



REPUBLIC OF GHANA

Forestry Development Master Plan

(2016-2036)

Ministry of Lands & Natural Resources

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Ministry of Lands & Natural Resources

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ACRONYMS

AAC	Annual Allowable Cut
CF	Consolidated Fund
CRMU	Collaborative Resource Management Unit
CSO	Civil Society Organization
EIA	Environment Impact Assessment
ESIA	Environmental and Social Impact Assessment
EPA	Environmental Protection Agency
FAA	Financial Administration Act
FASDEP	Food and Agriculture Sector Development Policy
FAWAG	Furniture and Wood Products Association of Ghana
FC	Forestry Commission
FCPF	Forest Carbon Partnership Facility
FCTC	Forestry Commission Training Centre
FIP	Forest Investment Programme
FLEGT	Forest Law Enforcement, Governance, and Trade
FM&R	Forest Management and Regulation
FASDEP	Food and Agriculture Sector Development Policy
FORIG	Forest Research Institute of Ghana
FRs	Forest Reserves
FSC	Forest Service Council
FSD	Forest Service Division
FWP	Forest and Wildlife Policy
GAG	Ghana Auditor General
GDP	Gross Domestic Product
GEDAP	Ghana Energy Development and Access Project
GHG	Green House Gas
GHI	Genetic Heat Index
GIFMIS	Ghana Integrated Financial Management Information Systems
GoG	Government of Ghana
GPDP	Government Plantation Development Programme
GPRS II	Growth and Poverty Reduction Strategy
GSBAs	Globally Significant Biodiversity Areas
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
GTMO	Ghana Timber Millers Organization
HFZ	High forest zone
IGF	Internally Generated Funds
IMF	International Monetary Fund
KWCI	Kumasi Wood Cluster Initiative
LEB	Log Export Ban
LI	Legislative Instrument
LULUCF	Land Use, Land-Use Change, and Forestry
LUS	Lesser Used Species
MDAs	Ministries, Departments, and Agencies
MESTI	Ministry of Environment, Science, Technology, and Innovation
MLNR	Ministry of Lands and Natural Resources

MMDA	Metropolitan, Municipal, and District Assemblies
MMSE	Micro, Medium, and Small Scale Enterprises
MoF	Ministry of Finance
MOPs	Manual of Procedures
MRV	Monitoring, Reporting and Verification
MTEF	Medium Term Expenditure Framework
NDPC	National Development Planning Commission
NRE	Natural Resources and Environmental
NREG	Natural Resource and Environmental Governance
PAs	Protected Areas
PEFA	Public Expenditure and Financial Accountability
PER	Public Expenditure Review
PES	Payment of Environmental Services
PSC	Public Services Commission
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RMSC	Resources Management Support Center
RWE	Round Wood Equivalent
SMEs	Small and Medium Enterprises
SRAs	Social Responsibility Agreements
TIDD	Timber Industry Development Division
TNA	Training Needs Assessment
ToR	Terms of Reference
TRF	Timber Rights Fee
TUCs	Timber Utilization Contracts
TVD	Timber Validation Department
VLTP	Validation of Legal Timber Project
VPA	Voluntary Partnership Agreement
WAG	Woodworkers Association of Ghana
WD	Wildlife Division
WITC	Wood Industry Training Center

FOREWORD

Within the Framework of the 40-year National Development Blue Print, the 2012 Forest and Wildlife Policy and the on-going sector interventions, a 20-year Ghana Forestry Development Master Plan has been formulated as a first step instrument towards (i) cooperation, coordination, coherence and synergy in forestry-related issues at all levels; (ii) promoting good governance through accountability and transparency (iii) modernizing forest enterprises as a means of job creation for the rural and urban poor, iv) promoting timber plantation development; (v) ensuring biodiversity conservation and ecotourism development and vi) pursuing sustainable financing of forestry sector activities. This master plan is the product of several consultative processes involving engagements with experts and technocrats in the forestry sector, traditional authorizes and landowners, development partners, forest fringe communities, policy makers and legislators.

The vision, goal, and objectives of the Forestry Development Master Plan (FDMP) reflect the national development agenda, the National Climate Change Action Plan, Sustainable Development Goals of the United Nations, and the on-going sector activities. The plan seeks to contribute to reducing Green House Gas (GHG) emissions from deforestation and forest degradation, climate and temperature regulation, sustainable supply of timber and woodfuels, reducing poverty and helping to conserve biodiversity.

This plan has taken into full account the need to improve the state of the environment, whilst addressing the complexities of land and tree tenure and the importance of appropriate and efficient land use. The plan is about the place of law, government, organizations, companies, traditional authorities, landowners and individuals in forestry, and how all of these would interact for the national interest and the conservation of forest and wildlife resources. It is about measures to harmonize the relationships between the different elements that lay claim to our land and scarce water resources, and to bring equity into their allocation. It is about the conservation of flora and fauna and the natural environment. It is about people, their beliefs and the forest environment, their working conditions and their livelihoods. It also recognizes the international guidelines and conventions to which Ghana has ratified.

The full implementation of the forestry development master plan will witness a structural transformation of the forestry sector including the industries and institutions. It will respond to climate change issues and ensure improvement in the livelihood of the forest dependent communities and individuals. The plan will achieve technology-led forestry management systems that will rehabilitate and restore all degraded forest and savannah landscapes through massive plantation development, and farm/community forestry. It will ensure the development of viable domestic wood market development, sustainable woodfuel production, and marketing and decentralization of forestry sector activities at all levels of governance. It will ensure transparent governance, equitable benefit sharing and stakeholder participation in forest, wildlife, and woodfuel resource management. Indeed engaging the private sector and civil society organizations for forestry development is one of the major transformational pillars of this plan.

The plan will provide financial intermediation and incentive mechanisms for natural forest management, timber plantation development, plant and machinery development of tertiary processing activities and micro and small wood processing enterprises. It is the peoples plan. I therefore call for an attitudinal change and support from all stakeholders in pursuit of excellence in the forestry sector.

Forest - our heritage, our lives and identity. Let us work together to sustain it.



HONOURABLE NII OSA-MILLS
Minister of Lands and Natural Resources

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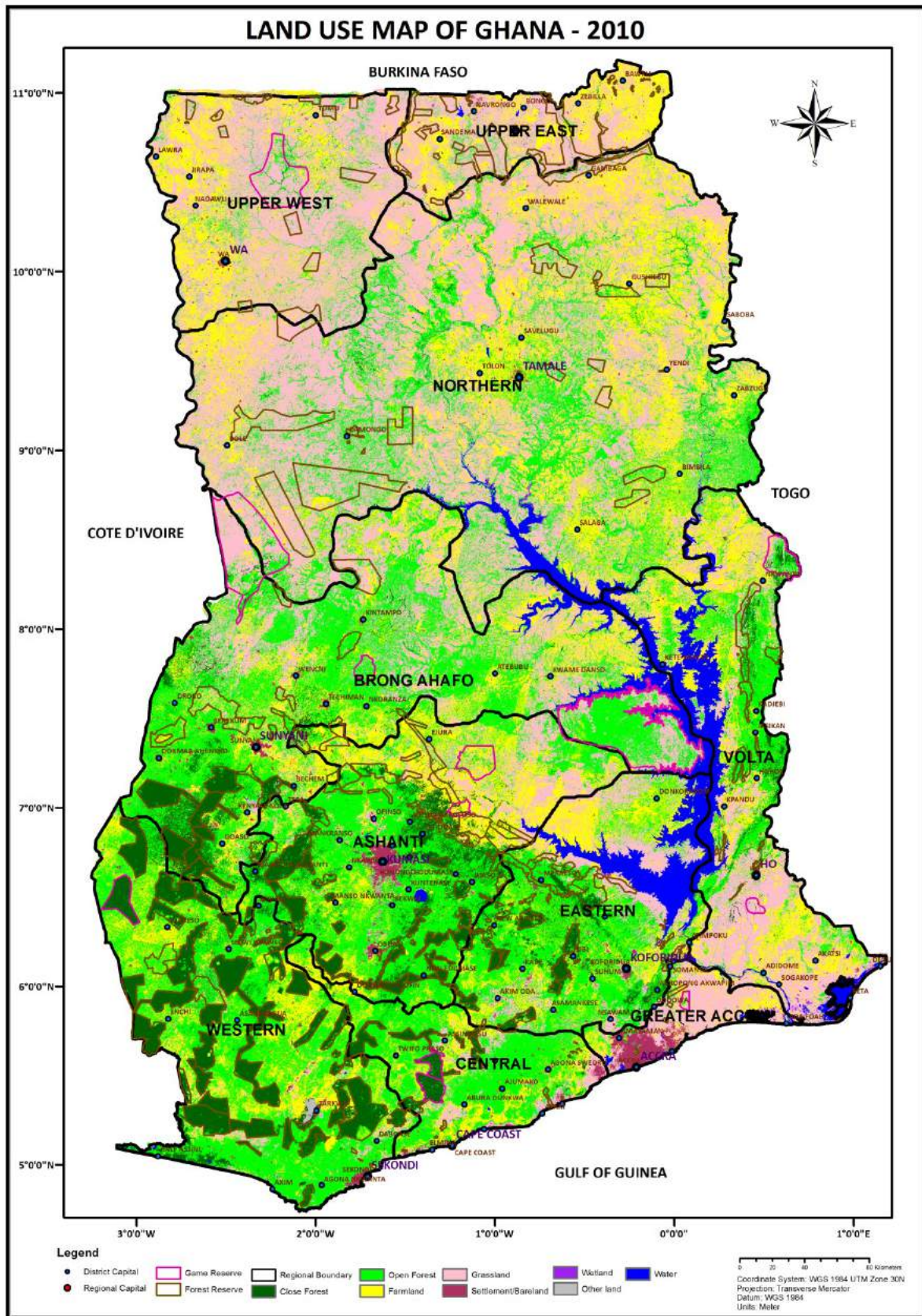
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Figure 1: Land use map of Ghana



EXECUTIVE SUMMARY

As Ghana progresses steadily towards a middle income economy, the ecosystems are also increasingly approaching their carrying capacity limits. The increasing pressure on the forest resources will worsen in the coming decades as the result of rapid urbanization, population increase accompanied by rapidly increasing middle class citizens and high rate of urbanization. There will be increasing demands for food, energy, human habitat, and transportation and these have direct implications on the forestry sector.

There is a paradox in the forestry sector. Past policies, programmes and initiatives coupled with massive development assistance and institutional strengthening and capacity building have neither resulted in the desired change and growth, nor improved the forest resource integrity. Over the last three decades, the forestry sector has been characterized by deforestation and forest degradation. The driving forces of deforestation and forest degradation have been agriculture expansion, illegal logging (chainsaw operation) and unauthorized mining (*galamsey*) operations in the forest areas, illicit and uncontrolled exploitation of wildlife, unsustainable production of woodfuel especially in the fragile ecological areas of the savanna regions and wildfires. The timber industry has operated with obsolete equipment. Trade in bush meat and other non-timber forest products (NTFP) remain unregulated. The domestic timber market is dominated primarily by informal sources using inefficient and unsustainable practices. Although timber demand is high, there is very limited investment in new equipment and the needed resources, because the enabling conditions are not conducive for continuous private sector engagement.

The growing negative effects of climate change on the natural resources coupled with increasing rural poverty require a new ecosystem based strategy with improved governance in natural resource management. The 2012 Forest and Wildlife Policy as well as the 2013 National Climate Change policy demand a new approach and focus towards forestry sector development in Ghana. There is the need to place emphasis on non-consumptive values of the forest in order to ameliorate the environment, create wealth, and a balance between timber production and marketing to satisfy domestic wood demand.

The realization of these approaches requires a long term plan to deal with the intractable weakness inherent in the forestry sector. The plan will also ensure sustainable natural resource management for the present and future generation.

Vision, Goal and Objectives of the Forestry Development Master Plan (FDMP)

The vision of the FDMP is to achieve a just, prosperous, and sustainable forestry sector that inclusively and continuously optimizes welfare and provides adequate means of livelihoods to all Ghanaians.

In tandem with the 2012 Forest and Wildlife Policy, the goal of the Forestry Development Master Plan is to ensure the conservation and sustainable development of forest and wildlife resources to create a balance between forest products, services and marketing to satisfy domestic and international demands whilst ensuring good governance and transparent forestry enterprises development, biodiversity conservation and ecotourism development.

In pursuance of this goal, the objectives of the FDMP are:

- i. To manage and enhance the ecological integrity of Ghana’s forest, savannah, wetland and other ecosystems for the preservation of vital soil and water resources, conservation of biological diversity, carbon stock enhancement within a resilient environment for the sustainable production of domestic and commercial produce.
- ii. To promote the rehabilitation and restoration of degraded landscapes through forest plantation development, enrichment planting, and community forestry informed by appropriate land-use practices to enhance environmental quality and sustain the supply of raw materials for domestic and industrial consumption and for environmental protection.
- iii. To promote the development of viable forest and wildlife based industries and livelihoods particularly in the value added processing of forest and wildlife resources to satisfy domestic and international demand for competitively-priced quality products.
- iv. To promote and develop mechanisms for transparent governance, equity sharing and stakeholders participation in the forest, wildlife, wetlands and savannah resource management.
- v. To promote training, research-based and technology-led development that supports sustainable forest and wildlife management whilst promoting information uptake both by forestry institutions and the general public;
- vi. To promote and develop financing mechanisms for natural forest management, timber plantation development, plant, and machinery, development of tertiary processing activities, woodfuel processing, and micro/small forest based enterprises.

Programmes

The FDMP is a continuum of the ongoing forestry sector initiatives and programmes and a projection into the future to structurally transform the sector. The plan seeks to implement the goal, objectives, and strategies of the 2012 Forest and Wildlife Policy. The vision, goal, and objectives of the plan reflect on the national development agenda, the National Climate Change Action Plan, Sustainable Development Goals of the United Nations, and the UN sustainable development goal 15. It also seeks to contribute to reducing Green House Gas (GHG) emissions from deforestation and forest degradation, climate and temperature regulation, reduce poverty and help conserve biodiversity.

The FDMP has taken into full account the need to improve the state of the environment, whilst addressing the complexities of land and tree tenure and the importance of appropriate and efficient land use. The plan is about the place of law, government, organizations, companies, and individuals in forestry, and how all of these would interact for national interest and conservation of forest and wildlife resources. It is about measures to bring harmony in the relationships among the different elements that lay claim to our land and scarce water resources, and to bring equity into their allocation. It is about the conservation of flora and fauna and the natural environment. It is about people, their beliefs and the forest environment, their working conditions and their livelihood. It also recognizes the

international guidelines and conventions to which Ghana has ratified. The FDMP also recognizes the urgent need to address problems of unemployment and poverty and provide support to gender empowerment in national development.

Accordingly, an integrated strategic programming approach is envisioned under the FDMP namely:

- A continuation programme that seeks to complete the on-going sector activities to address the current gaps in the forestry sector within the resilience of the national economy.
- A structural transformation programme of the forestry sector that will build an effective and efficient institution for sector development.
- A consolidated programme that will optimize the welfare of citizenry by ensuring equity, safe, transparent, and sustainable management of forest and wildlife resources for national development.

The five-year continuation programme is a defensive strategy that seeks to complete the on-going sector initiative to maximize the sector support projects to avoid the worst case scenario. The programme will seek to complete the relevant activities remaining under the 1996 Forestry Development Master plan and continue with the implementation of the current programmes and reforms and to consolidate the gains. Under this strategy, Ghana will continue to implement the Plantation Development Strategy, Wood Tracking System (WTS) under the Voluntary Partnership Agreement (VPA) Programme; move into full scale implementation of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) strategy; continue with the implementation of the on-going Forest Investment Programme, and support the implementation of the Forestry Industry Development Blueprint. An improved governance programme will be put in place to implement collaborative resource management, contain illegal logging, and support higher private sector participation in the sector development programmes.

The ten-year continuation programme will ensure the full implementation of the on-going projects within time and budget, maximizing the available resources to achieve the desired quality of the project products. The implementation of the programme will be within the current approved budget with modest increase in funding for the planned programmes. The funding will be within the constraints of the national budget supported by the current international donor funding. The forestry sector will continue to rely on external funding to complement Government of Ghana budgetary allocations. The Forestry Commission will remain under the public service structure.

The successful implementation of the short term programmes strategies will set the pace for Ghana to adopt a coherent transformational and programmatic approach to develop the forestry sector. This will be done within the context of the new Forest and Wildlife Policy, Ghana Shared Growth and Development Agenda, the Climate Change Action Plan, the proposed 40-year blue print for national development, and Ghana's obligations under various multilateral environmental conventions and international treaties including the United Nations Non-legally Binding Instruments on all types of forest (NLBI) and the United Nation's Sustainable Development Goals (SDGs). The transformational process is based on the axiom that the current challenges in the forestry sector far outstrip the available resource and that massive investment would be required to transform it.

The strategic focus will be on enhancing the natural forests in the high forest, transitional and savannah ecosystems; developing agro-forest landscapes within the cocoa growing areas;

developing the savannah woodlands, wetlands, and the wildlife ecosystems to maximize the rate of social and economic development of the country. The interrelationships among the thematic components provide great opportunities to optimize welfare and provide adequate livelihoods to the majority of Ghanaians, especially those within the marginal ecosystems.

The last five-year consolidated programme will aggregate all the gains made under the two phases in order to ensure an efficient self-financing forestry sector. The plan will enforce sustainable forest management principles and continue the conservation and sustainable development of forest and wildlife resources for maintenance of environmental stability and continuous flow of optimum benefits from the social and economic goods and services that the forests provide to the present and future generations. During the consolidation phase, the Forestry Commission will operate as an autonomous institution undertaking core activities within the forestry sector. Other ancillary activities will be implemented by the decentralized agencies which will operate under the local governance system.

Within the programming directions, the thematic areas that form the basis for implementing the FDMP are:

- i. Sustainable management and utilization of forests, wildlife, wetlands, and savannah ecosystems.
- ii. Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, woodlot development, and natural regeneration.
- iii. Reducing GHG emissions from deforestation and forest degradation through climate smart agriculture and agro-ecological farming within the forest areas, while reducing poverty and conserving biodiversity.
- iv. Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources.
- v. Institutional and legislative reforms for transparent governance, equity sharing and stakeholder participation in forest and wildlife resource management.
- vi. Promoting innovations, capacity development, research and technology development that supports sustainable timber, woodfuel, and wildlife management.
- vii. Stimulating political and institutional support for the implementation of the forest and wildlife policies and programmes at all levels of governance
- viii. Development of sustainable and predictable financing instruments to support forestry sector activities.

Road Map towards the Implementation of the Forestry Development Master Plan Strategies

The 20-year duration is considered as a first step towards developing the non-consumptive values of the forest to create a balance between wood production and marketing to satisfy domestic demands whilst ensuring good governance, transparency, and equity in the forestry sector. In keeping with the strategy, the FDMP would be implemented under three planning phases to coincide with the three planning programmes as follows:

Phase I:	2016 - 2020	(Short Term Continuation Programmes)
Phase II:	2021- 2030	(Medium Term Structural Transformation Programmes)
Phase III:	2031– 2036	(Long term Consolidation Programmes)

The strategies to be implemented under each phase have been planned under the nine main components with various programmes, outputs, and targets. The components are the main focal areas of the plan with sets of targets, outputs, and results framework to be achieved within the planned period. The performance of the plan will be reviewed yearly, but there will be a comprehensive sector review every five years to assess the impact of the programmes on the sector.

Financing

The indicative cost of implementing the FDMP based on the current level of activities is estimated to cost US\$ 8.9 billion. It is expected that the forestry sector would be able to finance at least 23 per cent of this cost through internally generated funds and the private sector support. The main sources of funds for the implementation of the plan will be as follows:

- 23 per cent of the total programme costs will be financed through internally generated fund (IGF) by the Forestry Commission, payment for ecosystem services,
- 52 per cent support from the Ghana Government budgetary allocations
- 25 per cent from development partners mainly to support the establishment of social infrastructures and capacity development for sustainable forest.

Ghana has since the colonial era, pursued sustainable forestry development agenda aimed at managing the high forest to enhance human welfare and national development. Priority interventions in the sector have been on forest management and resource development (including natural regeneration and timber plantation programmes), institutional capacity building, governance (including policy and institutional reforms), and biodiversity conservation. However, the exigencies of the current situation have introduced a set of complex and increasingly interlinked issues which impinges on the growth and development of the forestry sector. The challenges have brought, the need to strengthen political commitments and actions at all levels of governance to implement sustainable management of all types of forests and contribute to achieving national growth and environmental sustainability.

From the '*timberization*' policies and plans of the 20th Century, the Ghanaian forestry sector intends to make a paradigm shift to create a balance between timber production, good governance, forest enterprise development, biodiversity conservation, ecotourism development, and effective marketing to satisfy the domestic wood demand.

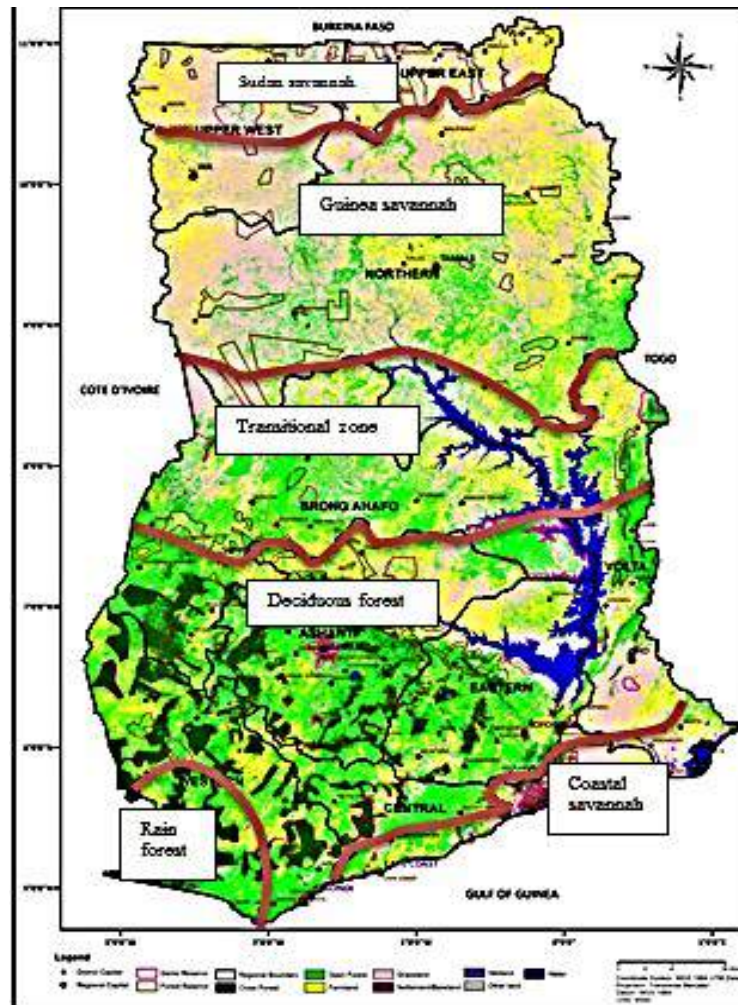
PART I: OVERVIEW OF THE FORESTRY SECTOR

1.0 BACKGROUND INFORMATION AND SECTOR ANALYSIS

1.1 Geographic Profile

Ghana, has a total land mass of 239,460 km² lying between latitude 11.5°N and 4.5°S and longitude 3.5°W and 1.3°E. Ecologically, the country is made of three broad zones namely, the high-forest in the south (rain and deciduous forest), accounting for about one-third of the land area (8.2 million hectares), a savanna (15.7 million hectares – Coastal, Guinea and Sudan savannah), and a transition zone (1.1 million hectares¹ mostly semi-deciduous forest in the middle belt) (Figure 2).

Figure 2: Ecological Zones of Ghana



¹ The area of the transitional zone is not fixed. It continues to change with time either in favour of the forest or adding up to the savannah.

Based on the global forest resource assessment category, three land cover classifications are identified in Ghana as Forests, Other Lands, and Water. The forest area covers 39 percent of the landmass and it includes land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use. The Other Lands cover 56 per cent of the land area and is predominantly agricultural and/or urban land use and have patches of tree cover that span more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity. It includes both forest and non-forest tree species. The water covers 5 per cent of the landmass and it is made up of inland water bodies including major rivers, lakes, and water reservoirs.

Utilizing Landsat imageries over the last one and half decades, the land-cover map of Ghana shows an increasing forest cover of 0.3 per cent annually as summarized in Table 1 (FPP Report, 2015). The increasing forest cover may be the results of national afforestation programme, natural regeneration, and significant reduction in the incidence of forest fires. However, the increase in forest cover cannot be translated to mean improved quality of the forest since deforestation rates and illegal forest operations are seemingly high.

Table 1: Land Cover Classification of Ghana (1990 -2015)

Global forest resource assessment category	1990	2000	2005	2010	2015
Forest	8,627,401.9	8,908,607	9,053,360	9,195,137	9,294,349
Other land	14,126,598.1	13,845,393	13,700,640	13,558,863	13,459,651
Water	1,100,000	1,100,000	1,100,000	1,100,000	1,100,000
Total	23,854,000	23,854,000	23,854,000	23,854,000	23,854,000

Source: Global Forest Resources Assessment (2015)

1.2 National Demographic Characteristics

The total estimated population of Ghana in 2014 stood at 26.3 million people, with about 49.8 per cent living in rural areas (GLSS 6, 2014). The distribution of the population by locality shows that more people live in rural forest (6.9 million) than in rural savannah (4.7 million) and rural coastal (1.5 million). The female population represents 51.7 per cent compared to 48.3 per cent men. This indicates a sex ratio of 93 males to every 100 females. More than half (56.3 per cent) of the adult population is literate in English with a higher rate for males (67.3 per cent) than for females (46.9 per cent). The average annual population growth rate was 2.4 per cent in the 2014 and the total population is projected to reach 49 million by 2040.

The demographic characteristics of the country imply that a) without any significant increase in the forest cover; the forestry sector cannot sustain the future population. By 2040 Ghana will require 63.7 million m³ of wood for fuel and 1.76 million m³ of timber for domestic use². The imbalance in domestic timber demand and supply, and illegal chain saw milling will persist thereby exacerbating the deforestation process; b) with increasing rural forest population, the

² Per capita woodfuel consumption of is estimated at 1.3m³ and 0.036 m³ for timber.

forestry sector will to be constrained by expansion of cocoa farms, illegal harvesting, degradation and poor management of forest reserves, if no actions are taken; c) the high female population ratio, means that gender mainstreaming in forestry sector interventions should be a priority. This signifies that the future population will have serious repercussions on the utilization of forest and savanna resources in all the ecosystems. Without additional forest and savannah woodland cover, Ghana cannot meet the future wood demand.

1.3 Macroeconomic Profile

Ghana has experienced a relatively stable macroeconomic environment over the last decade. After the rebasing of the Gross Domestic Product (GDP), the national economy moved from a low-income to a lower middle-income economy in 2011. Within the period, the country also experienced a positive growth rate in the Gross Domestic Product (GDP), political stability, good governance, and increased exports of the traditional cocoa, minerals, timber products, and crude oil. Ghana’s GDP for 2015 showed a growth of 3.9 percent over the 2014 estimates. The Agriculture sector contracted from a growth of 4.6 percent in 2014 to 2.4 percent in 2015 and its share of GDP also decreased from 21.5 percent in 2014 to 20.3 percent in 2015. The forestry and logging sector however maintained a growth of 3.8 percent with increased contribution to GDP of 2.3 percent (Ghana Statistical Service, 2016).

The economy of Ghana has in the past depended mainly on cocoa, gold, and timber as the major contributors to the country’s GDP. However, with the inception of oil production in 2011, the country is now transitioning into an emerging oil economy. The contribution of the various sectors to the real GDP shows that gold, crude oil, cocoa, and timber were the country’s top export earners in 2015, accounting for 78 per cent of export receipts. A summary of the merchandize trade flow for Ghana between 2012 and 2014 (Table 2) shows that the value of timber export has been increasingly marginal, accounting for 1.4 per cent (US\$181.2 million) in 2014.

Table 2: Merchandize Trade Flows (million US\$)

Major Exports	2012	2013	2014
Merchandise export (fob)	13,552.3	13,751	13,216
Cocoa	2,192.7	1,612.1	2,079.7
Gold	5,643	4,965.7	4,388.1
Crude Oil	2,976.1	3,885.1	3,725.0
Timber	131.0	165.8	181.2
Other Exports	2,609.3	3,123.1	2,842.1

Source: Bank of Ghana (2015)

1.3.1 Contribution of the Forestry Sector to the National Economy

The forestry sector is one of the most important sectors in the Ghanaian economy in terms of jobs creation, incomes for local communities, foreign exchange earnings through timber products export and protection of the environment. Forestry is the provider of multiple tangible and intangible goods and services classified into three categories as follows:

- Timber and wood products.
- Non-timber products including bush meat and other wildlife products, bamboo /rattan, essential oils, tannins, resins, gums, dyes, cork, honey, and medicinal plants among others.
- Environmental Services, such as watershed protection, biodiversity conservation, carbon sequestration and clean air, micro-climate regulation/modification, soil fertility improvement, soil conservation/soil erosion control, recreational (aesthetic) value and
- Job creation/ generation of employment

Between 1990 and 2015, timber production has remained Ghana’s third biggest foreign exchange earner, and its contribution to the Gross Domestic Products (GDP) has been increasing in nominal terms over the years (Table 3). In real GDP terms forestry contribution has declined due to the crude oil exports, however in nominal terms its contribution has been increasing over the years. The forestry and logging contribution to GDP (at 2006 constant prices) has been more than cocoa since 2013. This underpins the importance of the forestry sector in the national economy.

Table 3: Sector Contribution to GDP (at 2006 Constant Prices in million Ghana Cedis)

Sector	2007	2008	2009	2010	2011	2012	2013	2014	2015
Forestry & Logging	705.9	632.4	687	757	651	695	726	754	783
Cocoa	493.2	509.1	535	535	771	699	717	747.8	738
Mining	531.6	544.4	581	690	2,116	2,462	2,747	2,834.4	2753
Oil and Crude oil	-	-	-	65	1,372	1,669	1969	2,058	2076
TOTAL GDP in purchase values	19,518	21,304	22,336	24,101,	27,486	30,040	32,237	35,522	34,823

Source: Ghana Statistical Service (2016)

The contribution of forest to the national accounts is captured mainly from the formal sector consisting of regulated industries in timber and timber products. However, the informal sub-sector, which is characterized by Small and Medium Forest Enterprises (SMFEs), broadly covering wood products, non-wood forest products and forest services are not catered for in the national accounts, although it provides additional and/or alternative income source to over 3 million Ghanaians (GLSS, 6).

The 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. The SMFEs include small scale carpentry, chainsaw milling, charcoal production, wood carving (including canoes) and the trading of non-wood forest products (NTFPs) which is made

up of 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, among others (Table 4).

Two categories of NTFP exploiters are recognized in the country. These are people who collect, gather, and process NTFPs for domestic use and those who gather to sell. The former 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. Those who collect and process the products for commercial use usually require permits and pay fees from the exploitation.

Table 4: Small-Medium Forest Enterprises Found in Ghana (2015)

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 Fuel wood 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

Source: MLNR, Annual Report (2015)

1.3.2 Non-Wood Forest Products

An estimated 380,000 tonnes of bush meat are consumed annually with an estimated value of about US\$350 million (FC, 2014). 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 the northern Ghana collect about 130,000 tonnes of nuts yearly, 40 per cent of which are exported. This contributes about US\$30 million annually to the national economy (Osei-Tutu et al. 2010). Two NTFPs (thaumatin, a sweetener from seeds of *Thaumatococcus danielli*, which is easy to cultivate under plantation trees; and novella, an oil/margarine from seeds of *Allanblackia parviflora*) are on the export market. A small-scale processing facility for thaumatin production has been established at Samerboi and the value of exports of this product in 2014 was reportedly \$430 million. Table 5 gives an indicative estimate of wood and non-wood small, medium scale forest-based enterprises in Ghana.

Table 5: Indicative Estimates of Wood & Non-wood SMFEs in Ghana

Wood SMFEs	Nos. of Organizations/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 million.
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 million m ³ of wood valued at about US\$200 million 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 220,000 and 380,000 metric tons of bushmeat valued at between US 210 million and US \$ 350 million for domestic consumption annually.

Source: Forestry Commission, (2014)

There are 30,000 small-scale carpentry firms employing an estimated 200,000 people, and there are about 5,000 woodcarvers and 1500 canoe carvers (MLNR, 2014). Chainsaw milling, although illegal, provides jobs for about 130 000 Ghanaians and livelihood support for about 650 000 people; 5000–6000 people are estimated to be employed in the bush-meat industry (FC, 2014).

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 fuel wood and charcoal production, wood-carving, canoe-carving, rattan production and chewing stick-gathering (MLNR, 2014).

Rural/Urban energy is an important aspect of the forest economy and depends largely on wood fuels (fuel wood and charcoal). Traditional energy accounts for 85.8 per cent 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.

1.3.3 Ecotourism

Ecotourism in Ghana is expected to earn US\$ 1.6 billion in annual revenue generation, and tourism will likely become the number one foreign exchange earner in the national economy in the future (Ghana Tourist Board, 2012). Table 6 gives a list of frequently visited ecotourism sites in Ghana.

Table 6: Frequently Visited Ecotourism Sites 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 species 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 species of large animals, 400 species of butterflies	Central
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	Monkeys, 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: Wildlife Division (FC) (2014)

Kakum National Park 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 bird’s eye view of the rainforest. It is the first of its kind in Africa.

Based on the formal and informal activities, the estimated real contribution of the forestry sector to the Ghanaian economy is estimated at US\$852 million (FC, 2014). The estimated annual value of harvested woodlot is US\$206,776.32 (GLSS6).

1.4 Forestry Sector Development Interventions Since 1996

Until November 2012, the provision of the 1996 Forestry Development Master Plan was the main instrument for planning development activities and change in the forestry sector. The goal of the 1996 Forestry Development Master Plan (FDMP) was identical to the goal of the 1994 Forest and Wildlife policy from which the following objectives were derived:

- Management and enhancement of Ghana's permanent estate of forest and wildlife resources;
- Promotion of viable and efficient forest-based industries, particularly in secondary and tertiary processing;
- Promotion of public awareness and involvement of rural people in forestry and wildlife conservation;
- Promotion of research-based and technology-led forestry and wildlife management, utilization and development;
- Development of effective capacity and capability at national, regional and district levels for sustainable forest and wildlife management.

The development activities that took place in the forestry sector since the inception of the 1996 Forestry Development Master Plan has shown that to a greater extent the objectives of the master plan were greatly achieved (Appendix 1). The 1996 master plan introduced a number of strategic initiatives that improved and developed the forest and wildlife resource base and integrated good governance, transparency, equity, and poverty reduction in the forest and wildlife sector. The plan became the entry point for raising awareness on issues related to forest and wildlife management, preparing or updating forest policies, preparing specific action programmes and projects, and stimulating financial and political support to implement these initiatives. The summary of sector programmes and projects since 1996 was as follows.

1.4.1 Enhanced Policy and Regulatory Reforms for Forestry Development

Under the 1996 Forestry development master plan the forestry sector witnessed various reforms and the major programmes were centered around:

- Improvements in the policy and regulatory environment for high forest management and timber industry development;
- Improved forest governance, transparency, equity, and poverty reduction;
- Legislative and sector institutional reforms;
- Enhanced local community involvement in sustainable management of the high forest and savanna woodland zones;
- Farmer adoption of improved land and water management techniques;
- Improved management of wildlife resources while increasing their contribution to local livelihoods and economic development; and,
- Implementation of the National Forest Protection Strategy to enhance conservation of globally significant biodiversity in priority reserves.

1.4.2 Improvement in the Policy and Regulatory Environment for High Forest Management and Timber Industry Development

The most significant forestry policy and legislative reform included:

- Maintenance of the log export ban and control on illegal chainsaw lumbering;
- introduction of transparent and efficient allocation of timber resources and control of over-cutting of timber;
- Formulation on the basis for the appropriate pricing of timber and other forest-based products;
- Rationalization of the timber industry and the adoption of appropriate fiscal and taxation measures;
- Facilitation of equitable distribution of benefits to forest-owning communities; and
- Promotion of rights to community participation.

1.4.3 Savannah Woodland Resource Management

Two interventions took place under the 1996 FDMP to promote sustainable savannah woodland management as savannah resource management and the northern savannah biodiversity projects. The purpose of these interventions were to sustainably manage savannah woodland resources in pilot catchments areas in the savannah zone; enabled efficient productive use of these resources, piloted improved production and marketing of the woodfuels; helped local communities to improve their living conditions; and created biological corridors for wildlife management.

The programmes were implemented based on the integrated land use plans starting on mini-watersheds from headwaters areas, building on the experiences of the land and water management component of Ghana Environmental Resource Management Project (GERMP). The programme took account of the relevant physical factors related to the resources, as well as the market situation, and the culture, needs and capabilities of the communities which rely on the land resources for their livelihood.

The achievements made under this subcomponent included preparation of six integrated watershed management plans; community natural woodland reserves; nursery development; bush fire management; soil fertility improvement techniques and establishment of wildlife corridors.

1.4.4 Legislative Reforms

The legislative reforms that took place during the period under review were the:

- Revision of the Forest Plantation Fund Act, 2000 (Act. 583),
- Removal of duty on the imported timber for processing (Customs & Excise Duties Amendment Act, 2000),
- Regulation of investments into the forestry sector (Revision of Ghana Investment Promotion Centre Act, 1994- Act. 478),
- Increases in the fines and punishment for committal of forest offences (Forest Protection Amendment Act, 2002),
- Introduction of competitive bidding in the allocation of timber and other forestry resources (Amendment to the Timber Resources Management Act, 1997 – Act. 547 and the Timber Resources Management Regulations, 1998 –L. I. 1649).

- Amendments to the Timber Resource Management Act, 1997 (Act 547) and Timber Resources Management Regulations, 1998 (LI 1649). The Timber Resources Management (Amendment) Act, 2002 (Act. 617) and the Timber Resources Management (Amendment) Regulations, 2002 and Timber Resources Management (Amendment) Regulations, 2003 (L.I. 1721), have paved way for the:
 - Adoption of competitive bidding in the allocation and utilization of timber resources;
 - Adoption of Social Responsibility Agreement backed by law to assist inhabitants within the contract area with amenities;
 - Permit private plantation developers to harvest their planted trees for commercial purpose without a TUC and the consent of the landowners;
 - Revised sanctions under NRCD 243 and PNDCL 142 so as to make it unattractive to cause damage to any forest reserves and extend the liability under Act 547 and LI. 649 to include not only drivers of vehicles used to transport illegal timber but also those who hired them or the one under whose instructions the vehicle was operated to “carry, haul, evacuate or transport” such timber;
 - Revised law to empower the Ministry to regulate new investments into the forestry sector and ensure that only the required plant and equipment for the country’s needs are installed in the wood-processing sector.

1.4.5 Sector Institutional Reforms

One of the most remarkable achievements of the 1996 FDMP was institutional reforms and arrangement to facilitate sustainable forest management. The following laws were enacted to support the institutional reforms:

- The Forestry Commission Act 1999 (Act 571) re-established a new Forestry Commission (FC) in accordance with the national constitution.
- The Act 571 empowered the FC to act as a corporate body responsible for the implementation of forest policies and the management of the utilization of forest resources in the country. All the forestry sector institutions were made divisions of the FC, which was given implementation autonomy under the law. The divisions of the FC were the Forest Services (FSD), Wildlife (WD), and Timber Industry Development (TIDD).

1.4.6 Local Community Involvement in the Management of the Forest and Savannah Woodland Resources

One of the main tenets of the FDMP was community involvement in sustainable forest and woodland management. Accordingly a collaborative wildlife management policy has been formulated to ensure a more active participation of local communities, civil society groups and other stakeholders in wildlife management In Ghana. The institutional mechanisms for implementing collaborative wildlife management both in and outside the Protected Areas were the Protected Areas Management Advisory Units/Boards and the Community Resource Management Area (CREMA) approach.

The CREMA concept was based on the belief that people will manage wildlife and other resources when provided sufficient incentives to do so. The incentive system could be economic, or direct financial benefit. Another tenet of the CREMA was the belief that people who live with and are responsible for the management of natural resources must be the primary beneficiaries of those management efforts. The establishment of a CREMA offers environmental, economic, and financial benefits to the farmers. It improves environment security improve incomes of farmers leading to greater food security and poverty alleviation.

Collaborative natural resource management (CNRM) was implemented in the High Forest Zone using CNRM support teams, established for that purpose. Much of the CNRM operations involved contract boundary clearing by forest fringe communities and Community Based Organizations (CBOs); modified taungya systems and integrated tree planting contracts for plantation establishment as inputs into the development of forest reserve management planning.

1.4.7 National Forest Protection Strategy

The Forest Protection Strategy was developed by the FC, to protect and conserve some identified areas within the system of forest reserves that have a very high biological diversity. These areas were accordingly designated as Globally Significant Biodiversity Areas (GSBAs) and the instrument used to determine their suitability for such classification is the Genetic Heat Index (GHI), which gives an indication of the level of diversity of a forest is in terms of its genetic variation and variability.

Under the biodiversity conservation (BC) component of the NRMP key elements of the Forest Protection Strategy and the National Biodiversity Strategy were implemented over a six-year period corresponding to the first two phases of the NRMP. A comprehensive action plan to secure the valuable biodiversity harboured by the GSBAs was prepared.

1.4.8 Forest Management Certification

In 1996 a forest management certification process was adopted countrywide as an important tool in forest management and accountability since it was an essential mechanism which could be used to achieve sustainability of forest management as well as producing forest products aimed at environmentally sensitive markets in Europe. A National Committee on Certification (NCC) comprising Chiefs, traditional authorities and representatives of governmental and non-governmental organizations was set up.

The purpose of promoting Forest Management Certification Scheme was to provide verification that forests are being managed sustainably. The forest certification programme therefore seeks to improve forest management and enhance multiple values from forests in accordance with the definition of sustainable forest management principles.

With donor support, national certification working group was formed as a non-governmental organization, to develop and publish standards and criteria for forest certification. The criteria and indicators have been field tested by independent experts, and approved by the Forest Service Council (FSC). The principles for forest management certification in Ghana has nine thematic areas centred on compliance with laws and regulations; land tenure, stakeholder and resource rights; community relation and worker's rights; conservation and maintenance of biological diversity; rights and responsibilities of workers; benefits from the forest: revenue generation and the equitable distribution of costs and benefits; maintenance and enhancement of ecosystem productivity and forest management system. The standards are applicable to all forest operations

seeking FSC certification within Ghana. This includes Natural Forest and Plantation in Ghana.

The development of verifiable standards that would make it possible for specific forests to be certified as being responsibly managed is only one of the latest initiatives in the process of developing quality forest management in the country. The next most important aspect is the implementation and mainstreaming of the standards in the forest management operation in Ghana. This is yet to be done.

1.5 Justification for the Revision of the 1996 Forestry Development Master Plan

The implementation of the 1996 master plan with all the associated reforms, programmes, and projects could not address the underlying causes of deforestation and forest degradation in Ghana. Deforestation has increased and illegal chainsaw and mining (*galamsey*) operations in forest areas have thrived over the years despite conscious national efforts to curb the situation in collaboration with the security agencies. Wood fuel productions especially in the fragile ecosystems have remained unsustainable whilst wildfires continue to be an annual occurrence in all parts of the country. The timber industry still operates with obsolete equipment and having installed capacities exceeding the Annual Allowable Cut (AAC).

Until recently, the primary emphasis in the forestry sector planning was on assessing forest timber resources and formulating strategies, primarily in relation to sustainable forest industries. Today there is a new scope of forestry development which has expanded to address causes of deforestation; established needs for reforestation; promote the contributions of forests to food security and rural energy; and building the capacity for national forestry administrations. The approach of forestry sector planning has been further modified by UN Sustainable Development Goals and 'sustainable forestry' which oblige national forest planning efforts to translate evolving ideas on sustainability into operational guidelines.

The forestry sector today is confronted with emerging global issues like the Voluntary Partnership Agreement (VPA), Forest Certification and Reducing Emissions from Deforestation and forest Degradation (REDD) which have far reaching implications for the forest and wildlife industry as well as local livelihoods. Besides, the Ghana Government has initiated steps towards the formulation of 40-year national development plan for a just, free, and prosperous society. The goal of the FDMP therefore is to achieve an inclusive and resilient economy, equitable and tolerant society, safe and sustainable communities, effective and efficient institutions and contributing to world peace and justice.

The new global and national initiatives demand a new scope and strategy to reposition the forestry sector to meet the challenges. In order to build up institutional capacities to respond to the issues of climate change, forest degradation and deforestation, efficient utilization, transparent governance and financing of forestry programmes, there is the need for the following:

- Adoption of new legislation on tree tenure to support massive afforestation and plantation development in both the high forest areas and the savannah ecosystems;
- Institutional reorganization of the Forestry Commission to make it more efficient, autonomous, self-financing and dynamic forestry institution;
- Decentralization of forest management responsibilities and transfer of responsibilities from the centre to stakeholders at local community levels;

- Modernization of the timber industry to become an efficient high value low volume enterprises;
- Coordination and harmonization of actions within a coherent, holistic and inter sectoral strategic frameworks.

1.6 The 2012 Forest and Wildlife Policy

In keeping with the limitations and challenges, a new Forest and Wildlife Policy-2012 was prepared as a paradigm shift from the past policies. The new policy placed much emphasis on the non-consumptive values of the forest and sought to create a balance between timber production and marketing to satisfy domestic wood demands whilst ensuring good governance and transparency in the forestry sector. The policy objectives are to:

- Consolidate good governance through accountability and transparency,
- Enhance active participation of communities and land owners in resource management,
- Develop small and medium forest and wildlife enterprises as a means of job creation, for the rural and urban poor,
- Increase biodiversity conservation and ecotourism development,
- Increase government commitment to degraded landscape restoration through massive plantation development schemes,
- Promote sustainable management of the savannah woodland,
- Improve research and application of modern and scientific technology in resource management,
- Develop climate change adaptation and mitigation measures, and
- Secure sustainable financing for the forest and wildlife sector

With the adoption of the new policy, it has become very necessary to revise the 1996 Forestry Development Master Plan, to align it with the objectives of the new policy. It is also important to take up the responsibility of implementing the unfinished programmes under of the 1996 FDMP and respond to the current challenges in the forestry sector.

2.0 CURRENT STATE OF THE FORESTRY SECTOR

It has become widely accepted that forestry sector planning needs to be redefined to make it a more iterative process rather than a blueprint of activities, and to involve participation, consultation, and dialogue between various concerned groups. Sound planning is based on a good knowledge of the current state of affairs and the various options for the future. Such information is currently far from satisfactory in many developing countries. Better knowledge is needed on state of the forestry sector and on global, regional, and national level, priorities, and conditions which affect resource management at levels of governance.

2.1 Relevant National Policies and Programmes Impinging on Forestry Sector Development

2.1.1 The Ghana Shared Growth and Development Agenda (GSGDA) II [2014-2017]

In pursuance of Ghana's development agenda, many different national policy frameworks aimed at providing direction particularly towards reducing poverty have been enacted and implemented. In the last three decades such documents as the Ghana Vision 2020, GPRS 1 and II and currently the Ghana Shared Growth and Development Agenda (GSGDA), have guided the development agenda of the country and have formed the basis for engagement with development partners in Ghana. All these policy frameworks have serious implications for the forestry sector development.

The sustainable management of natural and renewable resources as identified in the Ghana Shared Growth and Development Agenda (GSGDA) is essential to deliver the medium-term national development agenda. The key objectives of the sector are to:

- Improve cross-sectoral environmental management, including the consideration of global issues such as climate change and loss of biodiversity, as well as the opportunities of initiatives such as REDD+, VPA/FLEGT;
- Apply strategic environmental assessment (SEA) to inform decision-making and mainstream environment into all sectors of the economy, especially as regards the cost of environmental degradation;
- Improve environmental and social impact assessment (ESIA) processes and compliance;
- Decentralize environmental management, including the enforcement of laws on waste, illegal mining and chain-saw logging at the local level;
- Improve environmental monitoring and reporting; and
- Strengthen functional partnership and participation in environmental management with civil society, development partners, industry, and research bodies.

2.1.2 The National Biodiversity Strategy and Action Plan

As part of the obligations under the Convention on Biological Diversity, Ghana developed a National Biodiversity Strategy in 2002. The strategy is for the sustainable use of biological resources, Forest Reserves, National Parks and other wildlife reserves including various traditional forms of conservation have been set to ensure biological conservation. The strategy document recognizes that there is a lack of information on biological resources in Ghana and there is a need to address these data gaps. It is further recognized that for sustainable

development, there is a need to integrate biodiversity issues into national development planning programmes. The strategy recommended the establishment of a National Biodiversity Commission to coordinate policy and the implementation of the strategy among the relevant agencies under the Ministries as well as NGOs, CBOs and local communities. Implementation of strategy has not been very effective as the coordinated effort from the various agencies for implementation have not materialized, with the proposed Biodiversity Commission, also not seeing the light of day. In its place, the National Biodiversity committee was established, but being starved of operational resources, the committee was still-born.

2.1.3 The National Environment Policy - 2014

The need to ensure a sustainable socioeconomic development of the country in the long-term necessitated the balancing of national development efforts and the quest for economic growth with a rational exploitation of the natural resource base. The biodiversity conservation initiatives in Ghana received a big boost in March 1988, when the government initiated a major effort to bring environmental issues to the forefront of national development system. The latter outlined the status of biodiversity in environmental policies. The adoption and implementation of the EIAs in 1989 partially stabilized the increasing rate of biodiversity depletion caused by implementation of the Economic Recovery Programme.

The most effective tool for environmental protection is “prevention”. This is reflected in the Environmental Policy of Ghana formulated in the National Environmental Action Plan (NEAP) of 1994. The NEAP defined a set of policy and other actions that would make Ghana’s development strategy more environmentally sustainable. The Ghana environmental policy aims at a sound management of resources and the environment, and to avoid developments that are unsound or environmentally destructive. The policy seeks reconciliation between economic planning and environmental resources development with the view to achieving sustainable national development. Within this context the policy seeks among others to:

- Develop procedures for the utilization of land resources that ensure the maximum degree of economy in the use of land and avoid or minimize conflicts;
- Institute and implement an environmental quality control and sustainable development program by requiring prior Environmental Assessment (EA) of all developments; and
- Take appropriate measures to protect critical ecosystems, including the flora and fauna they contain against harmful effects, nuisance or destructive practices.

The specific objectives of the policy include:

- Ensuring sound management of natural resources and the environment;
- Protecting human, animals and plants and their biological communities and habitat;
- Guiding development in accordance with quality requirement to prevent, reduce and as far as possible eliminate pollution and nuisance; and
- Integrating environmental considerations in sectoral, structural and socio-economic planning at all levels.

The adoption of the NEAP led to the enactment of the EPA Act 1994 (Act 490) which for the first time gave legal support to Environmental Assessment (EA) implementation in Ghana, after

almost fifteen years of experimentation. The passing of the Ghana EIA Procedures into the EA Regulations (LI 1652, 1999) further consolidated EA application in Ghana.

2.1.4 National Wetland Conservation Strategy

Ghana's *Wetlands Conservation Strategy* is aimed at achieving the guiding principles of ensuring sustainable land use within the general context of Ghana's Land Policy. The Policy seeks to promote the judicious use of the nation's land and all its natural resources by all sectors of the Ghanaian society in support of various socio-economic activities undertaken in accordance with sustainable resource use and maintenance of viable ecosystems.

Recognizing traditional perceptions, local needs, national aspirations, as expressed in Ghana's Vision 2020, as well as international guidelines, conventions and agreements, the following are listed as the key principles the Ghana's National Wetlands Conservation Strategy is expected to promote the:

- Principle of *wise use*, emphasizing on managing wetlands within biological and physical constraints, to ensure that future generations have access to the same resources as the present generation;
- Principle of *interdependence* between physical, biological, social, cultural, economic, technological and environmental conditions of wetlands ecosystems;
- *Precautionary principle* by avoiding activities, which would affect the integrity of wetlands and subjecting all development activities to environmental impact assessment process;
- Principle of "*polluter pays*" will apply to all development activities in wetland habitats;
- Principle that *local knowledge and traditional management strategies* play a role in the management of wetlands;
- Principle that the livelihood of local communities within the catchment area is *inter-linked* with the ecological integrity of wetlands;
- Principle of *participatory approach* by the involvement of traditional authorities, local communities and all concerned people and organizations at all levels of decision-making in the sustainable management of wetlands;
- Provision of *incentives and disincentives* are effective means of managing the use of wetlands and wetland resources; and
- Principle that *international co-operation* is essential in the conservation and management of shared wetland resources.

2.1.5 The National Land Policy, 1999

The National Land Policy provides the framework for addressing land acquisition and management related problems and constraints to ensure equity in land allocation and holding and to *maintain a stable environment* for the country's sustainable social and economic development. The Land Policy of Ghana aims at the judicious use of the nation's land and all its natural resources by all sections of the Ghanaian society in support of various socio-economic activities undertaken in accordance with sustainable resource management principles and in maintaining viable ecosystems.

The policy captures vividly the aspects of coastal wetland management with respect to biodiversity. The use of wetlands for farming, grazing, fishing, timber and salt-winning is recognized in this Policy as an encouragement for the conservation of ecosystem, biodiversity and the sustainable productivity of wetlands. It prescribes conformity of mining, mechanized agriculture, and cattle ranching, forest timber harvesting, soil erosion control, tree planting, to environmental conservation principles.

The Land Policy makes references to environmental principles and laws without any pointers to how forest and biodiversity conservation could be enhanced especially for the savannah ecosystems. The statement on biodiversity in the policy talks about protected area development for ecosystem maintenance of biodiversity conservation, scenic beauty preservation and a collaborative management with communities. The distinction is not made for savannah ecosystems that have special demands because of the fragility.

2.1.6 National Climate-Smart Agriculture and Food Security Action Plan

The Food and Agriculture Sector Development Policy (FASDEP) was developed as a policy of the Government of Ghana to guide development and interventions in the agricultural sector. The FASDEP policy stands for the improvement of planting materials, technology development and dissemination, financial service support to agriculture, infrastructure support, human capacity development, and creating enabling environment through policy. In November 2015, a national climate Smart Agriculture and food security action plan was initiated.

The agriculture and food security plan is focused on eight programmes. It is built on the principles that understanding the sustainability of natural resources including land, forest, water, and genetic biodiversity will significantly influence agricultural practices. It also calls for the need for sustainable agricultural systems as the fundamental basis for achieving national food security and poverty reduction.

The programmes under the action plans in order of priority are:

- i. Institutional capacity development for research and development
- ii. Development and promotion of climate-resilient cropping systems
- iii. Support to water and conservation and irrigation systems
- iv. Improved marketing systems
- v. Improved post-harvest management
- vi. Adaptation of livestock production systems
- vii. Risk transfer and alternative livelihood systems
- viii. Support for climate adaption in fisheries and aquaculture

The programme seeks to enhance the environment for all categories of farmers, while targeting poor and risk prone and risk-averse producers. Based on the role of agriculture in the national development framework, the objectives for the food and agriculture sector policy are as follows:

- Food security and emergency preparedness
- Improved growth in incomes
- Increased competitiveness and enhanced integration into domestic and international markets
- Sustainable management of land and environment

- Science and Technology Applied in food and agriculture development
- Improved Institutional Coordination

The emphases of the Action plan is on modernization of agriculture, enterprise development and commercial agricultural makes it even more imperative that issues of biodiversity be taken into account, however this is not given much emphasis and the linkages with other agencies with responsibility for biodiversity conservation are not developed in the policy document.

2.1.7 National Water Policy (2006)

The Water Policy draws attention to fisheries and aquatic ecosystem protection, integrating natural resources issues with socio-economic dimension. In water resources management, it acknowledges that planning for use and preservation of the natural resource must take the wider sustainable development needs of society into consideration. It proposes integrating water resources management and development with environmental management in order to ensure the sustainability of water resources in both quantity and quality. The following action areas are identified: (i) coordinating water resources planning with land use planning; (ii) adopting the river basin (or sub-basin) as a planning unit; and (iii) integrating river basin management with management of the coastal zone and wetlands. However, the water policy does not deal with marine resource management.

2.1.8 Traditional Conservation Practices

Historically, the people of Ghana have had traditional laws that tended to conserve the environment and natural resources. Even in pre-colonial days when population was quite low and natural resources were "limitless" and hunting and farming equipment were so basic that no extensive damage was done to the environment, traditional laws and practices on conservation were established. These laws and practices, some of which persist to date, tended to protect the ecology in 3 main ways by:

- Protecting specific ecosystems;
- Protecting particular plant/animal species; and
- Regulating the exploitation of plant and animal resources.

The most important of these conservation practices that have persisted to date are the sacred groves which are dotted all over the country. The principles of protected area system are therefore not alien to the Ghanaian society. Such protected areas were governed by local mores and are linked with the ethical, mythical, and spiritual beliefs of the people. Unlike the state system, no institutions were established for enforcement but wildlife protection was the duty of all citizens. However, there is a general weakening of traditional values and the statist system has also undermined their operation.

Sacred landscapes serve important ecological and socio-cultural functions by preserving virgin forests, being important refuges for rare and useful local biodiversity, and being sources of herbs for medicinal, social, and religious purposes (Ortsin in Taylor, et. al., 2015). There are an estimated 2,000 -3,200 sacred groves in Ghana, about 80 per cent of which occur in the southern half of the country (GEF/SGP, 2014).

Due to the linkage between traditional beliefs and divine deities or ancestral spirits, disobedience or disregard of traditional laws (taboos) attracts severe punishments for culprits, and high prices of atonement, including making sacrifices and performing certain rites to avert any mishaps, ill-health and death. Unfortunately, this has not been an effective deterrent for the reckless use of biological resources by local communities due to:

- Rapid population growth and its attendant problems of urbanization, migration, and resettlement,
- Increased dependence on western technology, and
- The growing influence of foreign religions and beliefs.

2.1.9 Natural Resources and Environmental Governance Programme (NREG)

NREG is a series of three development policy operations (DPO-1, DPO-2 & DPO-3) to GoG in order to support Ghana as it implements reforms under the NREG program. It is a sector budget programme as compared to the specific project/programme interventions described earlier. The reform will focus on the forestry and wildlife, mining and environmental protection sectors. The programme is financed by five Development Partners including the World Bank, Agence Française de Développement (AFD), DFID, UK, EC, and the Embassy of the Kingdom of the Netherlands.

The key objectives of the NREG are stated as follows:

- Ensure predictable and sustainable financing for the forest and wild life sectors and effective law enforcement;
- Improve mining sector revenue collection, management, and transparency;
- Address social issue in forest and mining communities; and
- Mainstream environment into economic growth through Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), a development of a climate change strategy.

2.1.10 Voluntary Partnership Agreement (VPA)

This a trade agreement between the European Community and the Republic of Ghana on Forest Law Enforcement, Governance and Trade (FLEGT) in Timber Products into the Community. The objective of this Agreement is to provide a legal framework aimed at ensuring that all imports into the European Community from Ghana of timber products covered by this Agreement have been legally produced and in doing so, to promote trade in timber products. In addition, this Agreement provides a basis for dialogue and cooperation between the Parties (the European Community and the Republic of Ghana) to facilitate and promote the full implementation of this Agreement and enhance forest law enforcement and governance.

Although focused on ensuring that only legal timber enters the European market, Ghana in the agreement has decided to apply the standards to its domestic market as well. Thus, successful implementation of the Agreement will to a large extent contribute to sustainable forest management.

2.1.11 Cocoa Farming and Biodiversity in Ghana Project

The application of the sustainable cocoa farming concept, which allows the use of agricultural methods that integrate sound ecological and economic farm practices, could have low impact on the forest environment, while also increasing the farmer's standard of living through the introduction of new revenue generation streams. This project investigated the feasibility and potential of cocoa production in a biologically diverse environment and established a cocoa farm tourism initiative in the project community.

The project was expected to conserve and increase biodiversity on selected farms through the management of a sustainable cocoa ecosystem, and improve farmer's incomes through increased productivity and farm tourism. An important long-term output of the project will be increased awareness and understanding amongst project participants and stakeholders of key issues surrounding sustainable cocoa production and farm livelihoods in the cocoa sector of Ghana. The project was a partnership between Cadbury Schweppes, Nature Conservation Research Centre, the Cocoa Research Institute of Ghana, and Reading University.

Currently under the FIP, the Forestry Commission and the Ghana COCOBOD are collaborating to enhance carbon stocks through facilitation of plantation investment in severely degraded landscapes. They are promoting integrated pest management and integrated crop management within the cocoa landscapes of the Western region. A combination of cultural, biological, and chemical control measures as well as management of soil, nutrients, water and compost is being within the cocoa landscape.

2.1.12 Climate Change Initiatives

Ghana is vulnerable to climate change. Majority of its society still depends on small-scale agriculture and other key economic assets threatened by climate change, such as the coastal zone and water resources. Currently, there are observed rise in temperatures across all ecological zones in Ghana, and rainfall patterns are becoming less predictable (MESTI, 2010). The Government of Ghana recognizes the social and economic impacts, and the development challenge arising from climate change. It is committed to mainstreaming climate change into key planning processes on the national, regional, and local level (MESTI, 2010). In early 2010, the government started the process of developing a National Climate Change Policy Framework (NCCPF). To support this process and a further harmonization of climate change related activities in Ghana, the Ministries of Finance and Economic Planning (MOFEP) and Environment, Science, Technology and Innovation (MESTI) expressed demand for a mapping of the most important past and current climate change related activities in the country, and of international climate change related funding opportunities. The outcomes of the study helped to identify overlaps and gaps and provided guidance for future needs.

2.1.13 Climate Finance Opportunities

Globally, the largest multilateral climate finance initiatives include the GEF and World Bank funded programs. Ghana has a relatively good track record in assessing funding for these, while Ghana's track record in assessing carbon market financing has been weak. The largest bilateral climate change initiative is Japan's *Satoyama Initiative*. Ghana is currently receiving funding from this global initiative in the frame of regional projects, such as the *Africa Adaptation*

Programme implemented by UNDP. Ghana also has close ties of bilateral cooperation with a number of donor countries with active representation in the country itself.

2.1.14 REDD+ (Reducing Greenhouse Gas Emissions from Deforestation and Forest Degradation)

As part of climate change mitigation actions Ghana has opted for REDD+ through the forest sector. This is aimed at:

- Reducing emissions from deforestation;
- Reducing emissions from forest degradation;
- Conservation of forest carbon stocks;
- Sustainable management of forest; and
- Enhancement of forest carbon stocks.

Ghana's Readiness Preparation Proposal (R-PP) has been approved and is currently piloting activities in seven pilot sites across the country. The R-PP provided the bases for developing the REDD+ strategy. The capacity needs, and overview of the current situation, the challenges, and steps for implementation of the strategy are all outlined in the policy. Ghana's R-PP was approved in March, 2010.

Ghana is currently in the 'readiness' phase', with preparations for REDD+ ongoing since 2008 (FCPF, 2012). This has included the development of a National REDD+ Strategy, in addition to the development of policies and capacity building activities. Ghana is in the Implementation Phase of its Readiness Preparation Proposal (R-PP) as a Participant Country of the Forest Carbon Partnership Facility (FCPF). Ghana is also a Pilot Country to the Forest Investment Programme (FIP) and has developed an Investment Plan. Ghana does not receive direct support from UN-REDD for its national programme, but in 2011 joined as a Partner Country (UN-REDD Programme, 2011). As of 2014, there are a number of REDD+ initiatives and carbon projects being implemented in Ghana, including seven REDD+ pilot schemes, which are being coordinated by the Climate Change Unit of the Forestry Commission; the REDD+ secretariat of the National REDD+ Technical Working Group (FORESTRY COMMISSION, 2012).

2.1.15 Global Objectives on Forests

Ghana by being a signatory to international conventions is obliged to meet global objectives for the development of forestry as follows:

- Reverse the loss of forest cover through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation;
- Enhance forest-based economic, social and environmental benefits, by improving the livelihoods of forest-dependent people;
- Increase significantly the area of sustainably managed forests, including protected forests, and increase the proportion of forest products derived from sustainably managed forests;
- Reverse the decline in official development assistance for sustainable forest management and mobilize most significantly, on new and additional financial resources from all sources for the implementation of sustainable forest management.

2.1.16 Sustainable Development Goal 15

The Sustainable Development Goals aim to conserve and restore the use of terrestrial ecosystems such as forests, wetlands, dry lands and mountains, combat desertification and halt, and reverse land degradation and halt biodiversity loss. The targets set under the goal are:

- ❑ By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreements.
- ❑ By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
- ❑ By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
- ❑ By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.
- ❑ Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.
- ❑ Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.
- ❑ Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.
- ❑ By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.
- ❑ By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts
- ❑ Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.
- ❑ Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.
- ❑ Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities.

2.2 State of the Ghana Forest Resource Base

The recent forest assessment of the high forest zone estimated the total forest land in Ghana at 9.337 million ha in 2015. This is made up of 1.556 million ha closed forest and 7.781 million ha open forest. The forest degradation rate in Ghana is estimated at 45,931.03 ha per annum since 1990 (Forest Preservation Programme report (FPP), 2013). The size of the closed forest has decreased from 2.704 million ha in 1990 to 1.556 million in 2015 indicating a depreciating rate of 38,529.65 ha per year. The changes in the total forest area of Ghana is summarised in Table 7a.

Table 7a: Forest Lands in Ghana (1990-2015)

Year	Closed Forest (ha)	Open Forest (ha)	Total Forest land (ha)
1990	2,704,422.0	5,922,979.8	8,627,401.9
2000	2,317,165.7	6,591,441.3	8,908,607.0
2010	1,785,801.6	7,409,335.0	9,195,136.6
2015 (estimated)	1,556,146.4	7,780,853.6	9,337,000.0

Source: FPP Report (2014)

Ghana's primary forests which are the naturally regenerated forest of native species with no clearly visible indications of human activities and where the ecological processes are not significantly disturbed is estimated to be 395,000 ha (FPP, 2013). These forests have remained relatively intact in their natural state for years now without much interference and are wholly protected. Significant among the primary forests are Cape Three Points, Ebi Shelterbelt, and Dadieso Forest Reserves. Planted forests, mainly teak plantations have been increasing. Forest plantation development was initiated in 2000 by the Forestry Commission with an annual planting target of 20,000 ha. By 2015 the total planted forests in Ghana was 325,000 ha (Table 7b).

Table 7b: Trends in Forest Areas (000 ha)

Categories	1990	2000	2005	2010	2015
Primary forests	395	395	395	395	395
Naturally regenerated forests	8,182	8,454	8,498	8,540	8,617
Planted forests	50	60	160	260	325
TOTAL	8,627.	8,909	9,053	9,195	9,337

Source: FC, (2015).

2.2.1 Timber Production

To ensure sustainable management of the country's forest resources, the Forestry Commission has adapted an Annual Allowable Cut (AAC) 500,000 m³ from Forest Reserves harvested from an estimated area of 715,000 ha (RMSC, 2015). The AAC was derived based on the following:

- Using the results of the inventories and applied to 82 economic species,
- Making use of the interim yield formula, and
- Adoption of a 40 year felling cycle.

Since the suspension of the felling quotas for off reserve areas in 2006, no tangible AAC has been set for off reserve areas. Out of the 82 timber species inventoried in 2001, 64 of them form the commercial species exploited by timber companies have been grouped as follows;

- 18 Scarlet Star species comprising the main traditional commercial timbers now under threat of economic extinction because of high level exploitation in the past (200% of the sustainable level).
- 16 Red Star species significantly being over removed and will eventually become economically extinct, if the levels are not controlled.
- Finally, 30 Pink Star species, some of which are being exploited but not at an alarming rate, i.e. less than 50 per cent of the sustainable harvest. However in 2014, 99 different species were extracted.

In 2014 the total stems extracted were 141,273 equivalents to a total volume of 930,270.48 m³ involving 99 different species. Compared to 2013, it shows an increase of 3 species being African Blackwood, Annogeisus and Tiabutuo. About 66% of the total volume was extracted from forest reserves. Analysis of species exploited shows that Onyina and Wawa were the two species mostly exploited. The first 5 Species in 2014 maintained their position in the same order as in 2013. Sanya, which was not among the first ten in 201 find a place in 2014 top ten species list. The volume of Rosewood (Krayie) decreased by half compared to 2013 volume. Most of the volumes of rosewood harvested were from Brong Ahafo.

The size of timber production areas from the natural forests have been declining over the years as shown in Table 18. From an area of 1.64 million ha in 1990, the total timber production areas dwindled to 0.86 million ha by 2010 indicating an average annual decline of 29,030 ha. Significantly, the size of the social forests have also been declining by 1,500 ha annually over the last two decades.

Table 8: Production Forest Areas (1990-2010)

FOREST CLASS	AREA IN HA			
	1990	2000	2005	2010
Production forest	1,694,526	1,386 478	1,255,205	1,123,933
Production from natural forest	1,644 526	1,326 478	1,095,205	863,933
Production from Plantations	50,000	60,000	160,000	260,000
Protection of soil and water	352,500	352,500	352,500	352,500
Conservation of biodiversity	42,700	42,700	42,700	42,700
Social forests	89,009	72,828	65,932	59,037
Unknown or no designation	6,448,666.9	7,056,919.6	7,336,943.1	7,616,966.6
Total Forest area	8,627,401.9	8,911,425.6	9,053,280.1	9,195,136.6

Source: (RMSC, 2014).

2.2.2 Trends in harvesting of on-and off reserves timber resources

Over the years there has been cumulative excess extraction of timber from the on and off reserves. The Table 9 shows the trends in wood harvesting on and off reserves since 2004. The Annual Allowable Cut (AAC) of 0.5 million m³/annum records an overall draw down difference of 9.3 million m³ representing over 266 per cent over the allowable cut.

Table 9: Harvesting Trends in the Forest Reserves (up to 2014)

Mean Tree Volume (MTV) of Timber Extracted from On and Off Reserves						
Years	On Reserve			Off Reserve		
	Total Stem	Total Volume	Mean Tree Volume	Total Stem	Total Volume	Mean Tree Volume
2014	45,779	635,845.21	13.89	95,494	321,425.27	3.36
2013	50,465	687,178.44	13.62	98,710	325,378.58	3.30
2012	41,711	562,069	13.48	41,527	302,343.14	7.28
2011	40,370	499,879.30	12.38	28,909	316,541.38	10.95
2010	44,646	613,486.14	13.74	25,815	287,668.41	11.14
2009	37,567	487,726.49	12.98	17,651	273,226.52	15.48
2008	49,491	619,272.43	12.51	18414	278,888.69	15.15
2007	51,385	605,300.37	11.78	20,943	273,197.79	13.04
2006	51,371	610,044	11.88	21,443	248,816.63	11.6
2005	48,629	605,883	12.46	25,242	329,002.11	13.03
2004	43,004	535,138.76	12.44	27,7729	367,093.30	13.24

Source: RMSC, 2015

2.3 Plantation Development in Ghana

Historically, plantation development in Ghana started in the 1920 where the policy was to plant mainly indigenous species in the High Forest Zone (HFZ). The objectives at that time were introducing fuel wood near large population centers and to fuel boilers for electricity generation or for mining use. The exotic species planted included *Eucalyptus torelliana* and *Eucalyptus tereticornis*. In the Savannah Zone (SZ), however, a large number of exotic species were tried from 1951 to supply timber, poles, and fuel wood. Species that showed promise included *Azadirachta indica*, *Senna siamea*, *Cedrela mexicana*, *Dalbergia sissoo*, *Gmelina arborea*, and *Tectona grandis*. Records show that *Cedrela* was introduced from the Caribbean in 1898 (Truope, 1932) and teak from Burma (Lane, 1956). Records indicate that *Tectona grandis* trials in the country dates back to 1905 under the German administration in the Volta Region of the country (Kadambi, 1972).

The major forest plantation development programme was undertaken from 1963 to 1987 mostly in the “degraded” parts of the forest reserves due to easy access to land in these areas. They were undertaken mainly through the “Taungya” system and by 2002 an areas of 19,378.26 ha in the High Forest Zone was covered with plantation. Over 70 per cent of these plantations consist of *Tectona grandis* (Teak). Other species established include *Cedrela odorata* (*Cedrela*), *Terminalia spp.* (Ofram and Emire), *Gmelina arborea* (*Gmelina*), *Senna siamea* (*Cassia*), *Eucalyptus spp.*, *Heritiera utilis* (*Nyankom*), *Aucoumea klaineana* (*Aucoumea*), *Nauclea diderrichii* (*Kusia*), *Khaya ivorensis* (*Mahogany*), *Triplochiton scleroxylon* (*Wawa*) and *Mansonia altissima*

(Oprono). Forest plantations in Northern Ghana (Upper East, Upper West and Northern Regions) were estimated to cover 2,553 ha and were primarily established for fuel wood production and environmental protection. Tree species planted include Teak, Gmelina, Anogeissus and Eucalyptus.

Private sector plantation development prior to the year 2002, cover an estimated area of 44,198 ha and are made up of:

- 35,000 ha by individuals and tree grower associations (mainly teak);
- 4,000 ha of Gmelina arborea by Subri Industrial Plantations Limited (SIPL);
- 5,198 ha of teak by British-American Tobacco (3,096 ha), Ashanti Goldfield Company Ltd. (100 ha), Global Green (1,315 ha) and Dupaul Wood Treatment Ltd (667 ha).

2.4 National Forest Plantation Development Programme

In 2001 a new national plantation development programme (NFPDP) was launched to accelerate the rate of establishment of forest plantations. The key objectives of the programme was to restore the forest cover of degraded forest lands; generate employment as a means to reducing rural poverty; address the future wood deficit situation and enhance food production through the adoption of the taungya system. Field implementation however, commenced in 2002.

The outcome of the 2002 plantation development efforts has contributed to an estimated 190,449 ha of forest plantations established nationwide by both public and private sector, mainly within degraded forest reserves from 2002 to 2015 as summarized in Table 10.

Table 10: Plantation Development under NFPDP (2002-2015)

YEAR	PUBLIC SECTOR (ha)	PRIVATE SECTOR (ha)	TOTAL (ha)
2015	108.00	3,802.20	3,910.20
2014	487.56	7,795.51	8,283.07
2013	3,038.35	4,309.51	7,347.86
2012	5,949.64	3,549.89	9,499.53
2011	6,990.48	4,439.88	11,430.36
2010	14,115.66	4,612.84	18,728.50
2009	7,763.14	3,894.35	11,361.31
2008	5,007.67	5,986.65	10,994.32
2007	14,468.32	1,613.00	16,081.32
2006	14,407.50	1,609.00	16,016.50
2005	13,582.93	1,609.00	15,191.93
2004	21,599.84	1,609.00	23,208.84
2003	17,541	1,609.00	19,150.00
2002	17,341	1,609.00	18,950.00
TOTAL	144,887.29	45,562.63	190,449.92

Source: FC, (2016)

2.5 Biodiversity Conservation

Ghana is relatively well-endowed with natural resources, including fertile soils, forests, wildlife, and mineral deposits of gold, diamonds, manganese, and bauxite. Ghana has some 1,185 known species of amphibians, birds, mammals, and reptiles (World Conservation Monitoring Centre, 2010). Of these, 0.8 percent is endemic and 3.0 percent are threatened. Ghana is home to at least 3,725 species of vascular plants, of which 1.2 percent are endemic. 4.6 percent of Ghana is protected under IUCN categories I-V. It is known that 225 species of mammal occur in Ghana. However, the populations of large mammals have been much reduced outside the protected areas through hunting. Unfortunately, the forest zone is also under threats to support a disproportionately large fraction of the mammalian fauna.

Recent inventory recorded that 20 of the larger mammals in the forest zone are globally threatened and 5 rodent's species and 2 species of fruit bat have limited distribution. Bush meat continues to be in local demand at astronomical levels threatening the extinction of several species. Over 12,000 tonnes of bush meat per annum are traded per annum in the past decade and from 3,172 wild animals have been recorded to be supplied to “Chopbars” country-wide annually. Loss of habitats and incessant wildfires in specific ecological environment has led to the destruction of migratory routes and sustenance cover.

Apart from being rich in biological diversity with very high environmental value, Ghana's ecosystems support human livelihoods and the economic sector. Around 11 million of Ghana's population lives in forest areas, and around two-thirds of them are supported by forest-related activities (The World Bank, 2006).

Conservation of biodiversity in Ghana is guided by “modern approaches to conservation”, for both in situ (use of both traditional and scientific methods – sacred growth and protected areas), and ex situ (gene banks, zoological and botanical gardens). The major ex situ conservation facilities in Ghana are located at:

- University of Cape Coast (Botany Department herbarium),
- University of Ghana (Zoology Department Entomology Museum, Botany Department Herbarium and Botanical Gardens and Noguchi Memorial Institute of Medical Research),
- Kwame Nkrumah University of Science and Technology Botanical Gardens and Forestry Herbarium,
- Kumasi Zoo
- Aburi Botanical Gardens,
- Bunso Plant Genetics Research Centre and Arboretum, and
- Akropong Centre for Scientific Research into Plant Medicine Herbarium and Arboretum.

Within the in-situ conservation approaches Ghana has established legal protected areas, notably Forest Reserves, Wildlife Protected Areas, and RAMSAR sites. Currently, there are 280 Forest Reserves in Ghana under the management of the Forestry Commission, covering a total area of about 23,729 km², or 11 per cent of the total land area of Ghana. About 75 per cent of these reserves have been designated production reserves, which are exploited for timber, while the remaining 25 per cent are protection reserves, which are not currently under exploitation, probably because of inaccessibility (FC, 2014).

For in situ conservation, wildlife protected areas provide relatively better protection/conservation for biodiversity than any of the other protection forms. There are 21 legally-constituted wildlife protected areas, notably six national parks, six resource reserves, three wildlife sanctuaries, and one strict nature reserve. There are also three proposed wildlife conservation areas (one national park and one wildlife sanctuary), as well as six RAMSAR sites under the management of the Wildlife Division (Forestry Commission) (Table 11).

Recent innovations in biodiversity conservation have witnessed the establishment of Globally Significant Biodiversity Areas (GSBAs), Important Bird Areas (IBAs), and Community Resource Management Areas (CREMA). The Forestry Commission has designated 29 Forest Reserves as GSBAs, because of their importance as habitats for globally-significant biodiversity. The IBAs operate under the concept of birds as important bio-indicators, and were developed to conserve wildlife protected areas, some off-reserve areas, and forest reserves that harbor nationally or globally important birds and other biodiversity. The Ghana Wildlife Society (GWS), in collaboration with BirdLife International, have currently identified 36 IBAs-covering about 11,494 km² (about 4.8 per cent of the total land area of Ghana).

Table 11: Wildlife Protected Areas in Ghana

Type	Name	Area (km ²)	Year of reservation	Location / Region
National Park	Mole	4,577	1971	Northern
	Digya	3,478	1971	Volta
	Bui	1,821	1971	Northern / Brong Ahafo
	<i>Kyabobo</i>	360	2009	Volta
	Kakum	207	1990	Central
	Nini-Suhien	160.2	1976	Western
	Bia	78	1977	Western
Wildlife Sanctuary	Bomfobiri	53	1975	Ashanti
	Owabi	13	1971	Ashanti
	Buabeng-Fiema	4.4	1974	Brong-Ahafo
	Agumatsa	3	Proposed	Volta
Resource Reserve	Gbele	565	1975	Upper West
	Ankasa	343	1976	Western
	Kalakpa	320	1975	Volta
	Bia	228	1977	Western
	Assin-Attandaso	140	1990	Central
	Shai Hills	49	1971	Greater-Accra
Strict Nature Reserve	Kogyae	386	1971	Ashanti
RAMSAR Site	Keta Lagoon Complex	1,200		Volta
	Songor	330		Greater-Accra
	Muni-Pomadze	90		Central
	Densu Delta	70		Greater-Accra
	Sakumo	35		Greater-Accra
	Owabi	13		Ashanti
Total Area		14,173		

Source: WD-FC (2014)

The CREMA concept was initiated by the Wildlife Division under its Protected Areas Development Programme (PADP) to encourage communities bordering protected areas to manage and sustainably utilize wildlife resources within a defined area through a Community Participatory Approach (Wildlife Division, 2004). There are 27 CREMAs in Ghana with 19 of them certified.

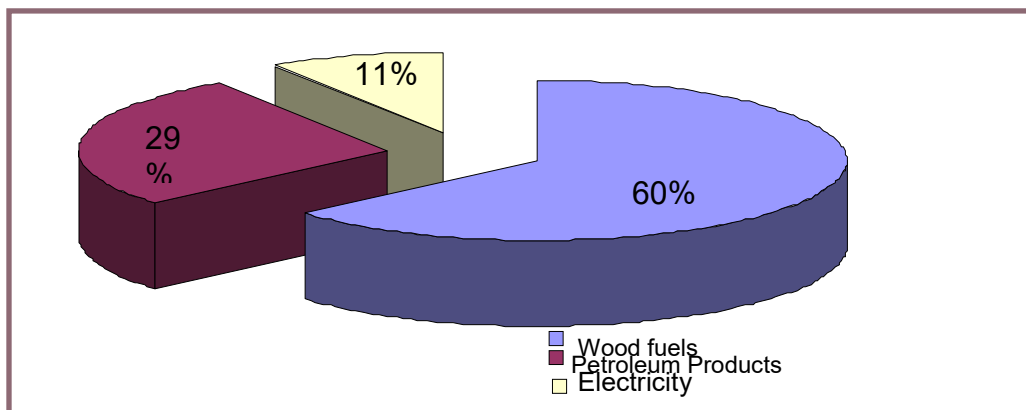
Unfortunately, in situ conservation has suffered from encroachment by local communities for farming, hunting, and settlement purposes, causing widespread deforestation. There are also administrative problems arising from low government budgetary allocations, inadequate staffing, and lack of infrastructure and basic field equipment. Ghana has lost major primate species since the Convention on Biological Diversity came into force. The Red Colobus Monkey has been extinct since 2003, because of destruction of its habitat. Habitat loss is the key factor in loss of biodiversity and hunting is responsible for the threat to specific wildlife species. The hunting tradition is still very strong and bush meat consumption has historically represented a significant source of protein for the rural Ghana. The most commonly hunted game species are the larger birds and medium-sized mammals such as forest antelopes (duikers) and diurnal monkeys.

2.6 Woodfuel Production

Ghana depends on woodfuels as its main source of energy consumption especially in the rural communities. Woodfuels are used for cooking and heating in households and in the commercial/service sectors and within the informal industrial sector like bread baking, palm oil processing, brewing of local drinks, tobacco curing, tie and dye production, fish smoking and soap making amongst others.

The current total annual woodfuel consumption has been estimated to be between 14-16 million tonnes coming from between 25-28 million cubic metres of wood (Strategic Energy Plan, 2009). About 50 per cent of the woodfuel supply is for the production of charcoal with the other part being used directly as firewood. The final energy consumption of woodfuels (charcoal, firewood and crop residues) constitutes 60 per cent of the national energy consumption.

Figure 3: Final Energy Consumption in Ghana (2010)



Source: Energy Commission (Strategic Energy Plan, 2009)

The supply of woodfuels has come mainly from the natural forests; indeed more than 90 per cent of woodfuel consumed in Ghana has been estimated to be supplied from farmlands and natural forests within the transitional and savannah zones. The remaining 10 per cent is obtained from

other sources including logging residues, sawmills and plantations or woodlots. Current aggregate consumption of woodfuel in the country is beyond sustainable harvesting levels of the natural woodlands. In the Northern region, consumption of woodfuels is approximately 2 per cent above the overall sustainable harvesting levels. In the Upper East and Upper West regions the consumption is respectively 60 per cent and 30 per cent over sustainable harvesting levels. In the Upper East Region there are relative wood fuel scarcities of woodfuels.

Production of commercial firewood and charcoal is an integral part of the survival strategy of most rural households, especially the poor. More than 80 per cent of all the charcoal and commercial firewood producers are women (SRMC, 2003).

2.7 The Timber Industry

There are 84 sawmills and 12 companies with plywood capacity in the formal sector, directly employing about 120,000 people (FC, 2013). The timber industry has experienced over-capacity and low production yields irrespective of the applications of efficient processing methods and the use of appropriate machinery suited to the sizes of materials available. In addition, the timber industry is experiencing dwindling raw material base, low value-added processing of timber, low morale of forestry staff and low performance. The processing mills on the whole are constrained by limited supply of timber and range of species from the natural forest.

2.7.1 Export of Wood Products

The volumes of wood products exported and revenue from the export of wood products over the period 2000 to 2016 is presented in Table 12. The volumes of export have declined from 498,843.32 m³ in 2000 to 267,379.45 m³ in 2015 while revenue declined from €210,292,773.64 to 135,024,200.64 over the same period. However there has been an increase value per cubic meter from €421 to €504.99 in 2000 and 2015 respectively. In between this period the value has fluctuated reaching its lowest value of €300.84 in 2009. Export volumes of wood products have declined consistently since 2008 reflecting the depletion of forest resources.

The total export of Ghana's wood products in 2015 was 267,379.45 m³ in volume valued at €135,024,200.64. There were ninety-nine (99) exporters who were involved in the export of fourteen (14) different wood products in thirty-four (34) species to thirty-three (33) different countries. The trends in the export of timber products since 2000 are summarized in Table 12.

Table 12: Export of Timber Products (2000-2015)

YEAR	PRIMARY		SECONDARY		TERTIARY		TOTAL	
	volume(m ³)	value(€)	volume(m ³)	value(€)	volume(m ³)	value(€)	volume(m ³)	value(€)
2015	44,405.97	12,485,373.11	212,790.26	118,386,101.76	10,183.23	4,152,725.77	267,379.45	135,024,200.64
2014	59,346.96	9,535,582.68	285,086.08	122,457,140.82	11,602.97	6,404,894.38	356,036.01	138,215,617.88
2013	9,096.71	2,359,501	248,956.82	109,166,139.90	13,718.66	7,802,138.81	271,772.19	119,327,780.00
2012	10,863.52	2,614,079.40	227,875.94	90,078,723.20	12,506.15	7,143,591.19	251,245.61	99,836,393.79
2011	27,524.89	4,844,100.39	274,884.26	93,226,150.04	17,433.76	9,361,744.22	319,842.91	107,431,994.65
2010	35,430.39	6,779,912.84	348,250.53	120,844,644.95	19,573.16	10,223,279.70	403,254.08	137,847,837.49
2009	64,271.58	12,613,305.50	346,145.23	107,487,800	15,805.10	8,125,878.10	426,221.91	128,226,983.89
2008	111,699.07	20,576,874.49	405,497.51	151,858,921.92	28,718.50	14,175,650.79	545,915.08	186,611,447.20
2007	85,344.11	16,685,819.50	409,386.38	151,229,766.79	33,839.63	16,258,435.77	528,570.13	184,174,022.06
2006	23,655.46	4,794,985.75	392,207.75	147,268,131.68	35,744.80	18,034,784.84	451,608.02	170,097,902.27
2005	333.21	69,798.59	422,203.25	160,569,603.00	43,618.81	23,371,921.86	466,155.27	184,011,323.45
2004	0	0	403,505.13	143,048,790.52	51,675.24	27,438,573.61	455,180.37	170,487,364.13
2003	0	0	397,451.11	140,040,587.50	46,937.51	22,952,195.23	444,388.62	162,992,782.73
2002	0	0	409,900.64	152,168,169.54	62,525.92	31,197,666.75	472,426.56	183,365,835.70
2001	0	0	435,536.24	165,228,559.63	40,964.24	24,055,597.16	476,500.48	189,284,156.79
2000	1,023.83	873,958.58	468,857.82	188,230,636.72	28,952.67	21,188,178.34	498,843.32	210,292,773.64

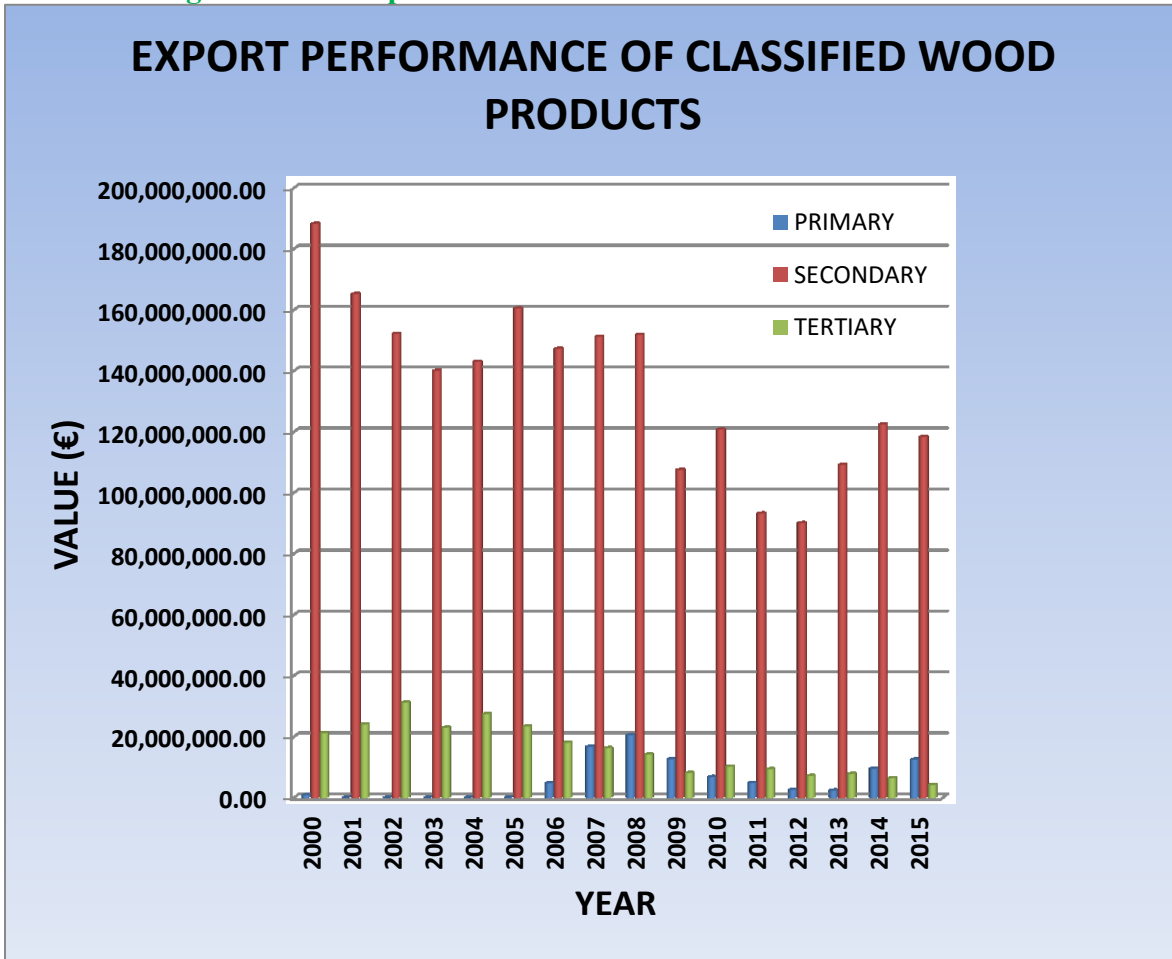
Source: TIDD (2015)

Timber and wood products exported from Ghana are in three forms namely:

- **Primary:** Poles, Billets, logs;
- **Secondary:** lumber (air dried, kiln), boules (air dried, kiln), veneers, blockboards, plywood, kindling; and
- **Tertiary:** dowels, flooring, processed timber/moulding, profile boards, and furniture parts.

The trends in the export of wood and wood products since 2000 is depicted in figure 4.

Figure 4: Export Performance of Classified Wood Products



3.0 EMERGING ISSUES IN THE FORESTRY SECTOR

The rapid transformation of the national economy coupled with the effects of the climate change has implications on the future of the forestry sector. Considering the amount of available forest resources, and the carbon sequestration potential, there is the need to analyse the main issues in order to formulate transformational actions for the future of the forestry sector.

3.1 Effects of Climate Change and Variability on the Forestry Sector

Ghana is highly exposed to climate change and variability due to its location in the tropics. Ghana's Second National Communication to the UNFCCC assessed the predicted climate change for the six eco-climatic zones, namely: rain forest; coastal savannah; deciduous forest; transitional zone; Guinea savannah and Sudan savannah. Following the 30-year mean of observed temperatures, the predicted scenarios developed over 2020, 2050 and 2080 time horizons, temperatures are generally expected to change by 0.6° C, 2.0° C and 3.9° C in 2020, 2050 and 2080 respectively (Table 13). The hottest months in the year are still likely to be between February and May whereas between June and September temperature will be relatively low.

Table 13: Scenarios of Mean Annual Change in Rainfall (%) for the Ecological Zones

Year	Sudan	Guinea	Transitional	Deciduous Rainforest	Rainforest	Coastal Savannah
2020	0.8	0.8	0.8	0.8	0.8	0.8
2050	2.6	2.5	2.5	2.5	2.5	2.5
2080	5.8	5.4	5.4	5.4	5.4	5.4

Source: MESTI, (2012)

Using the observed rainfall records between 1961 and 2000, the scenarios for changes in rainfall for the six ecological zones for 2020, 2050 and 2080 predicts that annual mean rainfall levels are likely to reduce between 1.1 per cent and 3.1 per cent across all the agro-ecological zones by 2020 (Table 14). The highest reduction is expected in the rainforest and the coastal savannah zones. The changes in annual mean rainfall by 2080 is expected to be between 13 per cent and 21 per cent of the observed baseline values. The rainforest zone is still likely to be the wettest areas in Ghana whereas Coastal and Sudan Savannahs continue to experience the least rainfall.

Table 14: Scenarios of Mean Annual Change in Rainfall (%) for the Ecological Zones

Year	Sudan	Guinea	Transitional	Deciduous Rainforest	Rainforest	Coastal Savannah
2020	-1.1	-1.9	-2.2	-2.8	-3.1	-3.1
2050	-6.7	-7.8	-8.8	-10.9	-12.1	-12.3
2080	-12.8	-12.6	-14.6	-18.6	-20.2	-20.5

Source: MESTI (2012)

3.1.1 Climate Impacts on Forest Dependent Livelihoods and Food Security

In most forest dependent communities, the life of ‘the poor’ is a life of vulnerability, which reflects the deeper problem of insecurity (MESTI, 2014). The poor depend heavily on environmental goods and services and their livelihoods are punctuated by dependence on agriculture, fisheries and forestry (which revolve on the use of land and water resources), and on the capacity of ecosystems to provide the services vital for environmental balance, without which food production and other productive activities cannot be carried out on a sustainable basis. This trend puts the poor at risk in both rural and urban forest Ghana. The poor are indeed highly vulnerable to environmental disasters and environment-related conflicts and it is believed that the depth of vulnerability is correlated with the pace of environmental degradation exacerbating climate change impacts. Droughts, forest fires, and floods impact the poor in rural and urban areas more and show an increasing trend. Evidence of some extreme climate events that the country has experienced over the years includes:

- Floods
- Drought
- Bush fires
- Erratic rainfall patterns
- Sea level rise along the eastern coast
- Increased desertification/land degradation
- Consistent loss of forest cover
- Loss of some biodiversity
- Severe soil erosion and siltation of water bodies

Under a changing climate, poor farmers are finding it difficult to predict the timing of rainy seasons. Consequently, it is becoming difficult to manage climate risks to crop production. Failure in crop production is one of the key factors undermining food security. The World Food Programme’s (WFP) Comprehensive Food Security and Vulnerability Analysis (2009) found that 5 per cent of the population or 1.2 million people are food insecure. The bulk of the food insecure populations are rural is located in the northern regions: 34 per cent in Upper West, 15 per cent in Upper East, and 10 per cent in Northern region. This is the equivalent of approximately 453,000 people.

3.1.2 Climate Change-Induced Forestry Challenges

There is a high agreement by all national and regional scale analyses of vulnerability by various sources including government commissioned reports and independent scholastic research that vulnerability especially to drought effects has geographical patterns and socioeconomic associations, with the three northern regions (Northern, Upper West, and Upper East regions) being the most vulnerable. Similarly, the adaptive capacity of these three northern regions is the lowest nationwide due to low socioeconomic development and heavy dependence of local economies and livelihoods on rain-fed systems such as agriculture and forestry.

Decreasing annual rainfall and increasingly erratic rainfall patterns, due to climate change, will adversely affect rural livelihoods in northern Ghana especially agricultural and pastoral practices. Such decreases in annual rainfall with erratic patterns are also expressed as drought and flooding posing enormous challenges to local communities to deal with such extreme events. Against this

backdrop, it is predicted that the livelihoods of communities in the northern Ghana will increasingly be vulnerable to water-related impacts of climate change. There will be decreasing of annual rainfall, increasingly erratic rainfall patterns, and increased frequency of high intensity rainfall events. The climate change-induced, decreases in the availability and increasing unpredictability of water resources, and the associated negative impacts of these trends on the livelihoods of rural communities will result in the massive extraction of savannah woodland for charcoal production. This will further exacerbated the deforestation of the savannah woodland resources.

Non-sustainable forest management under high rate of deforestation is amplifying climate change impacts in Ghana manifested in scarcity of freshwater, deforestation, loss of soil fertility, loss of agricultural productivity, loss of fuel wood, loss of safety nets in Non-Timber Forest Products(NTFPs), and increased sensitivity to human and natural hazards.

3.2 Forestry Sector Challenges

Analysis of the forestry sector reveals the following challenges:

- a. Production and consumption of timber and woodfuels off reserves are beyond sustainable levels. The timber Annual Allowable Cut (AAC) is being exceeded in the off-reserved forest areas. In the savannah ecosystem, the Mean Annual Increment (MAI) is less than the harvesting of woodfuels.
- b. The management of savannah woodland resources is weak. Access to commercial utilization of woodland resources is perceived as public goods, which are free of charge and of unrestricted use. Both primary and secondary users have not adopted sustainable management practices.
- c. There is poor accountability in the exploitation of resources off-reserves and lack of cost-effectiveness in the uses of resources especially in the savannah regions. More than twice the AAC harvested are not accounted for in the national accounts leading to considerable loss of revenue to the stool lands, farmers' District Assemblies and the state.
- d. Although the civil society groups are being incorporated in the sustainable natural resource management, yet their capacities are weak to carry out the responsibilities. Genuine stakeholder involvement in management and sharing of responsibilities require that the capacities of these groups should be developed up to a level where it can be self-sustaining.
- e. The Land Use, Land Use Change, and Forestry (LULUCF) sector in Ghana has rapidly changed from sink to a considerable source (25 per cent) of total GHG emissions (EPA, 2012). There has been a rapid transition from traditional shaded cocoa cultivation (under primary or secondary forests) to progressively open cocoa cultivation, driven mainly by higher short-term profit, increasing competition for land combined with other factors. Currently shaded cocoa farming only accounts for less than 30 per cent in Ghana (21 per cent in the Western Region and 47 per cent in Brong Ahafo Region); while the rest is primarily open cocoa farming with little or no shade trees. From a carbon management perspective, the shaded cultivation represents carbon stock almost equal to off-reserve forest areas or degraded forest reserves, while transition to open cultivation represents a loss of about 50 per cent of the carbon stocks.

- f.** The existing tree tenure regime and rights to benefit from naturally growing, especially commercial trees on farms have exacerbated the loss of trees on farms and forests in the agricultural landscape. The current benefit sharing regime on trees, enshrined in the Ghanaian Constitution, posits benefit sharing arrangements under which stakeholders like tenant farmers and tenants feel that they are not getting a fair share of the benefits accruing from trees harvest. This is a major disincentive in the off-reserve areas and also influences the perceptions and attitudes towards trees and forests within the reserves.
- g.** Despite efforts to improve on governance and contain illegal logging, as well as the pilot role and commitments to the VPA/FLEGT process, there appears not to have been significant reductions in illegal logging in recent years. The most pronounced feature of the situation with illegal logging is the supply of timber from the chain saw milling sector.
- h.** Biodiversity loss is very high with more than 10 species projected to becoming extinct in less than a decade. Most of the indigenous species like, *Milicia excels* and *Milicia regia*, the mahoganies (*Khaya* and *Entandrophragma* species), *Pericopsiselata*, *Naucleadiderrichii*, and *Triplochiton scleroxylon* which mainly generate substantial revenues for Ghana’s economy, have drastically reduced. The timber stocks in the off-reserve areas are disappearing at faster rates, leaving the forest reserves areas as “*vulnerable small isolated islands*” with limited populations of trees and animals and no possibilities for genetic exchange.
- i.** The development of viable and efficient forest-based industries to fully utilise timber and other non-forest products to satisfy domestic and international demand has not been as expected. Value-adding in the sector is inefficient and skewed towards sawmilling with an expanding inefficient and illegal chainsaw milling sub-sector. Average conversion rates for sawmilling are between 25-35 per cent with chainsaw milling at the lesser end. Estimates indicate that the primary processing industry is virtually value-subtracting if sawn-timber were graded and priced at world market prices.
- j.** The true value and contributions of non-timber forest products (NTFPs) to national development has not been captured and the resources are not being sustainably managed and planned to derive the perpetual flow of optimum benefits to all segments of society. There is little processing for high-value processing export markets for NTFPs enterprises like rattan furniture, mouldings, and honey. The small and medium enterprises for the NTFP are less promoted and supported.
- k.** There are leakages in the stumpage fees collection and timber laundering occurs, thus making it necessary to impose post-harvest levies.
- l.** The Forestry Commission operates at a high cost in regulating off reserve timber production compared to the stumpage collected. In terms of management cost it is not worth continuing to manage off reserve forests.

3.3 Forestry Sector Strengths, Weaknesses, Opportunities and Threats

In order to understand the current state of the forestry sector, a participatory SWOT (strengths, weaknesses, opportunities, and threats) analysis was performed. The SWOT analysis represents a systematic thinking and comprehensive diagnosis of the factors relating to future forest products, services, technology, management, and planning of forest resources. This includes both, internal factors (strength and weakness) and external factors (opportunities and threats). The SWOT analysis therefore serves as an instrument of strategic planning which scans internal strengths and weaknesses of the forestry sector organizations and illuminates the opportunities and threats of the environment. It is a good strategy that maximizes internal strengths and opportunities and minimizes external threats and weaknesses and forms a good basis for strategy formulation.

From the perspectives of the major stakeholders, the internal strengths and weaknesses as well as the external influences, which are the opportunities or threats, were analyzed in order to derive promising future strategies. Upon the findings of these analyses a creative method was applied to formulate the SWOT strategies. The summary of the SWOT analysis is shown in Table 15.

Table 15: Summary of Forestry Sector SWOT Analysis

INTERNAL STRENGTH	INTERNAL WEAKNESS
<ul style="list-style-type: none"> • Improvements in the policy and regulatory environment for high forest management and timber industry development; • Enhanced local community involvement in sustainable management of the high forest and savanna woodland zones; • Improved management of wildlife resources while increasing their contribution to local livelihoods and economic development; • Implementation of the National Forest Protection Strategy to enhance conservation of globally significant biodiversity in priority reserves • Introduction of transparent and efficient allocation of timber resources and control of over-cutting of timber; • Formulation of the basis for the appropriate pricing of timber and other forest-based products; • Rationalization of the timber industry and the adoption of appropriate fiscal and taxation measures; • Facilitation of equitable distribution of benefits to forest-owning communities; • Introduction of “Modified Taungya System” which guarantees greater security of tenure for farmers and yield incremental benefits to each beneficiary farmer, a hectare per annum; • Prompt settlement in terms of payment of rent and stumpage liabilities or indebtedness to 	<ul style="list-style-type: none"> • Weak capacity in the forestry commission in financial mobilization and management; • Ineffective decentralization of functions, and inadequate forestry staffs and resources at district level to properly manage forest and savannah resources; • Inability to put the savannah resources under sustainable management; • Irregular environmental auditing; • Weak enforcement of legislation and regulations; • Ineffectiveness in the enforcement and curtailment of illegal operations; • Limited or no incentives for stakeholders to protect forests and wildlife from illegal operations; • Absence of law no benefit-sharing framework for plantation development; • Forest certification has not been adopted fully and Ghana has missed certified markets that has emerged in many parts of the world; • Access to credit is limited for investments in the forestry sector.

<p>the stool landowners and District Assemblies;</p> <ul style="list-style-type: none"> • FC is demonstrating readiness to support verification of legal origin and legal compliance under the Legal Assurance System of the VPA. 	
<p style="text-align: center;">EXTERNAL OPPORTUNITIES</p>	<p style="text-align: center;">EXTERNAL THREATS</p>
<ul style="list-style-type: none"> • Initiatives such as the Legal Assurance Scheme (LAS), the wood tracking system (WTS) and independent monitoring of the licensing scheme are being supported by industry and government; • There is a growing demand for certified timber products across the European Union, who are the major consumers of timber products from Ghana; • There has been an advocacy for a shift from the traditional preservation approach in protected area management to the more flexible concept of conservation through sustainable use involving collaborative resource management together with local communities and District Assemblies. • The Government of Ghana recognizes the social and economic impacts, and the development challenge arising from climate change and is committed to mainstreaming climate change into key planning processes on the national, regional, and local level; • There is increasing global interest in forests as carbon sink. Ghana has initiated a number of REDD+ initiatives and carbon projects including seven REDD+ pilot schemes being coordinated by the REDD+ secretariat of the National REDD+ Technical Working Group. • Ghana has a relatively good chance in assessing carbon market financing. 	<ul style="list-style-type: none"> • Climate change and variability will adversely affect the performance of the forestry sector • Supporting the civil society groups has become one of the main activities of the forestry sector institutions but they have weak capacities • The timber industry wants cheap wood supplier and sees small-scale illegal operators as the suppliers. • The timber industry is a step behind technology as the second processing is dominated by outmoded process equipment. • Poverty coupled with increasing population was identified as one of the main underlying causes of environmental degradation in the savannah region; • Woodfuel production relies on rudimentary technology with low efficiencies; • Donor funding support to the forestry sector has been dwindling over the years. • Reduced enthusiasm of the population for tree planting and forest management due to various reasons. • Introduction of exotic species in plantation development in the natural forests. • Local financial institutions offer little support for private sector projects that aim to reduce deforestation and forest degradation, as well as to promote sustainable forest management

3.3.1 SWOT Strategies

Based on the strengths and opportunities, the weakness and threats, four different strategy types were envisaged as follows:

- Matching internal strength/opportunity-strategies to internal strength(s) that can be used to realize external opportunity(ies) (ideal case),
- Analyzing the internal weakness/opportunity strategies to reduce internal weakness (es) or develop missing strength(s) to realize external opportunities,
- Analyzing internal strength(s) that can be used to minimize external threats; and
- Matching internal weakness/Threats strategies aimed at reducing the internal weakness (es) to avoid external threats (only defensive strategy, worst case scenario).

For each evolved strategy considered, SWOT combination(s) are listed in order to create a rational comprehensible result. The aim of the strategy formulation is to produce possible and attractive strategies. The results of mapping out strategies are summarized in Table 16.

Table 16: Mapping out SWOT Strategies

Factors	Internal Strength	Internal Weakness
External Threats	<ol style="list-style-type: none"> 1. Promote sustainable management and utilization of forests, wildlife, wetlands resources in both high forest and savannah ecosystem. 2. Support innovations, capacity development, research and technology development for sustainable forest and wildlife management. 	<ol style="list-style-type: none"> 3. Develop viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources. 4. Undertake institutional and legislative reforms for good and transparent governance, equity sharing, and civil society participation in forest and wildlife resource management.
External Opportunities	<ol style="list-style-type: none"> 5. Rehabilitate and restore degraded landscapes through plantations development, community forestry, and natural regeneration. 	<ol style="list-style-type: none"> 6. Develop sustainable and predictable financing instruments to support forestry sector activities.

The SWOT strategies have provided a summarized overview of the forestry sector and linkages to the ongoing interventions in the forestry sector. The strategies are related to the forest and wildlife policy of 2012 (Figure 5). It has made it possible to identify the important problem areas and provided a solid basis for strategic thinking.

3.3.2 Linkages between the Forestry Development Master Plan Strategies, the Sustainable Development Goals

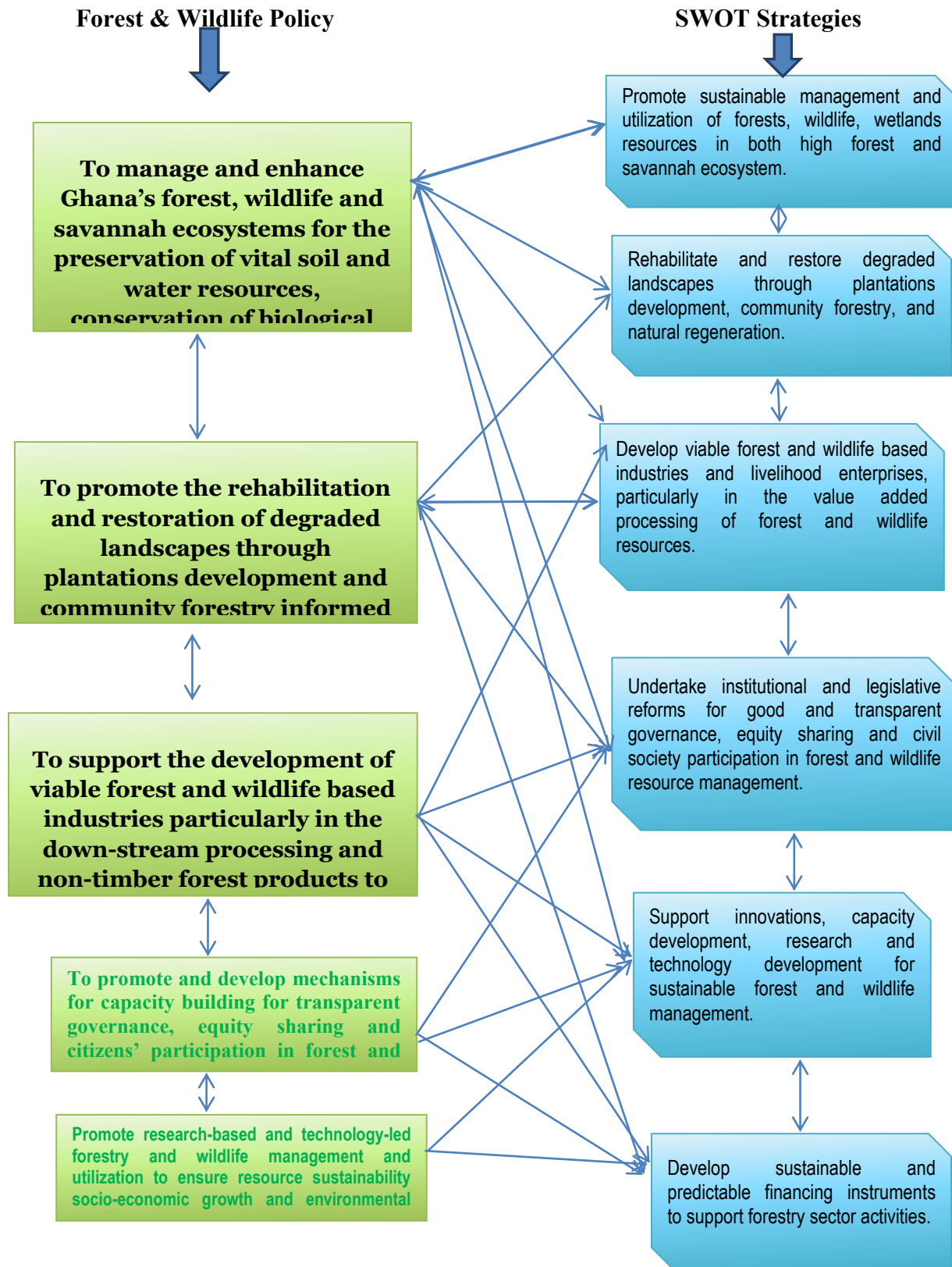
The implementation of the Forestry Development master plan by 2036 will contribute to the attainment of the SDGs in the following ways

- It will contribute to the attainment of SDG15 by ensuring the protection, restoration, and sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

- By 2020 the plan will ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreements.
- By 2030 it will promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally.
- By 2030, it will combat desertification, restore degraded land and soil, including land affected by desertification, drought, and floods, and strive to achieve a land degradation-neutral world.
- By 2030 it will ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.
- It will take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and by 2020 protect and prevent the extinction of threatened species.
- It will promote fair and equitable sharing of benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed.
- It will take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products.
- By 2020 the plan will introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.
- By 2025 it will integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies, and accounts.
- It will mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.
- It will mobilize significant resources from all sources and at all levels to finance SFM and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.
- It will enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities.

Thematic linkages to the forest and wildlife policy are shown in figure 5. The thematic areas identified are highly related to the 2012 forest and wildlife policy objectives. This provides the basis for developing the vision, scope and programmes for the master plan.

Figure 5: Relationship between SWOT Strategies and 2012 Forest and Wildlife Policy Objectives



PART II: STRATEGIC FOCUS AND PROGRAMMING

4.0 STRATEGIC FOCUS OF THE FORESTRY SECTOR

As Ghana progresses steadily towards a middle income economy, the ecosystems are also increasingly approaching their carrying capacity limits. The increasing pressure on the forest resources will worsen in the coming decades as the result of rapid urbanization, population increase accompanied by rapidly increasing middle class citizens and high rate of urbanization. There will be increasing demands for food, energy, human habitat, and transportation and these have implications on the forestry sector.

The irony is that, past policies and initiatives in the forestry sector have not resulted in the desired impacts. The forestry sector is experiencing deforestation and degradation in the forest resource base, Illegal chainsaw and mining (*galamsey*) operations in forest areas, illicit and uncontrolled exploitation of wildlife, unsustainable production of woodfuel especially in the fragile ecological areas of the savanna regions, wildfires and limited participation of the stakeholders in the resource management. The timber industry operates with obsolete equipment with installed capacities that exceeds the Annual Allowable Cut (AAC).

The growing negative effects of climate change on the natural resources coupled with increasing rural poverty require a new ecosystem based strategy with improved governance in natural resource management. The 2012 Forest and Wildlife Policy as well as the 2013 National Climate Change policy demand a new approach and focus towards forestry sector development in Ghana. There is the need to place emphasis on non-consumptive values of the forest in order to ameliorate the environment, create wealth, and ensure a balance between timber production and marketing to satisfy domestic wood demand. This requires a long term planning to deal with the intractable weakness within the forestry sector. A long term plan will ensure sustainable natural resource management for the present and future generation.

4.1 Vision, Goal and Objectives of the Forestry Development Master Plan

4.1.1 Vision

The vision of the forestry development master plan is to achieve a just, prosperous, and sustainable forestry sector that inclusively and continuously optimizes welfare and provide adequate means of livelihood to all Ghanaians.

4.1.2 Goal

In tandem with the 2012 Forest and Wildlife Policy, the goal of the forestry development master plan is to ensure the conservation and sustainable development of forest and wildlife resources to create a balance between forest products services and marketing to satisfy domestic and

international demands whilst ensuring good governance and transparent forestry enterprises development, biodiversity conservation and ecotourism development.

4.1.3 Objectives

In pursuance of this goal, the objectives of the FDMP are:

- a. To manage and enhance the ecological integrity of Ghana's forest, savannah, wetland and other ecosystems for the preservation of vital soil and water resources, conservation of biological diversity, carbon stock enhancement within a resilient environment for the sustainable production of domestic and commercial produce.
- b. To promote the rehabilitation and restoration of degraded landscapes through forest plantation development, enrichment planting, and community forestry informed by appropriate land use practices to enhance environmental quality and sustain the supply of raw materials for domestic and industrial consumption and for environmental protection.
- c. To promote the development of viable forest and wildlife based industries and livelihoods particularly in the value added processing of forest and wildlife resources to satisfy domestic and international demand for competitively-priced quality products.
- d. To promote and develop mechanisms for transparent governance, equity and stakeholders participation in the forest, wildlife, wetlands and savannah resource management.
- e. To promote training, research-based and technology-led development that supports sustainable forest and wildlife management whilst promoting information uptake both by forestry institutions and the general public;
- f. To promote and develop financing mechanisms for natural forest and wildlife management, timber plantation development, plant and machinery, development of tertiary processing activities, woodfuel processing, and micro/small forest based enterprises.

4.2 Strategies for Forestry Sector Development

The vision, goal and objectives of the Forestry Development Master Plan (FDMP) reflects on the national development agenda, the National Climate Change Action Plan, Sustainable Development Goals of the United Nations, and the on-going national 40-year development plan. It also seeks to contribute to reducing Green House Gas (GHG) emissions from deforestation and forest degradations, climate and temperature regulation, reduce poverty and help conserve biodiversity.

The FDMP has taken into full account the need to improve the state of the environment, whilst addressing the complexities of land and tree tenure and the importance of appropriate and efficient land use. The plan is about the place of law, government, organizations, companies, and individuals in forestry, and how all of these would interact for national interest and conservation of forest and wildlife resources. It is about measures to bring harmony in the relationships among the different elements that lay claim to our land and scarce water resources, and to bring equity into their allocation. It is about the conservation of flora and fauna and the natural environment. It is about people, their beliefs and the forest environment, their working conditions and their livelihood. It also recognizes the international guidelines and conventions to which Ghana has rectified. The FDMP also recognizes the urgent need to address problems of unemployment and poverty and provide support to gender empowerment in national development.

4.2.1 Forestry Development Master Plan Priority and Thematic Focus

The Forestry Development Master Plan (FDMP) is a continuum of the ongoing forestry sector initiatives and seeks to implement the goal, objectives, and strategies of the 2012 forest and wildlife policy. The focus of the plan is to accomplish the unfinished programmes under the 1996 Forestry Development Master Plan, consolidate the gains made under the on-going interventions, address the current development gaps in the forestry sector, and respond to national obligations dictated by international conventions and treaties impinging on the forestry sector. In pursuance of this three (3) integrated strategic programming approach is envisioned under the plan as follows:

- a. A continuation short term programme that seeks to complete the on-going sector activities to address the current gaps in the forestry sector within the resilience of the national economy.
- b. A structural transformation medium to long-term programme of the forestry sector that will build an effective and efficient institution for sector development.
- c. A consolidated long term programme that will optimize the welfare citizenry by ensuring equity, safe, transparent, and sustainable management of forest and wildlife resources for national development.

4.2.1.1 A Continuation Programming Approach

The continuation programme is a defensive strategy that seeks to complete the on-going sector initiative to maximize the sector support projects to avoid the worst case scenario. The programme will seek to complete the relevant activities remaining under the 1996 Forestry Development Master plan and continue with the implementation of the current programmes and reforms and to consolidate the gains. Under this strategy, Ghana will continue to implement the Plantation Development Strategy, Wood Tracking System (WTS) under the Voluntary Partnership Agreement (VPA) Programme; move into full scale to implement the Reduced Emissions from Deforestation and Forest Degradation (REDD+) strategy; continue with the implementation of the on-going Forest Investment programme, and support the implementation of the Forestry industry development blueprint. An improved governance programme will be put in place to implement collaborative resource management, contain illegal logging, and support higher private sector participation in the sector development programmes.

The continuation programme will ensure the full implementation of the on-going projects within time and budget, maximizing the available resources to achieve the desired quality of the project products. The implementation of the programme will be within the current approved budget with modest increase in funding for the planned programmes. The funding will be within the constraints of the national budget supported by the current international donor funding. The forestry sector will continue to rely on external funding to complement Government of Ghana budgetary allocations. The Forestry Commission will remain under the civil service structure.

4.2.1.2 A Structural Transformation Programming

A ten-year transformational programme will be initiated to develop the forestry sector after the successful implementation of the short-term continuation (muddling-through) strategies. This will be done within the context of the new Forest and Wildlife Policy, Ghana Shared Growth and Development Agenda, the Climate Change Action Plan, the proposed 40-year blue print for national development, and Ghana's obligations under various multilateral environmental conventions and international treaties including the United Nations Non-legally Binding Instruments on all types of forest (NLBI) and the United Nation's Sustainable Development Goals (SDGs). The transformational process is based on the axiom that the current challenges in the forestry sector far outstrip the available resource and that massive investment would be required to transform the forestry sector.

The strategic focus will be on enhancing the natural forests in the high forest, transitional and savannah ecosystems; developing agro-forest landscapes within the cocoa growing areas; developing the savannah woodlands, wetlands, and the wildlife ecosystems to maximize the rate of social and economic development of the country. The interrelationships among the thematic components provide great opportunities to optimize welfare and provide adequate livelihoods to the majority of Ghanaians, especially those within the marginal ecosystems.

4.2.1.3 A Consolidated Programming for Efficient Self-financing Sustainable Forestry Sector

The consolidated programme will aggregate all the gains made under the two phases in order to ensure an efficient self-financing forestry sector. The plan will enforce sustainable forest management principles and continue the conservation and sustainable development of forest and wildlife resources for maintenance of environmental stability and continuous flow of optimum

benefits from the social and economic goods and services that the forests provide to the present and future generations. During the consolidation phase, the Forestry Commission will operate as an autonomous institution undertaking core activities within the forestry sector. Other ancillary activities will be implemented by the decentralized agencies which will operate under the local governance system.

Within these three programming directions, the thematic areas that will form the basis of implementing the FDMP are:

- Sustainable management and utilization of forests, wildlife, wetlands, and savannah ecosystems.
- Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, woodlot development, and natural regeneration.
- Reducing GHG emissions from deforestation and forest degradation through climate smart agriculture and agro-ecological farming within the forest areas, while reducing poverty and conserving biodiversity.
- Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources.
- Institutional and legislative reforms for transparent governance, equity sharing and stakeholder participation in forest and wildlife resource management.
- Promoting innovations, capacity development, research and technology development that supports sustainable timber, woodfuel, and wildlife management.
- Stimulating political and institutional support for the implementation of the forest and wildlife policies and programmes at all levels of governance
- Development of sustainable and predictable financing instruments to support forestry sector activities.

4.3 The Key Intervention Strategies

The key intervention strategies to be pursued under the FDMP to realize the objectives and focus are summarized in Table 17.

Table 17: Strategies to Achieve the Development Focus of the FDMP

Master plan development objectives and focus	Strategic direction	Planning horizon
Development Objective 1 To manage and enhance the ecological integrity of Ghana’s forest, savannah, wetland and other ecosystems for the preservation of vital soil and water resources, conservation of biological diversity, carbon stock enhancement within a resilient environment for the sustainable production of	1. Manage Forest Reserves in line with national policies and legislation as well as international treaties that Ghana has ratified.	Short to medium term intervention.
	2. Develop off-reserve forest production areas with well-defined and legally established compatible sustainable forest management principles.	Short to medium term intervention
	3. Ensure the reduction of mineral prospecting and mining in Forest Reserves.	Short to medium term

<p>domestic and commercial produce.</p> <p><i>Development focus 1.1</i></p> <ul style="list-style-type: none"> <i>Sustainable management and utilization of forests, wildlife, wetlands, and savannah ecosystems.</i> 		intervention.
	4. Support natural regeneration in and off-reserve areas and establishments of Community Resource Management Areas (CREMAs) in off-reserve forest and savannah areas.	Short to medium term intervention.
	5. Support the establishment of community-based wildfire management activities within the high forest, transitional and savannah ecosystems.	Short to medium term intervention.
	6. Establish network of National Parks, and other protected areas to adequately conserve ecologically representative areas and biological corridors that maintain genetic continuity of flora and fauna.	Short to medium term intervention.
	7. Mainstream wetland management into the national landuse planning policy and promote the wise use of wetlands for farming, grazing, fishing, woodfuel production, and salt-winning.	Medium to long term intervention.
	8. Sustainably manage and develop commercial woodfuel supplies and other non-timber forest products on both on-and off-reserved forest areas.	Short to Medium term intervention
	9. Develop systems and technologies for sustainable management of savannah woodland resources for environmental protection and enhancement of socio-economic development.	Medium term
	10. Promote sustainable management of mangroves to safeguard the wetlands and also protect endangered species like marine turtle.	Short to medium term intervention.
	11. Promote urban forestry as landscape intervention enhancement, provision of recreation, erosion control and supply of fruits and woodfuel to the urban areas.	Medium term intervention
	12. Build a monitoring and enforcement capacity by using social media, education, and awareness-raising to eliminate and or minimize the demand for illegal trading in forest and wildlife products.	Short to medium term intervention

	13. Strengthen capacities in public institutions and civil society organizations to engage in future international and domestic mechanism that will respond to climate change.	Short to medium term intervention
<p>Development objective 2 To promote the rehabilitation and restoration of degraded landscapes through forest plantation development, enrichment planting, and community forestry informed by appropriate landuse practices to enhance environmental quality and sustain the supply of raw materials for domestic and industrial consumption and for environmental protection</p> <p>Programme focus 2.1 Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, and natural regeneration.</p>	14. Implement the national plantation development strategy.	Short term intervention
	15. Develop systems and incentive package to support public, private sector and community investment in reforestation and forest plantation development in degraded priority forest areas.	Short term intervention
	16. Develop a framework, plan, and incentive packages to support public, private sector and community investment in reforestation and woodlot development in degraded priority savannah areas.	Short to medium term intervention.
	17. Support increased investments in research and development, training and capacity building in forest plantation and woodlot development in all the ecosystems.	Short term
	18. Build the capacities of vulnerable forest-based communities to mainstream restoration of degraded forests and agricultural landscapes (dedicated forests, sacred groves, wildfire management) in their farming practices to redress the problems of deforestation and forest degradation.	Short to medium term intervention
<p>Programme focus 2.2 <i>Reducing GHG emissions from deforestation and forest degradation, while reducing poverty and conserving biodiversity.</i></p>	19. Aggressively promote wildfire management in the transitional and savannah ecosystem.	Short to medium term intervention
	20. Support community investments in climate smart cocoa agro-forest corridors with communities in cocoa areas.	Short to medium term intervention
	21. Support community investments in climate smart Shea and Dawadawa cultivation in degraded savannah reserves.	Short to medium term intervention
	22. Enhance the traditional autonomy for the protection and management of sacred forests and community dedicated forests for biological and cultural diversity on and off-reserves.	Medium to long term

	23. Build capacities and create incentive schemes to support community supplementary livelihoods for woodfuel, climate smart agriculture and agro ecological farming.	Short to medium term intervention
<p>Development objective 3 To promote the development of viable forest and wildlife based industries and livelihoods particularly in the value added processing of forest and wildlife resources to satisfy domestic and international demand for competitively -priced quality products.</p> <p>Programme focus 3: Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources.</p>	24. Promote community restoration of degraded forests and agricultural landscapes (dedicated forests, sacred groves, and wildfire management)	Short to medium term intervention
<p>Programme Objective 4 To promote and develop mechanisms for transparent governance, equity sharing and stakeholders participation in the forest, wildlife and woodfuel resource management.</p>	25. Develop domestic wood markets for regular supply of legal quality wood, through the enforcement of standards and specifications, price regulations and improved access to investment capital.	Short to medium term intervention
	26. Support the modernization of the tertiary wood industries and promote value addition through research, application of modern technologies, retooling, training, standardization, and access to credit.	Medium to long term
	27. Facilitate the setting up and development of national timber industry development fund to support the retooling and technological improvements in the tertiary wood sector.	Medium to long term
	28. Support specialized training and craftsmanship schemes for processing wood, bamboo, rubber wood, cane and rattan and lesser-known tree and non-timber forest products.	Short to medium term.
	29. Promote the development of wildlife based industries.	Short to medium term intervention
	30. Enact legislation to enhance small and medium forest and wildlife enterprises and support trade in legal (sustainable) lumber, commercial breeding (domestication) of wildlife in heavy demand for export and domestic markets and woodfuel development.	Short to medium term
	31. .Enact legislation to support trade in legal savannah lumber based on the sustainability of the resources.	Short to medium term intervention
	32. Enact the necessary legislation and regulations to facilitate and enhance local participation and control through decentralization of forestry operations at the district level.	Medium to long term
	33. Enact legislation to support transparency, equity and legalize stakeholder participation in sustainable forest, woodland, and wildlife resource management.	Short to medium term

<p><u>Programme focus 4</u> Institutional and legislative reforms for transparent governance, equity sharing and stakeholder participation in forest and wildlife resource management.</p>	34. Enact legislation to support the allocation of all timber resources (and other natural resources where appropriate) through transparent competitive bidding and continuous auditing of the forest utilization operations to ensure compliance with forest management specification and environmental protection standards.	Short to medium term
	35. Decentralize Forestry Commissions function in the management and utilization of forest resources to all levels of governance.	Long term
	36. Develop a strategic national plan to eliminate illegal logging and chainsaw operations.	Short term intervention
	37. Promote effective and efficient engagement of forest forum and other relevant and recognized platforms in forest and savannah woodland governance.	Short to medium term intervention
<p><u>Programme objective 5</u> To promote training, research-based, and technology-led development that supports sustainable forest and wildlife management whilst promoting information uptake both by forestry institutions and the general public.</p> <p><u>Programme focus 5.1</u> Promoting innovations, research and technology development that supports sustainable timber, woodfuel and wildlife management</p> <p><u>Programme focus 5.2</u> Supporting training and capacity building for human resource development and improvement of forestry sector institutions</p>	38. Integrate indigenous and scientific knowledge in forest and wildlife management.	Short to medium term
	39. Promote targeted research in forest and wildlife issues and support the publication and dissemination of results to increase awareness.	Short to medium term intervention
	40. Support continuous update of forest information database to monitor sustainable forest management.	Short to medium term intervention
	41. Build national capacity for accurate accounting and timely collection of resource production and utilization of data to be linked up with macro-economic data.	Medium to long term
	42. Support research and development to enhance efficiency in the wildlife industries.	Short to medium term intervention
	43. Support the development of research infrastructure for the savannah ecosystem.	Medium term
	44. Initiate steps to intensify public education to link natural resources, over-exploitation, environmental degradation, and community poverty.	Throughout the plan implementation
	45. Set up research and think tank unit within the Forestry Commission to undertake strategic and tactical planning within the forestry sector.	Short term
	46. Establish appropriate linkages between the Forestry Commission and FORIG.	Medium to Long term
	47. Promote sectoral and cross-sectoral institutional collaboration to generate and	Throughout the plan

	share information to improve forest policy and management.	implementation
<p>Development Objective 6</p> <p>To promote and develop financing mechanisms for natural forest management, timber plantation development, plant and machinery, development of tertiary processing activities, micro and small enterprises.</p> <p><i><u>Programme focus 6.1</u></i> Development of sustainable and predictable financing instruments to support forestry sector activities.</p>	48. Set up national revenue mechanisms for conservation trust funds, systems of payments for environmental services, debt-for-nature swaps, economic valuation of protected area goods and services, access and benefit sharing agreements.	Medium term
	49. Set up a board to manage trust funds to provide flexible source of funding for (i) communities in support of establishing Community Resource Management Areas (CREMAs), dedicated forests and similar opportunities and (ii) advocacy organizations that hold government more accountable.	Medium to long term
	50. Formulate and implement national policy reform and incentives to engage the private sector (concessions, private reserves, etc.) and other stakeholders to improve protected area financial sustainability and management	Short term
	51. Review forestry regulations and operations to cede out some the current public sector activities that the private sector has the comparative advantage.	Medium to long term
<p><i><u>Programme focus 6.2</u></i> Stimulating political and institutional support for the implementation of the forest and wildlife policies and programmes at all levels of governance.</p>	52. Institute an annual forestry forum where all stakeholders will meet to review actions and plan programmes.	Throughout the plan period
	53. Decentralize forestry governance system to local level to ensure transparency accountability and equity.	Short to medium term
	54. Enact specific legal provisions governing the establishment and management of Protected Areas.	Short term

4.4 Roadmap towards the Implementation of the Forestry Development Master Plan Strategies

The development goal, objectives and strategies of the FDMP seeks to transform the forestry sector over a twenty year period and contribute to the overarching goal of eradicating poverty and achieving sustainable development. The plan duration of 20 years was carefully selected to complete a 40-year cycle since the implementation of the 1996 forestry development master plan. The end of the plan period will enable the Policy Makers to determine the level of growth and changes that has taken place in the forestry sector.

The 20-year duration is deemed adequate to develop the non-consumptive values of the forest and create a balance between wood production and marketing to satisfy domestic demands whilst ensuring good governance, transparency and equity in the forestry sector. In keeping with the strategy, the FDMP would be implemented under three planning phases to coincide with the three planning programmes as follows:

Phase I: 2016 to 2020 (Short term continuation programmes)

Phase II: 2021-2030 (Medium term structural transformation programmes)

Phase III: 2031 – 2036 (Long term consolidation programmes)

The strategies to be implemented under each phase have been planned under nine main components with various programmes, outputs and targets. The components are the main focal areas of the plan with sets of targets, outputs and results framework to be achieved within the planned period.

4.5 Plan Components and Programmes

COMPONENT 1: Sustainable Management and Utilization of Forests, Wildlife, Wetlands, and Savannah Ecosystems

Background

The purpose of this component of the plan is to ensure sustainable management of forests, wildlife, wetlands, and savannah ecosystems to preserve vital soil and water resources, conserve biological diversity, and enhance carbon stocks for sustainable production of domestic and commercial produce. Accordingly the programmes to be pursued under the plan components are to:

- Manage Forest Reserves in line with national policies and legislation as well as international treaties that Ghana has ratified.
- Develop off-reserve forest production areas with well-defined and legally established compatible sustainable forest management principles.
- Ensure the reduction of mineral prospecting and mining in Forest Reserves.
- Support natural regeneration and establishments of Community Resource Management Areas (CREMAs) in off-reserve forest and savannah areas.
- Support the establishment of community-based wildfire management activities within the high forest, transitional and savannah ecosystems.
- Establish network of National Parks, sanctuaries and other protected areas to adequately conserve ecologically representative areas and biological corridors that maintain genetic continuity of flora and fauna.
- Enhance the traditional autonomy for the protection and management of sacred landscapes and community dedicated forests for biological and cultural diversity on and off reserves
- Mainstream wetland management into the national land use planning policy and promote the wise use of wetlands for farming, grazing, fishing, woodfuel production, and salt-winning.
- Sustainably manage and develop commercial woodfuel supplies and other non-timber forest products on both on-and off-reserved forest areas.
- Develop systems and technologies for sustainable management of savannah woodland resources for environmental protection and enhancement of socio-economic development.
- Promote sustainable management of mangroves to safeguard the wetlands and also protect endangered species like marine turtle.
- Promote urban forestry as landscape intervention enhancement, provision of recreation, erosion control and supply of fruits and woodfuel to the urban areas.

Programme 1.1: Managing Forest Reserves in line with National Policies and Legislation as well as International Treaties that Ghana has Ratified

This is a short to medium term programme that seeks to prevent forest and wildlife produce extraction above the annual allowable cut by ensuring that timber harvesting and wildlife off-take are within sustainable limits. It is part of the on-going Ghana Investment Plan for the Forest Investment Programme (FIP) which seeks to ensure the integrity and sustainable management of forest reserves, restore forest cover in off-reserve areas, promote climate smart cocoa and agriculture farming, and develop alternative livelihoods to local communities to reduce pressure on the forests. Currently, the FIP is being piloted in the Brong Ahafo and Western Region.

Under the programme, the main activities are:

1. Strengthen the legal framework to give permanency to gazetted forest reserves (GFRs) and Protected Areas (PAs) in order to conserve representative samples of major ecosystems and species (biodiversity) in the country. In pursuance of this the plan will;
 - a. Ensure that all Gazetted Forest Reserves are covered with approved Forest Management plans and are guided by the best forest Practices and national forest management standards.
 - b. Conclude legal processes for the reservation of all proposed forest reserve areas;
 - c. Reduce as much as possible the prospecting and mining of minerals resources in gazetted forest reserves
2. Promote inter-sectoral collaboration among relevant Ministries, Departments and Agencies concerned with sustainable management of forest and wildlife ecosystems. In pursuance of this the plan will enact legislation to legitimize the involvement of all primary stakeholders in forest management, planning, policy formulation and decision-making.
3. Develop capacities of decentralized local institutions including the District Assemblies, Traditional Authorities, civil society organizations to sustainably manage “off-reserve” timber resources and non-timber forest products (NTFPs) in both natural and plantation areas.
4. Update information and conducting biological inventories on forests on regular basis and monitoring the growth and health of the nation’s forest and wildlife resources. This would be done by:
 - a) Regularly conducting forest inventory to support forest management policy;
 - b) Developing framework (technical and legislative) for natural and artificial regeneration to ensure prompt establishment of a satisfactory growing stock to increase forest/tree cover;
 - c) Supporting the development of techniques for natural and artificial regeneration.
5. Support the FC to manage wildfires in the forest reserves and off reserve timber production areas
6. Strengthen the FC through training to ensure that all timber utilization contracts and permits are legal and fall within the allowable cut and meet all payment schedules,

social and environmental mitigating responsibility agreements as well as following forest management plans, operating procedures and guidelines.

The plan seeks to reduce pressure on forest ecosystems, promote sustainable management of forests, and develop an institutional and legal/regulatory framework that supports sustainable management of forests and protects the rights of local communities. The implementation of the plan will strengthen the legal framework to give permanency to the gazetted Forest Reserves, and Protected Areas (PAs) and to improve the recognition, support, and overall effectiveness for biodiversity conservation, sustainable livelihoods, and resilience to climate change, and local community conserved areas (ICCA). The FDMP will formulate reforestation plans to guide afforestation programme in all the three ecological zones (high forest, transitional zone and savannah).

Strategic Actions and Targets

The strategic actions and targets for sustainable forest management are to

- Review, revise/update forest management plans covering all the gazetted Forest Reserves and Wildlife Protected Areas in Ghana for approval and implementation by 2020;
- Conclude all legal processes for the reservation of all designated forest reserves to be gazetted by 2020;
- Reduce prospecting and mining of mineral resources in gazetted Forest Reserves by 60 per cent in 2020 and 100 percent by 2035;
- Reduce the incidence of wildfires in the gazetted Forest Reserves by 60 per cent in 2020 and 90 per cent by 2035;
- Continuously update and conduct systemic biological inventories of all gazetted forests reserves and wildlife Protected Areas every five years starting from 2020.

Programme 1.2: Framework for Sustainable Management of Off-Reserve Production Forest Areas Developed and Implemented

Background

The total off-reserved forest area (farmlands, fallows, and residual forest patches, sacred groves) is estimated to be 6,547,100 km² in the high forest zone and 14,747,500 km² in the savannah ecosystem. It is further estimated that about 80 per cent of total timber harvest comes from the off-reserve timber production areas (the policy being to harvest valuable economic trees before farming activities).

Under the FIP, Ghana has initiated a project that seeks to restore forest cover in off-reserve areas by securing tree tenure and benefits, forest plantations and landscape restoration, and rehabilitation of degraded forest land. The project seeks to increase trees and enhance carbon stocks in the farming system by promoting sustainable cocoa and agriculture practices, and payment for environmental services. The project will also mitigate the effects of agricultural expansion on forests and carbon stocks (particularly cocoa expansion and transition to open cocoa farming in the high forest zone).

The policy direction under the FDMP is to develop off-reserve forest production areas with well-defined and clearly established objectives compatible with sustainable forest management principles. This will be achieved by continuously survey and inventory all potential off-reserve timber production areas, and to constitute them into forest management units with active involvement of the local landowners. In view of this policy direction, the plan will develop a framework for managing off-reserve forest areas for production of timber, increase tree cover on farms to enhance carbon stocks and promote climate smart agriculture especially in cocoa production. The plan will seek to update information and conduct biological inventories on off reserved forests on regular basis and monitor the growth and health of the nation's forest and wildlife resources.

The plan will also seek to maintain and strengthen different production systems and their elements, including agriculture practices based on local and traditional knowledge, that allow continuous evolution and adaptation (adequate population sizes, seed systems, movement of useful materials, and access to ex-situ materials). The plan will link genetic diversity maintenance to improve food security and economic returns for rural communities and farmers (including local market access and market regulations). It will develop policies, strategies, legislation, and regulations that shift the balance in agricultural production in favor of diversity rich approaches. These include support for the adoption of appropriate fiscal and market incentives to promote or conserve diversity on-farm and across the production landscape and strengthen the capacities of the agricultural development, extension and research communities and institutions that are needed for in-situ conservation, so that agricultural biodiversity would be embedded in sustainable intensification and adaptation to climate change.

The programme will also strengthen the capacities of community and smallholder organizations, and farmers (both men and women) to participate in the identification, development, and implementation of solutions.

Strategic Actions and Targets

The strategic actions and targets under the plan are to:

- Continuously undertake biological inventory of all production forests outside the Forest Reserves and constitute them into forest management units covered by forest management plans with active involvement of the local landowners by 2025;
- Build the capacities of decentralized local institutions in the forest and savannah areas including the District/ Municipal/Metropolitan Assemblies, Traditional Authorities, and civil society organizations in sustainable “off-reserve” timber resources and non-timber forest products (NTFPs) by 2020;
- Support farmers, landowners and civil society groups to initiate the restoration of forest cover in off-reserve, rehabilitated degraded forest landscapes by 2025;
- Support local farmers to increase trees farms and fallow areas to enhance carbon stocks within the agricultural landscape by promoting sustainable cocoa and agriculture practices, and payment for environmental services by 2030;
- Monitor the enactment of tree tenure and benefit sharing agreements by 2020;
- Develop technical, financial market incentives and support the establishment of rural enterprises and viable alternative livelihoods for local communities by addressing a

- broad range of technical, financial and market incentives, to reduce pressure on existing forests by 2025;
- Fully decentralize the operations of the Forestry Commission in the management and utilization of forest and wildlife resources off reserves to District/Municipal and Metropolitan Assemblies, by 2035;
 - Build the capacities of stakeholders in sustainable management off-reserve timber resources and non-timber forest products (NTFPs) work with the local Governments in the management of off reserve production forests by 2030;

Programme 1.3 Mineral Prospecting and Mining in Forest Reserves Reduced

Background

In 1997, a policy decision was taken that mineral exploration activities would be allowed within at least 2 percent of the production areas of the Forest Reserves. Guidelines for mining in forest Reserves were 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.

The policy direction is to reduce as much as possible the prospecting and mining of mineral resources in gazetted Forest Reserves. The strategy is to eliminate the prospecting and mining of mineral resources in gazetted Forest Reserves would be reduced by 2030.

Programme 1.4 Support Community Resource Management Areas (CREMAs) and Collaborative Forest and Savannah resource management

Background

The implementation of the 1994 policy with all the associated reforms, programmes, and projects could not halt the degradation and challenges in the forest resource base. Illegal chainsaw and mining (*galamsey*) operations in forest areas have thrived over the years despite conscious national efforts to curb the situation in collaboration with the security agencies. The greatest threat to wildlife was not through over exploitation by hunting but by the conversion of habitat used by wildlife into other land uses mostly agriculture. The rapid conversion of land compromised wildlife and environmental security in Ghana as the existing legislation was not sufficient to provide adequate incentives for farmers to take care and protect wildlife on their properties.

The concept of collaborate management was developed to give practical meaning to the 1994 Forest and Wildlife Policy and to ensure more active participation of the local communities, civil society groups and other stakeholders in wildlife management. The institutional mechanisms for implementing the collaborative wildlife management both in and outside Protected Area were the Protected Area Management Advisory Boards/Units and the Community Resource Management Area (CREMA) approach.

The CREMA concept was initiated by the Wildlife Division under its Protected Areas Development Programme (PADP) to encourage communities bordering protected areas to manage and sustainably utilize wildlife resources within a defined area through a Community Participatory Approach (Wildlife Division, 2004). The underlying reason was that. There are 27 CREMAs in Ghana with 19 of them certified.

The purpose of this programme is to support local communities to develop forest management systems and establish CREMAs to conserve forests through natural regeneration and adequate resource management. In pursuance of this the following actions and strategies would be implemented:

- Support community participation in natural resource management in the forest and savannah ecosystem through appropriate participatory models including the Community Resource Management Area (CREMA) concept for sustainable livelihood of fringe communities by 2025;
- Promote agreements between the Forestry Commission and the local communities to introduce the institutional coordination with community forests through traditional approaches of working with chieftaincies and District Assemblies by 2025;
- Support the establishment of Community Resource Management Areas (CREMAs) in at least 80 per cent of potential off-reserve zones in the savannah zone to give management authority over forest areas and natural resources used by the community by 2020;
- Develop incentive systems to promote investment in community-based eco-tourism and commercial wildlife conservation and development by 2020;
- Support the establishment of 200 Community Resource Management Areas (CREMAs) or ‘Designated Forests’ in 50 per cent of potential off-reserve zones to give management authority over forest areas and natural resources used by the community by 2025;
- Create and manage at least 5 biological corridors between off-reserve areas and all globally significant biodiversity areas in the high forest zone through natural regenerations and creation of CREMAs by 2025.

Programme 1.5: Protected Area Management Systems Improved to Conserve Ecologically Representative Areas and Biological Corridors.

Background

Ghana has been experiencing long term decline in key indicator species, such as elephant, buffalo, pygmy hippopotamus and chimpanzee, have been observed in both the high forest and savannah areas. Similar decline has been observed in smaller species hunted for bush meat. The past programmes have supported the establishment and management of protected area systems and associated buffer zones and biological corridors. Supporting the management of protected areas is not only a sound investment in biodiversity conservation and sustainable use, but also provides significant additional economic and environmental benefits beyond the existence value of biodiversity.

Under the FDMP, sustainable protected area system is perceived as one that effectively protects ecologically viable and climate-resilient representative samples of the country’s ecosystems and provides adequate coverage of threatened species at a sufficient scale to ensure their long term persistence. The plan seeks to establish network of national parks, sanctuaries and other protected areas to adequately conserve ecologically representative areas and biological corridors that maintain genetic continuity of flora and fauna.

Specifically, the plan will seek to

- a) Create biological corridors between existing networks of conservation areas to maintain genetic continuity of flora and fauna,
- b) Increase community participation in wildlife management in all forest areas through appropriate participatory models such as the Community Resource Management Area (CREMA) concept for sustainable livelihood of fringe communities.
- c) Develop incentive systems to promote investment in community-based eco-tourism and commercial wildlife conservation and development.

Strategic Actions and Targets

The programme strategy is embedded in biodiversity conservation and sustainability in the management of wider production landscapes which is the “biodiversity mainstreaming” production landscapes. The plan targets are to:

- Develop policy and regulatory frameworks that provide incentives for biodiversity-friendly land and resource use that remains productive but that does not degrade biodiversity by 2020;
- Formulate and approve spatial and land-use plans which ensures that land and resource use is appropriately situated to maximize production without undermining or degrading biodiversity by 2020;
- Improve and change production practices to be more biodiversity friendly with a focus on sectors that have significant biodiversity impacts (agriculture, forestry, fisheries, tourism, extractives) by 2025;
- Develop biological corridors to link all important ecosystems by 2025;
- Manage all National Parks, Wildlife Sanctuaries, Wildlife Resource Reserves and other Protected Areas (PAs) in accordance with the duly approved wildlife management plans to ensure comprehensive biodiversity conservation and development in line with Government of Ghana’s commitment to international conventions and protocols by 2025;
- Increase community participation in wildlife management in all forest areas through appropriate participatory models such as the Community Resource Management Area (CREMA) concept for sustainable livelihood of fringe communities. Agreements will be made between the Forestry Commission and the communities to introduce the institutional coordination with community forests through traditional approaches of working with chieftaincies and District Assemblies by 2025;
- Develop incentive systems to promote investment in community-based eco-tourism and commercial wildlife conservation and development by 2020;

- Revise and/or formulate management plans to cover all Protected Areas in Ghana to conserve and restore the habitats of all endangered species by 2025;
- Support the establishment of Community Resource Management Areas (CREMAs) or ‘Designated Forests’ in 50 per cent of potential off-reserve zones to give management authority over forest areas and natural resources used by the community by 2025;
- Create and manage biological corridors between off-reserve areas and all globally significant biodiversity areas in the high forest zone by 2025.

Programme 1.6: Enhancing the Traditional Autonomy for the Protection and Management of Sacred Landscapes and Community Dedicated Forests for Biological and Cultural Diversity on and off Reserves

Background

Sacred landscapes are found within all ethnic settlements in Ghana. These are landscapes of cultural importance, conserved, protected, and governed by traditional norms, beliefs, systems, and technologies. They are sacred based on the cultural practices, beliefs, and historical antecedents that might have occurred on the site. The sacred landscapes are areas of interaction between the living, the dead, and nature which have occurred over time and have produced distinctive character with significant aesthetic, ecological, and cultural values. Most of the landscapes are endowed with wild fauna and flora which are considered sacred, prime and special enjoying absolute protection.

Recent studies on the state of the sacred landscapes indicated that the sizes are reducing and they are declining in resource contents. The grooves have survived the indiscriminate assault of man on fear, until recently when religion seems to question the belief system around them.

Notwithstanding the threats from these developments, sacred landscapes are still the most important sources of biodiversity and resource security in many communities in Ghana. They constitute potent gene pools for ex-situ development of tree species now rarely found in the range and fallow systems, including medicinal plants. Sacred groves are generally perceived as important floristic reserves; sources of medicinal plants and a citadel of resources capable of playing vital roles in the environmental recovery process. Surveys by GEF/SGP, (2011) revealed that the only areas that are able to survive the onslaught of annual wildfires and serve as the sanctuary for wildlife are the sacred groves.

Under the FDMP, the traditional sacred sites would be considered as part of the national Protected Areas and cultural heritage sites. This will be done by encouraging national planning agencies and protected area managers to engage with custodians of sacred natural sites to undertake best practices and support the development, testing, dissemination, and implementation of relevant international and national agreements and guidance in accordance with international and local guidelines. The FDMP will promote the execution of the following activities:

- Review relevant legislation to recognize the rights of local people and the customs and belief systems that lead to the management of their sacred sites. The legislation will encourage national planning agencies and protected area managers to engage with

custodians of sacred natural sites to undertake best practices and support the development, testing, dissemination and implementation of relevant international and national agreements and guidance in accordance with international and local guidelines;

- Ensure that economic and development planning authorities as well as other land use agencies all levels of governance recognize sacred natural sites as legitimate land use and their custodians as legitimate managers;
- Document sacred natural sites of biological, spiritual, religious, cultural and heritage values whilst maintaining their secrecy where required.
- Support the provision of livelihood systems (materially, socially and spiritually) for needy communities associated with significant sacred natural sites when the need arises.

The plan will support the establishment of dedicated funding mechanism for the sustainable management and rehabilitation of sacred landscapes. Modalities for the fund mobilization and disbursements would be developed.

Strategic Actions and Targets

The recommended actions under this programme are to:

- Review and enact relevant legislation to recognize the rights of local people and the customs and belief systems that lead to the management of their sacred landscapes by 2020;
- Survey, inventory and document significant sacred landscapes of biological, spiritual, religious, cultural and heritage values recognizing the ownership whilst maintaining their secrecy where required by 2025;
- Support the establishment of dedicated grant mechanism for the documentation, rehabilitation and management of sacred sites in all the ecosystems by 2020.

Programme 1.7: Savannah Ecosystems under Sustainable Management

Background

The savannah ecosystem has served as a major water catchment area for the Volta River and its tributaries and the woodlands and the grasslands are good sources of woodfuel, biodiversity storage and grazing fields for livestock. However, the exploitation of the savannah natural resources is unsustainable. The woodland lacks basic data on the structure, composition and density of species. There are no data on the supply of the goods and services it provides to determine its sustainability. Most of the gazetted forest reserves in the savannah have out-dated management plans to guide exploitation. Bushfires coupled with unsustainable farming have contributed significantly to the fast deterioration of the woodlands.

The FDMP seeks to develop systems and technologies for sustainable management of savannah woodland resources for environmental protection, supply of environment goods and services to enhance socio-economic development. The savannah woodland resources would be considered as part of the national assets to be protected and managed.

In pursuance of this the plan will:

- Support the forestry sector institutions to develop systems and manuals of operation to guide the sustainable management of savannah woodland resources building on indigenous and scientific knowledge on sustainable resource management;
- Survey and demarcate the productive savannah woodlands and put them under forest management units and develop management plans to manage them sustainably;
- Develop systems and structures to support sustainable commercial establishment of commercial woodfuels plantations whilst targeting the implementation of savannah biodiversity conservation strategy;
- Bring under control the high incidence of indiscriminate wildfires in the woodland with active involvement of land owners and resource users by developing sustainable wildfire management plans, provide incentive systems to implement with active involvement of landowners and resource users;
- Adopt landscape approach to manage the off reserved savannah woodlands;
- Establish savannah eco-restoration fund to be accessed by civil society organizations and communities for tree planting along ecologically sensitive areas.

Strategic Actions and Targets

The main targets under the sustainable savanna woodland management are to:

- Support the Forestry Commission to develop systems and manuals of operation to guide the sustainable management of savannah woodland resources building on indigenous and scientific knowledge on sustainable resource management by 2020;
- Develop systems and structures to support sustainable commercial establishment of commercial woodfuels plantations whilst targeting the implementation of savannah biodiversity conservation strategy by 2025.
- Build systems and technologies to control the high incidence of indiscriminate wildfires in the savannah woodland with active involvement of land owners and resource users 2025. This would be done by:
 - Developing sustainable wildfire management framework for the savannah areas with active involvement of landowners and resource users by 2017;
 - Providing incentive systems to implement the wildfire management plans by 2018;
 - Establishing savannah eco-restoration fund to be accessed by civil society organizations and communities for tree planting along ecologically sensitive areas by 2025.
- Resource and support the office of the Director of Operations for the northern savannah to operate as savannah woodland management unit under the Forestry Commission and to be responsible for the management and utilization of savannah woodland resources and reforestation of degraded areas by 2020;

- Initiate the mapping and continuous inventory of the savannah resources to delineate all productive woodlands and constitute them under forest management unit using GIS-based tenure mapping by 2025;
- Initiate the restoration of savannah woodland cover through woodland plantations development, landscape restoration; CREMA establishment, and rehabilitation of degraded areas by 2025;
- Increase savannah woodland covers to enhance carbon stocks in the farming system by promoting climate smart agriculture, and payment for environmental services by 2025;
- Develop viable alternative livelihoods for local communities by addressing a broad range of technical, financial and market incentives, to reduce pressure on existing forests by 2025.

Programme 1.8: Sustainable Production and Management of Commercial Woodfuel in the Savannah Woodland

Background

The National Energy sector is dominated by the supply, distribution and consumption of woodfuels mainly in the form of charcoal, firewood and to limited extent crop residues which are used mainly for cooking and heating in households and commercial/service sectors. The total annual woodfuel consumption has been estimated to be between 14-16 million tonnes coming from between 25-28 million cubic metres of wood (Strategic Energy Plan, 2006).

Woodfuel which consists of firewood and charcoal accounts for more than 70 percent of total primary energy supply, and about 60 percent of final energy demand. Majority of both rural and urban households use wood fuel for cooking and water heating purposes. Due to the impacts of increasing population, urbanization and relative price changes in alternative energy sources such as LPG, consumption of wood fuel will remain high and probably grow. This high demand coupled with unsustainable production practices, conversion and end-use inefficiencies and waste will put the country's forest and woodland resources which supply bulk of wood fuel under intense pressure. Besides these, there is low level of adoption of efficient charcoal production technology coupled with under-developed efficient charcoal and firewood use technologies at the household level. Since the demand for wood fuel will continue to increase there is the need for policy measures which will ensure efficient production and use of the resources. Moreover alternative fuel sources could be explored and harnessed to complement the important roles wood fuel is already playing in the socio-economic development of especially rural households.

Unlike timber, commercial woodfuel production is not under any licensing regime. There are no economic values to the tree species that are harvested to produce charcoal. No royalties are paid and operators pay for land rents although there some localized arrangement in some parts of the country where the land owners demand '*drinks*' before trees are harvested and converted into harvest and process the trees for charcoal and firewood. The current aggregate consumption of charcoal in the country is in all probability beyond sustainable harvesting levels of the indigenous woodlands. In the savannah ecosystem, consumption of woodfuels is 2 per cent over the sustainable harvesting levels.

Under the FDMP, funding will be directed towards activities that will ensure that

- Harvesting and production of woodfuels and other non-timber forest products (NTFP) would be done within sustainable limits on both reserve and off-reserve production areas in the savannah ecosystem.
- Production, transportation, and marketing of woodfuel would be done through licensed individuals, groups, and enterprises.
- Standards and regulation will guide the production and marketing of woodfuels
- Woodfuel tracking systems is in place to promote woodfuel certification system
- Improve efficiency of wood fuel production and carbonization process.
- Develop efficient technologies for full utilization of wood residue for energy /technology transfer and efficient technology for the carbonization process.

Strategic Actions and Targets

Under the FDMP the recommended actions and target to promote sustainable management of woodfuels in the savannah woodland areas are to

- Develop a participatory/regulatory framework for the sustainable management for savannah woodland management by 2020;
- Enact the necessary legislation and build the necessary institutional support to ensure that woodfuels from forest reserves, private and communal lands are managed according to the national forestry development objectives and resource owner's priorities by 2020;
- Develop standards and a chain of custody to ensure that commercial production and trading of woodfuels conforms to sustainable forest and woodland regulations by 2020;
- Enact the necessary legislation and build institutional capacities to ensure that commercial productions of woodfuels are certified by the Forestry Commission by 2025;
- Improve efficiency of wood fuel production by adopting kilns and other improved technologies for sustainable energy supply by 2025;
- Promote research and development programmes for commercially viable wood fuels by 2025;
- Build capacity of fuel wood producing communities, NGOs, CBOs, women groups and other identifiable groups to establish and effectively manage woodfuel plantations (including bamboo) by 2025

Programme 1.9: Sustainable Management of Wetland Resources

Background

Ghana has lost 47 per cent of mangrove cover between 2006 and 2014 mostly due to illegal activities (WD, 2014). The wetlands are threatened by deforestation resulting from over-cutting of mangroves for woodfuel, salt winning, and encroaching urban development. Wetland management has not been fully mainstreamed into the national landuse planning system and there are inadequate legislative instruments to promote sustainable use of resources within the wetlands. This has exacerbated the problems of wetlands in Ghana.

The Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central and Southern African Region (also known as the Abidjan Convention), and its protocol concerning cooperating in combating pollution in cases of emergency -came into force in 1984. It is a comprehensive umbrella agreement for the protection and management of the marine and coastal area, and aims to address -pollution, -from ships, dumping, land-based sources, exploration, and exploitation of the sea-bed, and pollution from or through the atmosphere. It also makes provision for liability and compensation in case of pollution. The Convention is the basis for co-operative efforts to address other issues such as --overfishing, control of the fish stocks, coastal-based tourism, coastal erosion, specially protected areas, and environmental impact assessment in the region. Unfortunately Ghana has not appropriated the provision of the convention.

The Forestry Development Master Plan seeks to mainstream wetland management into the national land-use planning policy and promote the wise use of wetlands for farming, grazing, fishing, woodfuel production, and salt-winning. This will be done within the context of ecosystem, biodiversity, and sustainable productivity of the wetlands. Accordingly, the FDMP seeks to promote sustainable management of mangroves to safeguard the wetlands and also protect endangered species like the marine turtles. This will be done by

- Enacting legislation to support the implementation of the national wetland conservation strategy.
- Supporting the mainstreaming of wetland management into district and community level natural resource management systems.

The programme will also seek the sustainable management of mangroves, promote marine and coastal-based tourism development, and promote interface between freshwater courses and marine and coastal ecosystems whilst addressing the problem of poverty through the sustainable management of marine and coastal resources.

Strategic Actions and Targets

The recommended strategic actions and targets to meet the objectives of the sustainable wetland management are to:

- Revise, map, inventory and document all potential wetlands of global significance in all the ecological zones of Ghana by 2025,

- Review and update/formulate for gazette, participatory wetland management plans for the RAMSAR site and other wetlands of national significance by 2025,
- Promote community mangrove reservation and rehabilitation of all degraded wetlands for mangrove restoration and marine protection using the CREMA governance system by 2025.

Programme 1.10: Reducing Poaching and Illegal Trafficking of Threatened Species

Background

Illegal trade in wildlife and wildlife parts is an emerging driver of biodiversity loss. The problem is particularly acute in savannah ecosystems where trade in bush meat is still rife, but iconic mammals are under siege. The impact of the loss of the largest terrestrial mega-vertebrates goes beyond their enormous intrinsic value. First, protected areas devoid of elephants and hippos will face increased opportunity costs brought about by reduced tourism revenue and result in greater pressure to convert protected areas to alternative land-uses that do not support biodiversity. Second, poaching is an insidious activity that weakens institutions and governance systems that are essential for effectively managed protected area systems. In addition, poaching at the current scale undermines the rule of law and economic development generally. Third, elephants and hippopotamus are keystone species that maintain the balance of other species in the ecological community. The richest wildlife communities in Ghana are found where woodland and savanna ecosystems meet and become interspersed with each other. Elephants in particular are one of the most important agents influencing the dynamics of that mixture, and their activities generally increase the overall biological diversity of their habitat.

The master plan will address both supply and demand aspects of wildlife poaching to build monitoring and enforcement capacity and using social media, education, and awareness-raising to staunch the demand for these products and pressure security agencies to improve enforcement of existing laws on illegal trading in wildlife. The plan will support strengthening decision making processes including legislation and its implementation, strategic planning, and capacity building. Support will include building the capacity of environmental law enforcement agencies and the judiciary to reduce poaching and illicit extraction of wildlife inside and outside of the protected area system and improving border enforcement through cross-sectoral collaboration.

Strategic Actions and Targets

The recommend strategic actions to meet the objectives of the FDMP are to:

- Review and strengthen legislation, institutions, and law enforcement to reduce poaching by 2020;
- Review and enact legislations to strengthen science-based wildlife monitoring, education and awareness by 2025;
- Conduct surveys and put in place incentive systems that will regulate the roadside sale of bush meat by 2025;
- Develop incentive systems and legislations that will support the rearing of wildlife as local livelihood enterprise development by 2025.

Programme 1.11: Urban Forestry Development

The growing population and rapid urbanization in Ghana induced by demographic switch from rural to urban society is outstripping the planning and carrying capacity of metropolitan and municipal authorities. A cursory review of urban forestry development in Ghana has shown that it is not well developed. There planned and unplanned tree on some patches of land in the urban areas grown for landscape enhancement, environmental protection and other benefits varied. In most cities *Azadirachta*, *Adansonia digitata*, and *Acacia* species are the dominant species. Other species found are *Acacia Terminalia* species, *Gmelina arborea*, *Tectona grandis*, and *Delonix regia*, species of palm. Rapid urban population growth, limited land area, and poor implementation of government policies are some factors affecting urban forests development in Ghana.

Programme Focus

To ensure sustainable development of urban forest management technique that accommodates human, social, political, cultural and economic factors there should be the political goodwill to implement the programmes. There should be appropriate social awareness programmes in the major urban centres to guarantee that urban forest initiatives are upheld by the metropolitan and municipal assemblies, the traditional authorities and the citizenry. There should be a strong collaboration with Department of Parks and Garden, Town and Country Planning and the civil society organizations to promote this programme.

The main objectives of promoting urban forestry is to promote landscape intervention enhancement, provide recreation facilities, control erosion within residential areas, ensure food security by supplying fruits and supply woodfuel to the urban population.

The major types of urban forestry resources to be supported under the plan will include: semi-private space like green space in residential and industrial areas designated parks, street trees and roadside plantations public green areas like green parks, botanical gardens, recreational gardens public and private tree plantations on vacant lots, green belts, woodlands and peri-urban tree plantations and rangeland, and forests close to urban area natural forest under urban influence, such as nature reserves, national parks, sacred groves and community forests for eco-tourism trees planted for environmental protection such as wind break, watersheds protection, etc. The floristic features, physiognomy, characteristics and socio-economic importance of these forests will vary with the ecological zones in which they are located.

Strategic Actions and Targets

Under the FDMP, the following actions and targets would be implemented towards urban forestry development:

- Review, all structure plans of the major cities to identify the various landuses designated as open spaces that can be developed into urban forests by 2017
- Revise/formulate for approval and implementation a national urban forestry development plan with realistic annual targets based on best practices and conditions in each ecological zone by 2018

- Develop systems and incentive packages to support public, private sector and community investment in urban forestry by 2019;
- Support the implementation of the urban forestry plan with technical and financial incentive packages by 2020;
- Review/develop and enact legal/regulatory framework that supports urban forestry development by 2020.

COMPONENT 2: REVERSING DEFORESTATION/DEFORESTATION RATES AND INCREASING NATIONAL FOREST COVER

The Land Use, Land Use Change, and Forestry (LULUCF) sector in Ghana has rapidly changed from sink to a considerable source (25 per cent) of total GHG emissions. Large tracts of Forest Reserves are degraded. Ghana has lost about 1.9 million hectares of forest cover and the annual deforestation rate is estimated at 2 per cent. One of the biggest environmental challenges facing the country today is the need to reconcile the conflicting demands of the various stakeholders for the dwindling forest resources.

1.1 Programme Focus

The on-going plantation development programme has been designed to ensure the involvement of government, private sector organizations, and local communities. The need for greater government and private sector capital investment in plantation development has been overemphasized and the following policy direction and strategies have been proposed:

- Developing systems and incentive packages to support public, private sector and community investment in reforestation and forest plantation development in degraded priority forest areas and private/community lands. Accordingly the FDMP will undertake the following activities:
 - Developing and implementing a National Reforestation Plan with realistic annual targets based on best practices and updated plantation information for both the savannah and forest areas;
 - Promoting community and private sector investments in Forest Plantations establishment for multiple functionality including biodiversity, agriculture productivity and soil and water conservation;
 - Reviewing the Plantation Development Fund to set up and operate a National Reforestation Fund indexed to the exploitation of timber and wildlife resources and managed by an independent reforestation board and operating through a national commercial bank with flexible terms of lending;
- Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, and natural regeneration. The policy direction is to reduce the degradation of the permanent forest estates, enhance habitat and carbon stock through rehabilitation of tracts of degraded forest lands using both the public and private sector initiative, enrichment planting and nursery development. The plan will rehabilitate and reverse the degraded and fragile landscapes and eroded ecosystems through effective national reforestation programme to sustain the supply of raw material. This would be achieved by:
 - Expanding the species extraction base to conserve the Scarlet timber species which are rare especially in the higher diameter classes and refocus extraction to the lesser used (the Pinks) timber species;
 - Developing incentives that secure all forests and protected areas and seek the collaborative involvement with benefits to forest fringe communities to ensure their commitment to better management of all forest areas;
 - Capturing new value from forests and watersheds through afforestation, watershed protection and the quality of the environment from carbon finance

- initiatives such as REDD+ and PES
- Placing higher priority on plant and animal biodiversity conservation recognizing their contributions to eco-tourism, medicinal and pharmaceutical uses, their spiritual and aesthetic values and protecting Ghana's unique contribution to the world's biodiversity heritage enshrined in the CBD and CITES;
- Creating additional protected areas and reinforce the protection and management of National Parks and wildlife protected areas expanding the CREMA concept and developing connections between isolated reserves and supporting trans-boundary collaboration with neighbouring countries;
- Developing inland and coastal wetlands and maintaining existing RAMSAR sites and mangrove resources;
- Revitalizing the development of plantations and providing opportunities to communities, small scale commercial operators and large scale investors on a transparent, competitive, openness and fair public private partnership processes;

Strategic Actions and Targets

Under the FDMP, the following actions and targets would be implemented:

- Review, revise/formulate for approval and implementation a national reforestation plan with realistic annual targets based on best practices for the savannah, and high forest zones by 2021
- Develop systems and incentive packages to support public, private sector and community investment in reforestation and forest plantation development in degraded priority forest areas and private/community lands by 2020;
- Plant and nurture at least two billion seedlings of exotics and indigenous species in the savannah area targeted at degraded landscapes by 2025;
- Review/develop Legal/regulatory framework that supports plantation development in all the ecosystems by 2020

Programme 2.1: Forest Plantations Development Programme

Background

A review (February- March, 2012) by the FSD of potential areas suitable for plantation development within forest reserves in the high forest zone indicated an estimated total area of 175,000 ha. An estimated 300,000 ha of potential sites, representing 70% of total forest reserve area in the Northern Savannah, was projected. In addition, under the Forest Preservation Programme, an estimated total area of 5.2 million hectares of cropland (both cropped and farm fallows) and 8.2 million hectares of grassland (including shrub lands) were identified off-reserve, as at 2010. It is anticipated that these off-reserve shrub lands and farm fallows will constitute potential lands suitable for plantation development nation-wide.

It is projected that 75 per cent of the cropland area (i.e. approximately 4 million ha) across the high forest, transition and Savannah zones will be targeted for trees-on-farms/farm boundary planting/climate smart agriculture by 2040. The expectation is that about 20% of the fallow and shrubland area (i.e. 2.68 million ha) could be sourced for forest plantation development.

According to the Forestry Commission (2015), the potential sites suitable for plantation development (on and off-reserve) is estimated at 3.1 million ha (Table 18).

Table 18: Summary of Potential Lands for Forest Plantation Establishment

LOCATION	AREA (ha)
On-reserve (High-forest Zone)	135,000
On-reserve (Savannah)	283,000
Off-reserve	2,680,000
TOTAL	3,098,000

The spatial locations of the potential planted sites for commercial forest plantation expansion are shown in Figure 6. Extensive surveys (ground-based and remote sensing), data collection, and consultation with land owners and other key stakeholders would be undertaken to confirm status, suitability and availability of these potential areas both on and off-reserve. However, the green and pink portions on the map indicate areas within the country where the planned targets under the strategy are expected to be concentrated.

Seedlings for the Strategy Period

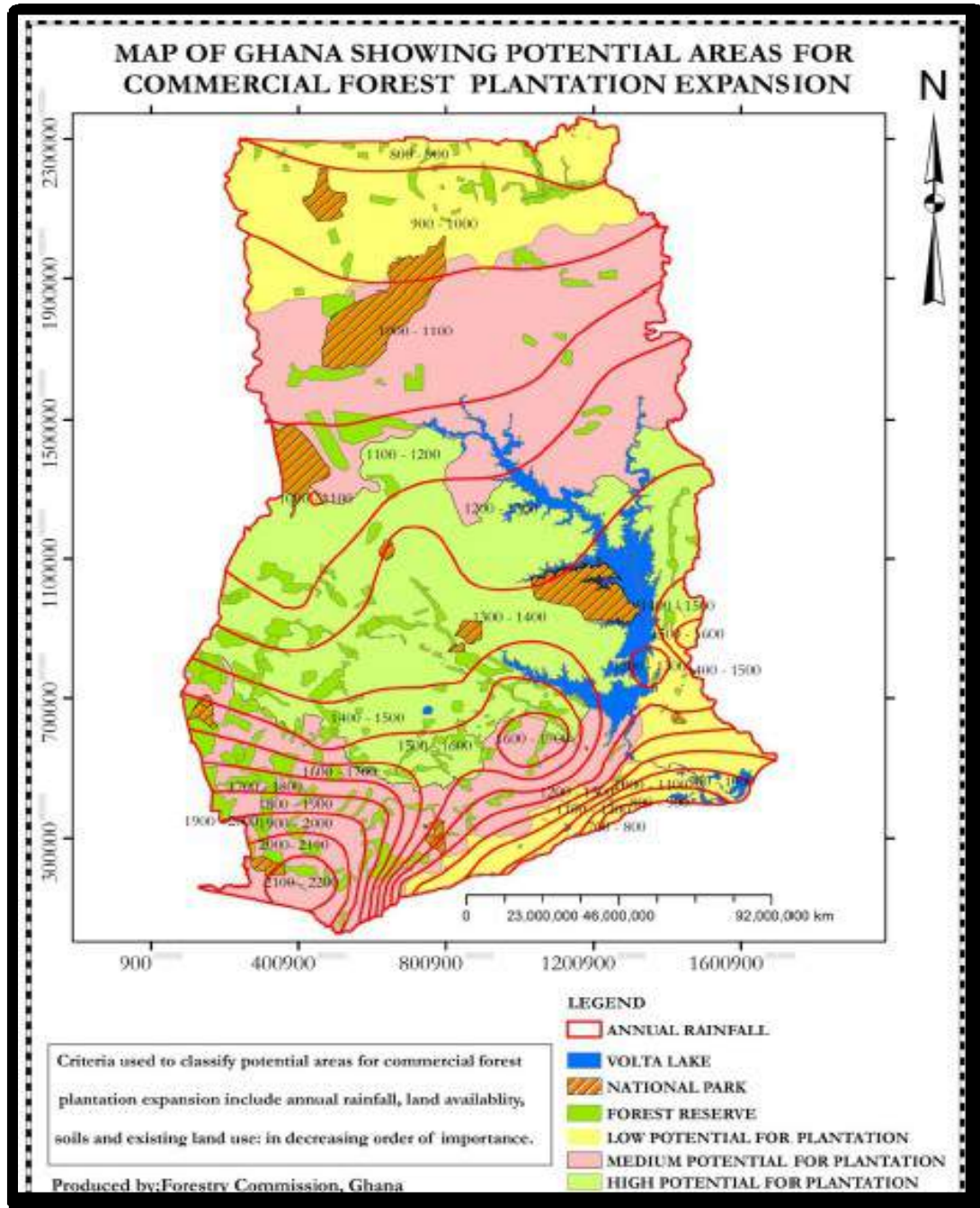
Over the period, an estimated 835 million seedlings will be required for establishing the 625,000 ha of forest plantations, an estimated 12 million seedlings for the 100,000 ha (approximately 800 compartments i.e. 40 compartments / year over 20 years) enrichment planting of poorly stocked forest reserves and 125 million seedlings for the trees-on-farm component making a total of 972 million tree seedlings over the strategy period. Based on a seedling production standard of 10,000 seedlings/ person/ year; an estimated 97,200 full time jobs will be created over the 25-year period from tree seedling production or an average of 3,888 full time jobs per year.

To ensure a level playing field, plantation development will be based on agreed (and certifiable) standards. The provision of grants and loans with concessionary rates and other tax incentives are also required. Plantations will have legally binding contracts detailing management plans, and agreements concerning the rights and obligations of all parties with regard to tree management and benefit sharing.

The strategic objectives for plantation development are:

- Establishment and management of planted forests through enrichment planting, and management of trees on farms,
- Promoting poverty reduction in rural communities through ensuring greater access to and benefits from plantation resources
- Promoting private sector investment in plantations
- Improving governance in the regulation and management of Ghana's forest plantations
- Improving financial support for plantation investment

Figure 6: Potential Plantation Development Sites



Source: FC, (2014).

Strategic Actions and Targets

Under the FDMP, forest plantation development would be executed by:

1. Establishment and management of 3.1 million ha of planted forests through direct planting, enrichment planting, and management of trees on farms by 2036.
 - The enrichment planting programme will aimed at enhancing the commercial productivity of a degraded forest. It will be undertaken where there is insufficient number of economically valuable trees in the natural stand. It accelerates the recovery of degraded forest with respect to its stocking, functions and resilience. Under this strategy, convalescence areas within forest reserves would be targeted.
 - The trees on farms (ToF) intervention are to optimize the productivity and sustainability of small holder farming systems by developing appropriate technologies that involve trees. This intervention will also provide technical support in the protection of agro-forestry systems from pests and diseases that affect the tree component and facilitating uptake of Conservation Agriculture (Climate Smart Agriculture) by smallholder farmers. An estimated 2 million seedlings of suitable tree species will be provided annually to farmers for incorporation into their farming systems.

Key actions to be implemented under this component include the following:

- Create land banks for forest plantation development on and off reserve,
- Promote integration of trees into farming systems,
- Procure improved seeds of selected exotic and indigenous tree species,
- Establish seed orchards (clonal and seedling) of improved cultivars of selected exotic and native timber tree species (500 ha),
- Maintain and tend seed orchards (existing and new)/ seed production areas,
- Develop protocols for mass production of selected genetically improved planting material,
- Establish and operate a biotechnology (tissue culture etc) laboratory and other facilities (vegetative propagation center),
- Establish and operate two (2) State-of-the-Art Central tree nurseries - 5 million seedlings capacity/ year,
- Review and consolidate existing forest plantation Manuals of Procedure (MoPs; A, B and C) and publish document for Enrichment Planting, wildfire management,
- Certificate and license forest plantation contractors and forest tree nurseries,
- Facilitate forest plantations management and chain of custody certification,
- Liaise with relevant institutions (i.e. Minerals Commission, Water Resources Commission, VRA, BPA, EPA etc.) to rehabilitate mined sites and reforest degraded watersheds etc. (target of 50,000 ha),
- Undertake coppice management and/or replanting of harvested coupes,
- Facilitate the enactment of policy/legislation to support ownership by farmers of planted trees on farms.

2. Promoting of poverty reduction in rural communities through greater access to and benefits from plantation resources by 2025. This would be achieved by
 - Recognizing tree ownership rights of farmers, and devolving management responsibilities to land and resource-owning communities,
 - Building the capacity of communities to co-manage plantations in forest reserves, through training programmes,
 - Strengthening Community Forestry Committees in forest reserves and off-reserve areas,
 - Developing social responsibility agreements (including benefit-sharing arrangements) for all plantation contracts, and
 - Designing and funding alternative livelihood opportunities and activities among forest dependent communities.
3. Review and develop incentive systems to support private sector and community member's investment in plantation development by 2035. Actions to be implemented will include:
 - Introducing public bidding for plantation rights (harvesting contracts),
 - Introducing land lease agreements and benefit-sharing agreements in reserve and off-reserve areas,
 - Promoting community-private sector partnerships,
 - Seeking technical and other assistance for contractors supplying technical support services in the private sector.
4. Review and improve governance in the regulation and management of Ghana's forest plantations by 2025. This will be done by:
 - Introducing public bidding for plantation harvesting contracts in existing FC plantations by 2017,
 - Introducing agreed (certifiable) plantation management standards, and independent management auditor to monitor performance, to ensure environmental and social requirements are met by 2018,
 - Improving policy analysis and advocacy capacity within the MLNR and FC to increase value of forest resources and share of resource owners by 2019,
 - Establishing a small specialist self-financing plantation division (or unit) within the FC, and providing adequate staffing and training, infrastructure and mobility particularly at a field level by 2020,
 - Adopting strategic and participatory management and planning processes for forest reserves by 2020,
 - Implementing the FC Service Charter with regard to plantations 2020.

5. Develop and improve the financial support for plantation investment by 2025 through:

- Reforming the forest plantation development fund (FPDF) to enable the fund to provide loans to community-private sector partnerships and commercial loans to medium and small-scale private investors (both at concessionary rates) and grants to farmers for small-scale plantations by 2018
- Seeking donor funding for small farmer and small scale community plantation grants by 2020
- Seeking innovative financial mechanisms and markets for forest environmental services to fund plantation programmes and rural livelihood programmes by 2020
- Supporting the private venture capital fund (PVCF) for larger scale plantation development by 2021.

Programme 2.2: Conservation and Enhancement of Carbon Stocks in Forest, and other Land uses, and support Climate Smart Agriculture

This programme seeks to develop agro-forest landscapes with the deciduous forest areas. It is a climate mitigation strategy to draw direct linkages with programmes under biodiversity, as well as climate change adaptation. It seeks to enhance and articulate complementary support from the sustainable forest management (SFM) program to generate multiple benefits. The strategy for LULUCF and agriculture will support projects that are designed to be adequate in scale and scope to mitigate climate change with additional attention to address leakage. Projects supported by this Program will be expected to address the root causes of forest carbon emission reductions and emissions from agricultural practices. Within such focus, the plan may also be used to address mitigation potential within the context of food security projects, and to strengthen and improve the MRV of the GHG emissions and carbon sequestration.

The FDMP will support robust climate change mitigation activities complementing sustainable forest management activities in order to integrate carbon consideration into forest management, and identification and monitoring of high carbon value forests. The SFM program may also contribute towards the sustainability of mitigation efforts in the forest sector by:

- Supporting efforts to diversify livelihoods and building capacity for improved forest management.
- Support protection of carbon reservoirs and adopt technologically viable measures to restore carbon sink.
- Focus on management practices in agriculture including Climate smart agriculture (CSA) initiatives that include mitigation objectives and activities recognizing a wide array of opportunities in the agricultural sector to reduce GHG emissions.
- Promote soil management practices, improved fertilizing methods, and precision agriculture measures to maintain soil quality and reduce N₂O emissions. CH₄ emission
- Promote improved livestock management, and improved wetland rice production.

Strategic Actions and Targets

The actions to be pursued under the FDMP are to:

- Continuously review of tree tenure through pragmatic measures and policy and legal reforms to contribute to the development of regimes on tree tenure and carbon rights by 2020.
- Address and remove the barriers for small-land owners, farmers and local communities to conserve and replant trees (especially on farm) by 2020;
- Operationalize the draft forest plantation and investment policy taking advantage of the Tree Crops Policy of the Ministry of Food and Agriculture (MoFA) by 2020
- Create an enabling investment environment that could foster the rehabilitation of degraded forest and the development of plantations by the private sector by 2020;
- Enhance the CREMA concept, to create incentives for farmers and land owners to retain naturally occurring trees on farms as well as forest in the off reserve landscape by 2020.

Programme 2.3 Support Forest Management Certification

In pursuing sustainable forest management, the FDMP will support the adoption of forest certification by the timber industry. The plan will seek to do the following:

- Provide technical support timber industry operators to adopt forest certification by 2025;
- Review and provide incentive packages to support the industry to move towards forest management certification by 2020;
- Support the application of the standards to all forest plantation development by 2022.

Programme 2.4 Wildfire Management

An assessment of Ghana's vulnerability to climate change indicated that carbon dioxide (CO₂) accounted for the largest share of Ghana's greenhouse gas emissions (EPA, 2012). The increasing levels of CO₂ were principally attributed to the removal of woody biomass stock and emissions from fuel combustion which is basically as a result of uncontrolled annual wildfires. The cumulative effect of increasing levels of CO₂ has been temperature rise, decreased precipitation and rise in sea levels. From the scenario build up if the current trends continue business as usual then within the next decade, will witness annual temperature rise by 2.5°C whilst annual rainfall will decrease by 170 mm. This will lead to a decrease in the yield of maize from 0.5% to 6.9% in the transitional zone and thereby undermine food security in the country and worsen poverty.

The focus of this programme therefore is to;

- Ensure effective and efficient prevention and control of wildfires,
- Encourage the adoption of alternative resource management systems that will minimise the occurrence of fire,
- Develop the necessary structures and systems which will ensure stakeholder

- participation in wildfire management,
- Promote user-focused research in wildfire management.

Strategic Actions and Targets

The recommended actions under this programme are to:

- Develop and promote integrated wildfire prevention and control practices based on appropriate technologies and systems by 2020.

The proposed actions are:

- Mainstream wildfire prevention and control issues in resource management planning at all levels by relevant institutions;
 - Initiate and promote conservation agriculture within forest fringe communities and ecologically sensitive areas;
 - Promote effective communication strategies, training and environmental education to sustain public awareness ;
 - Promote inter-agency coordination, cooperation and networking at international, national, district, and community ;
 - Develop adequate infrastructure and manpower to support wildfire prevention and control at all levels;
 - Introduce and promote Fire Danger Rating Systems to provide signals on potential for wildfire occurrences within the country;
 - Introduce and promote appropriate fuel treatment procedures and technologies to reduce combustible residue in the environment;
 - Disseminate and enforce decentralised regulatory measures on prescribed burning in farmlands and non-farmlands;
 - Enhance participation of communities and environmental groups in planning, implementation, monitoring and evaluation of wildfire prevention and control activities;
 - Empower and supporting Traditional Authorities, and District Assemblies to take the responsibility of managing and coordinating wildfire issues;
 - Involve women and other vulnerable groups at all levels in wildfire prevention and control programmes in the country;
 - Promote indigenous knowledge and systems of wildfire prevention and control.
- Promote alternative resource management systems by 2025.
In achieving this target, it is recommended that alternative sustainable resource management systems that will minimise the occurrence of wildfires should be put in place as follows:
 - Encourage agro-forestry, enrichment planting, enhanced natural regeneration and reforestation;
 - Promote sustainable rural enterprises such as snail farming, apiculture, ecotourism, domestication of wildlife, mushroom farming, and herb gardens;
 - Support the development of the capacities of local people in the management of common property natural resources such as communal forests and grazing lands as well as key sites in pastoral land use system;

- Support the adoption of improved and sustainable methods of wood carbonisation for the commercial production of charcoal.
- Develop the necessary structures and systems which will ensure stakeholder participation in wildfire management by 2020.

Sustaining wildfire prevention and control system will be pursued by developing the appropriate traditional structures and systems which will allow the full involvement of all stakeholders in decision-making, resource mobilization and implementation of wildfire programmes.

The following strategies would be pursued:

- Institutionalisation of participatory approaches in wildfire management at all levels and empowering traditional authorities and community leaders to take full responsibility for the control and prevent of wildfires at community and village levels.
 - Development of appropriate capacities of all stakeholders in wildfire management
 - Establishment of a National Wildfire Management Fund and a District-based insurance scheme to ensure sustainable participation of all stakeholders in wildfire management activities at all levels.
 - Institution of a reward scheme for communities, individuals and institutions that distinguish themselves in wildfire management.
 - Periodic review and amendment of laws and regulations on wildfire to introduce appropriate sanctions.
 - Ensuring that basic schools, Agriculture and Forestry Institutions of higher learning incorporate courses in wildfire management in academic curricula.
 - Promoting and sustaining public awareness, training and environmental education campaigns at all levels of governance to prevent wildfires particularly communities in high to medium fire risk areas.
- Promote User-Focused Research in Wildfire Management by 2020

Promoting user-focused research in wildfire management will include;

- Resourcing research institutions and other relevant bodies to conduct basic and adaptive research on wildfire management.
- Promoting effective collaboration and coordination amongst relevant local and international research institutions and other bodies
- Collation and dissemination of relevant research findings to appropriate institutions and stakeholders for adoption.

COMPONENT 3: DEVELOPMENT OF FOREST AND WILDLIFE BASED INDUSTRIES

Background

The forest and wildlife industry is dominated by sawmilling, tertiary wood processing, and processing of bush meat and other non-timber forest products. In general there are 84 sawmills and 12 companies with plywood capacity in the formal sector, directly employing about 120,000 people (TIDD, 2013). In the informal sector, however, a wide mix of actors and rural households depend on forest resources for their livelihoods, ranging from micro/small scale carpentry, hunting, illegal chain-saw operations, and fuelwood collection to the gathering and commercialisation of diverse non-timber forest products (NTFPs). It is estimated that about 11 million people live in forest areas of which about 67 per cent of their livelihoods are supported by forest-based enterprises (Birikorang and Rhein 2005).

The forest and wildlife based industry is experiencing dwindling raw material base, low value-added processing of timber, low morale of forestry staff and low performance. There is also distress in the secondary and tertiary levels of operation. The processing mills on the whole are constrained by limited supply of timber and range of species from the natural forest. Illegal logging continues to thrive and appears to be beyond solution. The timber industry has experienced over-capacity and low production yields irrespective of the applications of efficient processing methods and the use of appropriate machinery suited to the sizes of materials available

The main goal of the timber industry development programme is to promote the establishment of a modernized efficient timber and non-timber forest products' industry that will maximize the forest and wildlife resources. The plan seeks to develop a viable forest and wildlife based industries particularly in the down-stream processing and non-timber forest products to fully utilize timber and wildlife resources to satisfy domestic and international demand for competitively-priced quality products.

The strategic objectives of this programme are to facilitate the technological improvements and retooling of the timber industries to increase competitiveness; reduce waste and promote value-addition through high quality secondary and tertiary processing. In pursuance of this, the FDMP will;

- Set up standards and regulations to govern the operations of the small and medium scale forest enterprises including the development of the informal wood sector by 2020.
- Enact the necessary legislation to regulate the production and trade of legal/ (sustainable) lumber whilst promoting the development of the domestic wood market by 2018.
- Support specialized training and craftsmanship schemes for wood processing, bamboo, rubber wood, cane and rattan and lesser-known tree and NTFP species as a means of reducing reliance on chainsaw lumber by 2025.

- Develop a public procurement policy on timber and timber product for the domestic market by 2020
- Modernize and improve on wood processing efficiencies by 2025,
- Promote the marketing and export development of the non-timber products by 2030
- Develop the domestic wood market by 2025,
- Ensure sustainable supply of round logs to meet the installed capacity of the timber industry to build capacities within the timber industry and initiate policy and institutional reforms by 2035.

The FDMP will facilitate the setting up and development of funding initiatives to support the retooling and technological improvements in the tertiary wood sector to improve on efficiency. The programme outputs envisaged under this component include:

Programme 3.1: Development of Viable Forest Industries

The FDMP will support the establishment of a modern efficient timber industry where 60 per cent of the processing activities would be tertiary with secondary and primary taking 30 and 10 per cent respectively. The plan will seek to modernize forest based livelihood enterprises to maximize the forest and wildlife resources as a balance between the industrial capacity and the sustainability of the resource and contribute significantly to wellbeing of the rural dwellers.

Strategic Actions and Targets

The FDMP seeks to:

- Support the modernization of the tertiary wood industries and promote value addition through research, application of modern technologies, retooling, retraining, and standardization and providing access to credit so as to achieve 60 per cent tertiary wood processing in Ghana by 2030;
- Facilitate the setting up and development of national timber industry development fund to support the retooling and technological improvements in the tertiary wood sector to improve on efficiency by 2025;
- Support specialized training and craftsmanship schemes for wood processing, bamboo, rubber wood, cane and rattan and lesser-known tree and NTFP species as a means of reducing reliance on chainsaw lumber by 2020;
- Enact the necessary legislation to regulate the production and trade of legal/ (sustainable) lumber whilst promoting the development of the domestic wood market by 2020;
- Develop standards and regulations to govern the operations of the small and medium scale forest enterprises including the development of the informal wood sector by 2020;
- Support and regulate trade of legal wildlife based industries including bush-meat, and commercial breeding (domestication) of wildlife in heavy demand for export and domestic markets by 2025.

Programme 3.2: Improving Wood Processing Efficiencies

In promoting value adding strategy, the plan seeks to achieve high export earnings and strong market positioning. The plan will therefore support suppliers of wood working machines and machine tooling to set up service and support centers to support the timber industry. Support would be given to suppliers of quality machinery, modeling after leading tropical timber producing countries like Brazil, Indonesia, and Malaysia. The plan will encourage the importation and installation of high quality machinery.

Strategic Actions and Targets

In pursuing the wood processing efficiency programme the plan seeks to achieve the following results:

- Develop incentive systems to support the re-tooling of industry to ensure that the maximum yields and revenue streams can be realized from timber resources by 2025.
- Support the development of regional wood clusters to reduce operational and transactional costs in the secondary and tertiary processing sector by 2025. Lessons from previously established wood clusters (Nkinkase Wood Cluster) could serve as a model for refinement and further development.
- Develop collaborative relationships between the timber industry, universities and research/technical organizations including Forest Research Institute of Ghana (FORIG) Council for Scientific and Industrial Research (CSIR) and Wood Industry Training Centre (WITC) by 2020.
- Increase the use of lesser known species and plantations and test regimes to validate research findings by 2020 (product trials are of extreme importance to facilitate uptake and use of lesser known species).
- Support the training of personnel in Quality and Environmental Management Systems to improve timber operations and move to a more value added “right first time” processing culture by 2025.
- Strengthen and improve industry competitiveness in order to secure new markets while protecting the existing ones by 2025.
- Encourage the adoption of innovation and technology to become more competitive in both local and international markets by 2025.

Programme 3.3: Wood Marketing, Export Development and Trade Promotion

In responding to the demands under the FLEGT/VPA, the plan will first ensure that the illegal timber operations are minimized to the barest minimum by 2020. This will be done by leveraging the Wood Tracking System.

Strategic Actions and Targets

The FDMP seeks to achieve the following:

- Develop a well-structured marketing strategy that will link supply, product quality, environmental requirement, and pricing by 2020.
- Adopt cluster and niche marketing approaches by adopting a cluster marketing approach for many of Ghana’s small timber processors; especially those in the tertiary sector by 2020.
- Develop the capacity of the domestic wood sector through the development of standards, re-tooling, training, marketing and branding of SME products by 2025.
- Promote the development of new products by applying modern technologies and promoting the technological development and regional clustering of SME’s in the domestic market by 2030.

Programme 3.4: Domestic Wood Market Development

The domestic wood market is becoming increasingly important with increased demand for timber emanating from both local and regional markets (ECOWAS). This demand is dictated by the growth in the house building and construction sectors and construction activities in overland countries. It is reported that the domestic market is utilizing over 70 species of timber and the sector is dominated by carpenters, overland exporters, building contracting firms, small joinery firms, private contractors, and chain saw operators. The annual demand of the local market is projected to be between 756,815 m³ - 1 million m³.

Strategic Actions and Targets

In developing the domestic market, the following activities would be pursued:

- Promote sustainable supply of raw material by 2030 through;
- Research and dissemination of commercially available secondary and lesser known species by 2020;
- Encouraging increased harvesting yields from coupes that will encourage legal timber operators to fell and supply species not required by these operators into a central timber resource pool by 2020.

By removing this extra “unnecessary” timber from the forests, this strategy can mitigate the impact of illegal chain saw operators on the forests; who would otherwise target these species to supply the illegal trade. The “unnecessary” timber can then be channeled or allocated to TIDD registered domestic tertiary processors in the domestic market or alternatively be traded on a web-based trading platform accessible to tertiary processors keen on value added production for both local and international markets. This could contribute to increasing the amount of timber supplied by legal operators to the domestic market; but in a more regulated manner. Such assurances of support are critical to future investments in value added processing in the timber industry.

- Supporting plantation development targeting the domestic market by 2020.
- Limiting the export of lumber through fiscal policies by 2020

2. Development and enforcement of standards and specifications by 2020.

Stronger collaboration is required between TIDD and Ghana Standard Authority (GSA) to develop standards for timber products in line with international best practice. Once standards have been developed and gazetted, there will be a need to ensure that standards are enforced by the relevant authorities, especially in the house building and construction sector. This means that the TIDD will have to develop a strong technical development team to engage value-adding processors to assess product quality and provide vital technical information to a proposed timber standards development committee. It also means developing mechanism of disseminating the gazetted standards to the industry and other players in the value chain.

3. Reducing price distortions by 2020.

The variance that exists between export and import prices is a function of costs, supply and demand and profit maximization opportunities. To minimize the price distortions requires:

- Security of long term domestic timber supply to justify investments in value added processing;
- A vibrant secondary and tertiary processing industry which produces more value-added products from a narrow but focused group of commercially available secondary and lesser known timber species;
- Increased participation of the tertiary processing sector in export markets;
- Strengthening the technical capacity of personnel in value added operations;
- Adoption, application and enforcement of quality and specification standards for timber products in key sectors by all stakeholders – house builders, architects, specifiers, government procurement offices, local and municipal authorities, town and country planning agencies etc.

4. Facilitating small and medium wood enterprises to have access to investment capital for value addition by 2020.

Programme 3.5 Capacity Building and Institutional Reform

In every transformational and development initiative, capacity development is an essential component to ensure that the appropriate skills, experiences and best practice are brought to bear in the industry.

Strategic Actions and Targets

In pursuing this programme, the following strategic actions and targets would be pursued:

- Develop industry training partnerships with educational institutions both at diploma and tertiary level to help provide a pool of skilled workers available to the industry by 2020. This collaboration should also extend to international training and development institutions capable of supporting industry with the latest training and international best practices
- Develop specific curriculum for identified training institutions to help provide the requisite training to the artisans.
- Support training of wood clusters with a focus on value added processing for the domestic and export markets by 2021.
- Initiate capacity building and reform of forest agencies by 2020.

The development of a national strategy towards value added processing requires support to forest agencies through;

- Building the capacity of regulatory forest agencies to monitor and enforce policies and regulations pertaining to the timber industry by 2020.
- Providing adequate funding and human resources to assist forest agencies develop proactive initiatives to support industry by 2022.
- Strengthening technical co-operation and collaboration between key forest agencies (TIDD, FCTC, RMSC and FSD) and other government agencies – Management and productivity Institute (MDPI), Ghana Standard Authority (GSA), Council for Scientific and Industrial Research (CSIR), and Forest Research Institute of Ghana (FORIG) by 2025.
- Strengthening collaboration between key forest support agencies and the industry by 2020.
- Support specialized training and craftsmanship schemes for wood processing, bamboo, rubber wood, cane and rattan and lesser-known tree and non-timber forest products by 2025.

Programme 3.6: Development of the Wildlife Based Industries

In supporting the development of the wildlife based industries, the FDMP will seek to build partnerships to promote the development of the wildlife based industries. It will enforce the ban on hunting and capturing of all protected wildlife species in Ghana whilst re-establishing the control over bush meat hunting to bring these activities to a sustainable level.

Strategic Actions and Targets

In pursuance of these objectives, the following strategic actions and targets would be implemented;

- Develop incentive systems through legislative instrument to promote training/capacity development for the development of the bushmeat industry by 2025;
- Initiate collaboration with stakeholders in implementing programmes and liaising between government and rural people by intensifying the national awareness campaign about bush-meat and hunting issues by 2020;
- Develop incentive systems to support investments in commercial captive breeding (domestication) of wildlife in heavy demand for export and domestic markets by 2025;
- Enact legislation to enhance small and medium forest and wildlife enterprises and support trade in legal trade in wildlife in heavy demand for export and domestic markets by 2020.
- Enhance and establish more CREMAs to encourage more wildlife production.

Programme 3.7 Development of Viable Ecotourism Sites

Ghana has a number of ecotourism sites that need to be developed to enable tourism to become the number one foreign exchange earner in the country. The Wildlife Division will seek for technical and financial to support the private sector to develop the ecotourism sites indicated in Table 20. In addition, the FDMP will collaborate with communities, metropolitan, municipal, and district assemblies to identify more tourist sites for development.

Table 20 - Ecotourism Sites to be Developed

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
Kalakpa	Animal viewing, hiking, mountain trails	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
Duasidan monkey sanctuary	Mona monkeys, Black and White Colobus monkeys	Brong Ahafo
Bui	Pigmy hippos, canoeing	Brong Ahafo
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
Zukupri heritage conservation site	Watching hippo populations from a canoe on the Black Volta river, bird watching, mountain hiking	Upper West
Bobiri 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 species of birds and a butterfly sanctuary	Eastern
Domama	Cave, bats	Central
Nzulenzu	Unique wetland ecosystem, stilt village	Western
Bia	Elephants, chimpanzees	Western

COMPONENT 4: MECHANISMS FOR TRANSPARENT GOVERNANCE, EQUITY, AND CIVIL SOCIETY PARTICIPATION IN FORESTRY DEVELOPMENT

Background

Transparent governance is seen as a central requirement of the forestry development master plan. Steps will be taken to establish and strengthen the leadership and oversight functions of major stakeholders in order to ensure effective implementation of planned activities for poverty reduction. Communication between civil society, traditional authority and all branches of government will be institutionalised as a means of strengthening public policy management. The main purpose of this intervention is to ensure that no Ghanaian is excluded from participation in forest resource governance, from protection of their civil rights, from the pursuit of freedom and justice under the banner of the rule of law.

The main goal of this intervention is to promote transparent governance for the sustainable management of forest, wildlife and savannah resources. The objective is to institutionalize transparency, equity and legalize public participation in sustainable forest and wildlife resources management at all levels of governance.

Programme 4.1: Promoting and Developing Institutional and Legislative Reforms for Transparent Governance, Equity Sharing and Peoples Participation in Forest and Wildlife Resource Management

The current collaborative approach involves consultation, needs assessment, investigation, synthesis, and consensus building aimed at ensuring equity and the fair distribution of benefits and efficiency in the execution of forest management prescriptions. Accordingly the FDMP proposes policy changes needed to create an enabling environment for effective private sector led growth and civil society participation. The plan will aimed at removing bureaucratic restrictions and promoting positive attitudes towards transparent governance.

In order to realize the objectives outlined above the FDMP will focus on ensuring:

- Establish and document clear roles and responsibilities of all stakeholders
- Timely access to justice for all;
- Transparency of government decision making;
- Accountability and zero tolerance for corruption in both public and private sectors;
- Public participation in decision making;
- Decentralization of responsibilities;
- Observance of both rights and responsibilities; and
- Discipline and observance of laws, rules, regulations in both public and private sectors of the society.

The Collaborative Forest Management (CFM) approach will adopt the learning-up process, which concentrates on devising effective strategies at the conceptual stages, reviewing the

effective phase to make it more efficient and finally expanding the lessons learnt to cover the target area. Consultations will be done at both the strategic and operational levels of forest and wildlife management. Sadly, there are no legislative supports for the collaborative forest management practices. There is the need to develop legislative instruments to guide collaborative management practices.

Programme 4.2: Transparency, Equity and Legalized Public Participation in Sustainable Forest and Wildlife Resources Management Instituted

The FDMP will promote the enactment of the necessary legislation and regulations to facilitate and enhance local participation and control through decentralization of forestry operations at the district level. In pursuance of this, the plan will:

- Develop sustainable institutional frameworks for effective participation of key stakeholders in forest and wildlife resource management and governance.
- Enact the legislations that will enable communities and individuals to benefit from trees on their farms and fallow lands, provide off-reserve tree tenure security, authority to legally dispose of resources and allocate greater proportion of benefits accruing from resource management to community members individually or collectively.
- Establish and make accessible a stable source of financial support for building capacity and attitudinal changes of community institutions.
- Support local communities and Non-Governmental Organizations including women and youth to receive training that will allow them to meet their objective and assume optimal management responsibilities.

The FDMP will enact legislation to support the allocation of all timber resources (and other natural resources where appropriate) through transparent competitive bidding and continuous auditing of the forest utilization operations to ensure compliance with forest management specification and environmental protection standards. Efforts will be put in place to:

- Ensure increased institutional transparency, consistency, and credibility so as to foster responsiveness, accountability and the rule of law in forest and wildlife resource management.
- Allocate and define property rights (land and tree tenure rights, intellectual property rights), and rules that define permissible and non-permissible forms of cooperation and competition (licensing laws, laws of contract and liability, company and cooperative laws, anti-trust laws);
- Rationalize forest fees and taxation systems and improvement of the framework for apportioning, recovering and distributing equitably and effectively forest rent (royalties) between the resource owners, state and the users of the resources through consultative processes.

- Build partnerships for the effective collection of stumpage, fees and taxes as by law defined.
- Set up improved tracking system for exploited forest products (forest, wood fuels, wildlife, biodiversity, medicinal plants, and other non-timber forest products) to establish legal origin of these products.
- Define forest and tree tenure rights in all kinds of forests and ownership systems.

Strategic Actions and Targets

The actions and targets under the plan are to:

- Enact the necessary legislation and regulations to facilitate and enhance local participation and control through decentralization of forestry operations at the district level by 2020.
- Enact legislation to support the allocation of all timber resources (and other natural resources where appropriate) through transparent competitive bidding and continuous auditing of the forest utilization operations to ensure compliance with forest management specification and environmental protection standards by 2020.
- Conduct the feasibility of decentralizing some of the Forestry Commission functions in the management and utilization of off-reserve forest resources to all levels of governance by 2025
- Support the effective and efficient engagement of forest forum in forest governance by 2025.

Programme 4.3: Legislation to Support the Allocation of all Timber Resources (and other Natural Resources where appropriate) enacted

A legislation to support transparent competitive bidding and continuous auditing of the forest utilization operations to ensure compliance with forest management specification and environmental protection standards would be enacted to support forestry development. .

Strategic Actions and Targets

In pursuance of this the strategic actions and targets to be financed will be to:

- Enact a legislative instrument to support increased institutional transparency, consistency, and credibility so as to foster responsiveness, accountability and the rule of law in forest and wildlife resource management by 2020;
- Enact legislations to allocate and define property rights (land and tree tenure rights, intellectual property rights), and rules that define permissible and non-permissible forms of cooperation and competition (licensing laws, laws of contract and liability, company and cooperative laws, anti-trust laws) y 2025;

- Support the enactment of legislation to rationalize forest fees and taxation systems and improvement of the framework for apportioning, recovering and distributing equitably and effectively forest rent (royalties) between the resource owners, state and the users of the resources through consultative processes by 2020;
- Develop collaboration and build partnerships for the effective collection of stumpage, fees and taxes as by law defined by 2018;
- Review and set up improved tracking system for exploited forest products (forest, wood fuels, wildlife, biodiversity, medicinal plants, and other non-timber forest products) to establish legal origin of these products by 2025;
- Support the process of defining forest and tree tenure rights in all kinds of forests and ownership systems by 2020.

COMPONENT 5: RESEARCH AND TRAINING

Research and training are the twin pillars for sustainable forestry development. Given the emerging importance of environmental services and participatory governance, there is the need to strengthen capacity in resource economics, policy impact analysis, and genetic engineering in addition to the traditional disciplines relevant for sustainable forest management. Forestry research and education will be in line with national priorities and development programmes whilst taking advantage of emerging global technologies.

Conservation education will seek to:

- i) Increase peoples' awareness of the value of natural resources now and in the future,
- ii) Show people what threatens the well-being of their environment and how they can contribute to its improved management,
- iii) Motivate them to change their behavior/attitude in a way that leads to improved environmental management

Programme 5.1: Training, Research, and Technology Development that Supports Sustainable Forest Management

The purpose of promoting training, research, and technological development is to support the uptake and dissemination of information built on indigenous and scientific knowledge to improve on the management of forest and wildlife resources. The FDMP will upgrade the infrastructure for research, education and training at all levels of management in the forest and savannah ecosystems.

Strategic Actions and Targets

In pursuance of this, the plan will:

- Encourage institutions of higher learning and corporate bodies to integrate indigenous and scientific knowledge in forest and wildlife management by 2020;

- Promote targeted research in forest and wildlife issues and support the publication and dissemination of results to increase awareness by 2025;
- Update forest information database to monitor sustainable forest management and establish forest and wildlife research funds which research and academic institutions, as well as civil society can access by 2020;
- Build national capacity for accurate accounting and timely collection of resource production and utilization of data to be linked up with macro-economic information by 2025;
- Support the development of research infrastructure for the savannah ecosystem 2020;
- Promote cross-sectoral institutional collaboration to generate and share information to improve forest policy and management 2025;
- Set up a new savannah woodland development research institute in Tamale to undertake in new research activities in savannah woodland management 2020.

Programme 5.2: Increase Public Education and Create Awareness on the Value and Multiple Uses and Benefits of Forests

The FDMP will initiate steps to intensify public education on the links between natural resources, over-exploitation, environmental degradation, and community poverty. In pursuing this strategy, the plan will:

- Build capacities of communities, including the youth and women, to enhance their participation in sustainable resource management.
- Disseminate information on forestry events, issues and trends to allow informed participation by the wider public as well as the forest fringe communities.
- Provide advisory services through a dynamic forestry extension service to promote social acceptance of forestry.

Strategic Actions and Targets

The actions and targets to be financed under the plan will be to:

- Set up functional education unit under the FC equipped to increase public education to link natural resources, over-exploitation, environmental degradation, and community poverty by 2025.
- Initiate steps to intensify public education on the links between natural resources, over-exploitation, environmental degradation, and community poverty by 2025.

Programme 5.3: Support Research and Development to Enhance Efficiency in the Wildlife Industries

The FDMP will set up a support system to promote research in wildlife trade. The plan will support research into how to produce, package, brand and market wildlife products in the domestic and international markets by 2025. This will be a private sector led activity which will be supported technically by the Wildlife Division.

COMPONENT 6: FINANCIAL MOBILIZATION AND INCENTIVES FOR FORESTRY DEVELOPMENT

The forestry sector sources of financing traditionally include Government of Ghana (GoG) budgetary allocation, Internally Generated Funds (IGF), Plantation and Projects, and Grants from donors. The IGF consist of Stumpage Fees, Export Levy, Timber right fees, fees, and royalties, among others. Loans also constitute an additional source of financing for the sector.

The trends in the flow of funds to the forestry sector since 2007 is summarized in Table 21. About two-thirds of the forestry expenditure is currently financed from the GoG subventions. During the period between 2007 and 2012, the share of GoG financing of forestry activities increased from 18.9 percent to 63.1 percent. However, the IGF which used to be the highest source of financing for the Forestry Commission declined from 40.2 percent to 16.7 percent over the same period. There is also indication of donor support for the sector dwindling as the share of Plantation Development Grant to the Commission's income declined from 26 percent to 12 percent while recurrent grant from donor agencies also declined from about 15 percent to about 8 per cent over the period.

Table 21: Sources of Finance for the FC (GH¢)

Income	2007	2008	2009	2010	2011	2012	2013
Subvention from GoG	6,941,477	10,329,686	39,486,647	39,946,223	48,716,070	73,429,790	52,834,946
Internally Generated Funds (I. G. F)	14,758,300	16,229,858	9,076,371	13,115,630	12,771,979	19,446,397	25,002,662
Plantation Development Grant	9,532,953	10,559,714	9,348,366	14,760,311	6,599,137	13,917,242	0
Recurrent Grant from Donor Agencies	5,479,614	5,869,986	1,218,067	1,867,688	93,184	9,591,351	17,532,924
Total	36,712,344	42,989,244	59,129,451	69,689,852	68,180,370	116,384,780	95,370,532
Of which NREG		16,847,397	17976726	23654764	6,000,000		9000000

Source: Forestry Commission (2014) cited in Econoecon, (2015)

Due to the dwindling nature of financial flow in the forestry sector (Table 21), Ghana has begun to invest in improving financial sustainability of the forestry sector funding through the ENREG. However, the sector-wide funding gaps remain at the sub-sectoral levels especially in wildlife and savannah woodland management. Restricted government budgets coupled with irregular flow of international development funds have reduced the financial support for protected area management and sector programmes are chronically underfunded and understaffed. Thus, new financing strategies for forestry sector activities are critical to reduce existing funding gaps and improve management. Furthermore, protected area agencies and administrations are often ill-equipped to respond to the commercial opportunities that protected areas provide through the sustainable use of biodiversity. Hence targeted capacity building is also required in financial mobilization.

Programme 6.1: Financial Mobilization and Incentives for Protected Area Development

The forestry sector has made considerable progress in securing grant funding from the Forest Investment Programme (FIP) and REDD + the application of the financial strategy has been uneven to systematically close the financing gap in the sector and to ensure that increased revenues are being directed towards more effective management of globally significant habitat. Therefore, under the FDMP, support to improving protected area financial sustainability and effective management will be explicitly directed towards globally significant protected areas within the national system. Projects will identify the protected areas to which increased funding will be directed to improve management.

The FDMP strategy prioritizes the development and implementation of comprehensive, sector-level financing solutions. The plan will focus developing business plans and strategy developments for Protected Area management with minimal project resources. Much time and efforts would be dedicated to actual implementation of the financing strategies. In addition, the plan will use tools and revenue mechanisms like conservation trust funds, systems of payments for environmental services, debt-for-nature swaps, economic valuation of protected area goods and services, and access and benefit sharing agreements. The plan will also encourage national policy reform and incentives to engage the private sector (concessions, private reserves, etc.) and other stakeholders to improve protected area financial sustainability and management.

Strategic Actions and Targets

In developing sustainable and predictable financing mechanism to support forestry sector activities, the following actions would be pursued:

- Set up national revenue mechanisms including conservation trust funds, systems of payments for environmental services, debt-for-nature swaps, economic valuation of protected area goods and services, access and benefit sharing agreements by 2025;
- Set up a fund board to manage grants and trust funds as flexible source of funding for (i) communities in support of establishing Community Resource Management Areas (CREMAs), dedicated forests and similar opportunities and (ii) advocacy organizations that hold government more accountable by 2025.
- Formulate and implement national policy reform and incentives to engage the private sector (concessions, private reserves, etc.) and other stakeholders to improve protected area financial sustainability and management by 2025.
- Conduct a strategic review of forest regulations and the operations of the Forestry Commission that will cede out some the current public sector activities that the private sector has the comparative advantage by 2025.

Programme 6.2: Financing Plantation Development

The timber industry is very reliant on the availability of raw materials from the natural forests. However, with the dwindling levels of natural forest resources, there is an unquestionable need to take long term strategic investments in developing plantations. Unfortunately, the plantations developed by governments over the last 20 years have not yielded the desired results for a variety of reasons. Consequently, their contribution to improving the raw material supply situation has been very limited. There is therefore a need for government to make plantation investments attractive for private/public plantation partnerships to flourish in the sector.

Under FDMP, efforts would be made through legislative instrument to establish incentive schemes to support the establishment of plantation development fund. Tax holidays up to 10 years would be established for companies investing in plantation development subject to a minimum area of hectares to be planted on a sustainable basis. Specific government budgetary allocations would be made continuously up to 10 years to establish a plantation development fund to be managed by a national export and import bank to offer loans to plantation developers at concessionary interest rates. Other sources of the funds would be levies on wood consumption and polluter-pays policy.

Strategic Actions and Targets

A special 10-year incentive package (including access to land bank, tax holidays and access to credit) initiated to support timber plantation development by 2020.

Programme 6.3 Industry Specific Support Incentives

Strategic Action and Target

A legislative instrument would be enacted by 2020 to establish industry specific fund based on taxes from the export of wood. The following Incentive systems would be put in place:

- Tax allowances on investments in plant and machinery
- Exemption from import duties on plant and machinery
- Lease financing mechanisms for plant and machinery
- Funding support for retooling of industry
- Incentives for research and development activities
- Tax allowances for wood clusters meeting spatial distribution objectives of the government
- Matching grants for SME's export development initiatives
- Double deduction tax incentives for marketing development expenses to break into international markets.
- Soft loans for factory location/relocation to meet national spatial distribution and free zones policies.
- Skills development grants

A special 10-year timber and wood processing industry development incentive systems formulated and enacted by 2020.

Programme 6.4 Improving Revenues through Payment for Ecosystem Services (PES)

With declining timber and non-timber forest resources and the consequent reduction in IGF, one area that the FC could focus to increase revenues is the (PES). Payments for Ecosystem Services are incentives offered to landowners and resource users, including farmers, in exchange for managing their land to provide some sort of ecological service. One can describe PES as a transparent system for the provision of environmental services through conditional payments to voluntary providers that promote the conservation of natural resources.

The potential ecosystem services in the forestry sector are Biodiversity conservation and Eco-tourism services. The potentials for PES to generate considerable benefits in the forestry sector have been assessed by Hamilton Resources and Consulting and IUCN (2014). Specifically, estimates of PES was made for forest reserves and surrounding communities in the Wassa-Amenfi-Central District in the Western Region where investments in Globally Significant Biodiversity Areas, eco-tourism and resource development was modeled and the Atewa Range Forest Reserve in the Kwaebibirim District in the Eastern Region where a market potential for water provision as an ecosystem service was assessed and its economic value determined using Rapid Appraisals, focus group discussions, interviews with farmers, opinion leaders ordinary community members and forestry experts in the area, districts and regions.

Results of the analysis suggest that PES markets in the area have the potential to sustainably generate about US\$2,700 per hectare annually in forest benefits. The potential forest rent estimated are close to US\$800 per hectare or 30 per cent of the potential forest benefit. The report further estimates that this potential benefits is about 16 percent in excess of the optimal forest tax that could have been collected from a legal timber harvest level in 2005 or twelve times the current stumpage fees collectable from a 100 percent harvest. Also, the PES market has the potential to support integrated sector value chain in multiples of the potential forest benefit as well as creating opportunities for both direct and indirect employment.

The report further elaborate that private sector investments in the development of the PES market is about US\$ 890 per hectare or US\$ 180 annually for 5 years. The State's role in regulation and protection, alongside private investments is also expected to be about US\$ 15 per hectare per annum. In a situation where the state partner the private sector in resource development, a higher cost estimate of about US\$ 83 per hectare per annum may be required in the Atewa forest. Furthermore, the report suggest that PES provides a potential to support wider household and community participation in forestry and payment of their costs, as well as those of the State as a regulator or investor. It estimates that about 16 percent of total transactions will be used to compensate households, suggesting the importance of household in designing incentives to conserve forests. In a gist, PES markets in Ghana have the potential to sustainably generate annual benefits of at least US\$2,700 per hectare as against a total cost of about US\$1,900 per hectare.

Strategic Actions and Targets

- Put in place legislative modalities and structures for the initiation of the PES market in Ghana by 2025;
- Promote education to create public awareness of PES market in Ghana by 2020;
- Review all the stumpage fees to reflect on the current economic realities by 2020.

Programme 6.5: Cede out the Forestry Commission Activities that the Private Sector has the Comparative Advantage

The programme will conduct a sector wide technical and financial audit to identify activities that the private sector has comparative advantage and develop legislation to cede them out to the private sector. The programme will develop the capacities of the local government system to take over the management of off reserve forest production areas and the management of savannah woodland resources. The programme will through a legislative instrument phase out the management and utilization of off-reserve and savannah woodland management to resourceful metropolitan, municipal and district assemblies. This means that some of the staff of the FC will be ceded out to the MMDAs to support in the management and utilization of the off reserve management areas.

Strategic Actions and Targets

- Conduct a technical and financial audit of the forestry sector to identify activities that the private sector has high comparative advantage by 2018;
- Conduct financial and technical assessment of the activities to be ceded out and to package them for the private sector and other state agencies to implement by 2025.
- Train and equip state agencies and the private sector to take up the responsibilities that the FC will cede out by 2030.

PART III: PLAN IMPLEMENTATION ARRANGEMENTS AND COORDINATION

5.1 Programme Implementation Framework

5.1.1 Implementation Arrangement Principles

The focus of the FDMP is to structurally transform the forestry sector by addressing the drivers of deforestation and biodiversity loss, promote massive afforestation in all the ecosystems for the sustainable supply of wood and wood products, promote efficiencies in the wood processing sub-sectors, promote stakeholders participation in forest and wildlife management, support technology-led forestry development and put the forestry sector on the path of self-financing. The following principles will guide the implementation arrangements:

- Responsibilities of implementing agencies are in line with existing statutory mandates, and relative strengths in skills and knowledge. Capacity investments would be made on the basis of a clear mandate and commitment for long term action, and managed transfer of implementation responsibilities. Exploiting and strengthening existing coordination mechanisms will be favoured over establishing new ones.
- Ensure that logistical costs are minimized by placing support functions close to the implementers working on the ground.
- Build on existing synergies with the on-going government and donor programmes, with flexibility to exploit new opportunities during plan implementation. The ultimate objective of the programme is to influence a much broader adoption of best practices.
- Stakeholder participation and choice is at the centre of the plan. Environmental service markets are based on exploiting efficiencies through linking demand with voluntary supply (i.e., self-selection of least-cost providers). Activities on the ground would be predominantly community-driven with involvement of individual farmers via self-selection.

5.1.2 Programme Implementation Agencies

The programmes under the FDMP would be implemented under the leadership of the Ministry of Lands and Natural Resources (MLNR), strengthening its role and experience in coordinating cross-sectoral environmental and natural resource management programmes. At the policy implementation level, MLNR will in collaboration with the Ministries of Food and Agriculture (MoFA), Power (Energy Commission), Environment, Science, Technology and Innovations (MESTI) and the Local Government and Rural Development (District Assemblies) for the enactment of the relevant legislation and coordination.

As the secretariat to the plan implementation at the field level, the Forestry Commission will provide technical support to the plan implementation and assist with the coordination of cross-

sectoral activities at the Regional and District levels. Within the MLNR, the PPMED shall be the Plan Implementation and Coordination Unit (PICU) to manage the programmes under the auspices of a Programme Director (Technical Director). The PPMED includes an accountant from the Directorate of Finance and Administration at MLNR, and an experienced procurement Officer. The Director of Finance & Administration within MLNR will have the overall responsibility for the fiduciary management of the programmes, and works closely with the Programme Director.

5.1.3 Plan Implementation Oversight

For effective implementation of the planned programmes and activities under the FDMP, a national Plan Implementation Steering Committee (PISC) would be established by the Minister of Lands and Natural Resources. The PISC will be chaired by MLNR and shall have the oversight responsibilities for the programme implementation, monitoring and evaluation and periodic revisions where necessary.

The PISC will comprise of 15 members as follows:

- Two representatives from the MLNR (the Minister, and the Chief Director or their representatives)- [Alternative chairpersons]
- One representative each from the MESTI, MOFA, MLGRD, MoP;
- One representative from the EPA, Energy Commission, Minerals Commission;
- One representative from the Forestry Commission (Chief Executive);
- One representative from the National House of Chiefs;
- One representative from the Ministry of Finance
- One representative from the National Development and Planning Commission;
- Two representative of collation of NGO's/CSO (one from high forest and the other from the savannah)
- Programme Director, MLNR (Member Secretary).

The functions of the PISC will be as follows:

- a) Direct the PICU to prepare and submit annual programmes under the FDMP for the implementing agencies for approval by the PISC including:
 - Implementation plans and revisions
 - Annual work plans, including budget and procurement plan;
 - Annual progress reports, monitoring and evaluation framework of implementation;
 - Approval of sub-projects including taking cognizance of the spatial distribution among the districts in the project are for implementation
 - Financial and procurement reports;
 - Mid-term review and implementation completion reports;
 - Implementation of support strategy, including evaluation of the potential role of payment for environmental services.
- b) Provide strategic advice, reviewing progress made towards achieving the plan objectives and making recommendations for addressing any obstacles to the implementation of the plan.

- c) Facilitating the prompt and efficient coordination of programmes among the implementing agencies and other beneficiaries involved in the implementation of the programmes.
- d) Feedback on reports and reviews prepared by the implementing agencies and other beneficiaries involved in the implementation of the plan
- e) Mobilize resources for the implementation of the plan through government funds, donor or private sector support, as appropriate opportunities may arise.
- f) Perform other duties necessary to ensure the successful implementation of the FDMP.
- g) Provide advice on all technical aspects of the FDMP programmes, including recommendations for new techniques and knowledge that may ensure successfully implementation of the plan.
- h) Assist effective technical coordination between implementing agencies, and complementarity with related activities being undertaken by implementing agencies and other government agencies, including lesson-sharing with other sustainable land management activities in the northern Ghana.

5.2 Institutional Roles and Responsibilities

The implementation of FDMP will follow a sector wide approach involving all the actors in the forestry sector. These actors have different backgrounds and understanding of the role of forestry sector to national development. To ensure that all these actors work for the common good and deliver services in a complementary and non-duplicating manner, MLNR will need to coordinate and cooperate with all institutions that have a stake in the promotion and development of forestry sector. The roles and responsibilities of the major institutions are outlined in the next section.

5.2.1 Ministry of Lands and Natural Resources

The Ministry of Lands and Natural Resources (MLNR) is the sector ministry and will be responsible for formulating forest and wildlife policy and giving political direction in relation to the implementation of the FDMP. The Ministry has over-all responsibility for sector planning and policy direction and for monitoring and evaluation of development policies and programmes. It is headed by Cabinet Minister. The Ministry will ensure that an enabling environment and adequate capacity and infrastructure are provided for both private entities and public agencies to perform at their best in implementing the development programmes.

The Policy Planning Monitoring and Evaluation Division of the Ministry of Lands and Natural Resources (MLNR) will be strengthened to provide the lead role and strong coordination in planning, implementation, monitoring, and evaluation of all forestry activities. This will encourage every actor to plan and implement priority actions instead of wasting resources on non-priorities.

5.2.2 Forestry Commission

The Forestry Commission (FC) of Ghana is responsible for the regulation of utilization of forest and wildlife resources, the conservation, and management of those resources and the coordination of policies related to them. Under this plan, the FC will provide a range of technical services, and market intelligence to inform both Government and industry on pricing, trade, and product trends.

In addition to the activities of the FC Headquarters, the FC has five main Divisions and Centers that operationalize the activities of the Commission – the Wildlife Division, Forest Services Division, Timber Industry Development Division, Resource Management Support Centre (RMSC) and the Wood Industry Training Center (WITC) have been recently reorganized to form the FC Training Center (FCTC).

The Wildlife Division (WD) will implement the Government of Ghana (GoG) policy on safeguarding the integrity of the nation’s wildlife through management and sustainable development of wildlife and their habitats for their perpetual optimization of contribution to national socio-economic development. Towards this broader goal, WD in implementing the plan will continue to:

- Manage nations protected areas and regulate the utilization of wildlife resources,
- promote public awareness, education, communication and support for wildlife conservation,
- Promote eco-tourism development in protected areas,
- Develop wildlife management capacity at the national, district and community levels and
- Facilitate research to support wildlife development.

The Forest Services Division (FSD) implements Government of Ghana (GoG) policy of safeguarding the integrity of the permanent forest estate through protection, management, and development of forest resources for the benefit of resource owners and in the national interest at large. In relation to these under the plan, FSD will continue to :

- Establish planning systems for protection, harvesting and development of forest reserves for their sustainability;
- Regulate harvesting of the resource;
- Provide management and technical services in relation to its core functions;
- Promote public awareness and support for conservation and
- Facilitate development of forest plantations in order to expand the national forest cover.

The Timber Industry Development Division (TIDD) implements Government of Ghana (GoG) policy of promoting maximum utilization of timber and wood resources for the optimum benefits of all segments of society in consonance with environmental sustainability and guarantees for future generations’ access to the resource through a regulation of the timber and wood products trade and promotion of efficiency and development of an integrated timber and wood processing industry. Towards this broader goal, TIDD under the plan implementation will continue to:

- Regulate the timber trade and industry through industry registration, enforcement of export contract approval and permitting procedures, application of grading rules in timber and wood product markets, inspection, effective development and dissemination of appropriate timber industry standards, facilitation of trade arbitration and monitoring of timber and wood flows from domestic and foreign origins.
- Promote trade and industry development through sale of wood and wood products through trade missions, fairs and exhibitions, increased utilization of Lesser Used

Species (LUS) on local and international markets, efficient utilization of timber and wood products, integrated development of the timber and wood industry, including the development of the tertiary wood products sub-sector, and in particular, implementing strategic plans to promote poverty reduction among small-scale carpenters.

- Provide market intelligence, as well as publication and dissemination of technical information brochure for the benefit of the industry.
- Provide technical services, including the coordination of foreign technical assistance for the development of the Ghana timber industry, and building capacity and upgrading skills of both industry and the regulatory institutions.
- Collaborate with local and international agencies in the development, promotion, utilization, and marketing of wood products.
- The FC has also assigned TIDD responsibility for administration of the Forest Improvement and Plantation Development Levy.

The Forest Resource management Centre (RMSC) is the technical wing of the FC. The RMSC generally provides technical and advisory support to forest and wildlife policy. In particular, it supports effective implementation of forest and wildlife policy by the Divisions and other organizational units of the FC. In relation to these, RMSC seeks to develop, implement and/or facilitate and monitor effective and affordable forest and wildlife management systems, as well as develop forest and wildlife prescriptions to support globally acceptable standards and protocols. Stakeholder collaboration is an overarching strategy of RMSC.

In implementing the FDMP the RMSC will continue to:

- Provide data, information and technical guidance for forest management planning and implementation, industry development and generally for review of forest and wildlife policy
- Develop and facilitate adoption of effective, efficient and affordable forest, savannah and wildlife management and monitoring systems, and enforce compliance with related management prescriptions
- In relation to monitoring, develop and review Manual of Procedures (MOPs) and post harvesting checks
- In relation to enforcement, provide quality control measures to ensure adoption of certified forest and wildlife systems
- Develop and implement national forest assessment protocols and monitoring systems; this includes REDD+ , Measuring, Reporting and Verification (MRV) and Impact Monitoring (IM) of VPA programmes
- Train FC Division and Units as well as other organizations for implementation of forest and wildlife management systems,

- Undertake inventory planning and management to support sustainability of forest and wildlife resources and environmental quality, and provide updates on the state of the nation’s forest and wildlife resources
- Provide consultancy and extension services in forestry and wildlife governance

Training and skills development of FC staff and forest stakeholders are considered by FC to be a pre-requisite for attainment of its legal mandate. The Forestry Commission Training Centre (FCTC) was established to develop and implement appropriate strategies for technical training of FC staff and forest stakeholders in order to accomplish MLNR’s sustainable forest and wildlife policy. In line with its mandate, FCTC under the plan will:

- Provide short-term and refresher technical courses for the forestry and wildlife sectors;
- Introduce staff to emerging issues in the forestry and wildlife sectors and to new technical tools;
- Provide orientation to new graduate entrants into the Commission and to assist the wood industry with appropriate technology in downstream processing.

The specific roles of the agencies in the implementation of the FDMP are summarized in the implementation plan.

5.3 FDMP Implementation Plan

Plan Component	Plan Programme	Key Results Areas	Success Indicators	Road Map	Lead Institution	Means Of Verification
Development Objective 1						
To manage and enhance the ecological integrity of Ghana’s forest, savannah, wetland and other ecosystems for the preservation of vital soil and water resources, conservation of biological diversity, carbon stock enhancement within a resilient environment for the sustainable production of domestic and commercial produce						
Sustainable management and utilization of forests, wildlife, wetlands, and savannah ecosystems	Manage Forest Reserves in line with national policies and legislation as well as international treaties that Ghana has ratified	Ensure that all gazetted Forest Reserves are covered with approved Forest Management plans and are guided by the best forest Practices and national forest management standards by 2020.	FC will set up Task Force within Resource Management Support Centre (RMSC) to review all existing Forest Reserve Management Plans to identify the gaps	Phase 1	FSD, RMSC &WD Ghana Institute of foresters	TOR for Task force. Report on the status of FRs in Ghana
			RMSC will update forest inventory records using FPP data	Phase 1	Traditional Authorities	Forest Resource Assessment Report
			Wildlife Division will update inventory of fauna in all Protected Areas	Phase 1		Inventory report
			FC will use updated inventory data to update all existing Management Plans	Phase 1		Up dated Management Plan of FRs
			FC will formulate new participatory management plans to cover all FRs and PAs without one	Phase 1		New management plans
		Conclude legal processes for the reservation of all proposed forest reserve areas by 2020.	RMSC will review the legal status of all FRs and PAs in the country to determine those not legally constituted and pillared	Phase 1: 2016-17	MLNR, FC & Consultant	Legal status of all FRs and PAs in Ghana

			FC will initiate actions to pillar all defaced FR and PA pillars and conclude the legal process for the reservation of all FRs and PAs.	Phase 1: 2017-20		Quarterly report on FR Pillaring
			FC will gazette all non-gazetted FRs and PAs.	Phase 1: 2018-20		Published gazette
			MLNR and FC will initiate actions to pay all compensations relating to lands under PA reservations.	Phase 1: 2018-20		Report on compensation paid
	Prospecting and mining of mineral resources in gazetted Forest Reserves reduced by 50 per cent in 2020 and 90 percent by 2035		RMSC and FSD will conduct environmental audit to determine the status and relevance of all mineral prospecting activities in the FRs.	Phase 2: 2020-35	MLNR & FC	Annual status report of mining in FRs.
			On the basis of the report, FC and MLNR will to evolve a plan to minimize and eventually eliminate mineral prospecting in FRs.	Phase 1: 2017-18		Strategic Plan to minimize prospecting of minerals in FRs
			FC and MLNR will negotiate with the Minerals Commission to implement the plan to minimize eliminate mineral prospecting activities in FRs	Phase 1: 2018-20		Road map to minimize prospecting of minerals in FRs
	Systemic biological inventories of all gazetted forests reserves and Protected Areas completed by 2025.		RMSC will acquire the necessary additional equipment for comprehensive forest inventory	Phase 1: 2018-19	RMSC & FC	List of additional equipment
			FC will train personnel for systematic forest inventory using the latest technology	Phase 1: 2018-20		Report on training of personnel by type

			RMSC will initiate comprehensive systematic biological inventory of Reserved forests	Phase 2: 2020-25		Annual Report
			RMSC will complete forest inventory of all gazette FRs	Phase 2: 2020-25		Annual Report
	Develop framework (technical and legislative) for natural and artificial regeneration to ensure promote establishment of satisfactory growing stock to increase forest/tree cover by 2020		RMSC will review the existing technical and legislative for natural and artificial regeneration and coppice management and make recommendation to FC	Phase 1: 2016-17	FC & RMSC	Technical review report
			RMSC will development technical manual to guide natural and artificial regeneration and train frontline staff on its applications	Phase 1: 2017-19		Technical guidelines and manuals for natural regeneration and coppice management
			MLNR will review and legislate on guideline for natural regeneration and coppice management to guide forest management	Phase 1: 2018-19		Report on the legislative process
			FC will support the training and application of appropriate techniques for natural and artificial regenerations	Phase 1: 2018-20		Training Report
Sustainable management of off-reserve forest production areas	Continuously survey and inventory all production forests outside the Forest Reserves and constitute them into forest management units covered by forest management plans with		RMSC will continuously use latest technology to identify all potential forest production areas off reserve.	Phase 1: 2016-18	RMSC& FC	Off reserve inventory report
			RMSC will constitute all potential off-reserve production areas into forest management units	Phase 2: 2020-22		Off reserve FMU reports

	active involvement of the local landowners by 2025.	RMSC and FSD will develop participatory Forest management plans to cover these areas	Phase 2: 2020-25		Off reserve management plans
		FC will develop guidelines to support the management of off-reserved forest areas	Phase 3: 2022-25		Off reserve management guidelines
	Operations of the Forestry Commission in the management and utilization of forest and wildlife resources off reserves fully decentralized to the District/Municipal and Metropolitan Assemblies, by 2025.	MLNR will conduct technical and financial audit of the FC to determine activities which the private sector and Non-government organizations have comparative advantage.	Phase 1: 2016-17	MLNR/FC/ MLGRD	Technical and financial audit report of off reserve management activities.
		MLNR will disaggregate the functions of the FC into core and non-core according to the mandate of the FC.	Phase 1: 2017-18		Ministerial White paper on non-core activities to be ceded out
		Within the context of Local Government Act (462) the functions of FC relating to Off-reserve forest production management will be reviewed and decentralized.	Phase 1: 2019-20		FC Annual Report
		MLNR will initiate legislations to transfer functions of the FC that the private sector and Local Governments have comparative advantage	Phase 2: 2021-24		Bill to transfers functions to private sector and Das
		MLNR will conduct feasibility into the possibility of setting up a new division (Savannah Resources Management Service Division) under the FC to be responsible for the management of the Savannah woodland.	Phase 1: 2019-20		Feasibility report

			On the basis of the feasibility report, MLNR will set up Savannah Resources Service Division with headquarter in Tamale as a government agency to be responsible for the management of the Savannah woodland resources.	Phase 2: 2021-25		FC annual Report
			FC will transfer the management responsibility of the northern and coastal savannah to the new Savannah Resource management Division.	Phase 2: 2021-25		FC annual Report
	Capacities of public institutions and Civil Society Organizations in sustainable management off-reserve forest management and engagement with international and domestic mechanisms that will respond to climate change areas by 2035.		FC through the RMSC will develop the capacities for forest CSOs to work with FC.	2016-17	MLNR, RMSC, & CSOs networks	Training reports
			RMSC will assist the CSOs to develop a national network of CSOs operating the forestry sector.	2017-18		FC Annual Reports
			RMSC will build the capacities of the CSOs in policy dialogue, mainstreaming of biodiversity and gender and livelihood enterprise development	2017-20		FC Training reports
			MLNR will enact necessary legislations to guide the allocation of carbon rights allocation	Phase 2: 2020-25		Bill on carbon rights allocation
			FC will initiate awareness campaign on urban forest management and climate change	Phases 1&3 2019-31		Learning and teaching materials
	Protected Area management systems improved	Develop policy and regulatory frameworks that remove perverse subsidies and provide	WD will conduct technical, environmental and financial audit to identify all perverse subsidies that affects biodiversity conservation	Phase 1: 2016-18	WD & MLNR/ MESTI/ MOFA/	WD Annual Report

		incentives for biodiversity-friendly land and resource use that remains productive but that does not degrade biodiversity by 2020	On the basis of the findings, WD will liaise with MLNR to formulate policies and regulations that will encourage biodiversity conservation.	Phase 1: 2019-20	MLGRD	Annual Report of WD & MLNR
			WD will set up monitoring system, to monitor biodiversity conservation within the forest and savannah landscapes	Phase 2: 2020-22		M & E system in place
		Formulate and approve spatial and land-use plans which ensures that land and resource use is appropriately situated to maximize production without undermining or degrading biodiversity by 2025.	MLNR will liaise with the MESTI, MOFA and MLGRD to revive the national biodiversity committee and support it to function as prescribed by law.	Phase1 & 2 2017-21		Existence of the law
			MLNR will liaise with the MESTI, MOFA and MLGRD to update spatial maps to protect globally significant biodiversity areas	Phases 1&2 2017-25		Spatial maps
			MLNR will support the development of national land use plan.	Phase 2&3: 2020-32	National Land use plan	
		Improve and change production practices to be more biodiversity friendly with a focus on sectors that have significant biodiversity impacts (agriculture, forestry, fisheries, tourism, extractives) by 2020	FC will adopt landscape approach to develop, and validate replicable and up-scalable participatory forest resources management models in and off forest reserves to promote biodiversity conservation.	Phase 1: 2017-20	FC/MLNR/ TA/CSOs	Landscape strategic plan FC annual Report
			FC will concentrate on working with farmers and communities, on-farm trees (especially in cocoa farming systems), and reforestation to promote biodiversity conservation.	Phases 1&2 2018-21		FC Annual report
			FC will enhance carbon stocks in the off reserve areas in the HFZ by engaging communities in approaches that generate direct financial and	Phases 1&2 2018-21		FC annual report

		environmental benefits for them, leading to reduced deforestation and forest degradation in the landscape.			
		FC will conduct multi-stakeholder engagement in the on-going REDD+ Readiness process and focus on public and private sector investments in rehabilitation and restoration of degraded landscapes.	Phases 1&2 2018-22		FC annual report
	Develop biological corridors to link all important ecosystems by 2020.	FC/MLNR will initiate restoration of forest reserves and off reserve areas by addressing tree tenure in agricultural landscapes, including farm fallows that will have the potential to substantially increase carbon stocks in the landscape (soil carbon and above ground biomass).	Phases 1&2 2018-21	FC/MLNR/ Stakeholders	Annual Report
		FC will collaborate with stakeholders to develop viable alternative livelihoods for local communities by addressing a broad range of technical, financial and market incentives, to reduce pressure on existing forests.	Phase 1: 2017-20		Annual Report
		FC/WD will collaborate with MLNR to develop legal framework (laws, regulations, guidelines) covering all PA landscape corridors	Phases 1&2 2018-21		Bill on PA landscape corridors
	Manage all National Parks, Wildlife Sanctuaries, Wildlife Resource Reserves and other Protected Areas (PAs) in accordance	WD will collaborate with local communities to complete the formulation of management plans to cover all National Parks, Wildlife Sanctuaries, and Wildlife Resource Reserves	Phases 1&2 2017-25		WD annual Report

		with the duly approved wildlife management plans to ensure comprehensive biodiversity conservation and development by 2025	WD will complete fringe communities' involvement in protected area resource management	Phases 1&2 2018-21	FC & CSO	WD Annual Report
			WD will facilitate the implementation of community based participatory land use plans and management plans to avoid deforestation and degradation of PAs	Phases 1: 2020-25		WD Annual Report
		Complete community participation in wildlife management outside the PAs through Community Resource Management Area (CREMA) concept for sustainable livelihood of fringe communities by 2025.	WD will facilitate the formation of CREMAs in relevant areas fringing all PA	Phases 1&2 2018-25		WD Annual Report
			WD will provide extension services, inputs, certification and incentives towards the establishment of CREMAs.	Phase 2: 2017-25		WD Annual Report
			WD will facilitate CSO involvement in the management of land, trees and wildlife under the CREMAs.	Phase 2: 2017-25		WD Annual Report
		Sign agreements between the Forestry Commission and the communities to introduce the institutional coordination with community forests through traditional approaches of working with chieftaincies and District Assemblies by 2025	WD will develop and put in place a comprehensive monitoring and evaluation system to guide the operations of the CREMAs	Phases 2&3: 2020-32		WD Annual Report
			WD will facilitate the signing of agreement between FC and managers of CREMAs and traditional land owners.	Phases 2&3: 2020-32		Copies of signed Agreements
		Develop incentive systems to promote investment in community-based eco-	WD will collaborate with Ghana Tourist Authority to propose for the approval of FC Board, MLNR and Cabinet a comprehensive incentive	Phases 2&3: 2020-32		Annual report

		tourism and commercial wildlife conservation and development by 2020.	package for ecotourism development within the ambit of the national investment code.			
			WD will facilitate the implementation of ecotourism incentive system	Phases 2&3: 2020-32		Annual Reports
Sustainably manage and develop commercial woodfuel supplies and other non-timber forest products on both on-and-off-reserved forest areas	Legal/regulatory framework that supports sustainable woodfuel production and marketing by 2025		MLNR will enact legislative instruments to regulate the product and marketing of woodfuels in Ghana	Phase 1: 2018-20	MLNR & FC/DAs	Bill on woodfuel management
			MLNR and FC will support the functions of Savannah Woodland management support centre to be responsible for the licensing of commercial woodfuel producers	Phases 1&2 2018-21		Annual Report
			FC will education and create awareness on the new regulations for woodfuels.	Phase 1: 2018-20		Annual Report
	Sustainable production and utilization of NTFPs by 2025		In collaboration with the District Assemblies, MLNR and FC will formulate guidelines for the marketing and transportation of woodfuels.	Phase 2: 2018-25	MLNR, DA & FC	Guidelines
			FC will put in place a certification process for the production and marketing woodfuels	Phases 2&3: 2020-32		Guidelines for woodfuel certification
Enhancing the traditional autonomy for the protection and management of	National register of all traditional community conserved forest areas compiled and gazette by 2030.	FSD in collaboration with DA and Traditional Authorities register and document the history and reservation process of all community conserved forest areas (sacred groves) in Ghana.	Phases 1&2 2018-21	FC & DA/TA	Register of sacred landscapes in Ghana	

	sacred forests and community dedicated forests for biological and cultural diversity on and off reserves		FSD will develop guidelines to support community systemic biological inventory of all community conserved forest areas (CCAs) and classify them according to size and status.	Phases 1&2 2018-25		Guidelines
			FSD will class the wetlands based on their current status and potential for ecotourism development.	Phases 1&2 2018-21		Classification of wetlands
			FC in collaboration with the national house of chiefs will gazette all significant CCAs.	Phases 2&3: 2020-32		Gazette on CCAs
	Dedicated grant mechanism for the documentation, rehabilitation and management of sacred sites in all the ecosystems by 2020		MLNR will enact a law to set up dedicated grant based on taxes from the timber industry to be used to rehabilitate and manage CCAs.	Phases 2&3: 2020-32	MLNR & FC	Bill on dedicative grant mechanism for CCAs
			FSD will train and educate the CSOs to access these grants for the rehabilitation and management of ICCAs.	Phases 2&3: 2020-32		Training report
			FC will evolve a monitoring mechanism to monitor the growth and health of ICCAs.	Phase 2:2020-22		M & E on CCAs
	Savannah ecosystem under sustainable management	Savannah woodland management unit under the Forestry Commission established to be responsible for the management and utilization of savannah woodland resources		FC will conduct an internal technical audit to determine the operation locus and technical requirement of the Savannah Woodland Management Division (SWD).	Phases 1&2 2018-21	FC
			Based on the findings FC will set up SWD with full complement of staff and head office in Tamale.	Phases 2&3: 2020-32	Organogram of SWD	

		and reforestation of degraded areas by 2020.	FSD will support the operations of SWD with basic infrastructure and personnel.	Phases 2&3: 2020-32		Annual report
			FC will assist the SWD to develop and implement savannah reforestation plan.	Phases 2&3: 2020-32		Annual report
		GIS-based tenure mapping, wood tracking systems and woodfuel certification system for savannah woodland in place by 2025.	FC will support RMSC and SWD to develop GIS-based tenure mapping to guide management of woodlands in the savannah area.	Phases 2&3: 2020-32	FC	GIS Mapping on savannah woodland
			FC will support RMSC, TIDD and SWD to develop guidelines for tracking woodfuel production to marketing.	Phases 2&3: 2020-32		Woodfuel tracking system
			FC will enforce wood tracking system to enhance the sustainable management of woodfuel in Ghana.	Phases 2&3: 2020-32		Annual report
		Wetlands Development	All potential wetlands of global significance in all the ecological zones of Ghana mapped, inventoried and documented by 2020.	WD will conduct national inventory to identify all potential wetlands currently not under management.	Phases 1&2 2018-21	FC/WD
	WD will conduct detailed systemic biological inventory of all wetlands in Ghana.			Phases 1&2 2018-21	Inventory reports annually	
	WD will class the wetlands based on their current status and potential for ecotourism development.			Phases 1&2 2018-21	Annual report	
	Participatory wetland management plans formulated and implemented for the		WD will formulate participatory management plans to guide the utilization and management of wetland resources.	Phases 1&2 2018-30	Wetland management plans	

		sustainable management and utilization of the wetland resources by 2025.	WD will support local communities and CSO to implement wetland management plans	Phases 1&2 2018-21		Annual report
Reducing poaching and illegal trafficking of threatened species		National awareness on wildlife poaching and illegal trafficking of threatened species initiated by 2020	FC will resource the educational unit of the WD to embark on nationwide awareness campaign against illegal wildlife trafficking of threatened species	Phases 1&2 2018-21	WD	FC annual report
		Legislation and law enforcement to reduce poaching by 2025;	WD will review the current laws prohibiting trade in illegal wildlife and add current endangered species which are not on the list	Phases 1&2 2018-25		WD Annual report
		Science-based wildlife monitoring, education and awareness initiated by 2020	WD will liaise with RMSC to put in a science-based wildlife monitoring system	Phases 1&2 2018-25		FC report
Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, and natural regeneration		National reforestation plan for high forest formulated and implemented by 2020.	FC and MLNR will review the current national reforestation plan for the high forest zone to identify the lapses	Phases 1&2 2018-21	FC & MLNR	FC annual report
			On the basis of the findings, the FC will reformulate the national reforestation plan	Phases 1&2 2018-21		Revise reforestation plan.
			FC will support the implementing of the national afforestation programme	Phases 2&3: 2020-32		
		Legal/regulatory framework that supports plantation development put in place by 2020	MLNR will develop legal regulatory framework to legitimize the national plantation development project.	Phases 1&2 2018-25		

Development objective 2						
<i>To promote the rehabilitation and restoration of degraded landscapes through forest plantation development, enrichment planting, and community forestry informed by appropriate land use practices to enhance environmental quality and sustain the supply of raw materials for domestic and industrial consumption and for environmental protection.</i>						
Rehabilitation and restoration of degraded landscapes through plantations development, community forestry, and natural regeneration	Forest plantations development programme.	Developing systems and incentive packages to support public, private sector and community investment in reforestation and forest plantation development in degraded priority forest areas and private/community lands by 2020	FC will review the current Plantation development plan based best practices and support its implementation.	Phase 1: 2016-17	FC	Plantation Development Annual Report
			FC will develop guidelines to support community and private sector investments in forest plantation establishment for multiple functionality	Phase 1 2016-18	FC	Plantation Development Annual Report
			MLNR & FC will review plantation development fund and set National Reforestation Fund indexed to the exploitation of timber and wildlife resources and managed by an independent reforestation board and operating through a national commercial bank with flexible terms of lending	Phase 1 2018-20	FC	Plantation Development Annual Report
			FC will work with FORIG and other research institutions to initiate national programme for genetic improvement and mass productions of planting materials of key forest plantation tree species.	Phase 1 2018-20	FC	Annual Report
			FC will work with FORIG and other research institutions to support increased investments in research, training and capacity building in forest plantation development	Phase 1 2018-20	FC	Agreement with research institutions

Conservation and enhancement of carbon stocks in forest, and other land uses, and support climate smart agriculture	MLNR/FC will continuously review of tree tenure through pragmatic measures and policy and legal reforms to contribute to the development of regimes on tree tenure and carbon rights by 2020.	Phase 2: 2021-28	MLNR/FC	Tree tenure legislation
	FC/MLNR will address and remove the barriers for small-land owners, farmers and local communities to conserve and replant trees (especially on farm) by 2020;	Phase 1 2018-20	FC	Annual Report
	MLNR will operationalize the draft forest plantation and investment policy taking advantage of the Tree Crops Policy of the Ministry of Food and Agriculture (MoFA) by 2020	Phase 1 2018-20	MLNR	Annual report
	Support the adoption of forest certification by 2025	Short to medium term	FC/MLNR	Register of company under timber certification Field Audit reports
	MLNR/FC will create an enabling investment environment that could foster the rehabilitation of degraded forest and the development of plantations by the private sector by 2020;	Phase 1 2018-20	MLNR	Annual report
	WD /MLNR will enhance the CREMA concept, to create incentives for farmers and land owners to retain naturally.	Phase 2 2021-25	WD/MLNR	Annual report

Development objective 3						
To promote the development of viable forest and wildlife based industries and livelihoods particularly in the value added processing of forest and wildlife resources to satisfy domestic and international demand for competitively -priced quality products.						
Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources	Tertiary wood Industries modernized to achieve 60 per cent of the timber industry by 2030.	Facilitate the availability of technological improvements and retooling of the timber industry to ensure high quality tertiary processing; increased competitiveness; waste reduction and value-addition by 2025.	TIDD will collaborate with timber associations to evaluate the business and strategic focus of key timber operations to determine the management operations, markets, environmental and social compliance, investment culture and priorities and long term vision	Phase 1: 2017-18	FC & Timber Associations	Annual report
			TIDD will undertake a detailed survey of the machinery stock in key timber operations	Phase 1 2016-17		
			TIDD collaborate with the Timber Associations to identify the future machinery requirements of key operations in relation to its strategy, product focus and market opportunity.	Phase 1: 2016-20		
			TIDD collaborate with the Timber Associations to assess the technical skills and capabilities of key timber operations.	Phases 1&2 2016-22		
			MLNR & FC will seek funding support for required machinery/tooling and training needed in the tertiary subsector	Phases 1&2 2018-25		
	Set up standards and regulations and training in quality and environmental management system to	TIDD and Timber Association will introduce quality management systems (QMS) and processes into timber operations with monitoring procedures.	Phase 1: 2017-20	FC/Timber Trade Associations /MLNR	Quality management system	

	govern the operations of the small and medium scale forest enterprises including the development of the informal wood sector by 2025.	TIDD will introduce necessary software and data capture systems to support QMS in the timber industry.	Phase 1: 2018-20	Software on QMS
		TIDD will select appropriate expertise from industry and beyond to form a timber standards development committee to draft technical standards for the approval of Ghana Standard Board.	Phases 1&2: 2018-21	Annual Report
		TIDD will facilitate training in Quality and Environmental Management Systems	Phases 1&2: 2018-22	Training plan
	Enact the necessary legislation to regulate the production and trade of legal/ (sustainable) lumber whilst promoting the development of the domestic wood market by 2020.	MLNR will undertake a study to identify all the lapses in the local lumber industry	Phases 1: 2016-17	Study report
		MLNR will initiate enactment of legislations to regulate the production and trade of legal lumber	Phase 1: 2017-20	Legislation on illegal lumber
		FC will develop a strong technical product development team in TIDD to engage value-adding processors to assess product quality and provide vital technical information to a proposed timber standards development committee.	Phase 1: 2018-19	Annual Report
		TIDD will assess and evaluate proposed technical drafts for the development and gazettement of timber standards.	Phases 1&2: 2019-22	Timber standards
		TIDD will develop mechanisms for dissemination of gazetted standards to ensure that all stakeholders involved in timber supply chains are	Phases 1: 2018-20	Annual Report

			informed of the existence of gazetted timber standards		
			TIDD will promote enforcement and compliance mechanism for the standards developed.	Phases 1&2: 2019-22	Annual Report
Improve wood processing efficiencies	Support specialized training and craftsmanship schemes for wood processing, bamboo, rubber wood, cane and rattan and lesser-known tree and NTFP species as a means of reducing reliance on chainsaw lumber by 2030.		WITC will focus on value added processing for the domestic and export markets	Phase 1: 2017-20	Annual Report
			WITC will collaborate with industry to initiate the development of regional wood clusters to ensure that best practices and modern techniques of operation are implemented as quickly as possible.	Phase 1&2 2017-22	Report on regional wood clusters
			FC & TIDD will collaborate with industry to provide adequate funding and human resources to assist forest agencies develop proactive initiatives to support industry	Phases 1&2: 2020-25	Annual report
			FC will strengthen technical co-operation and collaboration between key forest agencies (TIDD, WITC, RMSC and FSD) for training of the wood processing industry	Phases 1&2: 2020-25	Annual Report
			WITC and Timber Association will set up service and support centres to support the timber industry	Phase 1: 2018-20	Service Support centres
			MLNR & FC will encourage the importation and installation of high quality machinery.	Phases 1&2: 2017-25	Annual Report
	Strengthen and improve industry competitiveness in order to secure new markets while protecting the existing ones by 2025				

			FC & MLNR will seek financial support to suppliers of quality machinery, modeling	Phases 1&2: 2020-30		Annual Report
Improve the development of wildlife based industries	Build partnerships to enforce the ban on hunting of all protected wildlife species in Ghana whilst re-establishing the control over bush meat hunting to bring these activities to a sustainable level by 2020	WD & FC will develop training and capacity development programme for the wildlife industry	Phase 1 & 2 2017-25	FC/FORIG/ Bushmeat Trade Associations	Training report	
		WD will collaborate with stakeholders in implementing programmes and liaising between government and rural people by intensifying the national awareness campaign about bush-meat and hunting issues	Phase 1 & 2 2017-25		Annual Report	
		FC will support investments in commercial captive breeding (domestication) of wildlife in heavy demand for export and domestic markets	Phase 1 & 2 2017-25		Annual Report	
Marketing, export development and trade promotion	Develop a well-structured marketing strategy that will link supply, product quality, environmental requirement, and pricing by 2020.	TIDD will develop a well structure marketing strategy specifically for the domestic market	Phase 1: 2017-18	FC/Timber trade Associations	Marketing strategies	
		FC will support the effective functioning of the domestic wood market.	Phase 1 & 2 2018-25		Annual Report	
	Adopt cluster and niche marketing approaches by adopting a cluster marketing approach for many of Ghana's small timber processors; especially those in the tertiary sector by 2020.	WITC and TIDD will develop niche-marketing strategies to promote cluster marketing for the small timber processor in Ghana.	Phase 1 & 2 2018-25		Annual Report	
		FC will support the development of cluster market for the domestic wood markets	Phase 1 & 2 2018-25		Local market intelligence report	

		Promote the development of new products by applying modern technologies and promoting the technological development and regional clustering of SME's in the domestic market	WITC will assist the SMEs to acquire and use new technologies.	Phases 1&2: 2017-21		Annual Report
	Capacity building and institutional reform	FC will develop industry training partnerships with educational institutions both at diploma and tertiary level to help provide a pool of skilled workers available to the industry.	FC will strengthen technical co-operation and collaboration between key forest agencies (TIDD, WITC, RMSC and FSD) and other government agencies – MDPI, GSB, CSIR, FORIG	Phases 1&2 2017-25	FC	Annual report
		FC will establish training of wood clusters with a focus on value added processing for the domestic and export markets.	FC will restructure the forestry training at WITC to function	Phases 1&2 2017-25	FC	AMR Annual Report

Objective 4:						
<i>To promote mechanisms for transparent governance, equitable sharing and civil society participation in the forest, wildlife and woodfuel resource management for forest management, governance and information</i>						
Mechanisms for transparent governance, equity sharing and peoples participation in forest and wildlife resource management in place.	Promoting and developing institutional and legislative reforms for transparent governance, equity sharing and peoples participation in forest and wildlife resource management.	Transparent system of governance in place by 2025	FC will support the functioning of forest forums and set up new one in places where they do exist at all levels of governance.	Phase 1: 2017-19	FC	AMR Annual Report
			MLNR will ensure that the necessary legislation and regulations backing civil society involvement in forestry governance system are enacted	Phase 1: 2016-19		Annual Report
			FC will set up transparent mechanisms and educate communities and individuals on benefits from trees on farms and fallow lands, off-reserve tree tenure security, authority to legally dispose of resources and allocate greater proportion of benefits accruing from resource management to community members individually or collectively.	Phase 1: 2016-20		AMR
			FC/MLNR will establish and make accessible a stable source of financial support for building capacity and attitudinal changes of community institutions.	Phase 2: 2021-25		Annual Report
			MLNR will enact legislation to support transparent competitive bidding and continuous auditing of the forest utilization operations to ensure compliance with forest management specification and	Phase 1: 2016-17		Annual Report

			environmental protection standards.		
			FC will promote women and youth involvement in forestry activities that generate income	Phase 1: 2017-20	AMR
		Capacities of civil society organization developed to enable them assume optimal management responsibilities by 2020	MLNR and FC will facilitate stable source of financial support to build up capacity and attitudinal changes of community institutions and CSO.	2016-20	Annual Report AMR Special study
			MLNR will facilitate the networking of the CSOS working in the forestry sector into national network of CSO working in the forestry sector.	2016-18	Annual Report AMR Special study
			MLNR will support forestry network of CSOs to develop their capacities in for effective national/global environmental policy and advocacy; Knowledge management platforms; CSO engagement in regional projects; Increased resource availability; Regional exchange programmes / visits training in project management, monitoring, and evaluation.	Phases 1&2: 2017-20	Annual Report AMR Special study
			FC and MLNR will strengthen civil society partnership with by enhancing their participation, contributing to policy and stimulating action.	Phases 1&2: 2018-22	Annual Report AMR Special study

		Partnerships for the effective collection of stumpage, fees and taxes by 2030.	FC &MLNR will rationalize forest fees and taxation systems and improve the framework for apportioning, recovering and distributing equitably and effectively forest rent (royalties) between the resource owners, state and the users of the resources through consultative processes.	Phases 1&2: 2018-22		Annual Report AMR Special study
			FC will set up improved tracking system for exploited forest products (forest, wood fuels, wildlife, biodiversity, medicinal plants, and other non-timber forest products) to establish legal origin of these products with clearly defined roles for the CSOs	Phases 2&3 2020-25		Annual Report AMR Special study
			FC will define rules and regulations that define permissible and non-permissible forms of cooperation and competition (licensing laws, laws of contract and liability, company and cooperative laws, anti-trust laws.	Phases 2&3 2025-33		Annual Report AMR Special study

Objective 5:						
<i>To promote research-based and technology-led forestry and wildlife management and utilization to ensure resource sustainability socio-economic growth and environmental stability</i>						
Research-based and technology-led forestry management and utilization	Training, research, and technology development to supports sustainable forest management	Encourage institutions of higher learning and corporate bodies to integrate indigenous and scientific knowledge in forest and wildlife management by 2025.	MLNR will liaise with RMSC and FORIG to develop guideline for incorporating indigenous knowledge in forest and wildlife management	Phase 2: 2020-22	MLNR, FC RMSC	Guidelines
			FC will support the research and academic institutions to incorporate indigenous and scientific knowledge in forest and wildlife management.	Phase 2: 2020-22		Annual Report
		Promote targeted research in forest and wildlife issues and support the publication and dissemination of results to increase awareness by 2030.	FC will support FORIG and other allied science institutions to conduct targeted research in forest and wildlife issues.	Phase 2: 2020-25	FC	Agreement with collaborators
			FC will support the establishment of scientific forum for researcher to share their findings and new technologies annually.	Phases 2&3 2018-35		Annual Report
		Update forest information database to monitor sustainable forest management and establish forest and wildlife research funds which research and academic institutions, as well as civil society can access by 2020.	FC to set up a portal that is accessible to all stakeholders to obtain data, scientific findings and revenue mobilization and disbursement.	Phases 1&2: 2017-22	FC	Annual Report
		Build national capacity for accurate accounting and timely collection of resource production and utilization of data	MLNR and FC will train staffs in natural resource accounting and modeling to assist in the monitoring of the forest and wildlife resources.	Phase 2: 2020-30	MLNR& FC	Annual Monitoring report

		to be linked up with macro-economic data by 20230				
		Set up savannah woodland research institute within the SARI by 2030	FC will set up Savannah woodland research unit within SARI to be responsible for researching into savannah ecosystem issues	Phase 2: 2020-30	FC	Annual Report
		Promote sectoral and cross-sectoral institutional collaboration to generate and share information to improve forest policy and management by 2025	FC will promote collaborate with research institutions and corporate bodies to set up system for sharing information using the virtual platform.	Phases 1& 2 2018-25	FC	Memorandum of Agreement
Public Education to create awareness on the Value and Multiple Uses and benefits of Forests	Build capacities of communities, including the youth and women, to enhance their participation in sustainable resource management by 2020.	FC will develop modalities for building the mainstreaming women and youth in the forest management systems.	Phase 1: 2018-19	RMSC& FC	Copy of modalities/ Annual Report	
		RMSC will initiate training of youth and women on their involvement in forest management	Phases 17 2 2017-22			Training report
	Disseminate information on forestry events, issues and trends to allow informed participation by the wider public as well as the forest fringe communities by 2025.	FC will create digital library and quarterly newsletter to publish events and issues	Phases 1& 2 2019-21	RMSC& FC	Annual Report	
		RMSC education unit will through film show and public forum educate the forest fringe communities on forestry issues.	Phase 1: 2017-20		Annual Report AMR	
	Provide advisory services through a dynamic forestry extension service to	FC will set up joint extension service for the forestry officer to render services to the rural communities concerning forest and	Phases 1& 2: 2018-20	FC	Annual Report	

		promote social acceptance of forestry by 2020	wildlife issues			
	Support Research and Development to enhance efficiency in the wildlife industries	Set up a support system to promote research in packaging and selling of wildlife on the export market by 2025.	FC to commission researcher and Food and Drugs Board to pilot wildlife packaging for the domestic and export market.	Phase 1: 2018-20	WD& FC	Pilot report
			WD will liaise with Ghana Standard Board and the private sector to develop a system of packaging wildlife to meet international standard.	Phase 1: 2018-20		Memorandum of Agreement
			Introduce certification of wildlife production and marketing	Phase 2: 2020-25		Certification procedures
<p>Objective 6:</p> <p><i>To promote financial mediation and incentives for natural forest management, timber plantation development, plant and machinery, development of tertiary processing activities, micro and small enterprises. strategic review of forest regulations and the operations of the Forestry Commission that will cede out some the current public sector activities that the private sector has the comparative advantage</i></p>						
Financial mediation and incentives for forestry development	Financial mediation and incentives for timber plantation development, plant and machinery, development of tertiary processing activities, micro and small enterprises promoted	Set up national revenue mechanisms like conservation trust funds, systems of payments for environmental services, debt-for-nature swaps, economic valuation of protected area goods and services, access and benefit sharing agreements by 2020	MLNR will enact legislation and regulations on national forestry development trust funds.	Phase 1: 2016-17	MLNR& FC	Bill on forestry development trust fund
			MLNR & FC will set up a trust fund board to manage grant and trust funds to provide flexible source of funding for (i) communities in support of establishing Community Resource Management Areas (CREMAs), dedicated forests and similar opportunities and (ii) advocacy organizations that hold government more accountable	Phase 1: 2017-20		TOR for the Trust Board

			MLNR will formulate and implement national policy reform and incentives to engage the private sector and other stakeholders to improve protected area financial sustainability and management.	Phases 1&2: 2017-19		Existence of Policy AMR
		National Forestry Development Trust Fund Board commissioned and made functional by 2020.	MLNR will through legislative instrument set up a tax (user fee) to fund plantation development	Phases 1 & 2 2017-19	MLNR/FC	Bill on tax to fund plantation development
			MLNR will review the current plantation development board to make them more functional and be able to mobilize funds.	Phase 1: 2016-17		List of Plantation Development Board
	Financial burden on FC reduced	Current relevant public sector activities ceded out to the private sector by 2025	MNLR will conduct technical audit to review the performance of the FC and to identify potential revenue mobilization source which the private sector has comparative advantage.	Phase 1: 2019-20	MLNR	Technical Audit report
			MLNR will enact legal framework (laws, regulations, guidelines) to cede out public sector activities to the private sector	Phases 1&2 2020-25		Framework/guidelines on how FC will cede out activities and monitor performance.
			MLNR and FC will prepare the modalities governing the operations of the private sector towards the implementation of ceded out activities.	Phase 2: 2020-21		Modalities/Framwork governing he private sector participation

	Industry specific support incentives	Special timber industry development fund established by 2025	MLNR will through legislative instrument establish industry specific fund based on taxes from the trade in processed wood.	Phases 1&2 2017-21	MLNR	Bill on specific industry funds
			MLNR will prepare special invest incentive to enhance investment in tertiary wood processing	Phases 1&2 2018-2022		List of approved incentive systems
	Payment for Ecosystem Services (PES)	Revenue generation from PES introduced by 2025	MNLR will engage consultant to review earlier and come out modalities for generating revenue through PES	Phases 2: 2020-25	MLNR	Report on PES
			MNLR will enact legislation to support PES	Phases 1&2 2021-25		Copies of legislations on PES

6. PLAN IMPLEMENTATION COST AND FINANCING

The indicative cost of implementing the plan was determined based on the current level of activities. Based on the average recurrent and development expenditure of the forestry activities, the total funds required to implement the master plan over the twenty year period is US\$ 8.9 billion. Annually the sector will need US\$441 million to be able to implement the programme. The summarised budget for implementation current cost of the FDMP is shown in Table 21.

Table 21: Summarized Budget for the Implementation of 20-year FDMP

Plan Components	Major Programmes	Key Results Indicators	Indicative cost (US\$ millions)	Possible sources of financing
Sustainable management of forests, wildlife, wetlands and savannah ecosystems	Sustainable management of forests	Forest management plans formulated, approved, and implemented to cover all Forest Reserves (FRs) and Wildlife Protected Areas (WPA) in Ghana by 2020.	75.00	GoG = 40% IGF = 60%
		Legal processes for the reservation of all forest reserve areas concluded in Ghana by 2020.	2.00	GoG = 60% IGF = 40%
		Prospecting and mining of mineral resources in gazetted Forest Reserves reduced by 50 per cent in 2020 and 90 percent by 2035.	1.00	GoG = 40% IGF = 60%
		Biological inventories of 60 per cent of all gazetted forests reserves and wildlife Protected Areas completed by 2020 and 100 per cent by 2025.	125.00	GoG = 90% IGF = 10%
		Formulate and initiate the implementation of national reforestation plan by 2020.	5.0	GoG = 95% IGF = 5%
		Benefit Sharing Agreements covering activities in all	1.25	GoG = 40% IGF = 60%

		forest reserves by 2020.		
	Sustainable management of off-reserve forest production areas.	All timber producing areas outside Forest Reserves covered by timber production/ management plans with active involvement of the local landowners by 2025.	25.00	GoG = 60% IGF = 40%
		Capacities of communities in sustainable management off-reserve timber resources and non-timber forest products (NTFPs) developed to collaborate with the Forestry Commission in the management of off-reserve forest production areas by 2030.	40.0	GoG = 60% IGF = 10% Donors = 30%
	Ecologically representative areas and biological corridors established	Community Resource Management Areas (CREMAs) established and given management authority around all wildlife protected areas by the community by 2030	150.00	GoG = 50% IGF = 20% Donors = 30%
		Biological corridors in off-reserve areas to link forest and wildlife reserve in the high forest zone (HFZ) and savannah zone (SZ) created and managed by 2036	55.00	GoG = 40% IGF = 20% Donors = 40%
	Sustainably managed and commercial woodfuel supplies and non-timber forest products on both on-and-off-	Legal/regulatory and incentive framework that supports sustainable woodfuel production and marketing by 2025	1.5	GoG = 100%
		Sustainable production and utilization of widely used	12.00	GoG = 50% IGF = 20% Donors = 30%

	reserved forest areas.	NTFPs by 2030		
	Traditional autonomy for the protection and management of sacred forests and community dedicated forests for biological and cultural diversity on and off reserves enhanced.	National register of all traditional community conserved forest areas compiled and gazette by 2030.	35.00	GoG = 40% IGF = 10% Donors = 30% TA = 20%
		Management plans for the management of all sacred forest in place supported by Grant Mechanisms in all the ecosystems by 2030	100.00	GoG = 50% IGF = 20% Donors = 30%
	Savannah ecosystem under sustainable management.	Institutional arrangement for a more effective Savannah woodland management support centre (SWMSC) under the Forestry Commission established by 2020.	55.00	GoG = 40% IGF = 30% Donors = 30%
		Management systems and plans for FR and WPA in the savanna area developed by 2030	120.00	GoG = 50% IGF = 20% Donors = 30%
	Wetlands under sustainable management	All potential wetlands of global significance in all the ecological zones of Ghana identified, mapped, inventoried and documented by 2030.	22.55	GoG = 60% IGF = 20% Donors = 20%
	Reduced poaching and illegal trafficking of threatened wildlife species.	Participatory wetland management plans formulated and implemented for the sustainable management and utilization of the wetland resources by 2025.	10.50	GoG = 50% IGF = 20% Donors = 30%

	Reduced poaching and illegal trafficking of threatened wildlife species.	National awareness on wildlife poaching and illegal trafficking of threatened species created by 2020.	55.00	GoG = 50% IGF = 20% Donors = 30%
		Science-based wildlife monitoring, systems in place by 2020.	35.00	GoG = 30% IGF = 10% Donors = 60%
	Urban forestry introduced to accommodate human, social, cultural and economic factors	National urban forestry development blue print developed and implemented by at least 60% of MMDAS by 2030.	50.00	GoG = 50% IGF = 20% Donors = 30%
Reversing Deforestation/ Deforestation Rates and Increasing National Forest Cover	National plantation development in FRs areas	420,000 ha of planted forests in HFZ and SZ FRs by 2025	4,550.00	GoG = 50% IGF = 20% Donors = 30%
	Degraded landscapes in off reserve areas restored through plantations development, community forestry, and natural regeneration	2.7 million off reserve areas for high forest and savannah planted with timber species through direct planting, enrichment planting and management of tree-on-farms by 2030.	2,220.00	GoG = 60% IGF = 10% Donors = 30%
		Legal/regulatory/incentives framework that supports management of naturally occurring trees in off reserve put in place by 2020.	0.5	GoG = 100%
	Conservation and enhancement of carbon stocks in forest, and other land uses, and support climate smart agriculture	Promote soil management practices, improved fertilizing methods, and precision agriculture measures to maintain soil quality and reduce N ₂ O emissions. CH ₄ emission by 2025	20.00	GoG = 30% IGF = 10% Donors = 60%

	Support forest certification and FLEGT in the HFZ	At least 80% of timber operators engaged in forest certification by 2025	10.00	GoG = 25% IGF = 5% Industry = 70%
	Ensure effective and efficient prevention and control of wildfires in all ecological zones	Integrated wildfire prevention and control practices implemented by 2025	500.00	GoG = 50% IGF = 10% Donors = 40%
	Promoting of poverty reduction in rural communities through access to and benefits from plantation resources	2.4 million full time jobs will be created through plantation development by 2035	2.00	GoG = 100%
Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources	Tertiary wood Industries to constitute 40 per cent of the timber industry by 2030.	Evidence that 40% of the value of export for timber and timber products is tertiary.	1.5	GoG = 80% IGF = 20%
	Legislation to regulate the production and trade of legal/ (sustainable) lumber enacted to promote domestic wood market by 2020	Legislation to regulate domestic wood market in place by 2025	2.5	GoG = 70% IGF = 30%
	National timber industry development fund to support technological improvements	Evidence of legal framework (laws, regulations, guidelines) indicating the source and application of the fund.	500.00	GoG = 50% IGF = 20% Donors = 30%

	and efficiency in the tertiary wood sector established by 2025.			
	Specialized training and craftsmanship schemes initiated for wood bamboo, cane, rattan and other NTFP processing, by 2020.	Number of master craftsmen trained in wood processing, bamboo, cane and rattan	50.00	GoG = 60% IGF = 10% Donors = 30%
		At least 80% of NTFP species with international and local market processed by 2030.	2.0	GoG = 60% IGF = 5% Donors = 25%
Promoting and developing mechanisms for transparent governance, equity sharing and peoples participation in forest and wildlife resource management.	Capacities of communities including (women and youth) and civil society organization developed to enable them assume optimal management responsibilities by 2030.	Evidence of legislation and regulations to facilitate and enhance local participation in forestry operations at the district and community levels by 2030	0.50	GoG = 100%
		Attitudinal change and capacity to manage forest and wildlife resources on <i>sustainable basis enhanced in</i> communities and civil society groups by 2030	12.5	GoG = 50% IGF = 20% Donors = 30%
	Institutional frameworks for effective participation of key stakeholders in forest and wildlife resource management at all levels of governance developed and operational by 2035	Existence of functional forest forum at all levels of governance by 2030.	10.50	GoG = 60% IGF = 10% Donors = 30%
		At least 50% of local communities and NGOs including women and youth who receive training annually in forest management within the FR agro-forest corridors by 2035.	20.5	GoG = 50% IGF = 10% Donors = 40%
		Current relevant public sector activities of FC ceded out to		

		the MMDA and the private sector by 2025		
Development of sustainable and predictable financing instruments to support forestry sector activities	National conservation trust funds, payments for environmental services, debt-for-nature swaps, economic valuation of protected area goods and services, access and benefit sharing agreements established by 2025	Evidence of legislation and regulations on national forestry development trust funds in place by 2025.	1.5	GoG = 100%
		Evidence of national policy reform and incentives to engage the private sector (concessions, private reserves, etc.) and other stakeholders to improve protected area financing.		
Total Programme Cost (US\$)			8,879.8	GoG = 52% IGF = 23% Donors = 25%

From the indicate cost analysis, the Ghana Government will be the major funding institution for the implementation of the master plan. The Forestry Commission internally generated funding sources will have to be stepped up to meet the general cost of the plan implementation. The MLNR will have to work with the FC to develop a strong mechanism to mobilise financial support from the development partners to assist the plan implementation.

6.2 Overall Results Framework

The overall results framework of the forestry development master plan has been developed to give clear guidance on the indicators, which can be used to monitor the programme implementation and to review the plan. The general results framework for the plan is summarized in Table 22.

Table 22: FDMP Results Framework

Plan Component	Major Programmes	Key Results Indicators	Baseline Conditions	Short Term results (2016-20)	Medium Term results (2021-30)	Long Term results (2031-36)	End Of Programme Situation	Means of Verification	Responsible organization
Sustainable management of forests, wildlife, wetlands and savannah ecosystems	Sustainable management of forests	Forest management plans formulated, approved, and implemented to cover all Forest Reserves (FRs) and Wildlife Protected Areas (WPA) in Ghana by 2020.	75% of WPA covered with mgt plans	25% of WPA covered with updated mgt plans	All FRs covered with updated Mgt. Plans	All FRs covered with updated Mgt. Plans	100% of FRs & WPAs with updated Mgt. Plans	Approved FR & WPA management plans Biological inventory reports Gazette law Annual Report Annual monitoring reports (AMR)	FC
		Legal processes for the reservation of all forest reserve areas concluded in Ghana by 2020.	90% of FRs with legal status confirmed	10% of FRs with legal status confirmed.	10% of FRs with legal status confirmed.	10% of FRs with legal status confirmed.	100% of FRs with legal status confirmed		MLNR & FC
		Prospecting and mining of mineral	Five companies with permit	No new permits to be issued to	No new permits to be issued to	No new permits to be issued to	All prospecting and mining		MLNR/FC/ EPA

		resources in gazetted Forest Reserves reduced by 50 per cent in 2020 and 90 percent by 2035.	to prospect minerals in reserves.	mining companies.	mining companies.	mining companies.	of minerals in FR will cease.		
		Biological inventories of 60 per cent of all gazetted forests reserves and wildlife Protected Areas completed by 2020 and 100 per cent by 2025.	40% biological inventories of all PAs completed.	15% biological inventories of all PAs.	35% biological inventories of all PAs.	10% biological inventories of all PAs.	100% biological inventories of all PAs.		FC
		Formulate and initiate the implementation of national reforestation plan by 2020;	Plantation Development plan in place.	National reforestation plan formulated and adopted for all ecological zones.	National reforestation plan for all ecological zones implemented	National reforestation plan for all ecological zones implemented	National reforestation plan for all ecological zones implemented		MLNR/FC/ MESTI
		Benefit Sharing Agreements	Draft benefit sharing	Benefit sharing agreement	Benefit sharing agreements	Benefit sharing agreements	Benefit Sharing Agreements		MLNR/FC

		covering activities in all forest reserves by 2020;	agreement in place.	covered with legal instrument	implemented	evaluated.	covering activities in all forest reserves legitimized		
Sustainable management of off-reserve forest production areas.		All timber producing areas outside Forest Reserves covered by timber production/ management plans with active involvement of the local landowners by 2025.	Production management plans for forests outside the FRs are outdated	30% inventory of potential off-reserved production areas completed with mgt prescription.	70% inventory of potential off-reserved production areas completed with mgt prescription	Management prescription of all off-reserved area evaluated	100% inventory of potential off-reserved production under management prescription.	Annual reports Baseline survey Socio-economic studies AMR	FC/ Traditional Authorities (TAs)/ MMDAs
		Capacities of communities in sustainable management off-reserve timber resources and non-timber forest products (NTFPs) developed to collaborate with the	Low community capacity in sustainable management off-reserve and mgt of NTFPs.	Feasibility of potential functions of FC in off-reserve management areas that can be decentralized to local communities conducted	At least 40% of potential functions of FC in the management and utilization of off-reserved forest and wildlife resources co-managed with local	60% of potential functions of FC in the management and utilization of off-reserved forest and wildlife resources co-managed with	100% of potential functions of FC in management and utilization of off-reserved forest and wildlife resources co-managed with		FC/TA/M MDA/ CSOs/TAs/ Landowner

		Forestry Commission in the management of off-reserve forest production areas by 2030.			communities	communities	communities		
	Ecologically representative areas and biological corridors established	Community Resource Management Areas (CREMAs) established and given management authority around all wildlife protected areas by the community by 2030	19 potential CREMA areas given management authorities.	10 CREMA areas given management authorities	16 potential CREMA areas given management authorities	15 potential CREMA areas given management authorities	60 potential CREMA areas given management authorities	CREMA Management plans. CREMA Agreements Field monitoring reports. Inventory Report Annual	FC (WD)/TAs/ Landowner

		Biological corridors in off-reserve areas to link forest and wildlife reserve in the high forest zone (HFZ) and savannah zone (SZ) created and managed by 2036	No biological corridors in off reserve areas between FRs and WPA in the HFZ and SZ created and managed.	Potential biological corridors in off reserve areas between FRs and WPA in the HFZ and SZ identified.	60% potential biological corridors in off reserve areas between FRs and WPA in the HFZ and SZ created and managed.	40% - 60% potential biological corridors in off reserve areas between FRs and WPA in the HFZ and SZ created and managed.	100% - 60% potential biological corridors in off reserve areas between FRs and WPA in the HFZ and SZ created and managed.	Report	FC (WD)/TAs/ Landowner
	Sustainably managed and commercial woodfuel supplies and non-timber forest products on both on-and-off-reserved forest areas.	Legal/ regulatory and incentive framework that supports sustainable woodfuel production and marketing by 2025	No legal regulatory / incentive framework supports sustainable woodfuel production and marketing	National strategy on sustainable woodfuel production marketing & incentives developed Bill on sustainable woodfuel production prepared.	Legal regulatory framework that supports sustainable woodfuel production and marketing incentives in place. Sustainable woodfuel production & marketing implemented in SZ	Sustainable woodfuel production & marketing implemented in all ecological zone	Legal regulatory framework that supports sustainable woodfuel production and marketing operational	Annual reports AMR Gazette Woodfuel monitoring system	FC/MMDA /TA/ Landowner

		Sustainable production and utilization of widely used NTFPs by 2030	Widely used NTFP production and utilization not under sustainable production	Studies on sustainable production and utilization of NTFP completed	Sustainable production systems in place for the production of NTFPs	Sustainable production system for NTFP evaluated	Sustainable production and utilization of NTFPs		FC/TA/ Landowners
Traditional autonomy for the protection and management of sacred forests and community dedicated forests for biological and cultural diversity on and off reserves enhanced.	National register of all traditional community conserved forest areas compiled and gazette by 2030.	Limited national data on traditional conserved areas	10% of all traditional conserved forest areas compiled and gazetted.	70% of all traditional conserved forest areas compiled and gazetted.	90% of all traditional conserved forest areas compiled and gazette.	100% of all traditional conserved forest areas compiled and gazette.	Register of ICCAs Annual reports Mechanism for dedicated grants in place	FC/TAs/ MESTI/ Research Institutions	
	Management plans for the management of all sacred forest in place supported by Grant Mechanisms in all the ecosystems by 2030	Two mgt plans in place for sacred forests/ community forests in all the ecosystems.	Modalities for grant mechanism developed for sacred / community forests management	Dedicated grant mechanism developed for sacred /community forest management	Dedicated grant mechanism for sacred / community forest management evaluated	Dedicated grant mechanism developed for sacred /community forest management		FC/TAs/ MESTI/ Research Institutions	

	Savannah ecosystem under sustainable management.	Institutional arrangement for a more effective Savannah woodland management support centre (SWMSC) under the Forestry Commission established by 2020.	Savannah woodland management is under the FSD	SWMSC established in Tamale but affiliated to RMSC	SWMSC established in Tamale , fully operational and under FC corporate HQ	SWMSC established in Tamale , fully operational and under FC corporate HQ	SWMSC established in Tamale , fully operational and under FC corporate HQ	Savannah woodland management plans Field reports AMR	FC/MLNR
		Management systems and plans for FR and WPA in the Savannah Area developed by 2030	Outdated plans and systems for WPAs	Production of GIS based maps for all FRs & WPA	All Plans and systems developed for FRs and WPA in savannah areas		All Plans and systems developed for FRs and WPA in savannah areas		FC
	Wetlands under sustainable management	All potential wetlands of global significance in all the ecological zones of Ghana identified, mapped,	No comprehensive data on inland wetlands of global significance	40% Wetlands of global significance mapped, inventoried and documented	60% of wetlands of global significance mapped, inventoried and documented		100% of wetlands of global significance mapped, inventoried and documented	Management plans AMR Community Agreements	FC/TA/M MDAs/ Landowners

		inventoried and documented by 2030.							
Reduced poaching and illegal trafficking of threatened wildlife species.	Participatory wetland management plans formulated and implemented for the sustainable management and utilization of the wetland resources by 2025.	RAMSAR wetland management plan outdated	40% RAMSAR sites management plan updated	60% RAMSAR sites management plan updated and implemented	100% of other inland wetlands of global significance identified and management plans developed.	RAMSAR sites and other inland wetlands of global significance covered with management plan.	AMR Annual reports	FC/MMDA /TA/Landowners	
Reduced poaching and illegal trafficking of threatened wildlife species.	National awareness on wildlife poaching and illegal trafficking of threatened species created by 2020.	Low awareness on wildlife poaching and illegal trafficking of threatened species	Educational and awareness creation messages on wildlife poaching and illegal trafficking of threatened species developed	Educational and awareness campaign on wildlife poaching and illegal trafficking of threatened species implemented	Educational and awareness campaign on wildlife poaching and illegal trafficking of threatened species implemented	National awareness on wildlife poaching and illegal trafficking of threatened species	AMR Annual reports	FC/MMDA /TA/CREMA executives	
	Science-based wildlife monitoring,	Manual wildlife monitoring	The use of satellite for effective	The use of satellite in wildlife	Wildlife monitoring, education	wildlife monitoring, education		FC/Research	

		systems in place by 2020.	system in place	wildlife monitoring, system piloted	monitoring, system made operational	and awareness evaluated	and awareness in place		institutions
	Urban forestry introduced to accommodate human, social, cultural and economic factors	National urban forestry development blue print developed and implemented by at least 60% of MMDAS by 2030	No major urban forestry development plan in place	National urban forestry programme formulated and launched urban forestry development	30% of MMDA implement urban forestry development plan	30% of MMDA implement urban forestry development plan	60% of MMDA implement urban forestry development plan	AMR FC annual report MMDA annual report	MLNR/FC/ NDPC/ MLGRD
Reversing Deforestation/ Deforestation Rates and Increasing National Forest Cover	National plantation development in FRs areas	420,000 ha of planted forests in HFZ and SZ FRs by 2025	191,000 ha of planted forests in FRs. By public and private sector in the last decade	25,000 ha of degraded HFZ FRs planted.	80,000 ha of degraded HFZ FRs planted.	30,000 ha of degraded HFZ FRs planted.	135,000 ha of degraded HFZ FRs planted.	Annual report on plantation development	FC/Private sector/Stakeholders
				50,000 ha of degraded SZ FRs planted.	150,000 ha of degraded SZ FRs planted.	83,000 ha of degraded SZ FRs planted.	283,000 ha of degraded SZ FRs planted.		
	Degraded landscapes in off reserve areas restored through plantations development, community forestry, and	2.7 million off reserve areas for high forest and savannah planted with timber species through direct planting, enrichment	National Plantation Strategy in place	National Reforestation Strategy developed. 0.3 million off reserve areas in HFZ & SZ planted	1.7 million off reserve areas for HFZ & SZ planted with timber species through direct	0.7 million off reserve areas for HFZ & SZ planted with timber species through direct	2.7 million off reserve areas in HFZ & SZ h planted with timber species	Annual reports AMR Gazette laws	FC/TA/ Landowners/National tree growers association

	natural regeneration	planting and management of tree-on-farms by 2030.		with timber species through direct planting, enrichment planting and mgt. of tree-on-farms.	planting, enrichment planting and management of tree-on-farms implemented	planting, enrichment planting and management of tree-on-farms implemented			
		Legal/regulatory/incentives framework that supports management of naturally occurring trees in off reserve put in place by 2020.	No legal regulatory framework to supports management naturally occurring trees	Legal framework for naturally occurring trees passed by Parliament	Legal regulatory framework that supports tree mgt	Legal regulatory framework that supports tree mgt.	Legal regulatory framework that supports plantation development in place	Laws in place AMR Annual reports	MLNR/FC/TA/ CSOs/
	Conservation and enhancement of carbon stocks in forest, and other land uses, and support climate smart agriculture	Promote soil management practices, improved fertilizing methods, and precision agriculture measures to maintain soil quality and reduce N ₂ O emissions. CH ₄ emission by 2025	Piloting improved management practice in selected agro-forest areas in Western and BA	160 communities supported around 10 agro-forest corridors	360 communities supported around 30 agro-forest corridors	200 communities supported in 20 agro-forest corridors	720 communities supported in agro-forest areas	Annual Reports AMR	FC/MOFA/COCOBO D

	Support forest certification and FLEGT in the HFZ	At least 80% of timber operators engaged in forest certification by 2025	9 timber companies in FSC forest certification	10 % of wood exported from certified sources	50 % of wood exported from certified sources	20 % of wood exported from certified sources	80 % of wood exported from certified sources	Annual Report on timber exports AMR	FC/Working Group on certification
	Ensure effective and efficient prevention and control of wildfires in all ecological zones	Integrated wildfire prevention and control practices implemented by 2025	Draft National wildfire policy in place.	Necessary structures and systems for stakeholder participation in wildfire management developed and implement in SZ	Necessary structures and systems for stakeholder participation in wildfire management developed and implement in all ecological areas	Satellite monitoring of wild fire in place	Integrated wild fire management in place	Annual Report	FC
	Promoting of poverty reduction in rural communities through access to and benefits from plantation resources	2.4 million full time jobs will be created through plantation development by 2035	One coupe (40ha) of newly establish plantation generates 94,560 jobs over 25 years.	420,000 jobs created through nursery dev't and Modified Taungya System (MTS)	1.85million jobs created through nursery dev't and MTS	200,000 jobs created through nursery dev't and MTS	2.4,000 job created through nursery dev't and MTS	AMR Plantation development quarterly reports	MLNR/FC/TA/CSOs/Land owners/Tree Planter

Development of viable forest and wildlife based industries and livelihood enterprises, particularly in the value added processing of forest and wildlife resources	Tertiary wood Industries to constitute 40 per cent of the timber industry by 2030.	Evidence that 40% of the value of export for timber and timber products is tertiary	3% of the total value of timber and timber products is tertiary product	5% of the industry timber industry involved in tertiary processing	10% timber industry involved in tertiary processing	40% timber industry involved in tertiary processing.	Tertiary wood Industries modernized to achieve 40 per cent of the timber industry.	Survey of timber industry Annual report	FC/MLNR/ Timber trade Associations
	Legislation to regulate the production and trade of legal/ (sustainable) lumber enacted to promote domestic wood market by 2020	Legislation to regulate domestic wood market in place by 2025	No comprehensive legislation regulates the domestic wood market	Bill of domestic wood market laid before Parliament Education and awareness on the Bill regulating domestic wood market	Domestic wood market regulated by the law	Law regulating wood market evaluated and deficiencies corrected	Domestic Wood market regulated	Annual reports AMR Special timber industry study Laws and regulations	FC/MLNR/ Timber trade Association s/ Chainsaw Operators
	National timber industry development fund to support technological improvements and efficiency in the tertiary	Evidence of legal framework (laws, regulations, guidelines) indicating the source and application of the fund.	No timber industry development fund available Clarify	Legal framework for developing and implementing forest industry development fund in place	National timber development fund in place and operational	60% of industry operators capable of accessing the timber industry development fund	100% of industry operators capable of accessing the timber industry development fund	Annual reports Annual report Special study	MLNR/FC/ Timber Trade Associations

	wood sector established by 2025.								
	Specialized training and craftsmanship schemes initiated for wood bamboo, cane, rattan and other NTFP processing, by 2020.	Number of master craftsmen trained in wood processing, bamboo, cane and rattan	Less than 10% of master craftsmen trained in wood processing.	20% of master craftsmen trained in wood and NTFP processing.	60% of master craftsmen trained in wood processing.	80% of master craftsmen trained in wood processing.	80% of master craftsmen trained in wood processing.		
		At least 80% of NTFP species with international and local market processed by 2030.	Less than 10% of NTFPS with international and local markets are processed	20% of NTFPS with international and local markets processed	70% of NTFPS with international and local markets processed	80 0% of NTFPS with international and local markets processed	80 % of NTFPS with international and local markets are processed	Annual reports Complete data of NTFPs with international value AMR	FC/Timber trade Associations/ NTFP operators
Promoting and developing mechanisms for transparent governance, equity sharing and peoples participation	Capacities of communities including (women and youth) and civil society organization developed to enable them assume	Evidence of legislation and regulations to facilitate and enhance local participation in forestry operations at the district and community	No Legal regulation to facilitate local participation in forestry operations	Bill to facilitate local participation in forest management developed and laid before parliament	Law guaranteeing local participation in forest management operational	Law guaranteeing local participation in forest management operational evaluated.	Legislation in place to cover local participation in forestry operations operational	Annual report Socio-economic study Annual report	MLNR/FC/ CSOs/ Stakeholders

in forest and wildlife resource management.	optimal management responsibilities by 2030.	levels by 2030						Individual project report	
		Attitudinal change and capacity to manage forest and wildlife resources on sustainable basis enhanced in communities and civil society groups by 2030	Capacity to manage forest and wildlife resources is weak in CSOs and communities	20% of capacity built	50% of capacities built in communities and CSOs c	30% of capacities built in communities and CSOs	100% capacities built in communities and CSOs for effective forest and wildlife management		
	Institutional frameworks for effective participation of key stakeholders in forest and	Existence of functional forest forum at all levels of governance by 2030.	Forest forum functions in less than 10% of forest areas	Forest forum becomes operational in 20% of forest areas	Forest forum becomes operational in 60% of forest areas	Forest forum becomes operational in 100 of forest areas	Forest forum becomes operational in 100% of forest areas	Annual Reports Guidelines for the operation of Forest Forum	FC/CSOs/ Stakeholders

	wildlife resource management at all levels of governance developed and operational by 2035	At least 50% of local communities and NGOs including women and youth who receive training annually in forest management within the FR agro-forest corridors by 2035.	No forest fringe communities receive training in forest management	At least 5% eligible forest fringe communities receive training in forest management	At least 25% eligible forest fringe communities receive training in forest management	At least 20% eligible forest fringe communities receive training in forest management	At least 50% eligible forest fringe communities receive training in forest management within agro-forest landscapes	Annual Report AMR Annual report Socio-economic study	FC/MLNR/TA/ Stakeholders
		Current relevant public sector activities of FC ceded out to the MMDA and the private sector by 2025	No activities of FC has been ceded to the MMDAs	Modalities to guide ceding out non-core activities of the FC to other agencies identified	Legal framework to transfer non-core functions of FC to other state agencies in place	Performance of MMDAs in forest management evaluated	Relevant activities of FC ceded out to MMDAs	Annual report Memorandum of Agreements signed.	MLNR/FC
Development of sustainable and predictable financing instruments to support	National conservation trust funds, payments for environmental services, debt-for-	Evidence of legislation and regulations on national forestry development trust funds in	No national forestry development trust fund in place	Bill on national forestry development trust fund in laid before parliament	National forestry development Act in place and implemented	National forestry development Act in place, implemented and evaluated	National forestry development Act implemented	Annual report Law on forestry development trust	MLNR/FC/ Stakeholders

forestry sector activities	nature swaps, economic valuation of protected area goods and services, access and benefit sharing agreements established by 2025	place by 2025.						fund	
		Evidence of national policy reform and incentives to engage the private sector (concessions, private reserves, etc.) and other stakeholders to improve protected area financing.	Incentives for private sector participation in plantation forestry being discussed	Legal framework and incentives for private sector participation in forest plantations enacted	Incentives packages for private sector participation in forest plantations implemented	Incentives for private sector participation in forest plantations implemented and reviewed	Legal framework and incentives for private sector participation in forest plantations in place	AMR Annual Report Existence of policy on incentives	MLNR/FC/ Stakeholders

6.2.1 Monitoring and Evaluation Framework

The objectives of the monitoring and evaluation framework for the FDMP are to gradually gather the needed information on the planned activities under the plan, analysed and synthesize them and use the results to measure the achievements/impacts in relation to the stated objectives. The information to be generated from the field activities monitored would be used as a basis for reviewing the plan. Table 23 gives the key results areas and the performance indicators.

It will be the duty of MLNR to continuously assess the progress of various key results areas in the FDMP as shown in the overall result framework particularly at activity level. Monitoring process requires collecting and analysis of data which serve as a guide to either continue the pace and direction of the plan in case the institution is on the right course of action or set up corrective measure if it had diverted from the original path. It is therefore necessary that the PPMED of the MLNR coordinates all the activities within the sector to ensure that various departments and agencies share information, experiences and above of all work towards the common a vision of the FDMP.

The following stakeholder would use the monitoring and evaluation information:

- Government (Ministry of Finance and Economic Planning, National Development Planning Commission, Ghana Statistical Service, MESTI, EPA) and development partners.
- MLNR PPMED
- Timber trade and industry
- Civil Society Organizations
- Primary beneficiaries: the private sector and decentralized entities, and
- Other partners intervening in the forestry sector

6.2.2 Data Collection and Reporting

The data to be collected and analysed would be for two reasons, to:

- Progressively monitor progress at activity level. This will be done to monitor the progress of the achievements of financial and technical targets and this is an internal process that will be carried out essentially by MLNR and FC staffs;
- Monitor and evaluate outcomes and impact of various MLNR operations: This will be an external process and data will mainly come from external services such as national surveys.

Monitoring is based on the assessment of what has been achieved at budget and activities level as compared to the planned. This assessment gives an indicator of performance at the technical, financial, and duration of the activity levels. For MLNR to achieve to this, analysed and verified field data will be used in analysing plans and achievements. It is on this basis that technical reports will be prepared and linked with the financial data. An annual plan as well as quarterly plans will be developed at the beginning of the end of each phase of the plan and these are monitored for comparisons purposes. All divisions under the FC will organize, under the

supervision of their executive directors, a quarterly meeting to evaluate activities achieved in the previous quarter as compared to what had been planned. The MLNR will organize half yearly review meetings to review performance of the plan implementation. This will allow them to make the necessary adjustments in the plan. The progress report on MLNR activities would be compiled by the monitoring and evaluation staff based on quarterly reports.

6.3 Awareness, Communication Strategy and Knowledge Management for the FDMP

The FDMP communications strategy is seen as a fundamental and integral part of the plan. The strategy takes into account both the short-term need to engage stakeholders in the conception and development of projects and activities under the plan as well as the longer term need to promote widespread support for implementing the FDMP.

The ultimate goal of this awareness and communication strategy is to improved awareness and understanding on forestry sector issues and initiatives under the FDMP contributing to poverty eradication and environmental sustenance. The goal would be achieved through a number of strategic objectives as follows:

- Build awareness, understanding and support for the implementation of FDMP;
- Advocate and promulgate necessary legislations and law to support the implementation of the strategies listed under this programme;
- Promote understanding and adaptation to climate change phenomenon in the development and utilization of forest resources in Ghana;
- Increase awareness and commitment among public and private sector organization, NGOs and agencies on the importance of implementing the 20-year forestry development plan
- Provide general information to the public about FDMP and how people can actively contribute, thus establishing a broader and stronger constituency for government policies;
- Build new partnerships between governments and civil society including local communities, indigenous people, women’s groups, the private sector and the general public;
- Enhance the government’s accountability and credibility as well as the cost-effectiveness;
- Ensure effective two-way communication between the project team and stakeholders and involve them in setting priorities and allocating resources; and
- Resolve potential conflicts amongst stakeholders.

The first phase will focus on raising and increasing awareness among key target groups on the considerable environmental, social and economic impacts of forest degradation and drought, particularly in the savannah land and the national development. The second phase will to arrive at a point where the level of public awareness of the national development problems would be linked to forest degradation, climate change, biodiversity (wildlife) loss, and wildfire. During the third phase, efforts will focus on raising the profile of the forestry sector and establishing it as an indispensable development tool to address poverty and environmental, social and economic challenges and generating national and global benefits, in addition to making a significant difference at the local level.

The strategic approach awareness creation will focus on:

- Building and/or strengthening databases on specific target groups as an integral part of establishing appropriate channels for natural resource accounting;
- Designing relevant and timely target-specific messages backed by strong research and scientific evidence;

6.3.1 Awareness-Raising Messages

Awareness-raising messages are meant to capture the imagination and attention of the general public so that they view desertification as their problem and concern regardless of their location. In this regard, the approach needed is to connect FDMP with people’s daily lives. Messages depicting the negative impact from failure to pay adequate attention to forest degradation would be needed. The strategy is to raise community consciousness to develop limited tolerance for negativity on the environment. By contrast, messages that would inspire and activate the “desire of the people to act” by demonstrating the benefits and achievements the FDMP will generate. This will increase motivation. This approach may succeed with the public at large, but it is necessary to capture the interest of decision makers by highlighting the political and economic gains.

Awareness-raising messages will also focus on reversing the stereotypical connotations associated with deforestation, illegal logging and all the vices in the forestry sector. Therefore, the message while keeping a focus on deforestation and degradation will market afforestation as an asset and opportunity for solving some of the national and local challenges. Recent global crises, such as food security and migration, and global initiatives, such as poverty reduction and climate change, would be linked to the implementation of the FDMP.

6.3.2 Educational and Communication Tools

Educational messages will be designed to deepen understanding of issues of interest, including policy process and in the field for practical solutions. Key messages will aim to move decision makers and the public to a position of “can we afford to do it!!”

The main objectives for communication during the implementation of the FDMP are to:

- Ensure that all the lessons learned from the implementation of the programmes/projects are captured, analyzed and shared with key stakeholders to promote learning within and across communities and countries.
- Help replicate and scale up its impact, as well as to inform policy.

The communication strategies are to

- Publish quarter e-magazines on the project activities and circulate them widely;
- Encourage civil society organizations and other stakeholders to initiate weekly radio programmes on topical issues on the environment;
- Publish annual case studies of best practices

The information to be captured and shared are;

Socio-economic impacts

- Measurable impacts (change in average household income, job creation, revenues, livelihood diversification, livelihood/income diversification, market access etc)
- Secondary benefits (investments into infrastructure, school fees, health care, disease control, etc)
- Positive change in socio-economic conditions since the project/initiative began
- Participation of women and indigenous people
- The measurable change in local incomes and job opportunities

Policy Impacts

- Impacts the community/project has had on policy-making at different governance levels
- Inclusion of community members in steering committees, advisory bodies
- Change in national, municipal and local laws because of community activity

The variety of targets and diversity of messages and approaches envisaged under this programme have implications for the mechanisms and tools required. Organizations distinguish and differentiate themselves by their products, which also serve as vital publicity tools.

Knowledge Management Plan

The MLNR through the FC will develop major knowledge centers for plantation development, community-based initiatives that address environmental problems at the local level while achieving significant global environment impacts. The key strategies to achieving this vision are to:

- Develop a web platform that allows better knowledge capture and sharing, monitoring and evaluation the use of new media;
- Systematize processes and create templates that facilitate data collection and community level for publication;
- Build capacity for knowledge management at the local level through training and learning;
- Contribute to relevant knowledge bases and fora by increasingly forming a constituency of CSOs with capacity, motivation and systematic information flow;
- Establish information exchange links with the national policy making bodies especially with Ministry of Environment Science, Technology and Innovation;
- Establish partnerships to upscale and replicate successful projects and best practices;
- Capture and disseminate the results, lessons learned and best practice from the FDMP via different media by streamlining and strengthening the database, intranet and website to allow for knowledge exchange and sharing;
- Provide guidance to the stakeholders on how to capture and disseminate knowledge and conduct knowledge exchange at the local level to be aggregated at global level.

At Local Levels the Strategy is to:

- Standardize, capture and disseminate the results, lessons learned and best practice;
- Organize consultations, training and knowledge exchange between communities and other key stakeholders;
- Support demonstration sites and knowledge centers around successful projects;
- Inform, contribute and influence local, regional and national policy with the best practices of projects in the country;
- Establish partnerships to upscale and replicate successful projects and best practices;
- Participate in communities of practice;
- Maintain database updated with the latest information on the projects

7. CONCLUSION

Ghana has since the colonial era, pursued sustainable forestry development agenda aimed at managing the high forest to enhance human welfare and national development. Priority interventions in the sector has been on forest management and resource development (including natural regeneration and timber plantation programmes), institutional capacity building, governance (including policy and institutional reforms), and biodiversity conservation. These interventions in the forestry sector until the late 1980s were mostly government funded through the annual budget. The last two decades, however witnessed donor support in excess of US\$ 643 million (in 2009 dollar value). The average annual investment between 1989 and-2009, was US\$ 32 million a year (in 2009 dollar value).

The development assistance to the forestry sector has been mostly through the Forest Resource Management Programme (FRMP) (1989-1997) which was project based; the Natural Resources Management Programme (NRMP) phase (1999-2008) mainly programme based; and the Natural Resource and Environmental Governance (NREG) phase (2008- date) which was sector budget support. Currently, the forestry sector is receiving support from the Forest Improvement Programme (FIP)-financed activities which is aimed at reducing Greenhouse Gas (GHG) emissions from deforestation and forest degradation, while reducing poverty and conserving biodiversity. The programme objective is to improve forest and tree management practices by cocoa farmers, Community Resource Management Area (CREMA) communities, and forest reserve managers to reduce forest loss and degradation in selected landscape corridors in Ghana's High Forest Zone.

In recent times the Government of Ghana launched a comprehensive National Environment Policy (2012) and National Climate Change Policy (2013), which aims to achieve a climate resilient economy while achieving sustainable development. This has been followed up with a national climate change action plan which presents a road map to addressing major environmental threats in Ghana. The Government of Ghana has also started a consultative process to develop a 40-year national development plan which seeks a just, free, prosperous, inclusive, and resilient national economy for a tolerant society, safe and sustainable communities, as well as effective and efficient institutions and global peace and justice.

The exigencies of the current situation have introduced a set of complex and increasingly interlinked issues which impinges on the growth and development of the forestry sector. The challenges have brought in their wake, the need to strengthen political commitments and actions at all levels of governance to implement sustainable management of all types of forests and contribute to achieving national growth and environmental sustainability. From the '*timberization*' policies and plans of the 20th Century, the Ghanaian forestry sector intends to make a paradigm shift to create a balance between timber production, good governance, forest enterprise development, biodiversity conservation, ecotourism development, and effective marketing to satisfy the domestic wood demand.

The development of forestry in Ghana encompasses all forms of forests in both the high forest and savanna ecosystems; commercial plantations development; and the promotion of the formal and informal forest-based industries which they support. The implementation of 2016 FDMP will promote research, science and technology to support the planting and use of trees on farms, in villages, towns and cities for amenity, recreation, for shade and for fuel; effective

decentralization of forest and wildlife governance and promotion of climate change mitigation and adaptation measures as well as payment for ecosystem services. It requires national efforts to seriously address drivers of deforestation and forest degradation and promote a paradigm shift from consumptive use of the forest to non-consumptive use.

The past Forest and Wildlife policies sought to maintain the forest resources as a source of timber to feed a vibrant timber industry, however given the current trends in the national development agenda, stakeholders' expectations and the international obligations, a change in policy direction is inevitable. The sector therefore envisions a future prosperous sustainable forest and wildlife sector that provide continued benefits to the present and future generation by promoting equity in the allocation of forest resources, supporting rural livelihoods and realigning the forestry sector institutions to meet multi-stakeholder's expectations without compromising the environmental integrity.

Failure to implement this plan will cause a relapse in the forestry sector which will reverse all the gains made over the last two decades. We need this comprehensive plan to complete the relevant activities remaining under the 1996 Forestry Development Master plan and continue with the implementation of the current programmes and reforms and to consolidate the gains. Under this strategy, Ghana will continue to implement the Plantation Development Strategy, Wood Tracking System (WTS) under the Voluntary Partnership Agreement (VPA) Programme; move into full scale to implement the Reduced Emissions from Deforestation and Forest Degradation (REDD+) strategy; continue with the implementation of the on-going Forest Investment programme, and support the implementation of the Forestry industry development blueprint. An improved governance programme will be put in place to implement collaborative resource management, contain illegal logging, and support higher private sector participation in the sector development programmes.

The implementation of the FDMP will enforce sustainable forest management principles and continue the conservation and sustainable development of forest and wildlife resources for maintenance of environmental stability and continuous flow of optimum benefits from the social and economic goods and services that the forests provide to the present and future generations. Indeed it will be the first step towards the forestry component of the 40 year national development plan.

Appendix 1: Summary of Past Forestry Sector Programmes/ Projects since the 1996 FDMP

No.	Programme / Project	Programme / Project Objectives	Outcome / Impact	Donor Agency
1	Forest Resource Management Project (FRMP) from 1989 to 1997	<p>To strengthen Forest Sector Institutions and Agencies, including infrastructure, training, development of policy, planning, monitoring and evaluation capability</p> <p>Management and planning of protected areas to systemize development and management of wildlife resources</p> <p>MLNR & FC to implement National Parks & Protected Area System Plan</p> <p>Promote dialogue with private sector</p>	<ul style="list-style-type: none"> • Management capacity at MLNR strengthened in forest sector monitoring, • Produced a National forest inventory, setting Annual Allowable Cuts (AAC) for timber (1 million m³) • Enforced a log export ban • Off-reserve forest areas under FC management initiated • Timber royalty collection and disbursement improved • Research and capacity training strengthened at FORIG and IRNR • Improved capacity at the Wildlife Division for protected areas management • Facilitated development of 10 PA Management Plans • Facilitated the review and development of a revised forest and wildlife policy 	World Bank -IDA, DANIDA and ODA)
2	Forest Protection and Resource Use Management Project from 1993 to 2008	To improve the ecology and socio-economic situation in the Volta Region of Ghana	The project brought the forest reserves in the Volta region under sustainable management. It introduced participatory forest management and established a number of forest forum which allowed the forest communities to participate in the management of forest resources in the Volta region	Funding support: GTZ/Kfw
3.	Forest Sector Development Project (FSDP) I & II from 1995 to 1999	<p>To assist with the establishment of a forest service capable of effective and efficient implementation of forest policy</p> <p>To carry-out an institutional review and transformation of the Ghana Forestry Department into an autonomous self-financing Forest Service</p>	<ul style="list-style-type: none"> • Forest Services Division established but with partial completion on the complimentary staffing needs, partial completion of institutional management and financial systems but weak centralised routine of monitoring and evaluation and reporting system to national levels. • Completed pilot studies on collaborative 	DfID

			forest management and manuals of procedures for planning in the High Forest Zone.	
4	Forest Sector Development Project (FSDP) II from 2000 to 2006	<p>The transformed institution was to be financially independent, maintain a lean staff size yet efficient in the discharge of its mandate with new condition of services, and human resources policy and capacity building.</p> <p>To assist the GoG and Other Stakeholders in the creation of an institutional framework that increases the sector's contribution to poverty reduction and sustainable economic growth in income, well-being, and empowerment to attain a high level of local ownership.</p> <p>To assist the Forestry Commission to fulfil its role as stipulated by the Constitution, the Forestry Commission Act and other GoG policies.</p>	<ul style="list-style-type: none"> The merger of 5 different institutions (FSD, WD, FPIB, TEDB, RMSC) under a new Forestry Commission with supported fiscal reforms in the upward adjustment of stumpage fees from \$ 3.00/m³ in 2002 to \$ 11.1/m³ by 2003 with guidelines for the publication of royalties; operationalized the FC HR and completed a graded and harmonized pay structure for the FC 	Funding support for FSDP I & II by DFID
5	High Forest Bio-diversity Conservation Project GEF from 1999 – 2006	To identify, document and demarcate forest areas within the high forest zone (HFZ) that are of high importance for global biodiversity conservation and to increase the ecological security of these areas	<ul style="list-style-type: none"> - A total number of 30 forest reserves (11 and 19 wholly protected and partially protected forest reserves, respectively) were identified and excluded from timber harvesting on the merit of their significance as biodiversity-rich areas. - All the 30 GSBAs were surveyed, demarcated, and pillared; legal documents forwarded to cabinet for approval and re-gazetting. - The survey, demarcation and pillaring of 42 PAs were also completed- Biodiversity management plans for all GSBAs have been written. - Undertook Capacity development for GSBA management. Staff of FC, University of Ghana, and RMSC benefited from knowledge, skills acquisition, and equipment supplies. - Community Biodiversity Advisory Groups 	GEF

			<p>were created</p> <ul style="list-style-type: none"> - Baseline studies were conducted for some critical areas of biodiversity maintenance. Examples are: socio-economic surveys, feasibility studies 	
6	High Forest Resource Management (HRM) in the HFZ	To establish the policy, legal, administrative, financial and technical basis for sustainable forest management including biodiversity conservation, collaboration and efficient utilization of forest products by private and public sectors and local communities.	<ul style="list-style-type: none"> • In terms of policy and legislation, new timber regulations under Act 547 were adopted e.g. TUC to replace timber concession leases • Increased collection of royalties through the introduction of timber pricing • Completion of log export ban study • 12 Forest Management Plans prepared • Green fire-breaks established in 7 Forest reserves in the transitional zone and Bush-fire control management system designed and pilot-tested. • Modalities for plantation development in the HFZ land bank completed. • Communities involved in modified taungya plantations and export incentive scheme introduced to small scale producers to encourage processing of less used species. • Forest management certification system initiated. 	GEF
7	Strengthening Participatory Approaches in Forest management in Ghana.	Collaborative Forest Management with rural fringe communities	Testing of collaborative forest management principles	FAO from 2000 – 2005
8	Northern Savannah Biodiversity Conservation Project (NSBCP) GEF from 2001/2002 - 2009	Specifically the project aims at the optimal and sustainable use of the savannah ecosystem to restore and conserve agro-biodiversity, threatened or rare farmer crop varieties, medical plants, wood fuel, bush meat and grazing lands and to alleviate rural poverty.	<ul style="list-style-type: none"> (i) Improved institutional capacity for savannah resource management (ii) Improved savannah resource management systems including building on indigenous knowledge (iii) Increased the participation and active involvement of fringe communities in the conservation and decision making process of Protected Areas and Forest Reserves. (iv) Increased education and awareness and expertise in formulating public resource 	GEF

			management programs (v) Developed and reviewed relevant policies and strategies, such as Bio-safety and bio-prospecting and the National Biodiversity Strategy and Action Plan (NBSAP).	
9	National Forest Forum (NFF) 2003 -2006 GoG / UNFAO National Forest Program Facility	Enhance implementation of all national forest programs addressing key constraints targeting adequacy of consultation with stakeholders including civil society, effective collaborative forest management and unproven modified tuangya system	Led to the establishment of the National Forest Forum operating at the national, regional (10) and District levels contributing to policy formulation processes and advocacy and thereby establishing properly constituted channel in addressing stakeholder concerns in the forestry sector	GoG / UNFAO
10	Wildlife Division Support Project (Accra, Kyabobo& Mole) RNG from 2001 – 2007	To support the transformation of the former Wildlife Department into a service oriented Wildlife Division, effectively implementing community conservation techniques, operating efficiently within the Forestry Commission and in partnership with other agencies.		Royal Netherland Government
11	Wildlife Resource Management support project with Seven (7) components with GoG/DP funding	<p>To ensure policy, legal, administrative and technical framework for conservation and sustainable management of wildlife resources with the participation of rural communities established within and outside of Protected Areas.</p> <p>To achieve institutional reform (HRD); Improve community participation in wildlife management; Enhance economic development of wildlife resources; Management of Protected Areas; Public education and awareness and establishment of the Education Unit at the WD; Strengthen research and monitoring capacity and functional role</p>	<ul style="list-style-type: none"> - Creation of WD with 3 divisions (operations/Development/Admin-Finance and HR) with qualified staff compliment and the introduction of management procedures for transparency and commitment in decision-making processes; - Implementation of training plan; - Community participation unit established and publication of operational manual and enactment of legislation; - Regulatory and legal framework for wildlife enterprise development revised; - All Protected Area Management Plans revised; Policy framework, basic infrastructure and institutional arrangements put in place to facilitate participatory and sustainable management and conservation of Ghana’s wetland resources. 	GoG/ Development Partners

12	Wildfire Management Project in Transitional Zone RNG from 2002 – 2012	To rehabilitate fire degraded forests and to recover lost economic, social and environmental benefits.	<ul style="list-style-type: none"> - One output of the project was a National Wildfire Management Policy which was adopted nationwide. - Since its adoption, various wildfire management interventions were put in place and the results have been a progressive decrease in the incidence of wildfires in the Transitional Zone of Ghana. - Data on the incidence of wildfire collected between 2009 and 2010 indicated that in the TZ there was a significant decrease in the occurrences of wildfire by 77 per cent. 	Royal Netherland Government
13	Bamboo And Rattan Development Programme (BARADEP) GoG from (2002 and Ongoing)	The specific objective of the project is to promote bamboo and rattan industry development as a complement to the wood industry so as to reduce the pressure on the natural forest for lumber and to increase income and employment opportunities for the rural poor.	<ul style="list-style-type: none"> - Bamboo and rattan craft village established at Ayimensah (Greater Accra) to serve as centre for artisans. - 20 artisans currently training in China in various bamboo and rattan production technology. - Additional 20 Ghanaians from various institutions and communities are in China training in bamboo cultivation technology. - Some private sector developers are being assisted by BARADEP secretariat to establish private bamboo plantation. 	Ghana Government & Technical Assistance from China
14	Community Forest Management Programme AFDB from 2003 – 2008	To improve household income of forest fringe communities and increase the supply of timber to meet supply demand gap.	Community forestry development in the Ashanti region.	African Development Bank (AFDB)
15	Participatory Forest Management Project (PAFORM) JICA from 2004 – 2009	To reach the state that participatory forest resource management is implemented in and around at least two forest reserves in Sunyani Forest District.	<ul style="list-style-type: none"> - One participatory forest management plan to proactively involve local communities in the sustainable management of Tain I forest reserve. - Processes for involving local communities in forest management planning was defined and documented as PAFORM Model - It created the platform for facilitating the direct involvement of the local communities in forest management especially the 	Japan Government (JICA)

			<p>implementation of the modified taungya system under the plantation development programme and multi-purpose greenbelt development to safeguard the Forest reserves from fire.</p> <ul style="list-style-type: none"> - Developed the capacity of FSD staff in Sunyani Forest District in participatory sustainable forest management - Piloted the Greenbelt development concept and the Income Generating Activity Concept which was a way of getting local community involvement in forest management 	
16	Protected Areas Development Project Phase 2(Ankasa & Bia National Parks) EDF (European Development Fund) + GOG counterpart Fund from 2005 – 2011	To consolidate and extend long-term management prospects for Ankasa and Bia Parks and to empower civil society to manage and benefit from natural resources in a sustainable manner.		European Union
17	National Plantation Development Programme GoG from 2001and On going	The National Forest Plantation Development Programme seeks to curb the increasing declined of forest and expand the forest cover.		Ghana Government (GoG)
18	Voluntary Partnership Agreement	<p>(VPA) was negotiated as an agreement premised on the forest law enforcement, governance and trade in timber products. The objectives were:</p> <ul style="list-style-type: none"> • to establish a Legality Assurance System (LAS) • to issue legality licenses on all European Union bound consignments including non-European bound consignments which will still go through LAS but will not carry FLEGT license and the domestic Market included in the LAS after piloting the formal sector • Conduct a legislative review (two tier 	<p>1)Wood Tracking System (WTS) pilot was completed and an independent review conducted.</p> <p>2)Procurement process for a WTS service provider for the national roll-out was initiated in November, 2011</p> <p>3)Legality Verification Protocols drafted and 3 manuals were prepared to cover:</p> <ul style="list-style-type: none"> ○ Verification framework and FLEGT license issuance ○ Chain of custody procedures for timber and timber products ○ Legal timber standards and guidance notes for auditors <p>4)The FC made institutional adjustments to meet</p>	EU

		<p>review)</p> <ul style="list-style-type: none"> • to work within an agreed time frame as set in agreement with EU (Voluntary Partnership Agreement – VPA) • to activate supporting measures of the VPA 	<p>the requirements of the VPA by creating a Timber Verification Division (TVD) at the FC Headquarters and filling the required position with qualified staff.</p> <p>5) The Forestry Commission conducted policy and legislative review and has taken on board broader VPA governance issues. In order to gain strong legal backing for FC to operate FLEGT license scheme, a strategy has been adopted to secure FLEGT LI as a short-term measure.</p> <p>6) Ghana has made some strides to improve on the domestic wood market.</p>	
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Source: MLNR, (2014)

APPENDIX II: FOREST RESERVES AND WILDLIFE PROTECTED AREA IN GHANA

Protected Area	Management type	Size (ha)	Marine area	IUCN Category	Latitude	Longitude
Abisu	Forest Reserve	1,907		IV	35.400723	-117.50427
Aboma	Forest Reserve	4,558		IV	35.396251	-115.646919
Aboniyere Shelterbelt	Forest Reserve	4,113		IV	35.607207	-114.812926
Abrimasu	Forest Reserve	2,616		IV	37.387649	-107.322279
Abutia Hills	Forest Reserve	899			35.336482	-116.267959
Afao Hills	Forest Reserve	3,471			35.366324	-120.375592
Afia Shelterbelt	Forest Reserve	2,100		V	35.306796	-115.160752
Afram dawa	Forest Reserve	20,124			37.366185	-112.883352
Afram Headwaters	Forest Reserve	20,124		III	37.384518	-110.163199
Afrensu Brohuma	Forest Reserve	7,252			37.4435	-113.142897
Aiyaola	Forest Reserve	3,471			37.425111	-118.631071
Ajenjua Bepo	Forest Reserve	570		V	37.421971	-106.65198
Ajuesu	Forest Reserve	958			37.410906	-111.097667
Amama Shelterbelt	Forest Reserve	4,403		III	37.365	-118.013604
Ambalalai	Forest Reserve	0		III	37.369599	-117.766706
Angoben Shelterbelt	Forest Reserve	3,471		II	35.354444	-115.603385
Anhwiaso North	Forest Reserve	363			35.226728	-115.00803

Ankaful Fuelwood	Forest Reserve	207			35.58392	-107.076156
Ankasa	Game Production Reserve	51,800			32.023668	-104.724644
Ankwai East	Forest Reserve	0			35.324066	-115.662786
Anumso North	Forest Reserve	4,377		IV	37.223017	-117.553981
Anumso South	Forest Reserve	1,269		IV	37.17478	-112.789522
Anwiaso East	Forest Reserve	12,432			37.136099	-111.925449
Aparabi Shelterbelt	Forest Reserve	1,917			35.241593	-115.366966
Apedua	Forest Reserve	414		IV	35.876139	-117.159851
Apepesu River	Forest Reserve	6,061			37.126332	-105.820909
Apramprama	Forest Reserve	3,470			37.071316	-112.983782
Asonari	Forest Reserve	155			35.271818	-115.881477
Assin Apimanim	Forest Reserve	1,140		IV	35.251655	-115.612652
Assin Attandaso	Forest Reserve	15,359			35.197319	-115.710363
Asubima	Forest Reserve	7,374			37.377688	-117.689276
Asufu S'belt East	Forest Reserve	1,140			37.367119	-112.996875
Asufu S'belt West	Forest Reserve	1,347		III	37.112137	-118.308317
Asukese	Forest Reserve	26,496			35.847331	-115.821029
Asuokoko River	Forest Reserve	11,603		III	36.996005	-117.753292
Atewa Range	Forest Reserve	23,232		IV	35.898482	-116.410254
Auro River	Forest Reserve	855			36.661592	-117.96536

Awura	Forest Reserve	13,390		IV	36.950782	-106.070661
Ayum	Forest Reserve	11,293			35.646681	-107.251785
Baku	Forest Reserve	1,295		III	36.650191	-120.722492
Bandai Hills	Forest Reserve	16,084		IV	35.839393	-117.391332
Bediako	Forest Reserve	699			37.001805	-118.175989
Bemu	Forest Reserve	4,377			36.659702	-118.176659
Ben East	Forest Reserve	2,538			36.668118	-117.81481
Ben west	Forest Reserve	5,569		IV	36.740894	-118.21063
Bia	Game Production Reserve	22,800		III	31.942531	-107.184098
Bia North	Forest Reserve	35,613		III	36.553204	-121.200537
Bia Shelterbelt	Forest Reserve	2,953		III	35.538246	-107.202584
Bia Tano	Forest Reserve	19,425		IV	36.735447	-114.954661
Bia Tano BlkI	Forest Reserve	0			36.643239	-117.6402
Bia Tawya	Forest Reserve	67,858		IV	36.88674	-118.141661
Bia Trans	Forest Reserve	0		III	36.518122	-121.131415
Bia Tributaries South	Forest Reserve	30,562		IV	35.519911	-118.126912
Bilisu	Forest Reserve	0			36.494527	-106.678463
Bimpong	Forest Reserve	10,452		IV	36.59067	-117.557134
Birim	Forest Reserve	3,911		III	36.541549	-121.159023
Birim Extension	Forest Reserve	2,176			36.469427	-118.783191

Boabeng-Fiema	Wildlife Sanctuary	444		IV	37.850791	-111.447218
Bobiri	Forest Reserve	5,465			36.296409	-117.306084
Bodi	Forest Reserve	17,534			36.405848	-121.730284
Boi Tano	Forest Reserve	12,846			36.365829	-117.819538
Boin River	Forest Reserve	27,765			36.330485	-115.121193
Bomfobiri	Wildlife Sanctuary	5,310			36.510555	-106.716138
Bomfoun	Forest Reserve	29,474			36.32649	-115.087288
Bonkoni	Forest Reserve	7,511			36.275009	-117.474529
Bonsa Ben	Forest Reserve	15,540		IV	36.306324	-114.715918
Bonsa River	Forest Reserve	16,058		IV	36.391458	-118.776026
Bonsam Bepo	Forest Reserve	12,432		III	36.289032	-117.83574
Bopong	Forest Reserve	0			36.195096	-114.155477
Bosomkese	Forest Reserve	13,831		IV	36.331267	-115.171063
Bosomoa	Forest Reserve	17,094		IV	36.003712	-116.113343
Bosumtwi Range	Forest Reserve	7,870			36.007799	-118.011517
Boti Falls	Forest Reserve	130		III	35.545829	-118.088461
Bowiye Range	Forest Reserve	12,018		IV	36.225431	-114.28633
Brimso	Forest Reserve	1,062		IV	36.003911	-117.157366
Bui	National Park	182,060		IV	31.591681	-108.347105
Bunkunaw	Forest Reserve	0		VI	36.233564	-114.685657

Bura River	Forest Reserve	10,308		V	36.180894	-117.445898
Buru	Forest Reserve	30,225		IV	36.310858	-121.501545
Chai river	Forest Reserve	18,236		III	36.09959	-121.301382
Chana Hills	Forest Reserve	4,359		III	36.130077	-116.453956
Chasi	Forest Reserve	7,252			36.245041	-121.357104
Chipa Tributaries	Forest Reserve	0		III	36.235777	-121.302454
Chiremoasi	Forest Reserve	600		IV	35.92277	-117.141814
Chirimfa	Forest Reserve	11,396		IV	35.911699	-117.978459
Dadieso	Forest Reserve	17,120		III	35.00817	-116.119706
Daka Headwaters	Forest Reserve	14,566		IV	35.855462	-118.109986
Damongo Scarp	Forest Reserve	3,937		III	35.863929	-115.095467
Dampia Range	Forest Reserve	8,030			34.90459	-116.008389
Dechidan Stream	Forest Reserve	0			35.172331	-120.233351
Dede	Forest Reserve	5,110		IV	35.043381	-115.768334
Denyau Shelterbelt	Forest Reserve	1,240		IV	34.920229	-116.347502
Desiri	Forest Reserve	15,100		IV	35.11951	-115.473591
Digya	National Park	347,830		III	31.590707	-108.648529
Disue	Forest Reserve	2,357		II	35.170643	-120.275267
Dome River	Forest Reserve	8,055			34.856811	-108.047367
Draw River	Forest Reserve	23,543		III	34.994437	-114.732941

Dunwli	Forest Reserve	0		IV	34.999314	-115.520645
Ebi Shelterbelt River	Forest Reserve	2,590		III	34.77497	-106.452112
Esen Epam	Forest Reserve	4,610		V	35.04437	-119.773819
Esuboni	Forest Reserve	2,849		III	34.775314	-107.490868
Esukawkaw	Forest Reserve	12,225		III	34.775771	-116.75009
Fiankonya Stream	Forest Reserve	0			34.727224	-115.411314
Fum Headwaters	Forest Reserve	7,252		III	34.93728	-114.662318
Fumbesi	Forest Reserve	0		IV	34.83856	-114.873526
Fure Headwaters	Forest Reserve	7,252			34.781652	-114.760072
Fure River	Forest Reserve	15,825		III	34.77403	-115.042021
Gambaga Scarp E&W	Forest Reserve	12,753		III	34.567073	-115.848933
Gbele Game Prod.	Game Production Reserve	56,540		III	32.046404	-104.820506
Ghira	Forest Reserve	0		V	35.858881	-116.102028
Gia	Forest Reserve	2,169		IV	35.653801	-116.030334
Gianima	Forest Reserve	1,709		IV	35.715867	-116.77808
Goa shelterbelt	Forest Reserve	2,383		IV	35.715592	-115.736461
Jade Bepo Extension	Forest Reserve	78			35.610631	-118.012142
Jema Asemkrom	Forest Reserve	6,605		III	34.75034	-116.513315
Jeni river	Forest Reserve	2,150		III	34.717437	-107.929296
Jimira	Forest Reserve	6,294		IV	34.697701	-107.866933

Jinmira Ext.	Forest Reserve	0		IV	35.705296	-118.13777
Kabakaba East	Forest Reserve	1,386			34.596743	-114.536969
Kabakaba Hills	Forest Reserve	1,386		IV	34.574446	-114.848433
Kabo river	Forest Reserve	13,598		VI	35.733775	-117.95525
Kade Bepo	Forest Reserve	1,684			35.777428	-116.330991
Kajeasi	Forest Reserve	2,668		III	35.720259	-116.327604
Kakum	National Park	20,700		III	45.205014	-120.518503
Kalakpa	Game Production Reserve	32,020		V	32.384548	-106.588384
Kandembelli	Forest Reserve	0		V	35.637014	-107.201162
Kani Kani	Forest Reserve	0		III	35.679378	-118.186398
Kanjarga Fumbisi	Forest Reserve	1,293		IV	35.537858	-115.655297
Karaka Plantation	Forest Reserve	0		IV	34.623206	-115.066694
Karanja	Forest Reserve	0		III	34.647424	-107.91324
Klemu Headwaters	Forest Reserve	1,088		III	34.369056	-114.468024
Kogyae Strict Nat. Reserve	Strict Nature Reserve	38,570		III	39.712068	-123.115207
Kokotintin Shelterbelt	Forest Reserve	910		V	34.124832	-106.602677
Kpandu Range (Dayi Block)	Forest Reserve	3,030			35.632152	-115.470373
Kpandu Range West	Forest Reserve	3,548			34.351789	-108.865121
Krochua	Forest Reserve	1,062			34.331425	-114.242325
Krokosua Hills	Forest Reserve	48,174		III	35.536894	-118.059099

Krowam	Forest Reserve	570			35.604183	-118.187611
Kulpawn Headwaters	Forest Reserve	15,540		IV	34.256878	-115.781491
Kulpawn Tributaries	Forest Reserve	15,540		IV	35.520058	-116.277919
Kumawu Waters	Forest Reserve	96		IV	35.498608	-118.217244
Kumbo	Forest Reserve	16,449			34.020347	-115.86869
Kunda	Forest Reserve	50			37.459328	-118.628827
Kunsimua Bepo	Forest Reserve	1,010		V	37.472011	-110.089172
Kwamisa	Forest Reserve	8,283			35.568722	-107.337344
Kwekaru	Forest Reserve	1,166		IV	35.568181	-118.437047
Kwesi Anyinama	Forest Reserve	181		IV	37.289873	-111.43685
Laboni	Forest Reserve	0		IV	34.021822	-114.561004
Lambo	Forest Reserve	11,339		IV	33.964935	-114.726817
Lawra	Forest Reserve	127		IV	37.396514	-106.701546
Mamang River	Forest Reserve	5,439		IV	35.118418	-117.190845
Mamiri	Forest Reserve	4,533		IV	35.034678	-115.048294
Mankrang	Forest Reserve	18,547			35.072813	-120.250531
Mawbia	Forest Reserve	12,950		IV	35.48558	-117.85345
Minta	Forest Reserve	2,176			35.359576	-117.299688
Mirasa hills	Forest Reserve	6,734		IV	35.106663	-115.925934
Mole National Park	National Park	484,040		III	45.347248	-120.515668

Mpameso	Forest Reserve	32,246		III	35.174418	-120.2397
Muro	Forest Reserve	6,346		III	35.000782	-115.187428
Nandom	Forest Reserve	188		III	35.072983	-120.247354
Nasia Tributries	Forest Reserve	31,469		IV	35.292904	-117.291496
Navrongo North	Forest Reserve	0			35.305386	-115.590113
Ndumfri	Forest Reserve	7,252			33.835268	-114.608315
Neung South	Forest Reserve	15,773			35.215516	-116.253162
Neung North	Forest Reserve	0		IV	35.190541	-115.570847
Nini-Suhien	National Park	16,000		IV	43.226415	-117.489031
Nkonto Ben	Forest Reserve	1,450		IV	33.657339	-105.974395
Nkrabia	Forest Reserve	10,020		III	33.502465	-116.304466
Nkwanda	Forest Reserve	803			33.650186	-115.97401
North Bandai Hills	Forest Reserve	7,280			33.694019	-108.068252
North fomangsi	Forest Reserve	4,275			33.766506	-114.510154
Northern Scarp East	Forest Reserve	32,246			33.24212	-116.527308
Northern Scarp West	Forest Reserve	6,475			33.028052	-109.018561
Nsemre	Forest Reserve	1,813			33.016249	-114.737008
Nsuensa	Forest Reserve	5,440			32.928329	-114.580098
Nuale	Forest Reserve	5,180			33.431797	-116.7318
Numia	Forest Reserve	5,020		V	32.825079	-116.058976

Nyamibe Bepo	Forest Reserve	2,230			33.175805	-116.543387
Obotumfuo	Forest Reserve	155		III	33.055176	-115.216573
Oboyow	Forest Reserve	6,371		III	33.112917	-114.802085
Obrachere	Forest Reserve	0		IV	32.986574	-116.015433
Obrachere 1	Forest Reserve	0		IV	33.461449	-117.017307
Ochi Headwaters Blk I	Forest Reserve	338		III	32.84545	-116.363762
Oda River	Forest Reserve	16,420		IV	32.562289	-107.186906
Odomi River	Forest Reserve	1,606		IV	32.7589	-116.234798
Ofin Shelterbelt Headwaters	Forest Reserve	1,295			32.664318	-115.995553
Ongwam	Forest Reserve	13,134		IV	32.630828	-108.897254
Ongwam Blk I, II & III	Forest Reserve	3,134		IV	34.823189	-107.843548
Onuem Bepo	Forest Reserve	3,440			32.949712	-116.432506
Onuem Nyamibe Shelterbelt	Forest Reserve	2,490			32.897336	-116.35312
Onyimsu	Forest Reserve	855		IV	32.597009	-116.865059
Opimbo	Forest Reserve	104		IV	32.423446	-106.911589
Opon mansi	Forest Reserve	11,655			32.364878	-109.025549
Opro River	Forest Reserve	11,292			35.000293	-114.684357
Pamu Berekum	Forest Reserve	18,907		IV	34.967385	-108.027913
Pogi	Forest Reserve	2,606			32.981536	-114.536751
Polli	Forest Reserve	3,561			32.970036	-115.961136

Pompo Headwaters	Forest Reserve	1,220			32.858104	-114.984331
Pra Anum	Forest Reserve	12,328			32.938589	-108.984476
Pra Birim	Forest Reserve	2,357		V	34.813322	-116.244314
Pra Suhyien Blk I	Forest Reserve	8,310			37.413179	-110.005647
Pra Suhyien Blk II	Forest Reserve	10,412		IV	32.880132	-116.279903
Prakaw	Forest Reserve	984		IV	34.81553	-106.450734
Pru Shelterbelt	Forest Reserve	9,272		III	34.730818	-115.148917
Pudu Hills	Forest Reserve	5,413		IV	34.777115	-115.933186
Red Volta East	Forest Reserve	21,760			34.823897	-115.508211
Red Volta West	Forest Reserve	26,159		IV	34.705818	-116.582451
Saboro	Forest Reserve	37		IV	37.339029	-110.044235
Sapawsu	Forest Reserve	1,531			34.440817	-114.771397
sawsaw	Forest Reserve	6,294			34.645156	-115.895421
Sekondi Waterworks (Blocks II & III)	Forest Reserve	1,010		IV	34.232213	-115.548005
Sephe	Forest Reserve	0		IV	34.641602	-115.556049
Shai Hills	Game Production Reserve	4,860		IV	31.949585	-108.104418
Sinsableswani	Forest Reserve	0		III	34.62276	-115.7384
Sissili Central	Forest Reserve	0		V	34.350824	-114.711298
South Fomangsu	Forest Reserve	4,144			34.581349	-114.443062

Southern Scarp	Forest Reserve	15,462		IV	34.296043	-116.584241
subin	Forest Reserve	23,828		VI	34.418332	-107.116825
Subin Shelterbelt	Forest Reserve	2,253			34.256852	-114.321163
Subri River	Forest Reserve	0		IV	33.874992	-115.602834
Subuma	Forest Reserve	35,846		IV	33.758267	-106.802112
Sui River	Forest Reserve	33,385			33.756239	-105.929286
Sukusuki	Forest Reserve	14,763			34.16851	-106.842156
Sumtwitwi	Forest Reserve	363			37.416714	-113.090119
Supong	Forest Reserve	3,574			34.418017	-115.226202
Supuma Shelterbelt	Forest Reserve	2,512		III	34.471554	-115.363012
Tain Tributaries II	Forest Reserve	3,056			34.01089	-115.399275
Tamale Fuelwood Blks I & II	Forest Reserve	215		IV	37.387899	-112.929416
Tanja	Forest Reserve	0		IV	33.783232	-115.566499
Tano Anwia	Forest Reserve	15,307			34.03005	-106.742138
Tano Ehuro	Forest Reserve	17,612			33.847068	-115.046788
Tano Nimri	Forest Reserve	20,591		IV	34.006168	-116.676827
Tano offin ext.	Forest Reserve	0		IV	34.092672	-116.551315
Tano Ofin	Forest Reserve	40,223		III	34.060443	-106.815205
Tano Suhyien	Forest Reserve	17,612		IV	33.993328	-114.496831
Tano Suraw	Forest Reserve	2,849			33.983036	-108.130225

Tano Suraw Extension	Forest Reserve	7,511		III	33.572611	-115.759262
Tapania	Forest Reserve	4,662		IV	33.53407	-106.806997
Tinte Bepo	Forest Reserve	11,551			33.49589	-114.991598
Tinte Bepo East	Forest Reserve	11,551			33.631621	-116.512126
Togo Plateau	Forest Reserve	14,763			32.049305	-106.98974
Tonton	Forest Reserve	14,634		III	33.367903	-114.84487
Totua Shelterbelt	Forest Reserve	6,346			33.229169	-108.971452
Tumu	Forest Reserve	5,439			33.474171	-103.827083
Uppe Bli	Forest Reserve	0			32.020964	-104.832064
Upper Wassaw	Forest Reserve	10,075		IV	32.08561	-107.623355
Volta River	Forest Reserve	5,051		IV	32.215684	-104.490651
Wawahi	Forest Reserve	3,885			31.371343	-108.991215
Wiaga	Forest Reserve	984			31.365428	-109.032589
Wiaga Kandema	Forest Reserve	5,180			32.032877	-104.818195
Worobong (North)	Forest Reserve	1,321			32.015131	-104.875503
Worobong (South)	Forest Reserve	10,619			31.41783	-109.062729
Worobong Kwahu	Forest Reserve	5,517			32.815922	-109.945876
Yakombo	Forest Reserve	121,095			32.70024	-109.882731
Yaya	Forest Reserve	5,128			32.696846	-108.887442
Yendi Town Plantation	Forest Reserve	75			35.441047	-116.093631

Yerada	Forest Reserve	42,481		IV	32.4924	-107.718775
Yongwa	Forest Reserve	777			35.427124	-115.202377
Yoyo	Forest Reserve	23,569		VI	32.615703	-116.527452
Zawli Hills	Forest Reserve	0		III	32.585819	-105.805492