

GHANA FORESTRY REPORT – draft

TOWARDS ECOWAS FOREST CONVERGENCE PLAN

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3/22/2012

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ABBREVIATIONS AND ACRONYMS

AU	AFRICAN UNION
ECOWAS	ECONOMIC COMMUNITY OF WEST AFRICAN STATES
FSC	FOREST STEWARD COUNCIL
ITTO	INTERNATIONAL TROPICAL TIMBER ORGANIZATION
MDGS	MILLENNIUM DEVELOPMENT GOALS
NFP	NATIONAL FORESTRY PROGRAMME
NLBI	NON-LEGALLY BINDING INSTRUMENTS
NWFPS	NON-WOOD FOREST PRODUCTS
PAs	PROTECTED AREAS
PFES	PERMANENT FOREST ESTATES
REDD+	REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION
SMFES	SMALL-MEDIUM FOREST ENTERPRISES
TBN	TRANSBOUNDARY
TBNRM	TRANSBOUNDARY NATURAL RESOURCE MANAGEMENT

GHANA FORESTRY REPORT:

TOWARDS ECOWAS FOREST ECOSYSTEMS MANAGEMENT CONVERGENCE PLAN

1.0 INTRODUCTION

West Africa's heritage of diverse tropical forest ecosystems range from evergreen dense humid forests, coastal mangrove forests, semi-deciduous forests, Guinea, Sudanese and Sahel savannah formations to the desert zones. These ecosystems are the major sources of wood energy, environmental services, exports of prime woods and non-timber forest products; the latter contributes substantially to improvements in food security, human nutrition, health and livelihood support generally of the estimated population of nearly 253 million inhabitants of ECOWAS.

Today, the major pressures and threats on the forests and woodlands in the sub-region include changes in climate, economic conditions and poverty, population growth; viz. deforestation, land degradation with multiple impact on other sectors.

The convergence plan is meant to integrate concerted efforts at ensuring sustainable management of the West African forest ecosystems. The objective is to provide the sub-region with a federative/unifying framework on which Member States would agree to implement national and regional actions relating to sustainable management of forest ecosystems in line with the ECOWAS Forest Policy of 2005 and Forest Dialogue process (2009) within the region.

Essentially, each member State should design a forest sector development programme that fully mainstreams the Guidelines and Strategies of the sub-regional Convergence Plan.

The launching of the TCP/FAO/RAF/3306 on "Supporting the preparation of the convergence plan for sustainable management and use of forest ecosystems in West Africa" was held in Abuja, Nigeria from March 15-16, 2011.

The ECOWAS Commission selected Ghana along-side four other countries—Benin, Liberia, Niger and Nigeria—as pilots for the Project.

A consultative workshop was held in Accra from May 3-4, 2011 to develop consensus among various stakeholder groups in the process of forging Ghana's inputs for the Convergence Plan.

Integrating Transboundary Natural Resource Management (TBNRM) into regional economic initiatives is essentially driven by national governments' priorities to alleviate poverty, and by private sector investments and mainstreaming conservation into national economic development.

Ghana's in-country natural resources management processes are described in this Report. Although cross-border interactions are somewhat an extension of national processes, differences in culture, language, political and policy environment may pose additional challenges to collaboration among countries. Exact mirror-image counterpart organizations may not exist across the border, or they may have different degrees of empowerment and responsibilities, which can also present problems. But it is abundantly clear that we can promote our collective countries' conservation efforts through the higher profile possible with transboundary management (TBM).

2.0 BIOPHYSICAL

Ecologically, Ghana is divided into a **high-forest zone** in the south, accounting for about one-third of the land area (8.2 million hectares), a **savanna zone** (15.7 million hectares), mostly in the north, and a **transition zone** (1.1 million hectares). FAO (2010) estimated that Ghana had 4.94 million hectares of natural forest in 2010, which is about 22% of the land area. It is also estimated the total area of (mostly degraded) mangroves about 13,700 hectares.

Change in Forest Cover: Between 2000 and 2010: Ghana lost an average of 115,000 ha or 2.1% per year. Ghana's forests contained almost 465 and 381 million metric tons of carbon in living forest biomass in 2000 and 2010 respectively, showing an annual loss of nearly 8,000 tons of carbon stock through forest degradation (SOFO, 2011).

2.1 Forest types. The high forest zone is divided into nine forest types: wet evergreen; moist evergreen; moist semi-deciduous (southeast); moist semi-deciduous (northwest); dry semi-deciduous (inner zone); dry semi-deciduous fire zone; upland evergreen; southern marginal; and southern outlier. The semi-deciduous and evergreen forests constitute the main timber-producing areas. The main species in the semi-deciduous forests are **Triplochiton scleroxylon (wawa)**, **Mansonia altissima (mansonia)**, **Nesogordonia papaverifera (danta)** and **Khaya ivorensis (mahogany)**; in the evergreen forests the main species are **Guarea cedrata (guarea)**, **Tieghemella heckelii (makore)**, **Tarrietia utilis (niangon)** and **Uapaca spp (assam)** (ITTO, 2011).

Forest Biodiversity : Ghana has some 1185 known species of amphibians, birds, mammals and reptiles according to figures from the World Conservation Monitoring Centre. Of these, 0.8% are endemic, meaning they exist in no other country, and 3.0% are threatened. Ghana is home to at least 3725 species of vascular plants, of which 1.2% are endemic. 4.6% of Ghana is protected under IUCN categories I-V I (IUCN, 2011)

The main threats to Ghana's wildlife are habitat destruction in PAs by agricultural encroachment, uncontrolled hunting and logging, fishing, and wildfires.

2.2 Permanent forest estate (PFE). Ghana's forests are divided into forest reserves and 'off-reserve' areas: of the 266 forest (production or protection) reserves, 216 occur in the high-forest, timber-producing zone, and the remainder occur in the savanna. Forest reserves were originally established by the state to promote ecological stability while seeking to guarantee the flow of goods and services for socioeconomic development.(Fig. 1; Tables 1 & 2).

The permanent protection areas consist largely of hill sanctuaries, swamp sanctuaries, shelterbelts, special biological protection areas, intact forest sanctuaries and fire protection areas.

Several of the protection areas are named after major rivers, watershed areas, or towns and include famous reserves such as : Abutia Hills F.R., Afram Headwaters, Atewa Range, Bandai Hills, Ho Hills, Krokosua Hills, Shai Hills, Kade Bepo (hill), Bosomtwe Range, Fum Headwaters, Ayum (river) F.R., Togo Plateau F.R; most of these hilly sanctuaries have slopes ranging from 40-90% gradient; these highland habitats are hence reservoirs of biological diversity and endemism.

The systematic reduction of vegetation cover over once-forested hill sanctuaries has resulted in loss of habitats for wildlife and loss of biodiversity, accelerated erosion, landslides, drying up of several streams and lowering of water harvested from forested areas within the Volta Basin for the Akosombo Hydro-dam.

By promoting tree growth and restoring stand structures more akin to mature forest, silvicultural treatments applied to badly degraded and secondary forests can both increase standing stocks of carbon and enhance biodiversity.

The Land Policy launched in June 1999 by the Ministry of Lands and Forestry made a landmark statement on ensuring sustainable land use of hilly sites in Ghana:

“no timber production activities shall be carried out on hill and mountain slopes of at least 30 degree gradient. Social and economic activities such as agriculture, mining, human settlement and other similar activities may be carried out on hill and mountain slopes provided appropriate technology is employed in each circumstance to mitigate any adverse environmental and ecological consequences”

Those were golden words indeed, but hilly ecosystems in Ghana continue to be destroyed by human activity, population growth, agricultural expansion and poverty.

2.2.1 The Guinea Savannah ecosystem is well represented in PAs such as Mole National Park, Yakombo Forest Reserve. These reserves are rich in woodland savannah species: Terminalia Avicennioides community, Acacia gourmaeni – A. dudgeoni community, Anogeissus leicarpus

community, *Loudetiopsis kernstingii* – *Polycarpaea fenuifolia* community, *Andropogon gayanus* – *Terminalia taxiflora* group.

Much information has been derived from recent botanical surveys in PAs undertaken by the Wildlife Division.

Threats to the Savannah vegetation in general consists of indiscriminate bush fires, land clearing for agriculture, over-grazing, fuelwood collection. Outside the PAs, there are few undisturbed natural ecosystems left except traditional conservation areas such as sacred groves.

But land clearing for cultivation is highly selective and only valuable trees such as sheabuttertree (*Vitellaria paradoxa* and *Parkia bibliobosa* are consciously protected outside official Protected Areas).

Sudan Savanna Zone: Gum is still being collected in wild populations of several species of Acacias: *A. segal*, *A. albida*, (*Faidherbia albida*), *A. dudgeon*, *A. nilotica*, *A. polycontha*, *A. sieberiana* in the Sudan Savanna Zone.

Forest Transition Zone: Land degradation continues to intensity with the **savannization** of the zone; the situation is aggravated by charcoal burning, overgrazing by Fulani herdsmen, annual bush-burning; and characterized by persistent land-use conflicts.

2.2.2. Protective measures in production forests. About 100 000 hectares of the production PFE are considered environmentally sensitive (i.e. on steep slopes or erodible soils, or in streamside buffers). Measures exist to minimize damage in such areas: for example, no logging operation is permitted within buffer strips (25 m on either side of streams, and 50 meters on either side of rivers). No felling into buffer strips is permitted, and any tree or debris that falls within watercourses must be removed (FC 1998).

Silviculture and species selection. The silvicultural system used in natural forests is a polycyclic selection felling system using a cutting cycle of 40 years. The Annual Allowable Cut (AAC) in the natural forests is decided on the basis of stock surveys and tree stem size limits prescribed.

2.3 Protected Areas (PAs) Management. The programme aims to ensure effective management of a system of PAs and that is fully representative of Ghana's various ecological communities and biodiversity. Currently, the Wildlife Estate comprises 18 PAs including 7 National Parks, 6 Resource Reserves, 4 Wildlife Sanctuaries, one Strict Nature Reserve and 5 Coastal Ramsar Sites.

The range system of patrols is being implemented in all PAs leading to the intensification of anti-poaching and law enforcement activities.

PAs have virtually become “ecological islands’ and there is the need for strengthening protection of existing reserve against encroachments. Perhaps the creation of buffer zones around National Parks and Reserves where selected botanical reserves can be used sustainably; e.g. Parkia, Vitellaria, Detarium, microcarpon, (for bee keeping), marenthes polycandra.

Tables 1 & 2 show Land-Use Categories in Ghana; Figures 1 and 2: show the Distribution of Forest and Wildlife Conservation zones.

Table 1: Land-Use Categories in Ghana (Min. of Agric., 2001)

Land Use (General)	Area Million km ²	Percentage %
1. Forest Reserves (266 F.Rs)	2.60	11
2. Wildlife Reserves	1.35	5.6
3. Unreserved closed forest	3.85	16.3
4. Unreserved Savannah Woodland	7.1	30.0
5. Annual Crops	1.2	5.0
6. Bush Fallow and other uses	6.0	25.0
7. Cultivated Tree Crops	1.7	7.1
8. Total	23.8	100

Table 2: **Vegetation Zones and included Forest Reserves**

(Source: J.B.Hall & Swain M.D., 1981; forestry Dept. 1990)

Vegetation Zone	Area of Forest Reserves ('000 ha) No. of FRs.	Area of Vegetation Zones ('000 ha)	% of Country's Area	Ecozone
Wet Evergreen	1,634 ha (266 FRs)	657	2.75	High Forest Zone
Moist Evergreen		1,777	7.45	
Moist Semi-Deciduous		3,318	13.90	
Dry Semi-Deciduous		2,144	8.98	
Southern Marginal		236	0.99	
South-East Outlier		2	0.008	
Total	1,634 (20% of High Forest Zone)	8,134	34	
Guinea Savannah	836 (24 FRs)	14,790		Savannah Zone
Sudan Savannah		190		
Others(thicket, swamp, grass etc)		750		
Total	836 (5% of Savannah Zone)	15,732	66	
GRAND TOTAL	2,470 (10.3% of Total)	23,864	100	

Figure 1: Vegetation Zones and Forest Reserves of Ghana

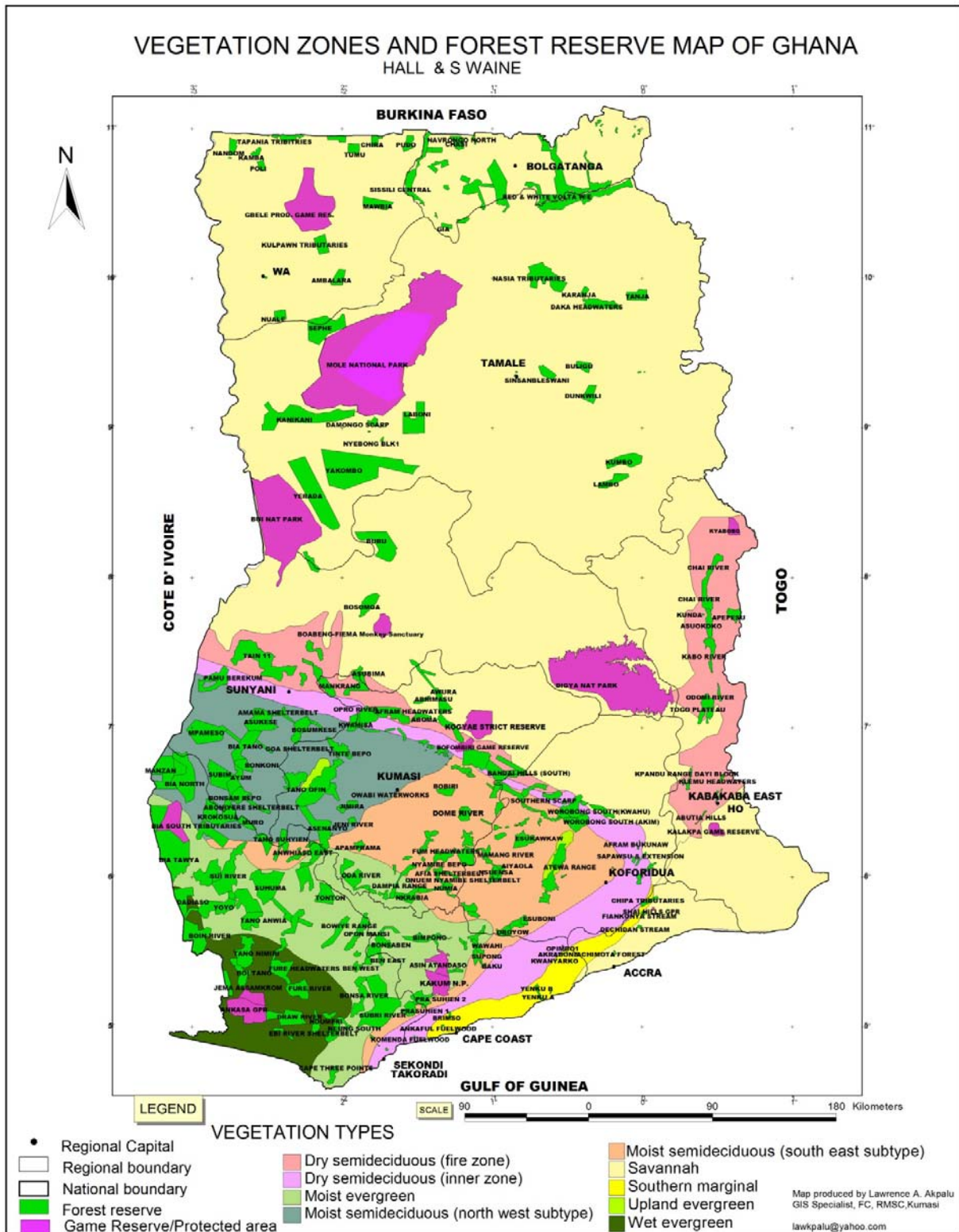


Fig.2: Wildlife Conservtion Areas in Ghana



2.4 Planted forests

Natural forest has high biodiversity but low timber productivity

-Mean Annual Increment in: Natural forest = 0.3 – 0.5m³/ha/yr

-Mean Annual increment in: Tropical plantation = 15-45m³/ha/yr

(Dr. Victor Agyemang, 2011: GIF AGM, Nov., 2011)

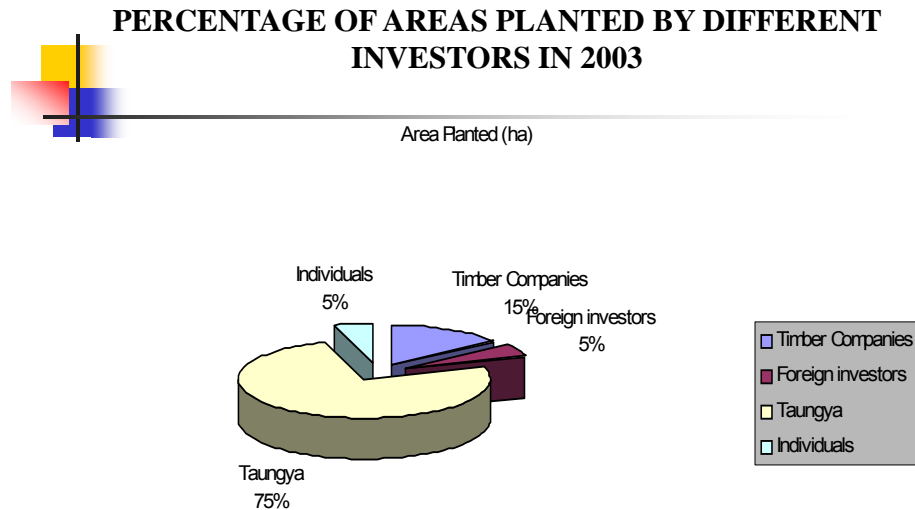


Figure 3: Percentage of Planted Aress by Different Investors in 2003: (Agyeman, V.K. 2011)

Traditional taungya system was practiced from the early 1950s to help replant impoverished FRs in land –hunger areas in the high forest zone. Between 1960 and 1982 FSD was engaged in a reforestation programme which covered about 50,000ha. The success rate was about 30% due to poor maintenance; yet these plantations provided the key source of transmission poles for rural electrification, furniture and for export. The main plantation species included Teak (65%), Cedrela, Gmelina and other species (35%).

The Plantation Development Fund was established in 1999; from 2001 the government lunched the National Plantation Development Programme and revived it in 2009 with the aim of planting 20,000 ha of trees per year. Mostly Cassia and Eucalyptus were planted in the northern and southern savannah zones for fuelwood.

Between 1973 and 1996, more than fifteen corporate bodies, communities and NGOs had planted a total of 23,279 ha (with Pioneer Tobacco Teak at Wenchi/Techiman in Brong Ahafo

region , 3538 ha and GREL Rubber Estate: 11,643 ha., Subri Industrial Plantation Ltd, 4640 ha).(FC,2010).

2.4.1 **The improved Taungya** of 2000 + brought more communities as shareholders.

The National Forest Plantation Development Programme, which was launched in early 2001, aims to encourage the development of a sustainable forest resource base that will satisfy future demand for industrial timber and enhance environmental quality. The program is being implemented under three main strategies. The first of these, the modified taungya system, involves the establishment of plantations by the Forest Services Division in partnership with farmers. The Forest Services Division provides technical direction and demarcates degraded forest reserve lands and supplies pegs and seedlings, while the farmers provide all the labour involved in site-clearing, pegging, planting, maintenance and fire protection. Farmers are permitted to cultivate their food crops, which are inter-planted with tree crops.

In addition to the food crops they harvest, farmers earn a 40% share of the returns on investment. The government also receives a 40% share and the landowner and community earn a 15% and 5% share, respectively.

The second strategy uses hired labour and contract supervisors to establish industrial plantations. Plantation workers are hired and paid a monthly allowance to establish and maintain plantations, while plantation supervisors are given one-year renewable contract employment to supervise and offer technical direction. The Forestry Commission's Plantation Department exercises general oversight and monitors field activities to ensure compliance with quality standards for plantation establishment. This strategy is employed by the Government Plantation Development Programme, which is funded through the Highly Indebted Poor Countries initiative. The plantations developed under this scheme are owned by government and those landowners who are entitled to royalty payments.

The third strategy involves the release of degraded forest reserve lands by the Forestry Commission to **private investors** after vetting and endorsing their reforestation and business plans. The operations of these private developers are then monitored through periodic field visits by the Plantation Department to ensure compliance with the approved reforestation plans. The private investor earns 90% of the total proceeds from the plantation while the Forestry Commission, landowner and community earn 2%, 6% and 2%, respectively. The estimated area of planted forest in 2010 was about 260, 000 hectares (FAO 2010).

Ghana began planting *Tectona grandis* (teak) in the Volta region in 1875, and teak is the most dominant species in today's plantation estate. Teak yields an average of 8–10 m³ per hectare per year on a 25-year cycle, and there is a ready demand for teak timber, both in domestic and export markets. The indigenous species planted are mainly *Mansonia altissima*, *Terminalia*

superba, T. ivorensis, Entandrophragma angolense, Khaya ivorensis, Ceiba pentandra, Heritiera utilis and Triplochiton scleroxylon. Other than teak, the exotic species are predominantly Cedrela odorata and Eucalyptus camaldulensis. A total of 68,558 hectares of plantation were established in the period 2005–2008 (FC, 2010).

3.0 SOCIO-ECONOMIC SITUATION

3.1 Importance of Forestry

Agriculture, including forestry, is the backbone of the Ghanaian economy. It provides 43% of the Gross Domestic Product, 50% of export earnings and 70% of total employment. Forestry as a sub-sector accounts for 6% of the GDP, 11% of export earnings and employs a labor force of 100,000 people (FC, 2010).

Box 1: Timber Industry Contribution to GDP(TIDD,2011)

TIMBER INDUSTRY CONTRIBUTION TO GDP

- ✘ In terms of GDP the forestry and wood industry ranks (with 6% of the total GDP) fourth after cocoa, minerals and tourism.

[BoG Economic Data for 2010]

- ✘ The wood industry in Ghana provides direct employment to about 100,000 people and a livelihood for more than 2,500,000 people.

Outside the permanently protected forest estates, there is very little intact forest remaining and much of this is confined to sacred groves and other culturally significant areas. Timber exploitations take place within timber contract areas, which cover both on and off Forest Reserves. Off reserved timber trees mostly stand on farmlands and fallow areas. Outside the reserved forests an estimated 400,000 ha of closed forest still exists.

There has been massive depletion of the “off-Reserve” timber resource base which in the 1970s to late 1980s supplied not less than 60% of timber exports and domestic requirements. The “off-reserve” areas served more or less as buffer to the F.Rs and PAs, but their weakened condition make FRs and PAs more vulnerable.

The range of products and services from the forest sector can be broadly grouped into

- (a) Wood and wood products,
- (b) Non-wood forest products and
- (c) Environmental services.

While these products and services cater to the needs of local, national and global consumers, the process of production also generates benefits to the owners of the resources (which include GoG, concession holders, local communities, farmers, etc.) and others involved in production by way of employment and income. Part of the income accrues to low income groups – especially forest fringe communities, farmers and others involved in forest-based enterprises – providing livelihood and thus helping to alleviate poverty.

The forests and woodlands provide for all the country’s timber and almost 86% of its biomass energy requirements. Over 50% of the population is rural and depend directly or indirectly on forest land resources for its livelihood.

3.2 Forest Products and forest-based industries

The wood industry is classified under three categories:

- i) Primary (poles, billets) which in 2009 accounted for **10.35% of Total Export Value.**
- ii) Secondary (lumber, plywood, kindling) accounted for **83.41% of Total Export Value.**
- iii) Tertiary (mouldings, dowels, flooring, profile boards, furniture) = **6.24% of total export value (TIDD, 2010)**

Timber production and trade. Total industrial roundwood production in 2008 was 1.39 million m³, little changed from the 1.37 million m³ recorded in 2004 (SOFO, 2011). Sawnwood production was 513, 000 m³ in 2008, compared with 490 000 m³ in 2004 and 455, 000 m³ in 1999. About 191 000 m³ of plywood was produced in 2009, compared with 140 000 m³ in 2004 and 75 000 m³ in 1999; 274 000 m³ of veneer was produced in 2009, compared with 301 000 m³ in 2004 and 150 000 m³ in 1999 (ITTO 2011). The estimated export value of primary

timber products was US\$207 million in 2009, comprising logs (US\$17.3 million – presumably teak and other plantation logs), sawnwood (US\$70.0 million), veneer (US\$63.4 million) and plywood (US\$56.0 million) (ITTO ,2011). Virtually all paper and paper board products are imported (Table 3).

Table 3: Production and Consumption of Woodfuel and Sawnwood,2008 (SOFO, 2011)

Area	Woodfuel (1000 m3)				Industrial Roundwood (1000m3)				Sawnwood (1000m3)			
	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption	Production	Imports	Exports	Consumption
Ghana	35363	0	0	35363	1392	3	1	1393	513	0	192	322
Total Africa	615636	7	7	61566	72059	754	3449	69365	8412	4862	1307	11967

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Table 4: Production, Trade and Consumption of Wood-based Panels, Pulp and Paper,2008 (SOFO, 2011)

Area	Wood- based Panels (1 000m3)				Pulp for Paper (1 000 m3)				Paper and Paperboard (1 000 m3)			
	Production	Import	Export	Consumption	Production	Import	Export	Consumption	Production	Import	Export	Consumption
Ghana	453	1	208	246	0	0	0	0	0	65	0	65
Total Africa	2962	1019	574	3407	2632	515	437	2710	4285	3604	1153	6737

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The industry has its share of booms and busts. The gradual decline in industrial output of wood and wood products occurred between 1973 and 1982, and revitalized from 1983-1994. In the face of dwindling raw material base, the Ghana timber industry has to face up to stiff competition on the global market. The ECOWAS wood market is gaining momentum.

The so-called lesser known and lesser used species categories have gained prominence through research and development. We have oversized primary and secondary processing sectors whose raw material requirements (2.5+million³) are far in excess of the resource availability in terms of the Annual Allowable Cut (1.1 million³).

In the 1970s, there was considerable decline in the timber industry. But under the Economic Recovery Programme of 1983, the timber industry was revitalized through massive investments in logging, sawmill equipment, and wood production increased almost 3-fold from 1982 to 1986; lumber production rose 2-fold over the same period (Table 4).

Table 5: Export of Wood and Wood Products (1973-2007)
(volume: '1000m³; value US\$ million, TIDD, April, 2007; * for Teak poles & curls)

	Logs		Lumber		Other wood Products		Total Volume '1000m ³	Total Value US\$ million
	Volume	Value	Volume	Value	Volume	Value	Total	Total
1973	1006.8	86.5	234.8	40.15	41.0	11.5	1282.6	138.2
1982	53.2	3.7	39.7	8.97	7.4	2.6	100.3	15.3
1986	195.8	25.4	83.6	18.84	16.6	5.5	296.0	49.7
1994	615.2	77.8	258.5	102.63	89.9	49.8	963.7	230.3
2004	--	---	209.7	91.0	244.9	125.1	454.6	216.5
2007	73.4*	20.4	205.6	99.77	247.6	132.1	526.9	252.3

High population growth, poverty, high dependence on natural resources and economic pressures in the late 1980s to early 1990s to increase exports and foreign exchange from agricultural, timber and minerals are the key contributors to decline in forested area.

Again globalization of several macroeconomic policies was achieved through Structural Adjustment Programmes (SAP), and Poverty Reduction Strategies.

In 1990s SAP conditionalities were imposed as pre-conditions for loans; this led to unprecedented extraction of natural resources (forests, minerals) for export and undermining

the interests of resource dependants; it also failed to take the environmental costs (soil erosion, land degradation) explicitly in their design.. But such policies tended to lower GOG budgets for forest resource regeneration.

Inadequacy of forest protection measures have resulted in forest encroachment and overexploitation of all categories of forest and wildlife resources.

Meanwhile habitat degradation and poaching of wildlife has become a big threat to forest biodiversity. Forest transition zone is also depleted through charcoal burning, livestock grazing (the alien Fulani factor).

Over the past two decades, the forest sector has been plagued by rampant illegality, which is a reflection that the rule of law in the forest sector has degenerated. Illegal chain-saw operations in all types of forests and encroachment on Forest Reserves by agricultural activities have virtually undermined GOG's efforts in undertaking SFM (FC 2010)

Box 2: Challenges to Meeting Domestic Wood Demand (TIDD, 2011)

CHALLENGES TO MEETING DOMESTIC LOG & LUMBER DEMAND

- ✘ Ever increasing demand for lumber on the domestic market.
- ✘ Excess capacity of obsolete and inefficient processing facilities.
- ✘ Under-developed and unregulated domestic market.
- ✘ Over 80% of lumber to the domestic market is supplied by illegal chainsaw milling.
- ✘ Over 60% of timber production are either primary or secondary wood products.

TIMBER INDUSTRY OUTLOOK

- ✘ Average total timber export for 2006 – 2010 is **471,114 m³** per annum.
- ✘ This volume translate into an average raw material input of **1.346 million m³** per annum (at 35% mill convention efficiency).
- ✘ Domestic lumber consumption in 2008 is estimated at **591,000 m³** (*TIDD/TBI/FORIG Study Report*).
- ✘ This also translates into an average raw material input of **1.182 million m³** per annum (at 50% mill convention efficiency).
- ✘ Total raw material demand as mill input is therefore in excess of **2.528 million m³** per annum.

BOX 3: TIMBER INDUSTRY OUTLOOK -TIDD 2011 1

TIMBER INDUSTRY PERFORMANCE FOR 2004 – 2010

YEAR	EXPORT VOLUME(M3)			EXPORT VALUE(US\$)		
	TOTAL	*TERTIARY	% CONTRIB.	TOTAL	*TERTIARY	% CONTRIB.
2004	455,180	51,618	11.35	216,518,952	34,846,969	16.09
2005	466,155	43,618	9.36	218,973,475	27,812,588	12.70
2006	451,608	35,720	7.91	214,323,357	22,717,107	10.60
2007	528,570	34,501	6.53	252,318,410	22,979,716	9.10
2008	545,915	30,523	5.59	251,925,453	21,558,046	8.56
2009	426,220	15,805	3.71	137,847,837	8,125,878	5.89
2010	403,255	19,574	4.85	128,226,984	10,223,279	7.97

TIDD/STATISTICS & DATAPROC UNIT

Box 4: Performance of Tertiary Processing Industry

3.2.1 Industrial over-capacity

The forestry sector is dominated by the timber industry comprised of some 250 logging firms and 130 sawmilling and plywood manufacturing companies. The operational capacity of the existing industry is believed to be in excess of 2 million m³ on an annual basis. This is to be compared to the present annual cut of 1 million m³. Consequently many of the timber companies are operating below maximum capacity leading to in-efficiency. This situation is compounded by the often poor technical and professional competence of the timber companies and the high levels of waste (TIDD, 2011).

Sawmill and tertiary industries are at the verge of collapse while the construction industry is flooded with alternative raw materials to wood, especially plastics. Addressing the Challenges to the Wood Industry will include: Importation of log and wood raw materials in the short-term for processing for both export and the domestic market.

There is the need to invest in modern efficient processing machines to convert “wood waste” into high valued finished products to increase recovery.

3.2.2 The formal timber industry has traditionally concentrated on exports. Domestic supplies, therefore, are supplemented by illegal logging: according to one estimate, 84% of domestic timber (about 497 000 m³) is supplied by illegal chainsaw milling operations, and an additional 260 000 m³ of timber from such operations is exported to neighbouring countries. Most of the logs are obtained from off-reserve sources (including in concessions, at the expense of concession holders), although there is anecdotal evidence that forest reserves are increasingly being raided (Marfo, 2010).

Measures have been put in place to reduce illegal forest activities, including the formation of a military task force, which patrols the forest; increased arrests and prosecutions; a ban on the sale of chainsaw lumber; and the development of a Voluntary Partnership Agreement (VPA) with the European Union. Such measures have enhanced the Forestry Commission’s capacity to control legal and illegal forest activities. Another potential measure is a new timber-tracking system, which is currently being piloted. This system is designed to monitor the movement of timber from standing trees in forests (including in forest reserves, off-reserve forests, and timber plantations) to processing facilities, or from point-of- import to processing facility, and to local sales outlets or export facilities. The system will enable the tracking of individual logs and consignments of processed products, and will include product labelling, physical inspections and documentary checks.

3.3 Informal Forest Sector

The forest sector in Ghana is the fourth largest foreign exchange earner for the country. This contribution however comes mainly from the formal forest sub-sector consisting of regulated industries in timber and timber products. The informal

sub-sector, characterised by small and medium forest enterprises (**SMFEs**) broadly covering wood forest products, non-wood forest products and forest services, has been largely left out in forest planning and management even though it represents the main, additional or alternative income source for about 3 million people in Ghana. SMFEs tend to accrue wealth locally, empower local entrepreneurship and seek local approval to operate. In addition to engaging many more people than the formal sector, SMFEs directly benefit local people and can therefore serve as an important vehicle to reduce poverty in Ghana.

SMFEs include small scale carpentry, chainsaw milling, charcoal production, wood carving (including canoes) and the trading of NWFPs: the collection, processing and sale of products like shea nuts, cola, chewing sticks/sponges, gum arabic/resins, spices, honey, edible and wrapping leaves, oily and edible seeds, baskets/hats/mats, bamboo and rattan products, snails, mushrooms, medicinal products, etc. (Table 6: SMFEs in Ghana, 2010).

Two categories of NTFP exploiters are recognised in the country. These are: the people who collect, gather or exploit NTFPs for domestic use. These people have communal/customary rights, which include the right to use products for meeting subsistence needs, with a Native Authority permit issued by a forest officer. These exploiters do not have to pay any fee for the products they exploit; the people who collect products for commercial use, such as those who sell the raw materials to consumers or processing enterprises as well as those who collect and process the products themselves.

Table 6: Small-medium forest enterprises found in Ghana (Osei-Tutu et. al. , 2010, Tropenbos, Ghana)		
Wood forest products	Non-wood forest products	Forest services
Small scale carpentry Chainsaw operation Charcoal production and trade Canoe/wood carving and trade Lumber trade Fuelwood production and trade	Shea butter Cola Chewing stick and sponge Gum Arabic/resins Spices (black and white pepper, prekese) Edible and wrapping leaves Essential oils Edible seeds Honey production Dyes Baskets/hats/mats Bamboo and rattan products Snails Mushrooms Medicinal products Bush meat trade Palm wine tapping	Ecotourism Plantation growers

3.3.1 Non-wood forest products. An estimated 380 000 tonnes of bush meat are consumed annually, mainly from forests, at an estimated value of about US\$350 million. Animal and plant products used in traditional medicine and cultural practices have an estimated value of about US\$13 million. Over 600 000 women in northern Ghana collect about 130 000 tonnes of nuts yearly, about 40% of which is exported. This contributes about US\$30 million annually to the national economy (Osei-Tutu et al. 2010). Efforts are being made to market, internationally, at least two Ghanaian NTFPs: thaumatin, a sweetener from seeds of *Thaumatococcus danielli*, which is reputed to be easy to cultivate under plantation trees; and novella, an oil/margarine from seeds of *Allanblackia parviflora*. A small-scale processing facility for thaumatin production being established; the value of exports of this product in 2004 was reportedly \$430 million.

Table 7: Indicative estimates of numbers of some Wood & Non-wood SMFEs in Ghana And their Turnovers	
Wood SMFEs	Nos. of organisations/people/annual turnover
Small scale loggers without sawmills	About 503 companies in GTA: US\$ 32 million
Chainsaw operations (mostly illegal)	About 17,000 people
Chainsaw lumber haulage	About 264,000 people involved in haulage sector
Informal Sector Timber Retailers and wholesalers	About 21,000 people in chainsaw milled lumber About 1,300 lumber brokers: turnover: US\$ 58 mln.
Small scale tertiary operators and artisans- furniture, windows, doors, coffins, wood carvers, handicrafts	About 30,000 small scale carpenters employing about 200,000 people. About 5000 wood carvers and 1500 canoe carvers
Fuelwood and charcoal production	About 16 milion m ³ of wood valued at about US \$ 200 millio is consumed in various forms as energy per year: this accounts for about 86% of urban energy; in rural areas, woodfuel makes up more than 95% of energy consumption.
Non-Wood SMFEs	
Herbal medicine	Plant and animal products used in traditional medicine and cultural practices are estimated at US \$ 130 million.
Shea nut	Over 600,000 women in Northern Ghana collect about 130,000 metric tons of nuts yearly, about 40% is exported; the turnover is about US \$30

	million annually to the national economy
Live animals and plant products exports	More than 21 animal exporters and 30 wild plant products exporters; estimated annual turnovers for 1997 and 2003 were US \$ 12.9 million and US \$ 18 million respectively
Bush meat hunters, traditional chop bar operators (food vendors)	300,000 hunters in rural areas producing between 2220,000 and 380,000 metric tons of bushmeat valued at between US 210 million and US \$ 350 million for domestic consumption annually
Source: Mayers, et al. 2008(quoted by Osei-Tutu et. al. 2010)	

According to Mayers et al. (2008) about 30 000 small-scale carpenter firms employ an estimated 200 000 people, and there are about 5000 woodcarvers and 1500 canoe carvers. Chainsaw milling, although illegal, provides jobs for about 130 000 Ghanaians and livelihood support for about 650 000 people (Marfo 2010); 5000–6000 people are estimated to be employed in the bush-meat industry.

3.3.2 Livelihood values. An estimated 2 million people depend on forests for subsistence uses and traditional and customary lifestyles. Forest-adjacent communities undertake a wide range of forest-related activities, including fuelwood and charcoal production, wood-carving, canoe-carving, rattan production and chewstick-gathering.

3.4 Rural/Urban energy is an important aspect of the forest economy and depends largely on wood fuels (fuel wood and charcoal).

Energy Consumption in Ghana(2004): Ghana’s energy comes from three main sources: hydro-electricity 7%, Petroleum products 15%, biomass (woodfuel) 71%.

Biomass is the bulk of energy consumed mainly for cooking & water heating in the residential & commercial sector. (Ghana state of the Environment, 2004).

Wood fuel accounts for 85.8% of primary energy used in Ghanaian homes and provides income-generating activity (charcoal producers, transporters and retailers) to a substantial part of the rural community. In 2000, 16 million metric tons of wood fuel was consumed, 9 million of which was converted to charcoal.

Apart from firewood and charcoal, energy derived from biomass is very unpopular. Biodiesel generated from plants such as *Jatropha* has, in the past, been promoted by the Ghana Government. However, lack

of adequate framework for the pricing and use of the technology as an alternative to fossil fuel has not encouraged the private sector to participate meaningfully.

The overall potential of woodfuels is seen as very promising among the renewable energy options, particularly in those rural areas where other sources of energy may be available (LPG/electricity), but are not affordable for day to day cooking and heating.

3.5 Ecotourism is expected to earn US\$ 1.6 billion in annual revenue generation by 2010, and tourism will likely become the number one foreign exchange earner in the national economy in the future. Table 8: gives a list of frequently visited ecotourism sites in Ghana

Table 8: Frequently visited ecotourism sites, their special attraction and location in Ghana		
Ecotourism site	Special attraction/products	Region
Amedzofe	Gbademe waterfall, Gemi mountain, hiking	Volta
Liate Wote	Afadzato mountain, Tagbo waterfall, hiking through the forest	Volta
Tafi-Atome monkey sanctuary	Sacred Mona monkeys	Volta
Xavi	Bird watching and canoeing	Volta
Boabeng-Fiema Monkey sanctuary	Mona monkeys, Black and White Colobus monkeys	Brong Ahafo
Tano Boase Sacred Grove	Hiking through towering rock formations in a semi-deciduous forest	Brong Ahafo
Tongo Hill	Natural caves in a landscape of granite rock formations	Upper East
Paga Crocodile pond	Crocodiles	Upper East
Wechiau Hippo Sanctuary	Watching hippo populations from a canoe on the Black Volta river, bird watching, mountain hiking, night on a silk cotton a platform built on a silt cotton tree.	Upper West
Bobire Forest and Butterfly Sanctuary	Butterfly sanctuary with over 500 species, Anurans (frogs), arboretum	Ashanti
Bomfobiri	Unique vegetation of transition zone waterfall	Ashanti
Bunsu Arboretum	Plant genetic resources: extensive variety of plants, trees and shrubs, more than 100 spp of birds and a butterfly sanctuary	Eastern
Domama	Cave, bats	Central
Bui	Pigmy hippos, canoeing, hydro-electric power station	Brong Ahafo
Kakum	Canopy walkway, varied wildlife with some 40	Central

	species of large animals, 400 spp of buterflies	
Mole	Wildlife, savannah vegetation, over 90 mammal species, 4 primate species and 300 bird species	Northern
Kalakpa	Animal viewing, hiking, mountain trails	Volta
Shai Hills	Momkeys, coastal savannah vegetation	Greater Accra
Nzulenzu	Unique wetland ecosystem, stilt village	Western
Ankasa	Biodiversity, 43 mammals species,10 primate species	Western
Bia	Elephants, chimpanzees	Western
Source: Ghana Tourist Board, 2008.		

Kakum National Park in the Central Region remains a focus of Ghana's ecotourism programme. Forest elephants, seven species of primates and high antelope and bird diversity provide tremendous potential to ecotourism. The Kakum canopy walkway, perched 30 meters above the ground, gives a unique eye view of the rainforest and is the first of its kind in Africa. The number of visitors increased from 20,000 in 1995 to 59,000 in 1998, while revenue from the walkway rose from US \$ 100,000 to US \$108,000 for the same period. Part of this revenue is used for sustainable projects in the communities around Kakum Park.

3.6 Forestry and MDGs

The sustainable management of forests and trees can make a meaningful contribution towards achieving the MDGs.; in particular:

- The management, harvesting, processing, and marketing of wood and non-wood forest products can provide opportunities for employment and income generation.
- The adoption of agroforestry practices(improved taungya system) has increased food production and food security, provided wood products for sale or consumption, provide source of household energy, and improve soil composition and structure.
- Watershed management can provide multiple goods and services, especially enhanced and sustained water production that is important to health and sanitation.
- Sustainable forest management can protect biodiversity, moderate climate change, and reverse desertification.

While SFM and agroforestry can make contributions to achieving all of the MDGs, their most important contribution relate to goal 1: eradication of extreme poverty and hunger; and goal 7: ensuring environmental sustainability.



Figure 4: Famous Kakum Canopy Walkway, Central Region of Ghana

3.7. Land degradation in the Savanna areas has resulted in:

- declining soil productivity, low crop yields, deterioration of socio-economic conditions; **incipient desertification**; out-migration is prevalent.

Strategic actions for conserving the Savanna ecosystem to include:

- human management of natural resources, including the protection and promotion of indigenous knowledge about savanna natural resources (eg. ecological knowledge, indigenous crops, medicinal plant resources); the **CREMA** concept envisions participatory management of the outer zone of the PAs.
- the potential of eco-tourism (such as in Mole Reserve) as an economic activity that connects conservation of natural resources and economic development.

- formulation of policy and institutional reforms that emphasize integration of agric, forestry, livestock production into other land uses.

3.8 Forestry Projects and Programmes enable the Forest Sector to achieve its mandate of protection, development, management and regulation of forest and wildlife resources in the country. Donor support as usual helps to sustain the implementation of a broad range of programmes of natural resource governance and environmental reforms. Several recent programmes are cited below.

Forestry Projects in Ghana

- i) **“National forest programme” (nfp)** generic expression of approaches towards forest policy formulation, planning, implementation & monitoring at the subnational and national levels.

NFP provides a framework and guidance for:

1. country-driven forest sector development;
 2. national implementation of internationally agreed concepts e.g. UN conventions and proposals -Proposals for Action drawn up during the IPF/IFF process; NLBI;
 3. an iterative, long-term process, composed of various elements, including the country policy and legal framework related to forests, the participation mechanisms, the capacity-building initiatives and others
 4. provides for learning cycles in all its phases allowing for realities experienced along the way to be shared.
- ii) **2005: Support for Ghana’s Biodiversity Conservation.**
GEF offered Ghana with a US\$ 8.7 million for the protection of high forest Biodiversity Conservation Areas, especially: Cape Three Points, Krokosua Hills, Tano Offin, Atiwa Forest Reserves. The project seeks the collaboration of forest fringe communities.
- iii) **2006: Northern Savanna Biodiversity Conservation Project (under GEF).**
- Conservation of biodiversity and sustainable utilization of medicinal plants in the three regions of Ghana.
 - To enhance degraded area restoration,
 - Establishment of faunal corridors and building local capacity in conservation and best practices in dry land resource use.
- iv) **2008: Natural Resources and Environmental Governance Programme (NREG)**
The Specific Policy Objectives under the 5-year NREG for the Year 2010 were as follows:
- Institutional Strengthening and Governance
 - Secure Natural Ecosystems for the benefit of all segments of society

- Sustainably Finance and Promote Investment in the Forest sector
 - Strengthen Monitoring and Evaluation/iCT systems
 - Promote equitable resource access rights and benefits for all segments of society.
- v) **Community Forest Management Project (CFMP)** ended in December, 2010. This project, funded by AfDB, was designed to rehabilitate degraded forest reserves while increasing production of agricultural, wood and non-wood forest products and strengthening the capacity of relevant institutions. The Modified Taungya System adopted by the project yielded good results.
- vi) **Government Plantation Development Programme (HIPC)** aims at rehabilitating degraded forest reserves, in off-reserve areas including mangroves, watersheds, urban tree planting, and creating employment for the youth.
- vii) **2008 Implementing the Forest Instrument: Non-Legally Binding Instruments (NLBI)** on all types of Forests in Ghana is a pilot project meant to support Ghana to move in the implementation of NLBIs channelled through **the NFP** and stakeholders.
: Ghana became the first country to systematically implement the Forest Instrument with technical support from FAO and German Aid Funds

The 24 policies and measures agreed in the Forest Instrument that are to be implemented at the national level represent a wide range of actions the forest sector of a country should undertake to achieve SFM. The NLBI has been found to be a useful tool for the systematic assessment of the performance of the country in the implementation of the NFP.

- viii) **Forest Investment Programme(FIP)** hopes to make long-term impacts on: reduced emissions and enhanced removal of GHG, reduced biodiversity loss, and increase forest resilience to climate change.
- ix) **Ghana's REDD-plus.**
Ghana is actively engaged in the Forest Carbon Partnership Facility and is developing a national **REDD+ strategy**. It has also been chosen as a pilot country of the **Forest Investment Program for up-scaled REDD+ investment. Ghana's REDD Plus Readiness Preparation Proposal (R-PP)** was technically approved in 2010.

Ghana is developing a comprehensive **low-carbon growth plan** that will address climate change as part of a national and sectoral development strategy and set REDD+ in a wider development context. Estimates of national-level forest biomass carbon stocks vary from 381 MtC (FAO 2010) to 610–890 MtC. There is no recent estimate of the net degradation; estimates made in

1994 suggest that 40% of the country's emissions may come from deforestation (Government of Ghana 2004, State of the environment). .

- x) **2009: Ghana's engagement in the FLEGT-VPA** was ratified between EU and FC with the object of reconciling data along the entire wood products destined for both export and the domestic market and verifying that the supply chain of wood and wood products is not contaminated with products from non-legal source.

4.0 MAJOR ISSUES

The advent of the twenty-first century has introduced a set of complex and increasingly interlinked issues related to the forestry sector (FAO, 2009). **These new and emerging issues** cover the following key areas:-

- I) Sustainable forest management
- II) The quality of forest governance" participatory/community-based forest management; forestry – livelihood linkages; tribal and indigenous people's rights over forest resources;
- III) environmental services from forests;
- IV) commercial needs; Biofuels
- V) climate change;
- VI) desertification;
- VII) Landscape restoration : biodiversity; and land degradation/mining in FRs.
- VIII) Emerging sources of finance for forests and options for sharing benefits of forests widely and equitably;

It must be realized that the above mentioned key areas demand immediate innovative solutions.

4.1 Mining in Forest Reserves.

In 1997, a policy decision was taken that mineral exploration activities would be allowed within at least 2% of the production areas of the Forest Reserves. Guidelines for mining in forest Reserves have since been drafted and implemented.

Aside the large-scale mining a lot of illegal mining activities are now taking place in both closed forest and savannah woodland areas. These illegal mining activities are uncontrolled and are not allowing the forest to regain from its intensive mining shock. The situation has further degraded the lands in these areas.

4.2 Forest Governance Issues

The Forestry Commission of Ghana is responsible for the management of forest and wildlife resources, which includes the conservation, sustainable management and utilisation of those resources and the coordination of policies related to them. It encompasses the various public bodies and agencies that were individually implementing measures to protect, manage and regulate forest and wildlife resources. It has five divisions: Forest Services Division (FSD), Wildlife Division (WD), Timber Industry Development Division (TIDD), the Wood Industry Training Centre (WITC) and the Resource Management Support Centre (RMSC).

4.2.1 Forest Tenure.

The alienation of land for permanent forest estates (PFEs)/Forest Reserves, Nature Reserves, Game Parks was part of a larger pattern of **colonial restructuring of Africa's land-use traditions**. Hence early efforts to protect the natural environment in Africa often alienated the interests of local communities for export-oriented interests in timber exploitation.

Land-tenure systems vary significantly from area to area in Ghana, with major regional differences between the north and south and between the Akan and related peoples of south and southwest Ghana and the neighbouring Ewe-speaking populations in the southeast. Some areas, including forest reserves, have been acquired by the government, though ultimately 'owned' by the chieftaincy; these are referred to as 'vested lands'.

Thus, in Ghana, forests are owned by communities vested in traditional authorities, held in trust for them by the state, and logged by private contractors; traditionally owned forest lands are known variously as 'stool land' or 'skin land'. Ownership arrangements are also reflected in the Timber Resource Management Act, 1997, the 1998 Timber Resources Management Regulations, and the Forestry Commission Act, 1999 (Act 571). The Timber Resource Management (Amendment) Act, 2002 (Act 617).

4.3 Strengthening Participatory Processes and Raising Public Awareness

- By defining the range of key stakeholders: local communities, government agencies, private sector, NGOs, CBOs
- Increase participation of CBOs and indigenous people in the sector to reduce conflict and increase legitimacy, and stewardship of the forest resource.
- Implementation will require strengthening of financial, human and technical competencies among all key stakeholders and institutions.
- To raise public awareness of the contribution of the sector to society and the potential consequences of mismanaging the forest resource.

4.4. Gender Balance: Women in rural communities constitute a major stakeholder group. Women gather wild plants and animals from forests and savannah woodlands for a variety of uses—as food, medicines, construction, tools manufacture and income. They provide a critical component of the economic systems of most rural people—as the primary subsistence producers. Women must be integrated into the utilization projects as both participants and beneficiaries to meet the dual objectives of better management of the resource base, and improved community welfare.

4.5 Revenue Sharing: The Constitution provides for the sharing of royalties between government and traditional owners as follows: 40% to stools and 60% to the state in reserve forests; and 60% to stools and 40% to the state in off-reserve forests. Social-responsibility agreements are reached between Timber Utilization Contract (TUC)-holders and the communities where timber extraction takes place for the provision of agreed social services and amenities; a process of consultation is also undertaken.

The following benefit-sharing arrangement for the **modified taungya system** and commercial plantation developers is in place: farmers and the Forestry Commission should each receive 40% of benefits accruing based on their inputs; landowners should receive 15% (comprising traditional authorities 7% and tribal landowners 8%); and forest-adjacent communities should receive 5%.

4.6 Forest policy and legislation. The first forest policy was established in 1947; this was revised in line with Ghana’s 1992 Constitution and approved in 1994 as the Forest and Wildlife Policy. No significant changes have been made to forest laws, policies or regulations. However, the government is in a consultative process (from 2009 to 2011 to review the Forest and Wildlife Policy and the 1996 Forestry Development Master Plan (which spans 1996–2020).

The role of GOG is to provide the policy framework that facilitates implementation of CBO, NGOs, and private sector; to provide technical assistance and extension service to resource managing partners; to provide the necessary infrastructure and basic services to resource managing partners.

4.7 Forest Management

Estimate of the area of forest sustainably managed for production. On the basis of information supplied by the Government of Ghana, FAO (2010) reported that 1.38 million hectares of forest was under sustainable management. ITTO (2006) estimated that 270 000 hectares of natural forest was being managed in a manner consistent with sustainability, including the operation of Samartex, a Ghanaian company in the Western Region.

Timber utilization permits: timber may be allocated through timber utilization permits (TUPs; LI 1649). Based on an application by a district assembly, town committee, any rural community group or an NGO and subject to such conditions as the Forestry Commission may determine, the Forestry Commission may issue a TUP exclusively for harvesting a specified number of trees in an area of land not subject to a TUC. Any timber harvested or converted to lumber under a TUP may be used only for social or community purposes.

Timber harvesting is used as both a silvicultural and a management tool. National forest inventories were undertaken in forest reserves in 1985–1992 and 2002, and the data from these have been used for, among other things, setting the AAC. Forest protection strategies have been incorporated and described in the 1995 Manual of Procedures for Stock Survey and Yield Allocation and backed by the 1998 Logging Manual.

In particular the field staff must ensure that compartment plans are followed, that the conditions for forest protection are adhered to, and that royalty payments are made in accordance with contract agreements.

The 2002 Law on Timber Resource Auctioning establishes that timber rights will be awarded by tender.

Outside the forest reserves, the annual production of timber by illegal chainsaw milling is reported to be as high as 2.5 million m³, five times the total AAC in the formal sector (Marfo 2010).

The current situation in Ghana is summed up in a 2006 report as follows:

“Long-held assumptions about Ghana's forest wealth are no longer valid. The off-reserve forest has largely gone; future timber supply will increasingly come from plantations; and constrained supply and changing international markets will encourage industry restructuring.” (World Bank et al, 2006).

Management Plans. Twenty-one plans have been developed covering an area of just over 400, 000 hectares of the PFE, and their implementation was scheduled to begin in January 2010. If the implementation of these initial 21 plans is successful, a second phase will involve

the development of plans for the remaining production forest reserves. The introduction of low impact logging techniques is under consideration. Constraints to SFM encountered in the past include inadequate funding; institutional weaknesses; a lack of adequate equipment; the poor implementation of management plans; increasing demand for forest resource use, sometimes resulting in conflicts; and encroachment and unapproved harvesting (FC.2010).

4.8 Deforestation and forest degradation.

All forests have suffered depletion, creating eroded hillsides in some cases and destroying genetic diversity in others. FAO (2010) reported a change in natural forest area of 677 000 hectares between 2005 and 2010, an annual average loss of 135 000 hectares. An estimated 66 500 hectares of wet evergreen, moist evergreen and moist semi-deciduous forest (in the southwest) in the PFE were formally converted to agriculture in the most recent two and half decades. Forest fires affect an estimated 500 000 hectares of forest per year (FAO 2010). Excessive logging can make the forests more vulnerable to fire by causing the accumulation of residues, which become readily flammable when dry. Illegal forest activities, including the use of portable chainsaw mills, are widespread in the high-forest zone, particularly in off-reserve areas. The invasion of woody weeds (Akyampong weeds, *Chorolema odorata*) affects an estimated 50 000 hectares.

Degradation of forests outside the reserved forest areas over the years has led to a decline in their contribution to Ghana's timber production, from 70–80% between 1960 and 1980 to 19–27% between 2003 and 2006 (Kotey et. al. 2006).

Immediate drivers of forest degradation include forest industry over-capacity; policy/market failures in the timber sector; burgeoning populations in both rural and urban areas; increasing local demand for agricultural and wood products; high demand for wood and forest products on the international market; heavy dependence on charcoal and woodfuel for rural and urban energy; and limited technological development in farming systems and continued reliance on cyclical slash-and-burn methods to maintain soil fertility (Forestry Commission 2010).

Road construction near or within forest reserves facilitates encroachment. Internal migration to the western forests for cash-crop (especially cocoa) cultivation accounts for the high rate of degradation in those forests.

There is deep concern for the future of the country's forests due to over-exploitation of timber and NTFPs, encroachment of reserves by agric activities, uncontrolled fires, surface mining, charcoal production and infrastructure which have tended to reduce the forest cover, and subsequently reduced the forests' capacity to produce ecosystem goods and services.

4.9 Wild Fire Management:

Given the large quantities of carbon released by forest fires, investments in fire management could contribute substantially to mitigating climate change while simultaneously preserving biodiversity, protecting stocks of timber and other forest products

A range of measures has been put in place to help reduce the impact of fire, including wildfire management plans, the establishment of a green fire belt, incentive schemes for fighting fires (volunteer schemes), education and awareness creation, and arrests and prosecutions. Such measures have helped to reduce the incidence of wildfire in some fire-prone communities.

Investments in forest fire management, reduced-impact logging, post-logging silvicultural treatments and tree planting can all help mitigate climate change and make forest ecosystems more resilient.

4.10 Climate Change

Vulnerability of Forests to Climate Change. Climate change and climate variability would be among the most serious threats to sustainable development, with potential adverse impacts on natural resources, physical infrastructure, human health, food security and economic activity.

In Ghana, the rural population (69%) depend directly on forests and woodlands for its livelihoods (W.B, 2004). Africa's enormous dependency on biological resources bring with it a particular vulnerability. Hence environmental degradation that leads to the destruction of the ecosystems is invariably viewed as a serious threat to Africa's future.

Changes in climate or weather patterns could affect the growth, yield and vitality of forests. Extreme weather conditions such as prolonged droughts, flooding could reduce the stability of the incidence of pests and diseases.

In Ghana, average annual temperature has increased by 1.0oC (from 1960 to 2010); this is likely to damage the integrity of forest ecosystems. Regardless of the pace of such change, healthy forests maintained under SFM will have better resilience to climate change than those weakened and /or endangered by overexploitation.

Adaptation to climate change

Few data are available on the adaptive capacity of the country to address the issue of vulnerability in the forest sector. More research and action-oriented planning is needed to assess more exactly the possible nature of climatic changes in each instance, the vulnerability of the forest to these anticipated changes, and the most suitable adaptive measures in each case. Many management options are available to increase the resilience of forest ecosystems, including adaptive silviculture and, in planted forests, judicious species selection. At the landscape scale,

the protection of large areas of forest with internal variations in climate, altitude and soils and the development of linking networks of forest would likely enable the internal migration of species and decrease vulnerability to climate change.

4.11. Forestry Research Results

FORIG under CSIR continues to develop its capacity to engage into emerging areas for research related to sustainable management of Ghana's forest resources, environmental management and climate change issues.

Ongoing research focus on the following areas:

- I) Natural Forests: Rehabilitation of degraded forests, impact of selective logging, natural regeneration, carbon stocks, soil carbon and CO₂ flux especially in Bobire FR.
- I) Development of Technologies for Plantation development; genetic Improvement of Planting material, seed processing,
- II) rural wood preservation.
- III) Community-based watershed management
- IV) Utilization of LUS, NWFPs; utilization of coconut wood, Oil palm wood, Rubber Wood, Borassus palm, and Broussonetia as timber resources; mushroom cultivation, snail farming.
- V) Wood Residues for Co-generation of electricity (from sawmill off-cuts, sawdust,etc).
- VI) Sustainable development of Bamboo Resources in Ghana.
- VII) Socio-economic development of fruit trees in Northern Ghana.
- VIII) Forest Protection: monitoring of Pests and Diseases in both monocultures and mixed plantations, especially *Nauclea diderichii* shoot borer, *orygmophora mediofoveates* in West Africa.
- IX) Contract research and technology transfer through training.
- X) Commercialization of Research; domestication of *Allanblanckia parviflora* from the high forest.
- XI) Publication of the Ghana Journal of Forestry for research dissemination

4.12 Funding Forestry

The Forestry Commission derives its revenue from the following source:

- a) Subvention from GOG, for personnel Emoluments, Administration, Services and Investment.
- b) Internally Generated Fund includes income from Stumpage, Plantation Sales, Export levies, Zoos and Parks entrance fees and others.
- c) Donor contribution, which includes cash, assets and technology consolidated into Natural Resources and Environmental Governance Programme (NREG), with the overall objective of ensuring sustainable economic growth, reduce illegal logging, poverty alleviation, increasing revenues and improving environmental conditions.

d) Emergence of new market opportunities for forest goods and services (Green Economy).

Climate change is a globalization issue that presents new forms of financing.

The development of PES (watershed protection, carbon sequestration, landscape beauty, biodiversity conservation) may increase financial returns for SFM. Several pharmaceutical companies are paying for high-value bio-prospecting.

4.13 Harmonization of Forest and Extra-forest Policies

It is essential that Forest Policy is formulated and implemented with support from several cross-sector agencies.

- Forests serve as water-catchment areas, are sources of wood fuel (biomass energy), habitats for wildlife (nature tourism), and impact on agricultural activities. Hence policies on Water, Energy, Agric, Fisheries, Tourism, Mining should have clear linkages with the Forest Policy.
- The need to create synergies between the various agency policies, and seek appropriate mechanism for achieving harmonization of various sectorial policies that touch on forestry: land-use planning, integrated water resources management planning.

It is also essential that Forest Policy conforms to the broader national development goals so as to receive the political support necessary for implementation. Implementation of Forest Policy is mostly hindered by institutional arrangements, legislative and cross-sectoral conflicts, and the dilemma between short-term developmental and ecological objectives.

4.14 Regional Cooperation:

Ghana's Political will to advance transboundary issues of shared interest through coordination of policies, institutions and management.

Climate change requires transboundary responses especially where watersheds straddle political boundaries; Control of illegal trade of forest products—eg. Smuggling of wildlife and timber products; PAs to provide connectivity of conservation areas; Joint strategy of control and monitoring.

5.0 TRANSBOUNDARY TRADE IN WOOD AND NON-WOOD FOREST PRODUCTS

5.1 ECOWAS Market Trends:

The ECOWAS market (mainly Nigeria, Senegal, Niger, Gambia, Mali, Benin, Burkina Faso and Togo) absorbed Euro 36,690,251(91.06 %) of Africa's Euro 40,291,005 wood imports from Ghana in Jan-December 2011, with plywood and lumber leading the export products.

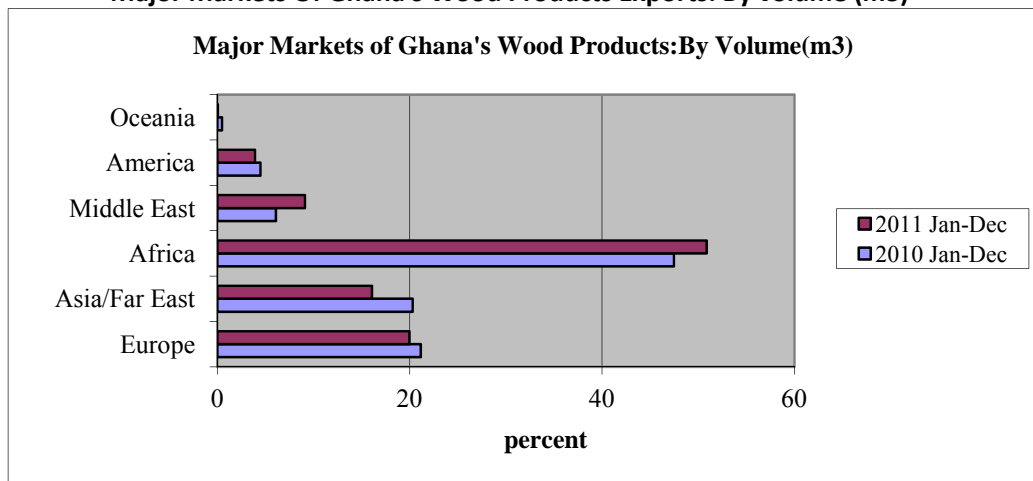
Europe accounted for Euro 31,203,779 (29.04%) and 63,892m³ (19.98%) in value and volume respectively of total wood exports in Jan- December 2011. Figures for the similar

period in 2010 were Euro 40,031,245 and 85,304 cubic metres (29.04% and 21.15%) respectively.

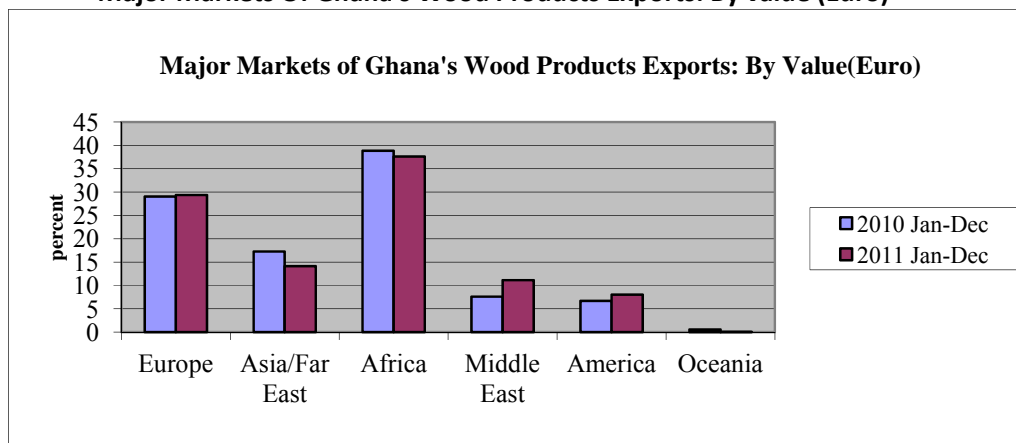
Table 9: (from TIDD Report, Dec. 2011)

MAJOR MARKETS OF GHANA'S WOOD PRODUCTS EXPORTS: JAN- DECEMBER 2010/2011							
Market Regions	VOLUME ('000'/m3)		VOLUME ('000'/m3)		VALUE (Euro/Million)		JS Jan-Dec 2011
	Jan-Dec 2010	% of Total Vol	Jan-Dec 2011	%Total Vol	Jan-Dec 2010	% of Total Val	
Europe	85.30	21.15	63.89	19.98	40.03	29.04	31.20
Asia/Far East	81.88	20.31	51.43	16.08	23.81	17.27	15.21
Africa	191.43	47.47	162.71	50.87	53.52	38.82	40.29
Middle East	24.56	6.09	29.17	9.12	10.49	7.61	12.01
America	18.10	4.49	12.50	3.91	9.22	6.69	8.63
Oceania	1.98	0.49	0.14	0.04	0.78	0.57	0.09
Total	403.25	100.00	319.84	100.00	137.85	100.00	107.43

Major Markets Of Ghana's Wood Products Exports: By volume (m3)



Major Markets Of Ghana's Wood Products Exports: By value (Euro)



**Table 10: (from TIDD Report: Dec. 2011)
Export Of Timber And Wood Products To ECOWAS Countries Jan- December 2010/2011**

Jan- December 2010				Jan- December 2011			
Country	Vol(m3)	Val(Euro)	Unit Price/m3	Country	Vol(m3)	Val(Euro)	Unit Price/m3
Senegal	14,085	3,859,188	274	Senegal	5,758	1,493,637	259
Nigeria	113,548	35,709,268	314	Nigeria	83,419	25,772,313	309
Niger	23,224	2,728,280	117	Niger	26,532	3,311,842	125
Mali	2,069	438,733	212	Mali	1,546	436,598	282
Burkina Faso	20,739	3,489,031	168	Burkina Faso	17,688	3,175,849	180
Togo	7,139	2,180,161	305	Togo	5,280	1,632,830	309
Benin	3,217	668,135	208	Benin	3,499	796,597	228
Gambia	175	47,869	274	Gambia	134	42,278	316
Liberia	198	60,851	307	Liberia	70	28,307	404
Total	184,394	49,181,516	267	Total	143,926	36,690,251	255

Most African countries are already net importers of paper and paper products; timber and timber products, and the available supply will not be sufficient to meet the regional demand without concerted efforts in sustainable management of natural production forests and major investment in the establishment of planted forests.

5.2 Main constraints to Sub-Regional Trade

The main constraints faced by African suppliers in the regional markets were identified both in the legal and policy framework and the capacity of the private sector. The former includes high tariff barriers in processed products, bureaucratic customs and inspection procedures and associated high transaction costs, corruption, inappropriate taxation and inadequate incentives, lack of sub-regional harmonisation of the national regulatory frameworks, competition from illegal harvesting and trade, and deficient statistical information on production and trade.

In the private sector the main constraints include lack of market information, weak marketing capability, high transaction costs of legal operations and competition from the illegal operations, multiplicity of documentation requirements in exporting and importing countries, limited access to trade finance; limited secondary processing capacity, low quality and design competitiveness of further processed products, and intense competition from outside the region. Among the buyers in importing countries, there is limited knowledge on African timbers and suppliers among potential buyers due to lack of necessary promotional activities and the image of African suppliers as reliable trading partners also needs improvement.

Action Plans

Trade and industry associations should establish a sub-regional/regional network for exchange of information and promoting common interests in trade facilitation and development as well as international policy issues.

5.3 Private sector

1. In partnership with government agencies, organise market promotion missions, business roundtables and participation in trade fairs and exhibitions to establish direct contacts with potential buyers in selected key markets.
2. Trade and industry associations should establish a sub-regional/regional network for exchange of information and promoting common interests in trade facilitation and development as well as international policy issues. Trade and industry associations should develop self-regulation (e.g. by codes of conduct) and engage in improving legal compliance and sustainability of their forest and raw material procurement operations including certification and independent verification.
3. Industry and trade associations to develop their own strong market information systems.

5.4 Role of Governments

- I. Reduce import tariffs of timber and timber products to the agreed levels and eliminate them in the long run to promote free movement of these products in Africa.
- II. Strengthen monitoring of the cross-border trade between neighboring countries to improve legal compliance and to remove inappropriate practices such as double documentation for exportation and importation of timber and timber products
- III. In partnership with the private sector, carry out trade promotion activities in the potential African markets.
- IV. Review the existing regulations and procedures as well as the taxes, fees and charges to reduce the transaction costs of trade in timber and timber products; and improve the incentives for further processed production to improve the competitiveness of export industries.
- V. Streamline trade payment rules and establish ICT platform promoting introduction of electronic trade documentation with the purpose for unifying customs and other procedures to reduce potential misconduct and unnecessary delays.
- VI. Improve the legality assurance systems including timber tracking and appropriate control procedures (including control measurements of the loaded volumes in ships) and other aspects of legal compliance considering the entire supply chains, and engage in the FLEGT VPA process, involving all the relevant stakeholders. The current operation of the Forest Service Division has been hampered by a lack of adequate operating funds and resulting low staff morale. The record of royalty collection is poor and the process of returning revenues to the stools and communities is unnecessarily slow and bureaucratic. Communities therefore see little benefit in protecting the reserves.
- VII. Recognize information as a strategic area of forest sector management with specific reference to production and trade, and improve the information systems to provide up-to-date and reliable data for monitoring and policy design, including periodic surveys of the informal sector.
- VIII. Through a participatory process involving various stakeholders, develop policies and strategies to remove illegal operations and to enhance the social and economic contribution of the informal sector in the supply chains of timber products based on legal and sustainable sources; this often requires studies on the size and characteristics of the domestic market and the role that the informal sector is playing in the supply chains.
- IX. Consider the needs of the trade of timber and timber products in the development of communication infrastructure as well as road, railway and river transportation and port facilities.

X. Investment in R&D, including provision of appropriate incentives, specifically for utilisation of lesser-used species

XI. Strengthen education and training in and other incentives for further processing, quality control and product design, marketing and market intelligence, including foreign language training, particularly in the education on forest products marketing.

5.5 Product Standardization

Involving the ITTO Trade Advisory Group and in cooperation with FAO and ATIBT, organize a regional workshop on harmonization of (i) nomenclature of trade names of African timber species, (ii) timber measurement, (iii) grading rules, and (iv) timber and timber product standards; and design and implement a follow-up implementation process to include the Ghana Standards Authority, v) Strengthen market intelligence units in ITTO member countries by supporting the existing networks and encouraging industry and trade associations to develop their own strong market information systems.

5.6 Regional Organizations

1. Within their existing strategies, ECOWAS, should organize workshops and follow-up implementation processes to improve customs procedures and cooperation between national customs agencies in order to facilitate trade, and to strengthen staff skills related to timber and timber products as these require specialized knowledge on products (identification of species, measurement, etc.).
2. ECOWAS should develop strategies and policies and action plans for sub-regional cooperative action to effectively remove tariffs and reduce other trade barriers of trade in timber and timber products between their member countries in order to promote legal trade of timber and timber products from sustainable sources
3. . Seek for technical cooperation with the European Union to share knowledge and experience in timber trade facilitation (harmonized documentation, digitalized procedures, etc.)
4. Ghana Timber Millers' Association in cooperation with chambers of Commerce of their sister organizations (especially Nigeria, Burkina Faso) in the region to set up the private sector network for exchange of information and to promote common interests, and in due course, explore the feasibility of formalizing such an arrangement.
5. ECOWAS has established a committee of experts including representatives of governments, private sector and other stakeholders to prepare the terms-of-reference for the strategic study on free movement of forest products in the sub-region and prepare a roadmap for the implementation of its recommendation

5.7 Forest certification. Ghana has been engaged in the development of forest certification for more than a decade. There is interest in developing a national scheme partly because FSC-accredited certification bodies, using their generic standards, have been unable to certify significant areas of forests in Ghana because existing TUPs and contracts might be in conflict with recent laws.

Estimate of the area of forest sustainably managed for production. On the basis of information supplied by the Government of Ghana, FAO (2010) reported that 1.38 million hectares of forest was under sustainable management. ITTO (2006) estimated that 270 000 hectares of natural forest was being managed in a manner consistent with sustainability, including the operation of Samartex, a Ghanaian company .

6.0 COMPARING COUNTRY-LEVEL AND SUB-REGIONAL LEVEL STRATEGIES

6.1 Ghana: Country-Level Strategies within ECOWAS Convergence Plan

6.1.1 Defining Levels of Stakeholder Participation and Governance

Key stakeholders will include those who will directly **influence** the outcome of the process because of their mandate or close interest and who will ultimately inherit the programme once it has been developed; and those who are directly **influenced** by the outcome of their inherent interest.

Protected Area departments, government ministries and local communities are those that directly influence and are influenced by any outcome—after all, they are the inheritors of the process.

Cross-border exchanges involve key counterpart organizations as well as representatives of all stakeholder groups across the border meeting and establishing a common vision for TBNRM. Although cross-border interaction is somewhat an extension of national processes, differences in culture, language and policy environment may pose additional challenges to collaborate among countries.

An attempt will be made in this Chapter to review which activities should be managed collaboratively across the borders, and which ones should continue in-country.

Achievement of Transboundary Natural Resources Management (TBNRM) goals require involvement of a wide range of stakeholders (Fig 4). Involvement of the local level is essential from the start, since this is where natural resource management occurs.

It is key to determine the appropriate levels to work with across the border; but National institutions, legal and policy frameworks may not necessarily correspond at the sub-regional level.

In the Figure 4, intensive dialogue should be going back and forth between issues/stakeholders within a country horizontally and vertically; communication is essential within and among levels in each country, and with the equivalent levels across the international border.

Closer to home, greater collaboration among the various natural resource sectors is needed for sound integrated ecosystem management and multiple land-use, in order to maximize possible benefits from TBM

FIG 6: DEFINING STAKEHOLDER LEVELS OF PARTICIPATION AND GOVERNANCE



6.2 Political and Policy Aspects

- Political will is essential for successful TBNRM. Regardless of the established transboundary collaboration, it is necessary to have political will at the local level.
- Enhance transparency, representation and accountability in land and resource use decisions at the country level, if international commitments are involved.
- Long-term commitment from bordering countries is essential as well. Since successful NRM is by nature a long-term process, and since partnerships and trust take time to evolve and mature, TBNRM is also a long-term process.
- The Draft Revised Ghana Forest Policy (2011) seeks:
 - To increase forest cover through tree planting on degraded forests
 - to ensure legal timber on the local market and help reduce illegalities in the forest;
 - To improve law enforcement and governance structures;
 - To ensuring capacity at high professional level; only recently have NGOs, CBOs been involved in conception, implementation and valuation of forest policies;
 - that forest sector development is integrated enough within national development in particular.
 - To promote the forest sector as a major player in the overall strategy to conserve the environment, biodiversity, reduce the vulnerability of rural people and combat poverty.
 - support for small and medium forest enterprises and community forestry;
 - integrating REDD+ and other climate actions into forest policy; and improving the sustainability of rural energy (wood fuel & charcoal).
 - Land and Tree Tenure Reforms
 - Decentralised Management of Natural Resources and empowering local communities.
 - Improved Revenue Capture Mechanism
 - Strengthening Capacities.
- Good national level Natural Resource Management including appropriate institutional structures and systems should be a basis for TBNRM.
- The national forest institutions will need to be strengthened to a minimum capacity before being able to play their roles in the more complex realm of TBNRM. Capacity can be described as having the knowledge, skills and abilities needed to fulfill a role. Increasingly, access to financial resources under GEF-UNDP can be explored.
- Capacity building may have to be a major activity early in the process to secure balanced input into the process from each country, and to ensure equitable decision-making power.
- Levels of capacity of country agencies and organizations is a crucial factor in determining whether TBNRM processes will be successful; good natural resource management practice comes from strong capacity and plans and programmes at national and lower levels within a country.

- Rural Energy is unsustainably sourced, and alternative sources should include Biofuels.
- Geo-Information/Forest Inventory; reliable data on forest cover, types of forests, biomass by forest types; monitoring and evaluation of changes in forest condition; recorded changes in land use.
- Research Needs:
 - Intensify research on LUS as substitutes for the traditional species
 - Introduction of appropriate preservation techniques for improving service life of LUS; Intensify research on NWFPs(Prekese, Tweapea, etc)
- Standardization of local grading rules of lumber to facilitate the standardization of lumber dimensions and pricing of lumber according to quality.
- Post-harvest cultural operations to promote regeneration
- Timber trends and statistics
- Application of indigenous knowledge systems, combined with appropriate scientific techniques, and introduced by Extension officers

6.3 RECOMMENDED SUB-REGIONAL STRATEGIES

De-facto high levels of integration of the Sub-Regional economies over a long historical time span, in terms of agricultural labour and timber markets, has implications for the forest sector policies; intra-regional trade in forest products and NWFPs is in the ascendency.

- I. Harmonization of forest and extra-forest policies;
 - helping to harmonize sub-regional trade policies; emerging ECOWAS timber markets; uncontrolled timber movements- unverified imports and untaxed exports.
 - developing awareness of the extra-sectoral implications of forest policies across the sub-region.
 - developing and agreeing on common standards for sustainable forest management and forest products.
 - Policies and legislation supporting SFM in place in neighbouring countries and at a minimum non-conflicting and preferably harmonized laws
 - Involvement of higher levels to ensure Policy Planning to achieve realistic targets.

- II. **improving the governance** of cross border trade in a context of FLEGT, i.e. standards imposed by external markets to mitigate illegal trade in timber; forest certification.
- III. **Institutional capacity building** to support sub-regional policy coherence; especially capacity in forest management and research; Forestry Training and Research building capacities of partners across the border to manage resources effectively through sharing of information and experience, and through training.
- IV. **Promoting the Use of Geoinformation**; one of the basic requirements for TBNRM is an efficient information gathering and sharing system, and will form the basis for TBNRM planning, implementation and monitoring.
- V. By mutual agreement, establish **Specialist Regional Institutions** (centers of expertise) performing certain technical functions such as Taxonomy, Traditional Knowledge Systems, Remote sensing/Geoinformation, Forest Seed Centres, Training, and Advisory Services that need not be duplicated at great expense in all countries of the Sub-Region; on the other hand, existing specialist institutions can be enhanced.

BOX 5: Transboundary Management of Migratory Elephants, Transhumance, Ecotourism

Elephants range normally cover large areas and frequently cross international borders to access water, shelter and breeding sites at critical times of the year. Transboundary planning should take these needs into account, and aim to maintain access for migratory and ranging species to critical sites and resources across borders, including those needed in extreme years Land-use plans on both sides of a border should include viable corridors linking resources if traditional ranges are encroached by other land uses.

Through the Convention on the Conservation of Migratory Species of Wild Animals, it should be possible to implement the establishment of corridors for elephants within the south-western and south-eastern borders of Burkina Faso with Togo, Ivory Coast, and Ghana.

Such biological corridors/landscape linkages serve as continuum to maintain ecological processes and functions, not only for the survival of wide range migratory animals, but also enhance integrated river basin management across borders, livestock and range management for transhumant pastoralists ,and as a strategy to approach anticipated impacts of climate change.

TBNRM will lay the foundation for deeper cooperation for the exploitation of underutilized **ecotourism potential** and the development of multi-country destinations to increase the variety of attractions across the borders.

There is the need to enhance the capacity of partners across the borders to manage resources more effectively, e.g., through planning, implementation and monitoring; sharing of information and pooling of expertise, experiences, and through training.

The development of a transboundary wildlife corridors involving multiple forms of land use is likely to involve different government ministries on both sides of the border, and local or national land-use planning authorities. The development of cross-border nature tourism as part of ECOWAS strategy is likely to involve multiple government ministries including those dealing with finance, planning, commerce and trade, and tourism, immigration and custom.

VI. Promotion of Cross-Border Parks and PAs;

Establishment and maintenance of transboundary PAs, and simultaneous securing of conservation and livelihood benefits; investing in the cross-border dimensions of protected area management (Box 1: Transboundary Management of Migratory elephants and Transhumance).

VII. Transhumance/Fire Management/Livestock and Range Management

Pastoralists (mobile livestock systems) move extensively with their herds in Savannah and forest transition zones, varying routes depending on resource availability in the different eco-zones; protocols for transhumance have been established, but are woefully abused and need reinforcement.

VIII. Developmet of Integrated Conservation and Development Projects

- Development of integrated management of watersheds; water-based ecosystems(rivers, lakes, wetlands, riparian buffer zones); River Basin developments; eg. Riparian States of the Volta: Box)
- Transboundary Eco-Tourism Development is constrained by security, infrastructure, and benefit-sharing mechanisms
- Develop modalities for Payment for ecosystem services
- Joint Sub-Regional strategy for timber supply to satisfy the needs of member states could make significant contribution to regional economic development, but additionally has to address the following:
 - a) Expand plantation forestry in the region to meet local and export demands.
 - b) Improve harvesting and processing capacity and quality.
 - c) Remove investment barriers like weak infrastructure in terms of communication and transport; security of tree and land tenure/complexity of land tenure;
 - d) Study social impacts of forestry projects
 - e) Standardized grading rules to ensure quality timber and product standards are kept.
 - f) Acceptable criteria for sustainable forestry development
 - g) Ensure an effective transit protocol to markets of the region.

BOX 6 : Volta Basin Riparian States

The Volta Basin, located in West Africa, the Volta River basin covers an area of 412,800 km² and comprises six riparian countries: Benin, Burkina Faso, Côte d'Ivoire, Mali, Togo, and Ghana.

Ghana and Burkina Faso are the two largest riparian states in the Volta basin, comprising 42% and 40%, respectively, of the total basin area. Smaller proportions of the basin area are contributed by Benin (3.6%), Côte d'Ivoire (3.3%), Mali (4.6%) and Togo (6.3%) (Ghana Water Resources Commission).

VOLTA BASIN

Total area: 412,800 km²

Area of Basin in Country

Countries	km ²	%
Burkina Faso	173,500	42.04
Ghana	166,000	40.21
Togo	25,800	6.26
Mali	18,800	4.56
Benin	15,000	3.63
Côte D'Ivoire	13,500	3.27.

Throughout the southern portion of the Volta basin, rapid rates of deforestation, combined with the transformation of previously vegetated landscapes to agricultural cropping areas, results in reduced rates of infiltration and aquifer recharge, further aggravating the situation.

The urgent need for transboundary water management at a basin level has been recognized by the riparian countries, as well as external role players, and is starting to be addressed by the Volta Basin River Commission.

IX. Global Climate Change impacts

The rural populations enormous dependency on natural resource base for subsistence.; hence continued deforestation will reduce the sub-region's ability to withstand the potential environmental and socio-economic impacts of global climate change. At stake is the use of Geoinformation relevant to climate change studies in the sub-Region (Box 3).

Box 7 : Transboundary Natural Resources Management and Climate Change in West Africa.

Climate change predictions suggest profound changes in Africa, affecting water resources, food production, human health, desertification and coastal zones. The frequency of extreme weather events—particularly droughts and floods –is already with us.

As natural ecosystems and species come under increasing stress from climate change, they will be more vulnerable to other stresses. Even though wild species and natural systems have evolved in fluctuating conditions and have evolved a certain amount of resilience and adaptability, they still require space and time to adjust to temporal changes in temperature across vegetational zones up slopes, mountains and river valleys. It is therefore very important to maintain landscape linkages—along temperature and rainfall gradients , among different types in a landscape, and along critical corridors to refugia from critical events—so that species have space to adapt to these changes.

Several countries in West Africa including Ghana have already prepared climate change mitigation and adaptation plans. Since changes to natural systems and species distribution normally occur across political boundaries, it will be important to expand these plans to include transboundary plans.

Natural resource managers should keep abreast of climate change prediction developments and early signs of climate change, and collaborate across boundaries as appropriate.

Resource managers perceive the need for: urgent requirement to reach agreement on dams and flow regimes of rivers; develop compatible land-use zonation across international boundaries; jointly approach donors for finance to leverage transboundary information and knowledge building capacity for improved natural resource management and implement these cooperatively, e.g., for fire management.

X. International Conventions and Agreements

Ratification and national strategies and Action Plans to implement Conventions on Climate Change, Biodiversity, Control of Desertification

Social, ethical and environmental concerns are increasingly influencing global discussions on tropical forests and this is reflected in the various international fora including UNFF and its predecessor arrangements IPF and IFF, as also the CBD, CCD, CITES and CCC arrangements..

Green economy

Forest carbon activities (through REDD + mechanisms) also offer significant co-benefits through rehabilitating degraded forest lands and soils, increasing productivity of agricultural landscapes, and expanding capacity of restoring natural habitat by tree planting

XI. Rural Energy

Renewable energy—Biomass, Biofuels from short-rotation biomass production.

XII. Funding and Resource Mobilization

Costs and benefits should be analysed before embarking on TBNRM projects. Moreover, the net benefits of transboundary collaboration also should be greater than the net benefits of working separately at country level; i.e. that benefits occur on both sides of the border, are shared equitably, and the people living with the resources have incentives to manage them sustainably.

TBNRM programmes can thrive on multiple source funding : transboundary eco-tourist industry, private investments, and donor funding.

XIII. Political

All integrative efforts must be rooted in the political will of the participating countries to recognise the existence of mutual transboundary interests, the need to establish coherence in the management practices of their respective adjacent conservation areas, and their interdependence in problem solving.

In addition to community empowerment, it is important for central government to devolve adequate power to local government in order for it to undertake Transboundary collaboration.

Table 11. Comparison of Country-level and Sub-Regional Strategies

THEME	COUNTRY -LEVEL	SUB-REGIONAL LEVEL
1. National Forest Policy	NR awareness and participatory framework; good governance essential for successful TBNRM	Seeking harmonization of forest policies and legislation across borders
2. Wood Industry Structure	Unique country endowment of NRs to balance export and domestic demands	Expert analysis of timber demands, supply and trends; Monitor terms of trade
3. Control of Illegal trade in timber and wildlife products	EU FLEGT programme with VPA for partnership for control of illegal trade in wood products	Support for FLEGT conditionalities
4. SMFEs	Priority area for promoting dominant informal sector	Supportive of grassroots enterprises for NRM
5. Community Forestry	Promoting CBFs & skills for SFM; community ownership and livelihood support & poverty alleviation	Supportive of CBFs
6. Land and Tree Tenure	Priority to promote forest regeneration on farm, private sector plantation development	Urgent reforms across borders; key to convergence plan
7. Revenue Sharing formula	Equity is major incentive for community participation	Relevant to TBNR revenue generation and sharing
8. Climate Change Actions	Capitalizing on mitigation and adaptation potential for REDD+ payments for SFM and conservation	Common strategy for addressing climate change especially in global negotiations
9. Rural Energy	has wider cross-sector policy integration	Priority area
10. Cross Border Trade	Ghana 's competitive advantage in the growing intra-regional trade in forest products	Focus for economic integration of the sub-region; legalize cross-border trade
11. Geoinformation and Inventory	Major Capacity constraints	Create synergies for info sharing & expertise
12. Public Goods and Services	Priority in national NRM policy	TBNRM priority ; develop multi-country tourism destinations
13. Capacity Building	Priority requirement for SFM	Sine qua non for TBNRM start-up and implementation
14. Funding	Reliable funding for SFM	Joint seeking donor support
15. Transhumant pastoralists	Major threat from neighbours	Reduce threats through collaborative control
16.TBM of PAs	Community-based natural resource management	TNB broad - landscape management; to maintain hydrological systems, biological corridors, animal migrations

International cooperation in Transboundary conservation aims to extend protection of natural habitats beyond the border of each cooperating country. The objective is to establish Transboundary Conservation Areas (TBCA) that allow each party to have an important extension of their protected area on their neighbour's territory put under a matching biodiversity conservation effort without incurring additional costs for its protection and management.

7.0 GENERAL RECOMMENDATIONS FOR GHANA 'S FOREST SECTOR

7.1 Support for the Informal Sector

Among the key challenges identified by the study are: Lack of requisite skills for effective business management: Most SMFEs in the informal forest sector are family-based and proprietors have low literacy levels. Hence, the proprietors generally lack proper business management skills. A dwindling resource base attributed to destructive harvesting practices, indiscriminate (illegal) logging and clearing of source areas for agriculture have destroyed the country's stocks of timber and non-timber forest products. As a result, proprietors have to travel long distances to collect raw materials, making harvesting costs high and returns low.

It is imperative that the SMFE sub-sector is strengthened, streamlined and increasingly formalized to fully take advantage of its untapped potential and fill the gap being created by a shrinking timber industry.

7.2 Wood Energy

- The need for National level study: collection and analysis of wood energy data; trends of supply and demand; projected needs.
- Integration of wood fuel into SFM
- Incorporation of wood energy-related policies into the country's energy planning policy.
- There are several opportunities for the conversion of fuelwood originating from energy plantations, traditional forestry and agroforestry systems, residues from timber processing industries, wood waste and other by-products for decentralized local energy supply and for input into larger-scale grids.

7.3 The strategy for the modernization of the formal wood industry will include the following activities:

- Facilitate technological improvements to increase competitiveness and reduce waste. Promote value-addition through high quality secondary and tertiary processing. Limit the export of green lumber and boules.
- Promote capacity building and specialization of the workforce to improve productivity and quality; fostering a competitive environment and avoiding the protection of inefficient firms.
- Promotion and development of the local market to satisfy domestic demands currently linked to illegal, low-yield chainsaw activities.
- To continue competitive bidding for harvesting in FRs to improve transparency, to increase revenues to reflect the real values of the resource.
- The demand for certification and/ for legally-verified timber products is invariably having an influence on the management of export-oriented supplies.

7.4 Community Forestry and Collaborative forestry should be entrenched.

To quote Daasebre Prof. Oti Boateng, Paramount Chief of New Juaben, current President of Eastern Region House of Chiefs during the Forest Policy Review consultations with Traditional Chiefs in Kumasi in Nov., 2010: “ the fundamental premise is that every nation has its roots grounded in its communities. The protection and development of a country, is synonymous with the protection and development of individuals and their communities within the country---making the communities the focal points of strategy for sustainable development.”

Substantial proportion of responsibility for local resource governance should be placed on community-level institutions, with technical and financial assistance channeled through local government or NGOs, CBOs.

The sustainability of CBFM is closely linked to enabling arrangements that facilitate the generation and equitable sharing of benefits from forests. Without legal recognition of rights over forest products, however, local people have neither the interest nor the courage to protect and develop forests.

Decentralization. A general trend towards decentralization and greater recognition of indigenous and local people is not yet matched by a flow of resources to support efforts to achieve SFM at decentralized local levels.

The costs of regulating the off-reserve resource are not justified by its economic and social benefits, and the devolution of control to local government and communities is suggested as the way forward.

Community involvement **in off-reserve** areas would help to create public buy-in to the fate of the sector, and might also help induce changes in farmer behaviour, encouraging them to retain trees in their fallows, in the knowledge that they and their communities would be the beneficiaries.

7.5 Develop secure resource tenure system: especially for land and trees—that make it worthwhile to invest in SFM.

The disconnection between the legal (gazetted PFEs) and customary ownership is a hindrance to SFM, exacerbating problems of governance, inequity and conflict and restituting the capacity of local communities to pursue development opportunities in forestry.

The pace of tenure reforms has been slow: hence new laws are required to clarify customary ownership and legal ownership of GOG

7.6 Sustainability of Forest Management

Agricultural frontier in Ghana is expanding at the expense of forests.

A general progression towards SFM in the tropics as a whole will be faster and more robust if SFM is seen as a financially competitive land use compared to mining, agriculture.

International communities are to increase payments for the global ecosystem services provided by tropical forests, including those related to carbon capture and storage.

REDD+ activities are increasing expectations that financial incentives will be provided to reduce deforestation and forest degradation and promote the enhancement of carbon stocks, including the sustainable management of forests.

It is equally important to incorporate **effective research** and adapt practical indicators for assessing progress made in SFM and to facilitate periodic monitoring and evaluation and reporting.

7.7 Encourage the development of Private Sector capacity in forest-related ventures—plant medicine formulation, game ranching, and landscape restoration; large-scale plantation development.

7.8 Regional and International Cooperation: Adopt and fully implement international treaties, Conventions, agreements that directly enhance forest biodiversity conservation.

7.9 Trans-boundary populations are to be sensitized to the need to preserve and develop forests. At the regional level, the focus is on shared analysis and harmonization of forest policies, as well as adaptation and harmonization of institutional, legal and fiscal frameworks, and promotion of regional planning activities.

7.10 Practical management of shared forest resources (transboundary forests, protected areas, wetlands, etc.) is seen as an important area to be developed. Several activities concern the production of information (through inventories or research activities about production and productivity of forests, and surveillance systems for transboundary areas).

7.11 Trade and Professional Associations

Industry associations and professional bodies can assist in achieving economies of scale by pooling together resources for the benefit of members, the forestry sector and the national economy as a whole. This has been successful in Ghana and could be done in other countries as well.

8.0 CONCLUSIONS

The sector's contribution to growth and employment in both the public and private sector largely depends on the tradable volume of wood. Undoubtedly, we have to be wary of the adverse impacts of reduced wood volumes on future revenues, industry size and turnover, as well as employment in both the public and private sector if pragmatic measures are not taken to balance Annual Allowable Cut with potential forest growth. Investments in forest management, especially in post-logging silvicultural treatments and tree planting can all help to restore the productive capacity of our forest ecosystems.

The wood industry require to be rationalized to ensure a balance between raw material input and installed wood processing capacity as well as promote downstream processing of timber, especially at the tertiary level. This can be achieved through : appropriate grading and pricing of logs to reflect prevailing market trends backed by effective market intelligence; effective control of the raw material inputs and recovery at the mills; quality production according to set standards or grading rules, and provision of disincentives with regard to the export of lumber (TIDD, 2011)

Informal Sector

Generally, with low rates of conversion, the informal sector is a bigger consumer of the wood fibre than the formal sector. However, there is potential for broadening opportunities for improved efficiency across the sector. In Ghana, this potential has been assessed, and the conclusion drawn that, overall, SMFEs, with their low capital base, do contribute significantly to the economy and sometimes add real value, whereas the formal sector detracts from value---with tertiary processing accounting for only 16% of total export value. The informal tertiary sector may have a higher potential to contribute value added than does the formal sector.

Discrimination against SMFEs, particularly with respect to access to the resource, is a major obstacle to realizing the SMFE potential and with it, poverty reduction.

Substantial proportion of responsibility for local resource governance should be placed on community-level institutions, with technical and financial assistance channeled through local governments and NGOs, Extension System.

Effective environmental awareness and education that combine the best of Traditional Knowledge and modern info systems in ensuring long-term Natural Resources conservation.

Plantation development, Industry restructuring, REDD and Certification, Value chain developments, Carbon payments, Innovative financing (PES-focus) for wider forestry-agricultural strategy are key imperatives to support sustainable land management and SFM as well.

Landscape Restoration: Planners at all levels must regard the entire landscape as interconnected, functional system, and plan for varying degrees of use that correspond to the

differing, but interactive, physical and biological characteristics of landscape components. Ecosystem function, wildlife migration patterns, local climate, water cycles, river flows, seed dispersal, etc, all cover or cross (transboundary) into larger areas than most parks, national territories.

Hence there is no longer room in the Sub-Region for development to be implemented through isolated and independent activities without considering the local, national, regional, and global consequences—a development accomplished through the development of an enabling environment that maintains a democratic “social contract” of shared rights and responsibilities between all tiers of government and constituents.

Forestry extension services for private tree growers are needed, and education programmes on forestry-related issues should be directed towards increasing the general public’s understanding of forestry issues.

An extension services section or division, similar to the Ministry of Food and Agriculture’s agricultural extension services, is urgently required to educate people on the need for SFM, conservation, tree planting and poverty reduction approaches to forest ownership and forest resources tenure.

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ANNEX I: PRIORITY ISSUES IDENTIFIED DURING STAKEHOLDER CONSULTATIONS/LUNCHING OF ECOWAS CONVERGENCE PLAN IN ACCRA, GHANA: MAY 3-4, 2011.

Working Group 1. Summary of Forest Governance Issues

- I.** Identification and clarification of Roles and Responsibilities of major stakeholders.

- II.** Conflicting roles of the State as policy maker, implementer of policy, and referee on forest landscape.
- III.** Past policies have tended to protect the lucrative export market than meeting the looming demands of the local market; the latter market being inundated with illegal supply chains.
- IV.** Forests figure prominently in rural livelihoods and in Poverty alleviation
- V.** Tenure problems tend to inhibit private sector investment in SFM
- VI.** Capacity building to enhance environmental governance (including promotion of carbon markets)
- VII.** Forest Policy linkage with Agriculture with heavy competitive presence on forest landscape to support sustainable land management.
- VIII.** Adoption of traditional knowledge and customary practices in the wake of adaptation to imminent climate change.
- IX.** Different institutional structures within sub-region do not make for easy communication;
- X.** National Forest Policies should normally flow from ECOWAS Forest Policy and Forest Dialogue (as models).
- XI.** Encourage intra-regional trade in wood products
- XII.** Political support needed for durable financing of cross-border resource management

Working Group II : Summary of Discussions on Forest Landscape Ecosystem Management

- I.** Forest landscapes are shaped by decisions of the multiple stakeholder groups' different values
- II.** Pay attention to transboundary wildlife and fire management
- III.** A forest landscape should be configured so as to accommodate forest plantations, protected reserves, ecological corridors in a rather fragmented landscape, and agroforestry systems and /or other agricultural systems that make use of on-farm trees; this lays the foundation for the multiple functions of the forest landscape mosaic.
- IV.** Foster Coordination of regional forest education, research and awareness creation of the values of forests and ecosystem components
- V.** Secure sustainable funding sources and incentives for private participation
- VI.** Harmonize legal framework for land-ownerships, crossborder illegalities in trade of forest products.
- VII.** Political will to remove the language barrier between the Francophone and Anglophone communities in ECOWAS at all levels

