners involved in logging activities and when the country has an unstable political regime.

This means that auto-financing of SFM is less a financial than it is a legal and trust issue. It is a legal issue because it is necessary to develop guidelines for SFM. Cameroon has developed such guidelines for concessions but it is also necessary to have an effective control of the implementation of these guidelines. It is also a trust issue, because the logging company needs to be secured with a long-term exploitation agreement for the concession. Given long term security of operations, it is likely that even foreign operators may be attracted to SFM. Here there are a number of important lessons.

The economic situation and how it affects forestry in the sub-regions are discussed in the FOSA reports (*FAO, 2003b, c & d*). The economic status of the sub-regions expressed as per cent of global GDP in 2000 is very low – 0.24 for West Africa and 0.10 for Central Africa. Income distribution and poverty, indebtedness, structural changes in the economy, economic liberalisation and regional and sub-regional integration are some of the other features highlighted. Changes in many of these economic features are determined by factors outside forestry. This makes it worth noting that studies in Ghana (*Mayers et al., 1996*) show that revenue from forestry, if fully recovered, can cover the cost of SFM and leave a surplus for contribution to government income. This idea that SFM can contribute to the national economy should be an added motivation for countries to hasten reforms in forestry towards SFM. For most countries, revenue from forestry can be substantially increased by recovering the full value of products exploited from private logging companies. Faulty policies governing forest utilisation, however, prevent the full recovery of the economic fees due to government, especially from timber exploitation. The World Bank, for instance,

estimates that stumpage fees for timber cutting are only 3% of the full economic value of exploited trees (Munro *et al.*, 1993). This makes exploitation very profitable for loggers, who retain most of the profit. This, coupled with the short duration of concession leases (originally as low as 6 months, now planned to be 10 - 20 years in Côte d'Ivoire, for example) provides loggers with little incentive to manage their forest allocations sustainably, or to consider replanting. Replanting requirements in Côte d'Ivoire can even be substituted with payment of a fine, with no clear programme of applying the proceeds from fines to forest regeneration. Clearly, the adjustment of policies and revision of mechanisms of forest revenue collection, to recover the maximum value of forest products, is one way of increasing revenue and improving the financial environment for forest management. The reforms should give top priority to devising mechanisms for recovering revenue. The current rush for logging concessions in Central Africa is a strong indication that the forestry sector can be profitable.

A favourable financial environment is also necessary to attract the private sector and broaden the range of participants in the wood production industry, particularly in wood supply.

Private investment in forest planting could assist in augmenting the supply of forest products. No evidence of private timber growing as a strict commercial proposition was reported in the study countries, no doubt because such production would be readily undercut by low-priced collection from public sources. Yet, the size of the deficit between wood supply and demand, accentuated in countries like Nigeria, is such that private planting is essential, to correct the imbalance between supply and demand. Wood production from farms in the context of agroforestry could add to supply, but there is a clear need for private participation in planting trees to be encouraged by governments. Through the application of suitable incentives, like elimination of institutional constraints to tree growing, such as regulations that require planters to obtain a permit before harvesting planted trees, and provision of appropriate technical support accompanied by fiscal measures, this can be achieved. Private participation in wood supply could supplement production from natural forests and thus assist in keeping logging within sustainable limits. Creating the appropriate financial environment that encourages this is a necessary requirement for promoting SFM. This requirement is at present far from being satisfied in the study countries.

#### 4.2.4 Maintaining the profitability of forest management

Measures such as long concession terms designed to minimise degradation and improve forest management and the financial environment are clearly unattractive to exploiters bent on short-term profits. For this reason it is necessary to explore further ways of maintaining profitability in SFM. In the Central African sub-region, where large concessionaires operate, most of the logging companies prefer to use the "cut and run" system which consists of abandoning the concession after a few years of logging. It is considered that forest management with a long-term period for timber production is a risky investment because of its low returns. Producers are therefore reluctant to make such investments. *Varangis (1992)* found that average annual price appreciation has been 1.2 % per annum in real terms over the period 1950 to 1992 (*Table 13*). *Kishor and Constantino (1993)* note that even if future timber supplies from natural forests decline, substitution from other sources will likely dampen any long-term upward trend in prices. *Reidar Persson (personal communication)* observes that falling real prices is currently a widespread feature of raw materials and is not peculiar to tropical timbers, and he notes also that there have been timber booms in Asia probably because taxes are not paid.

The question is how we can make logging profitable? To increase incomes generated by the activity, three major points along the chain should be targeted: exploitation, processing and marketing. Bringing in improvements such as reducing wastes and damages and good road planning could be a good approach at stand level. *Stewart (1992)* notes that 50% of usable wood is often left in the forest. Performance of African sawmills in converting logs into usable product is often low (35%), as contrasted with more modern standards that are up to 50% or more (*Karsenty, 1998; in Rice et al., 2001*). The number of trees harvested per hectare is also low (more or less one tree per hectare). A study conducted in 1995-1996 by Tropenbos Cameroon Programme, with IITO funding, on lesser known timber species has revealed new species with similar technological characteristics and potential uses as well known and commercial species. Promoting the use of these new species will make it possible to increase the harvest intensity and subsequently the total volume harvested, but it is noted that increasing the harvest intensity may also increase damage to the forest ecosystem, which at a certain level could jeopardise forest regeneration.

**Table 13. Percentage annual real price change for tropical timber, by product.**

Time period	Sawnwood	Plywood	Pulpwood	Meranti logs*	Sapelli logs*
1961-1970	-0.20	-	-	1.41	0.65
1971-1980	-1.62	2.97	1.52	7.45	11.78
1981-1990	0.23	0.06	1.66	-3.00	0.41
1991-2000	2.27	4.77	0.83	4.49	-2.06
<b>1961-2000</b>	<b>0.17</b>	<b>2.60</b>	<b>1.34</b>	<b>2.59</b>	<b>2.69</b>

Source: *World Bank, 2001*. \*Meranti and Sapelli are hardwoods commonly traded in Asia and Africa, respectively.

There is also a need (*Ljungman et al., 1999*) for market reform, which includes market information, legal framework and creation of new markets. The first market reform was the promotion of forest certification. According to *Ljungman et al. (1999)* such initiative has been driven by NGOs, most notably the Forest Stewardship Council (FSC), with industry support in some countries. Governments have reacted to this initiative in different ways; some have supported the initiative, a few have opposed it and a number have developed their own forest certification initiatives as alternatives to those of FSC. The legal framework that supports property rights has received little support. But, according to *Ljungman et al. (1999)*, initiatives such as Joint Forest Management have been promising in India where property rights are clarified and individuals are given greater security of tenure. In such situations, people are prepared to invest in improved forest management, and deforestation may be reduced or reversed.

To increase incomes generated by the forest, new markets for non-wood products and other forest goods and services, such as water, wildlife, biodiversity and carbon sequestration, could be developed. *Ljungman et al. (1999)* discusses experience with each of these different goods and services in contributing to efforts to support SFM. Good logging practices and implementation of silvicultural treatments, efficient milling and market reforms would be the solution to make SFM profitable. The rush of forest exploiters to get forest concessions that is observed in Central African region, should be used as an opportunity by policy-makers to bring in the necessary reforms and to develop and implement guidelines, which should make the activity profitable.

#### 4.2.5 The need for political stability

If the resource base, political will and financial environment are right, political stability is the next necessary condition for SFM to take root. Reference has already been made to this in connection with long-term viability of SFM, especially with foreign operators. The importance of political stability for forestry development is discussed extensively in the FOSA reports (*FAO, 2003b & c*). Instability in government, largely stemming from resource use conflicts, which has erupted into wars and physical combats in many countries of the sub-regions, affects forestry development in several ways. In many cases, management and protection break down as forest areas are themselves the arenas for physical combat, or forest resources are sequestered by one party or the other as a source of income to finance the conflict. The social disruption that attends conflicts undermines traditional livelihoods and drives many to fall back heavily on forest resources for food and energy, while displaced persons often take refuge in forests. In these circumstances normal forestry development or practice cannot take place. Even without physical conflict, political environments that are largely undemocratic cannot support reforms for more inclusive forest management practices, while frequent changes in government make it more difficult for reforms to take root.

In West Africa, while Ghana can be said to be currently enjoying stability that encourages hope that the reforms in that country will be sustained, the contrary is the case with Liberia and now Côte d'Ivoire. Indeed, the sub-region as a whole has suffered a long period of political instability (physical conflicts in Sierra Leone, Guinea and Liberia; military interventions in government in Nigeria) that has impeded forest

development. In Central Africa, forestry reforms are under way in all countries but CAR that is torn by socio-political turmoil (*ITTC, 2003*). Civil strife in Congo and DRC also impedes reforms.

#### **4.2.6 Reforming policy, legislative and institutional framework**

Designing the policy, legislative and institutional framework, building the necessary human and infrastructural capacity and generating the knowledge base for decision making and planning are the necessary steps that link political commitment to actual practice. There was ample evidence from the case studies that relevant policy, legislative and institutional reforms are taking place in the sub-regions. The reforms and their implementation are perhaps more advanced in Ghana than in any other study country (*Parren, 2000*). However, in view of the wide scope of activities involved in effectively reforming the forestry sector to overcome the inertia built up from a long history of unsustainable practices it is doubtful that any country in the sub-regions has achieved adequate capacity in human and infrastructural resources. Indeed, data in *Table 12* show the poor status and distribution of logistical capacities of government forest services in Cameroon. This situation can be generalised for all the study countries. Training to re-orientate forestry staff to new ways of relating with clients, training to upgrade skills of forest users and product processors and marketers, and development of the necessary supporting research capacity are some of the human capacity building needs. Data management and information systems are also required infrastructural resources. Adequate knowledge of the resource base must be readily at hand to facilitate planning and decision-making. All of these capacities are short in the study countries, but the inadequacies in the knowledge base are probably the potentially most constraining.

Knowledge of the forest resource base is hardly adequate for any country in terms of the currency, reliability and consistency of the data. Data on forest cover and types suffer from lack of consistency in the definition of terms and frequency of assessments, while those on protected forests are mostly out-dated in terms of the status and effective areas remaining. West Africa has hitherto paid more attention to acquiring the technical and ecological knowledge and skills, than to the social, economic and political factors, for forest management. Even so, there are still major gaps in knowledge of the forest as a biophysical resource. Silvicultural systems that balance the need for achieving profitability of logging with cutting rates, annual allowable cuts (AACs) and rotation lengths that do not transgress the ecological limits of the forest are yet to be discovered. The greater inclusiveness of the reforms now taking place in forest management with the resultant expansion of stakeholders, requires forestry to acquire economic as well as socio-cultural knowledge about its clients, so that it can better predict and take into account the factors that motivate these clients in the way they react to forestry. Given the multiplicity of factors identified in the Forestry Outlook studies as drivers of forestry development, the enormity of the information need at the interfaces of forestry and these factors is only now beginning to be realised.

The study did not assess the extent to which organisations like FORIG in Ghana, SODEFOR in Côte d'Ivoire or FORAFRI were addressing these new challenges and bringing their findings to bear on forest practice. But available information from the case studies shows that there is still a wide gap between the reforms and their implementation. Even where prescriptions are made based on available knowledge weak compliance is another factor that hinders implementation of reforms.

On compliance with laws and regulations, the four case studies in Central Africa show several violations by stakeholders. These violations consist of showing no respect of the concession area authorised by law, unclear allocation of concessions, no involvement of local communities all along the process, failure to implement scheduled silvicultural treatments, illegal logging and illegal wood markets, etc. The exploiter interviewed in Côte d'Ivoire did not carry out pre-exploitation inventory, contrary to the guideline outlined by the forest service. The conclusion must be that there is inadequate sensitisation of stakeholders and/or lack of institutional and infrastructural capabilities to enforce SFM laws and regulations.

Maintaining forest production by effectively implementing management plans is not always an easy task for the logging companies. In Central Africa, developed management plans varied from one case study to another, in terms of the concession areas, the rotation period, type of inventories used (single or multi-resource inventories), participation of local populations in the development and implementation of the management plans and in silvicultural treatments prescribed. These variations in management plans are quite normal, because their development depend on various factors that cannot be similar in all countries or

among ecosystems within the same country. These factors include the objective of management, the number of harvestable species and the volumes of each of them, the situation of the ecosystem (fragile or not), the minimum harvestable diameter, list of endangered species to be protected, etc.

The concession areas vary a lot among the countries, from 125,000 ha in Lokoundjé-Nyong in Cameroon to 1,151,000 ha for Pokola-Kabo-Loundoungou in the Republic of Congo. There was a lot of discussion in Cameroon when the country was developing its forestry law, and the decision was reached that 200,000 ha would be the maximum area for a forest concession. But today the area of forest concessions allocated in Cameroon varies between 61,000 to 650,000 ha according to the productivity of the forest area and the processing capacity of the concession-holder. Larger concessions increase the volume harvested annually for more profits to the logging company. But it could also generate a lot of waste. Then different rotation periods (25, 30 and 40 years) were used for almost the same forest ecosystem within the region. All of these parameters should be fixed with the objective to maintain the ecological and production functions of the forest ecosystem. The longer rotation periods (40-50 years) normally will allow for forest recovery, but it could also become a limiting factor (discouragement) for investors in the sector.

A wide range of silvicultural approaches were prescribed in Cameroon and Congo. These approaches encompass removal of non-commercial species around saplings of commercial species, post-harvest enrichment operations such as thinning of strips where seedlings of commercial species are planted, conservation of seed-trees on the stands, etc. The forest management plans in Lokoundjé-Nyong in Cameroon prescribe permanent sample plots, but this has not been implemented, while 20 post-harvest monitoring plots have been established in the Ngotto forest in CAR. Permanent sample plots in forest concessions constitute one of the solutions to fill the existing gaps in knowledge on the impact of logging activities on the ecosystem, but also on the regeneration after logging (reaction to logging) of such forest ecosystem. The latter information is important to re-adjust after a certain period of time (five or ten years) logging activities and silvicultural treatments. But this needs long lasting observations that concession-holders cannot afford without government (research institutions) support.

The general conclusion is that far-reaching production reforms towards SFM have been designed or prescribed, but these have largely not been implemented or complied with by government or exploiters. Government lacks the capacity for fully implementing the reforms, while concession holders are reluctant to handle long lasting and expensive forest operations that may threaten their profits in the short-term.

#### **4.2.7 Need for a more inclusive and participatory approach**

The reforms noted in the case studies dwell on a critical requirement for SFM – the need for a more inclusive approach than in the past. The extensive degradation of rain forests in West Africa, which is very pronounced in Côte d'Ivoire and Nigeria, depends to a substantial extent on population pressure on forest land, leading in many cases to massive encroachment into forest reserves. Sometimes, encroachment is a reaction from local communities who watch forest reserves, many of which are supposed to be held in trust for them, being exploited by logging companies without a share of benefits returning to the communities. There are sometimes also conflicts deriving from disputes between government and communities over ownership of forest reserve land. Although forest degradation is not yet an issue in most of the Central African countries studied, the same forces are operative albeit to a lesser degree.

Logging opens the way to agriculture, hunting and gathering and eventually conversion for settlement and infrastructure. In addition to all these, most of the supply of forest products to meet growing demands is derived from public or common property land, with no significant private sector investment in growing forest products. The reforms towards more inclusive and participatory policies are driven both by the need to minimise conflict with stakeholders and the realisation that governments alone cannot effectively manage all forest land to supply forest products and services to meet growing demands. The reforms, more advanced in Ghana than anywhere else, have as their central feature the involvement of stakeholders, particularly local communities and exploiters in forest management – sharing of responsibilities and benefits. Notions of community forest management, joint management of forest reserves, and decentralisation of forest management authority, are part of the new trend, which should promote the social sustainability of forest management. A prerequisite for meaningful participation and partnerships is the entrenchment of democratic processes which many countries subscribe to and are struggling to achieve.

In practice, the first step for successful forest management is to build a strong, transparent and fair partnership among the stakeholders, which may include government, logging companies, forest planners, NGOs, local communities and donors. This partnership should be seen as a kind of joint venture among the three following main actors: the government, logging company and local community. The main indicator of the strength of such partnership is the adoption of the consensus approach for taking major management decisions. An example is selecting silvicultural treatments to apply to the forest to achieve fast regeneration. The transparency of the whole process of forest management is also an indicator of the effectiveness of a partnership. Transparency could be achieved when information flows freely within the group of actors and when all stakeholders are at the same level and have the same information. In the Central African countries, most of the time the logging company and the government and forest planner are sharing the information, while NGOs and local communities are less informed. Improvement on the information flow increases trust among partners.

Partnerships should be based on three pillars: awareness and training of all stakeholders and support to strengthening of local communities. Stakeholders should be informed about the ultimate objective of the management plan and the “road map” for its implementation. Specialised training courses on the development and implementation of forest management plans should be shaped and organised according to the target stakeholders. As was the case for Lokoundjé-Nyong concession, local communities at the beginning of the process needed assistance from the project to organise themselves into rural forest committees (RFCs), which should represent all bordering villages. The RFCs should be trained on the basic knowledge of forest management. Similar village institutions, Community Forest Committees, empowered by years of sensitisation and training by NGOs and government, were noted in Ghana. But in Ghana, and to a growing extent in Côte d’Ivoire, the partnership between loggers and local communities is further underpinned by a formal social responsibility agreement. A further notable example of community empowerment for forest management is the Ekuri initiative of Cross River State of Nigeria (*Caldecott and Morakinyo, 1996*), in which the community was trained by the forestry department and NGOs, to manage a 250 000 ha community rain forest.

We conclude that SFM for industrial wood production is an enterprise that involves the interaction of many actors. Unless appropriate opportunities and mechanisms for this interaction are provided, failure in partnerships may stall efforts at achieving SFM.

#### **4.2.8 Influence of external factors**

External factors, notably the indebtedness of the countries, globalisation and liberalisation in world trade, international treaties and regional economic agreements can influence the viability, especially the economics, and success of SFM. In Ghana and Côte d’Ivoire, for example, as much as 20 and 28%, respectively, of the export income is expended on debt-servicing. This not only heightens the pressure on forests and forest land in order to export and earn more income but it further contributes directly to depress the economies of the countries. At the same time globalisation with its associated trade liberalisation makes it difficult to diversify and break into the export market for high value products like pulp and paper. On the other hand, inter-country cooperation fostered by the increasing trend towards regional integration in Africa is likely to provide trade opportunities that favour SFM. Already, regional integration among the Central African countries in initiatives such as CEFDHAC provides opportunities for sharing experiences and knowledge in support of SFM.

#### **4.2.9 Need for integration into global rural development**

One way of assisting the development of SFM is to have the process undertaken as part of a global rural development scheme. In this way, synergies can be exploited between forestry and rural development activities. Road building for the purpose of evacuating forest produce could be part of a rural development road network. The Ngotto Forest concession in CAR is one such attempt at integrating SFM in a global rural development scheme. The concession is part of the broader ECOFAC rural development programme, which covers an area of 800 000 ha, with other components such as conservation and rural development. ECOFAC is a sub-regional programme with similar forest management plans in other countries in the sub-

region (e.g. in Cameroon). Forest management is only one component within a broader rural development scheme of the ECOFAC programme.

### **4.3 Factors that inhibit SFM implementation**

Negative conditions or developments in any of the above factors would necessarily inhibit SFM. Several factors may therefore concur to do so and most of them may be interlinked. Dominance of the public sector and the decline of its capacity, unfulfilled goodwill from the main actors, lack of trust and transparency, gaps in knowledge on forest reaction to logging, and market demand and profitability of SFM are discussed below as examples.

#### **4.3.1 Public sector dominance and decline**

The dominance of the public sector in forestry (*FOSA, 2003*) is a heritage from the colonial period, where the public sector was the major player in economic development. In the absence of a large, developed private sector and with the preponderance of subsistence production, public sector intervention was perhaps inevitable to promote social and economic development and to harness natural resources for development. The role of the public sector in economic development became more pervasive after independence, and came to include all activities such as provision of health care, education and rural development. Forestry has been one of the key areas where the public sector has played a major role in defining, regulating and managing use of resources. Much of the earlier policies and legislation were designed to increase direct control of resources, facilitate their exploitation, support other government objectives or raise income in support of other activities. In essence this approach continues even now in most countries.

Unfortunately, the dominant trend is towards a continuous erosion of the capacity of the public sector in almost all countries in Africa, stemming particularly from the following factors:

- While the complexity of resource management has increased enormously over the last many years and is likely to increase still further, the human, material and financial resources available to the sector have at best increased only marginally.
- The effects of structural adjustment programmes, which in many cases have drastically reduced the capacity of public sector institutions.

The consequence of this is that in virtually all the study countries, public sector forestry organisations have become highly dependent on outside support. Apart from the uncertainties arising from such dependence, this has often also distorted priorities.

#### **4.3.2 Unfulfilled goodwill**

There is ample indication of government goodwill towards forestry in the study countries, but, as already indicated, much of this remains unfulfilled in terms of commensurate financial investment in forestry. Lack of goodwill on the part of other stakeholders is reflected by a high degree of violation of laws and regulations and pronounced corruption. There is the need to clarify the roles of all stakeholders, especially local communities, in such activities as the development and implementation of forest concessions, so that all stakeholders can play a greater role in monitoring actions. This should help in minimising irregularities and conflicts over forest ownership between the concession-holder and the government on one hand, and local communities on the other.

#### **4.3.3 Lack of trust and transparency**

Lack of transparency is particularly rife in the allocation of concessions. The Cameroon case study showed that the foregone revenue during the allocation of forest concessions in 1997, because of unclear criteria of bidding procedures, was as high as 2.5 billion Fcfa; and by allocating more than 50 % of the concession area to foreign companies in 1997 (*Table 11*), the Cameroon government created unnecessary frustration

and conflict among bidding companies. The existence of illegal logging and black markets for forest products (either from logging companies or from local communities) is also an indication of lack of transparency, where wrong information and data are returned to the forest administration. Cases of transportation of logs in the night or through the rivers to hide them from control of forest administrations are well known in Central Africa. In Ghana, to curtail such activities, movement of logs is banned at certain periods – between 6.00 pm and 6.00 am and during public holidays. If it became critical that logs must move at the prohibited times, this is done under special permit for which the log mover pays a special fee in addition to overtime pay for the workers involved. Greater trust and transparency than exists at the moment needs to be developed for SFM to succeed in the sub-regions.

#### 4.3.4 Gaps in knowledge

Developing SFM plans for productive forestry is relatively new. Past experience dealt with management plans for sustained timber yield. To bridge the knowledge gap, many logging companies in Central Africa request assistance from foreign research institutes (Canadian and French cooperation) or international organisations (ITTO, CIFOR, ICRAF and IITA) and NGOs (WWF, IUCN and WCS). National scientific communities are rarely engaged, hence knowledge on how to develop multiple-objective forest management plans remains largely foreign, and this situation is creating frustration among jobless local forest engineers, who are at the same time no longer recruited by the public services. Gaps in knowledge of stand growth characteristics and genetic variability of important commercial trees also constrain SFM. Without background information and data from long term sample plots, it is difficult to make proper forest growth simulations to assess forest reaction to silvicultural treatments, while the development of sound conservation strategies is impeded by limited knowledge of the genetic variability of important species. The reduction of forest cover, which is relatively low (0.4% annually) in the Central African region, may not be the key issue. The key issue is the loss of important timber tree species because of selective logging practices. Conservation strategies should therefore target threatened species rather than whole ecosystems. The loss of these species could later become a handicap for logging activities as has happened with *Triplochiton scleroxylon* in Nigeria. Inadequate knowledge of the approach and methodologies for multi-resources forest management could be a serious constraint to achieving SFM.

#### 4.3.5 Market demand and profitability

Low market prices of the forest products alone could be a bottleneck to achieving SFM. With regard to West Africa, attention was drawn in *Table 5* to the declining forest products trade surplus, as a result of declining primary commodity prices and increasing import costs, at a time when globalisation is making it difficult to diversify into higher priced commodities like pulp and paper. Data in *Table 13* also show that the highest percentage of annual real price growth for tropical wood products between 1961 and 2000 (almost forty years) was only 2.69. This increment is less than the inflation of the sawmill equipment and other costs that logging companies may have to face during the same period. Uncertainty about markets and profitability could be real deterrents to investment and implementation of SFM for industrial wood production in Africa.

### 4.4. What needs to be done by different actors?

The principal actors in industrial wood production in the study countries are (a) governments (through their various ministries, departments and units), which controls the public sector, (b) the organised private sector that dominates the timber industry, (c) the informal sector, which provides the bulk of the unskilled labour and includes the illegal loggers, as well as the poor that depend heavily on forest resources, (d) local communities, (e) international community, including donors and (f) the organised civil society. In pursuing sustainable forest management for industrial wood production, the expected roles of these actors are:

#### (a) Government

- Creation of the enabling environment for sustainable forest management by:

- Entrenching a democratic culture in governance, and promoting accountability and transparency in public life;
- Providing the appropriate policy, legislative and institutional frameworks;
- Coordinating national policies to exploit synergies and minimise conflicts;
- Adopting and striving for supportive macroeconomic policies;
- Developing the economy to eliminate poverty and stimulate investment in forestry;
- Providing appropriate incentives to encourage (i) private sector investment in plantation development, and (ii) production, processing and marketing practices that promote sustainable forest management;
- Investing a commensurate proportion of its budget (determined from a calculation of at least the productive and environmental values of forestry) in all aspects of forestry development, including management, resource assessment, human and infrastructural capacity building, knowledge generation, production, processing and marketing;
- Promoting the development of local institutions and structures and creating space for (i) civil society action to facilitate participation of rural communities in forest management, conservation and protection, (ii) principal actors in forestry to participate in policy formulation and implementation, and, (iii) third party assessment of forest planning and implementation and certification of forest products;
- Designing and enforcing national land use plans that ensure long term security and tenure of the forest estate against encroachment or conversion;
- Designing and monitoring the implementation of practices in exploiting, processing and marketing of timber that promote SFM; and,
- Subscribing to international conventions and relations that support SFM.

***(b) Organised Private Sector***

- Develop appropriate partnerships with government and local communities, especially with regard to social responsibility to communities.
- Given the necessary economic incentives, invest in plantation forest production to supplement production from natural forest.
- Apply enterprise and business skills to exploit opportunities for expanding the range of marketable products, technologies and markets.
- Participate fully (including financially) in policy formulation and inventories, and comply with exploitation, processing and marketing regulations deriving from the policies.

***(c) Informal sector and local communities***

- Develop and maintain suitable organisational structures for interfacing with other actors in sustainable forest management;
- Participate in policy formulation, and abide by regulations deriving from the policies;
- Exploit opportunities for building technical and other capacities for forest management;
- Respond to incentives and contribute through agroforestry and social forestry practices to wood supply;
- Exploit opportunities for joint or community forest management; and,
- Take active part in exploitation monitoring and forest conservation.

***(d) International community including donors***

- Address the debt-burden issue;

- Continue to show concern for rain forest degradation but reflect this in international negotiations involving trade in rain forest products; e.g. if prices paid for tropical timber were to incorporate lost economic values, in terms of forgone timber rentals, forgone minor NTFP benefits, and disrupted forest protection values (*Barbier, 1990*), the need to cut so much forest might be lessened in support of SFM; and,
- Step up and sustain assistance by technical and financial inputs to the pursuit of SFM (resource assessment, preparation of management plans, designing policy, legal and institutional reforms; building the knowledge base for SFM).

**(e) Organised civil society (NGOs etc.)**

- Continue to empower local communities, by awareness raising and capacity building, for effective participation in forest and environmental management;
- Continue to serve as a watch-dog against unsustainable forest management policies and practices; and,
- Continue to provide technical assistance to governments for forest resources assessment, planning, management and conservation.

#### **4.5 Replicability of the success stories**

It is too early to regard the forest management reforms now taking place in West and Central Africa as successes, but lessons can still be learnt from them in terms of problems experienced in the drive towards SFM. Such experiences can guide development in other places in terms of what to do and what not to do. Ideally, gathering of such experience should be made through painstaking understudy, involving information sharing and physical visits. The visits should be of duration long enough to observe operations and partnership interactions in practice. The understudying should be sufficiently analytical to grasp underlying causes for actions, and understand the milieu in which processes are taking place. It may be necessary to break down the practices being studied for copying into components such as:

- Policy, and its formulation process, content, coverage of related sectors and stakeholders;
- Administrative frameworks (governance structure, administrative backstopping);
- Technical management; designing of management plans; silvicultural systems;
- Human environment (workers and local communities);
- Economics of the operations; and,
- Equity in relations, especially with regard to benefit generation and sharing among stakeholders.

Issues to stress might also include the following:

- Public sector impact on SFM;
- Participation by stakeholders, especially local communities in concession areas;
- Impact on local communities, especially women, and its reach;
- Role of SFM in poverty reduction; and,
- Sustainability of timber production, biodiversity conservation, wildlife management and protection of fragile ecosystems

Such deep understudying will enable observations made to be faithfully replicated, through the kind of cyclical and re-iterative process described by *Mayers et al. (1996)*. This process begins with goal setting and continues with planning and capacity building, field trial, monitoring, information assessment, goal-revision and re-iteration of the process, until an acceptable practice is achieved. Evidently there is an emerging consensus that the transition to SFM requires such an approach. Clearly, the approach requires a

time horizon that can be accommodated only in long-term or perspective plans, which are not usual with donor supported programmes. Sustained government commitment, political stability and the assurance of long-term security of operations referred to earlier are critical for this approach.

## **5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS**

### ***5.1 The resource base***

The forest resource base exists in both West and Central Africa to support SFM for industrial wood production, if on-going reforms in approach to forestry are sustained. In West Africa, despite the extensive loss of forest cover under high population pressure, the resource base exists in the form of a network of protected closed forests in a matrix of farm/forestland. In Central Africa, which is the more forested sub-region, the resource base for wood production by SFM is greater, with more than 50 % of the land area of the study countries still under closed forest cover. In both sub-regions, data on the forest resources are obsolete and/or partial, and the forest resource base is not secured by the existence of national land use plans. In West Africa, there is also a long history and experience of efforts at sustained yield management and use of forestry to support national development that can be drawn upon to pursue SFM. In Central Africa, forestry is centred on harvesting by international corporations operating large concessions. Weak political and institutional structures further impair the ability to take advantage of the favourable resource situation to advance social and economic development.

#### **Recommendations:**

- 1. On-going forest management reforms in the sub-region should be encouraged and supported by the international community and civil society organisations.**
- 2. Technical and financial assistance should be provided to set up national systems for periodically updating information on forest cover, types, ownership, status and stocking, based on direct physical assessment.**
- 3. Governments, with assistance from the international community, should undertake some form of land use planning, involving all stakeholders in a participatory manner, so that appropriate adjustments can be made to secure the resource base for SFM.**

### ***5.2 Industrial wood production***

Industrial wood production remains one of the leading economic activities in both West and Central Africa. In West Africa, exploitation for timber occurs principally through concessions, contracts, licences and permits, in arrangements involving government, large and small scale private entrepreneurs, farmers and communities to varying degrees in the different countries of the sub-region. In general, the business in West Africa is dominated in numbers by indigenous entrepreneurs operating small scale concessions, but there are also some large-scale operators with larger concessions, often with foreign connections. By contrast, exploitation in Central Africa is dominated by a few, mostly foreign-connected, concerns operating large concessions. Forestry development in the sub-region is centred on these large-scale concessions. Lack of transparency is particularly rife in the allocation of concessions and the existence of illegal logging and black markets for forest products (either from logging companies or from local communities) is also an indication of lack of transparency in the business.

Marketing and profitability are key concerns, especially of the large-scale operators, leading to much violation of rules and regulations, which not only bias the profitability of the activity but also result in mismanagement of forest concessions. The focus on timber is at present to the detriment of other forest benefits; no attempt is made to augment the profitability of management by harnessing opportunities for multiple management objectives. This situation calls into question the viability of large-scale concessions for SFM. However, until returns from providing global services, such as biodiversity conservation or carbon sequestration, become significant, wood production will remain a dominant profit making objective

of SFM in rain forest. It is noteworthy that, in Ghana, biodiversity sensitive sites are already being excluded from logging.

**Recommendations:**

**4. Governments should develop and adhere to clear criteria for the allocation of concessions, allowing an independent body to intervene in the process in order to enhance transparency.**

**5. Policy reforms should be undertaken to provide for adequate incentives to attract stakeholders to SFM. For example, tenure of concessions should be sufficiently long to give loggers a sense of security for their operations and at the same time a sense of responsibility for sustaining production from their concessions. Also, mandatory return of benefits to local communities and payment of compensation by loggers to farmers for farm damage should be instituted as an incentive to attract farmers' collaboration in monitoring logging operations and stemming illegal logging.**

**6. Profitability of management for wood production should be enhanced by:**

**(a) Broadening the range of marketable products (inclusion of lesser-known species and extending the size of products) recoverable from exploitation.**

**(b) Forest certification with eco-labelling of wood to stimulate market demand; to increase transparency, this should be done through the creation of a national independent certification body, which should be internationally recognised and serve to give the eco-label to forest products.**

**7. To make logging economically more attractive, multi-resource management plans should be developed, in which non-wood forest products, ecotourism, fishery, beekeeping, wildlife management are incorporated as objectives.**

### ***5.3 On-going reforms***

Government commitment to on-going reforms is as yet not being fully expressed in terms of financial investment in forestry, leaving the forest services still under-resourced and short in the knowledge base, infrastructure and capacities for effectively prosecuting the reforms. The weak economies of the countries in the sub-region and the need to address such pressing problems as poverty probably account for the low investment in forestry. The reforms themselves exhibit weaknesses, particularly in the area of sharing responsibilities and rights.

**Recommendations:**

**8. In addition to addressing such issues as the debt-burden, support should be given to on-going economic recovery programmes in the countries to help reduce poverty and improve investment in forestry. The reforms themselves should be pursued in the context of global schemes of rural development in order to exploit synergies and reduce the financial burden.**

**9. On-going policy and institutional reforms towards sharing rights and responsibilities in forest management should be expedited; in particular, forestry staff should be re-trained and re-oriented away from old approaches.**

**10. To improve the financial climate for investment in SFM, mechanisms for recovering from forest revenues the full costs of forest management should be pursued, for example by species-differentiated upward reviews that tie forest fees realistically to market values, effective enforcement of regulations and charging higher penalty fees.**

**11. Roles and responsibilities for public and private sectors should be better defined in the reforms so that the public sector focuses on areas that are socially and economically important and where it has the comparative advantage and the roles of the private sector and local communities are reinforced in the development and implementation of forest concession management.**

#### ***5.4 Augmenting the knowledge base***

The reforms now being undertaken are greatly handicapped by a weak knowledge base in all facets of SFM. Knowledge of the forest resource base in most countries is at best fragmentary and grossly out-of-date; there is a new need for expansion of knowledge at the interfaces of forestry with other sectors of the economy, if the influences of these sectors are to be better understood and taken into account in forestry planning. Although much technical knowledge of forests as biophysical resources exists, particularly in the West African sub-region, the critical information on appropriate silvicultural systems to reconcile economic and ecological needs of sustainable forest management is not yet available. Knowledge to expand the marketable products and make logging and processing more efficient is also yet to be gained. There is great need to invest in building the capacity (human and infrastructural) for research to generate the required range of knowledge, and along with it the information management and dissemination system.

##### **Recommendations:**

**12. Multi-disciplinary approaches should be employed in generating knowledge for sustainable forest management. The complexity of managing forest concessions demands that the scientific community (research institutions and universities) participates in developing new methodologies and comprehensive technical guidelines (for inventories, development of forest management plan, silvicultural treatments, conservation strategies, etc.). There is also a need to develop new curricula for training staff.**

**13. The search for appropriate silvicultural systems should focus on managing forests as ecosystems, where other forest functions and values are not ignored in the pursuit of industrial wood production. Silvicultural systems that aim at simulating events as they occur in the gap-phase dynamics of rain forest regeneration should be developed.**

**14. Efforts should be made to establish annual allowable cuts (AACs) rationalised from knowledge of forest growth characteristics, e.g. mean annual increments (MAI), as the basis for exploitation.**

#### ***5.5 Inter-sectoral linkages***

The recently concluded Forestry Outlook studies demonstrate the strong influence of such key areas as population, land use, agriculture, settlements, infrastructure development, energy and macro-economic management, as drivers of forestry development. This underscores the need for strong cross-sectoral coordination of policy in the reforms now being undertaken. Success in achieving sustainable development depends greatly on the extent to which policies in these other sectors can be adjusted in favour of sustainable forest management. An agricultural policy that actively promotes intensification of land use through agroforestry, for instance, could help to reduce the pressure on forest land, in the same way that an energy policy that encourages the growing of fuelwood would do.

##### **Recommendations:**

**15. Policy formulation for any sector should involve all affected sectors, to exploit synergies, develop trade-offs and avoid conflicts; in particular, there should be effective forestry inputs in the formulation of policies for population, agriculture, land use, settlements, infrastructure development, energy and macro-economic management; at the very, least policy formulation in these sectors should be closely coordinated.**

#### ***5.6 Inclusive approach to management***

The main thrust of the reforms now taking place is towards a more inclusive approach to forest management than before, harnessing the resources of all stakeholders, from policy formulation to implementation. In order to sustain the necessary partnerships for this, much capacity building and empowerment needs to be undertaken among the principal stakeholders, i.e. the relevant ministries and departments of government, the organised private sector, the informal sector, local communities, the donor community and the organised civil society. Roles that are complementary rather than conflicting need to be

clarified among stakeholders in partnerships. For example, in collaborating to manage the national forest estate, while the forestry department retains the roles of monitoring and supervising compliance with regulations, actual management of concessions in terms of preparation of management plans, protection and maintenance, hitherto done by the forestry department, should be undertaken by the concessionaire. At present, the countries in the sub-regions mostly subscribe to and are struggling to achieve democratic governance structures that are necessary for the inclusive approach to forest management.

**Recommendations:**

**16. Civil society organisations, in particular those with donor support, should intensify their efforts in improving the capacities of local communities through awareness raising, skills development and by creating appropriate institutions to make them more effective in partnerships with other SFM stakeholders. The capacities of forestry staff and loggers should also be enhanced by training.**

### ***5.7 Making the transition to SFM***

Making the transition from present practices to SFM will be a long-term process requiring planners and policy makers to adopt appropriate time horizons. A cyclical process of goal-setting, planning and capacity-building, field implementation, monitoring, information assessment, goal-revision and re-iteration of the process is envisaged.

**Recommendations:**

**17. The transition from present practices to SFM should be seen as a long-term process, and approached systematically by re-iterating cycles of goal-setting, planning and capacity-building, field implementation (trial), monitoring, information assessment, and goal-revision, until a satisfactory management system is reached.**

**18. Special attention should be given to developing the capacity for monitoring, evaluating and assessing performance, as well as to the capacity for periodic auditing of management by the various stakeholders who will now be increasingly involved in forest management.**

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