

Multi-Purpose Rainforest Management in Ghana: An Exploratory Study

Tropenbos Ghana Programme



Final Report

May 2002

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Forestry Research Institute of Ghana

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EXECUTIVE SUMMARY

Introduction

Ghana's attempts at managing its forest resources for multiple benefits have not been very satisfactory, although forest management strategies have generally aimed at capturing all important benefits for society. The results of efforts towards planning and management of forest resources for multiple uses have been a mixture of complete failure and half successes, a situation that may account for an ever decreasing and degrading forest resource base. Since 1994, however, new attempts have been made to reverse this trend. These are backed by a new policy that highlights the critical importance of integrated use in the overall aim of achieving sustainable forest management in Ghana.

The challenge now is how to convert these existing arrangements into smooth management decisions and to fine-tune the plans and prescriptions for achieving multiple forest benefits on sustainable basis. Based on this the Tropenbos Ghana Programme through a stakeholder participation process identified integrated forest management as an area for research and development and has commissioned this exploratory study to provide an assessment of research needs for multipurpose rainforest management in Ghana.

The Forest Resources of Ghana

The forests of Ghana are found in two main zones: the savannah woodlands in the north, and the tropical high forest in the south. The high forest covers about 7% of Ghana's land area. Almost all of this forest is found in the forest reserves and it is estimated that about half of it is in reasonable condition. Considerable forest resources are found outside the reserves in small forest patches and trees on farms. The average annual rate of deforestation has been estimated at 750 km².

The high forest zone supports over 2,100 plant species, 200 species of mammals, 74 species of bats, 37 species of rodent, a variety of reptiles and over 200 species of birds. These forest resources have the potential to provide economic, environmental, ecological,

social and cultural benefits, if they are managed to that end.

Multiple Use of Forest lands

People have very different interests in tropical forests. Whilst some assert that forests are needed to store carbon, others are looking to carve off a piece of forests to convert into farm. Interests in forests range from those which are central to an individual's livelihood to the opinions and aesthetic preferences of those who live far away from the forest. Interests in the forests may be backed by strong political influence, legal rights and resources, or by none of these.

For multiple management of forest lands knowledge concerning the ecology and economics of a forest is necessary, but not sufficient. Information about relevant institutions, customs, and political factors is equally important in assuring the overall success of multiple-use forest management. Multiple use forest management is based on complete understanding of all the social, economic, political, environmental, and ecological parameters involved. In addition to the wide diversity in the Ghanaian forests, the distribution and strategic locations of the forests also enhance its potential to be used for multiple benefits.

Forest and Wildlife Policy, The Forest Development Master Plan and Multiple Uses of Forests

Policies affecting forests affect national development, sustainable livelihood and poverty alleviation. Sustainable and optimum utilization of the forest resources must therefore be guided by enlightened policies that on the one hand recognize the forest as a living- therefore renewable, destructible as well as dynamic – resource and, on the other, acknowledge the multiple claims and influences of a variety of people on the resource. The government must be committed in implementing policies that encourage multiple use of forest lands for sustainable forest management.

The background, strengths and opportunities, constraints and weaknesses of the 1994 Forest and Wildlife Policy and the Forestry Development Master Plan have been

discussed in relation to integrated multiple forest management.

Forest Management Strategies aimed at Integrating Multiple benefits of Forests in Ghana

A review of forest management strategies showed that forest management practices until the mid 1990s were largely timber driven. The FSD has conducted a number of studies since then to intensify their effort to develop and integrate timber and other forest products and conservation of genetic resources at the Forest Management Unit level. Ecological and environmental management systems that seek to integrate the various forest functions and benefits have been developed.

The challenge now is that management planning should be based on the principle of multiple-use management of forests, embracing both conservation and sustainable utilization to achieve an optimum combination of benefits from forests. Finally forest management plans should be updated periodically, to incorporate new information and to respond to changing environmental, ecological, social and economic circumstances.

Research Interventions towards Integration of Multiple Forest Uses in Ghana

Most research works aimed at integrating multiple benefits from the forest have been in the area of collaboration between the FSD and local people. The outputs of such research works have been discussed in this report. They include the development of collaborative management in the forest reserves as well as collaborative management in the off-reserve forests and the Bobiri Forest Reserve ecotourism project. A botanical survey in 1992 to assess the botanical diversity of the forest also resulted in the development of the current strategy for forest protection in Ghana.

Present Research Needs for Integration of Multiple Uses of Forest

Ghana has moved from a time of natural resources abundance and a low population to a time of resource scarcity and a rapidly growing population. The rapid population growth and the push for accelerated economic development place an increasing pressure on

existing forests. To meet this challenge, the primary aim of the present research needs should be to develop sustainable management systems that integrate multiple uses of forests. The report presented such areas that need research in order to have effective integrated forest management systems. These are:

- Policy for sustainable, integrated land use
- Land administration reform and security of land tenure
- Incentive mechanisms for integrating forestry and agriculture
- Data and information control systems
- Harmonized timber and non-timber forest products harvesting
- Promotion of Income Generation and Strategic marketing of products
- Resource-based enterprise development
- Establishment of Ecologically Representative Protected Areas
- Ecotourism Development

The potential for forest based livelihoods

Many of the world's poor depend directly on forests for sustenance. Timber and other forest products provide 350 million people living in or around tropical forests with 50 percent or more of their household needs and also directly providing 10 percent of jobs in developing countries.

The potential for the forest resources to support a wide range of forest-based livelihoods and to reduce poverty has been discussed in detail. These include income generation, employment and recreational opportunities, as well as providing support services for agriculture in the rural areas. The forests are also the source of a variety of foods that supplement and complement what rural households obtain from agriculture, and of a wide range of medicines and other products that contribute to health and hygiene.

Acknowledgements

The Tropenbos Ghana Programme (TGP) commissioned this study as part of their exploratory studies on sustainable integrated forest management. I wish to express my appreciation to Dr Joseph Cobbinah, Director of FORIG, Dr Boateng Kyereh, Lecturer at IRNR, Mr K.S. Nketiah, Team Leader of TGP and Dr Victor Agyeman, Project Manager at FPDC, for their advice, comments and support during the work. Thanks also go to various people who helped with information and advice, including: Mr Eric Krampah, Mr Joseph Darbah, Mr Bright Kankam and Stella Britwum.

List of Abbreviations and Acronyms

CFMU	Collaborative Forest Management Unit
CIFOR	Centre for International Forestry Research
DLH	Dalhoff Larsen and Horneman
FAO	Food and Agriculture organization
FC	Forestry Commission
FD	Forestry Department
FDMP	Forest Development Master Plan
FMU	Forest Management Unit
FORIG	Forestry Research Institute of Ghana
FSC	Forest Stewardship Council
FSD	Forest Services Division
GAP	Ghana Primewoods Products Ltd
GDP	Gross Domestic Product
GPRS	Ghana Poverty Reduction Strategy
IIED	International Institute for Environment and Development
ITTO	International Tropical Timber Organization
IUCN	International Union for Conservation of Nature (The World's Conservation Union)
MLF	Ministry of Lands and Forestry
MoPs	Manual of Procedures
NTFPS	Non-Timber Forest Products
ODA	Overseas development Agency
SRA	Social Responsibility Agreement
TUC	Timber Utilization Contract

Table of Contents

Executive Summary	iii
Acknowledgements	vii
List of Acronyms	viii
Table of Contents	ix
Introduction	1
The Forest Resources Of Ghana	16
2.1 The High Forest Cover of Ghana	16
2.1.1 Forest Area and Deforestation Estimates.....	16
2.1.2 Forest Reserves	16
2.1.3 Off-Reserve Forests	17
2.2 Forest Produce and Other Benefits	17
2.2.1 Economic Benefits	18
2.2.2 Environmental and Ecological Benefits.....	18
2.2.3 Social and Cultural Benefits	20
2.2.4 Biodiversity	20
2.3 Conclusion	20
Multiple Use Of Forest Lands	21
3.1 Introduction.....	21
3.2 Definition and Concept of Multiple Use of Forest Lands.....	21
3.4 Multiple-Use Potential of Forests in Ghana.....	24
3.5 Conclusion	25
The Forest And Wildlife Policy, The Forestry Development Master Plan And Multiple Forest Use	26
4.1 Introduction.....	26

4.2 Background to the 1994 Forest and Wildlife Policy.....	26
4.3 The 1994 Forest and Wildlife Policy and Multiple Use of Forest Resources.....	27
4.3.2 Forest and Forest Resources Tenure and Ownership.....	27
4.3.2 Strengths and Opportunities.....	28
4.3.3 Constraints and Weaknesses	30
4.4 The Forest Development Master Plan and Multiple Use of Forest Resources	32
4.5 Conclusion	34
Forest Management Strategies Aimed At Integrating Various Forest Functions And Benefits In Ghana	35
5.1 Historical Developments of Multiple Use Forest Management in Ghana	35
5.2 Present Management Strategies	37
5.2.1 Strategic and Operational Forest Reserve Management Planning.....	37
5.2.2 Management Procedures for Timber Production.....	38
5.2.3 Biodiversity Conservation.....	38
5.2.4 Environmental Protection	39
5.2.5 Community Participation.....	40
5.3 Conclusion	40
Research Interventions Towards Integration Of Multiple Forest Uses In Ghana	41
6.1 Introduction.....	41
6.2 Research Work that Integrate various Forest Functions and Benefits	41
6.2.1 Forest Protection in Ghana (Botanical Survey)	41
6.2.2 The Role of Collaborative Forest Management in Integrated Use of Forests in the Reserved Forests	42

6.2.3 The Role of Collaborative Forest Management in Integrated Use of Forests in the Off-Reserve Forests	43
6.2.4 Partnership for managing off-reserve forest resources	44
6.2.5 Community Conservation Programme	44
6.2.6 Non-Timber Forest Products Survey	45
6.2.7 Bobiri Forest Ecotourism Project.....	46
6.2.8 Logging Impact Studies	46
6.3 The Present Research Needs for Integration of Multiple Uses of Forest.....	47
6.3.1 Policy for Sustainable, Integrated Land use.....	47
6.3.2 Incentive mechanisms for integrating forestry and agriculture	48
6.3.3 Land Administration reform and Access to land	48
6.3.4 Data and Information Control Systems	49
6.3.5 Harmonised Timber and NTFP Harvesting	49
6.3.6 Promotion of Income Generation and Strategic Marketing of Products	50
6.3.7 Resource-Based Enterprise Development.....	50
6.3.8 Establishment of Ecologically Representative Protected Areas	51
6.3.9 Ecotourism Development.....	51
6.4 Conclusion	51
The Potential For A Range Of Forest Based Livelihoods, Benefits And Uses In The Forest Zone.....	52
7.1 Introduction.....	52
7.2 Forest Resources Potential for Forest-Based Livelihoods	52
7.2.1 Timber Resources	52
7.2.2 Non-Timber Forest Products.....	53
7.2.2.1 Medicine.....	55

7.2.2.2 Bushmeat.....	55
7.2.2.3 Canes.....	55
7.2.2.4 Fuelwood and charcoal.....	56
7.2.3 Other Potential Livelihoods.....	56
7.3 Forest-Based Livelihoods and Poverty Alleviation.....	56
7.4 Conclusion.....	57
Conclusions.....	58
References.....	60

INTRODUCTION

Ghana's attempts at managing its forest resources for multiple benefits have not been very satisfactory, although forest management strategies have generally aimed at capturing all important benefits for society. Forest management strategies have concentrated on timber production to the detriment of non-timber forest benefits. Although, there have been efforts towards planning and management of forest resources to ensure sustained multiple uses, the results have been a mixture of complete failure and half successes, a situation that may account for an ever decreasing and degrading forest resource base.

Early management intents in Ghana were towards environmental protection e.g. protection of water bodies, climate stabilization and halting the southward movement of the savannah. However, the importance of managing the forest resources for other benefits became apparent with time and led to the introduction of a forest policy to provide direction and drive for this new aspiration.

The 1948 Forest Policy set the tone for planned management of the reserved forests in the 1950s. During this period working plans for the forests were written. However, the implementation of sound management systems was severely restricted due to the greater influence of timber trade interests. The Forestry Department therefore adopted management systems, which were more commercially, than environmentally inclined. Non timber benefits were included in management plans but their management was either ignored in practice or administrative decisions gave preference for timber harvesting even in clear cases where this contradicted management prescriptions or jeopardized the availability of the other benefits.

Since 1994, however, attempts have been made to reverse this trend. These are backed by a new policy that highlights the critical importance of integrated use in the overall aim of achieving sustainable forest management in Ghana. The government's on-going strategy to address the problems in natural resource management are largely embodied in the

Environmental Action Plan, the 1994 Forest and Wildlife Policy, the Forestry Development Master Plan, the National Land Policy, etc. In collaboration with three other Ministries (the Ministry of Energy, the Ministry of Environment, Science and Technology and the Ministry of Local Government and Rural Development), the Ministry of Lands and Forestry is currently implementing a comprehensive ten-year sector investment programme called the Natural Resource Management Programme. This programme is to protect, rehabilitate and sustainably manage the national land, forest and wildlife resources through collaborative management and aimed at increasing the incomes of rural communities who own these resources (GPRS, 2002).

The Forest Services Division has also developed decision support systems and models to encourage the integration on non timber forest benefits into forest management plans for the sustainable management of Ghana's high forests.

The challenge now, however, is how to convert these arrangements into smooth management decisions and to fine-tune the plans and prescriptions for achieving multiple forest benefits on sustainable basis. Based on this the Tropenbos Ghana Programme through a stakeholder participation process identified integrated forest management as an area for research and development and has commissioned this exploratory study to provide an assessment of research needs for multipurpose rainforest management in Ghana.

The aim of the report is to review the existing situation on multi-purpose forest use in Ghana and to identify gaps that need to be filled to encourage multipurpose forest management. Specifically, the tasks of the study include the following:

- Review existing information on multiple-use of forests in Ghana
- Identify the strengths, weaknesses, opportunities and constraints provided by the 1994 Forest and Wildlife Policy, Forestry Development Master Plan and other relevant policy documents for multiple uses of forests in Ghana
- Highlight present management strategies aimed at integrating various forest

functions and benefits at the forest management level

- Highlight previous research interventions, corresponding outputs and the present research needs relevant to the integration of forest uses in Ghana
- Identify the potential for a range of forest-based livelihoods, benefits and uses in the forest zone.

This report is presented in eight sections. Following this introduction, section two highlights the state of forest resources of Ghana, both on and off reserve, and examines the importance of the forest resources. Section three focuses on multiple use of forest lands, reviews the concepts and principles of multi-purpose forest management and finally looks at the multiple use potential of forest resources in Ghana. Section four discusses the 1994 Forest and Wildlife Policy and the Forestry Development Master Plan in relation to multiple uses of forests.

Section five is a discussion of forest management strategies aimed at integrating various forest functions and benefits in Ghana. It first highlights the historical perspectives and then the present management strategies. Section six is in two parts: the first part highlights some of the previous research interventions and their outputs, focusing on those that are relevant to the integration of multiple forest uses; the second part draws attention to the present research needs for the integration of multiple uses of the forest. Section seven identifies the potential for a wide range of forest-based livelihoods, benefits and uses in the forest zone of Ghana. Section eight is the conclusion and it synthesizes the report and highlights the key research needs relevant to the integration of forest uses in Ghana.

THE FOREST RESOURCES OF GHANA

2.1 The High Forest Cover of Ghana

The forest resources of Ghana are found in two broad ecological zones: the tropical high forests of southern Ghana (with areas of scrub and grassland near the coast and around the Volta river, and mangrove vegetation around lagoons), and the savannah woodland of northern Ghana. The high forest zone covers about 1/3 of the land area of Ghana and is an ecological description covering seven main forest types (Figure 2.2) (Hall and Swaine, 1981).

2.1.1 Forest Area and Deforestation Estimates

In 1992, the IUCN estimated that there was about 15,000 km² of intact closed forests remaining in Ghana, covering almost 7% of the country's total land area of 230,020 km² (IUCN, 1992). This is partially secured in forest reserves and conventionally thought of as representing the current state of a deforestation process, which began accelerating about a century ago and reached a peak between the 1950s and the 1970s. A third of Ghana's forests has been estimated to have disappeared in the 17 years between 1955 and 1972 (Hall and Swaine, 1981) whilst the average annual rate of deforestation has been estimated at 750 km² (World Bank, 1988). However, a recent critical analysis has challenged assumptions about the nature and extent of "original" forest cover and the rates of deforestation in the early part of the 20th century (Fairhead and Leach, 1996).

2.1.2 Forest Reserves

Forest reservation began in the 1920s and continued up until the end of the 1940s. About 20 per cent of land in the high forest zone is under reservation. The area earmarked for permanent forest cover is 1.77 million hectares, of which 1.634 million hectares is under the management and control of the Forest Services Division (FSD) and 136,000 hectares under the Wildlife Division (WD).

Satellite imagery shows that the forest reserves numbering 214 are still largely intact

sixty years after reservation. However, closer look often reveals a much-degraded resource, both in structure and content. Only about half of the reserved forests is still in reasonable condition with only 15 % of the total area having experienced slight or no disturbance. In addition, the condition of the reserves themselves has been assessed drawing attention to the general trends and forest qualities within the reserve boundaries. (Hawthorne and Abu-Juam, 1995). The FSD is currently undertaking inventory of the forest reserves. Figure 2.1 shows the condition of the forest reserves as of 1995.

2.1.3 Off-Reserve Forests

Much forestland outside the forest reserves has been converted to farmland over the past decades (Kotey *et al.*, 1998; Mayers *et al.*, 1996). This has been legal, intentional and arguably often necessary for economic development. Ghana has depended on these lands over the last sixty years for the country's major export earner, cocoa (Mayers *et al.*, 1996). Today, the area outside forest reserves is a mosaic of agricultural field, fallow lands, secondary forest patches and settlements. The off-reserve forest-farm mosaic provides important habitat for many species. Although large mammals and some forest birds tend to disappear from the area, certain primates, birds and insects thrive in this ecosystem. The farm and fallow areas also host substantial forest resources. Due to the nature of the dominant farming system in the high forest zone, trees on farms are very common. There is still therefore, a lot of potential timber in these forests (Kotey *et al.*, 1998).

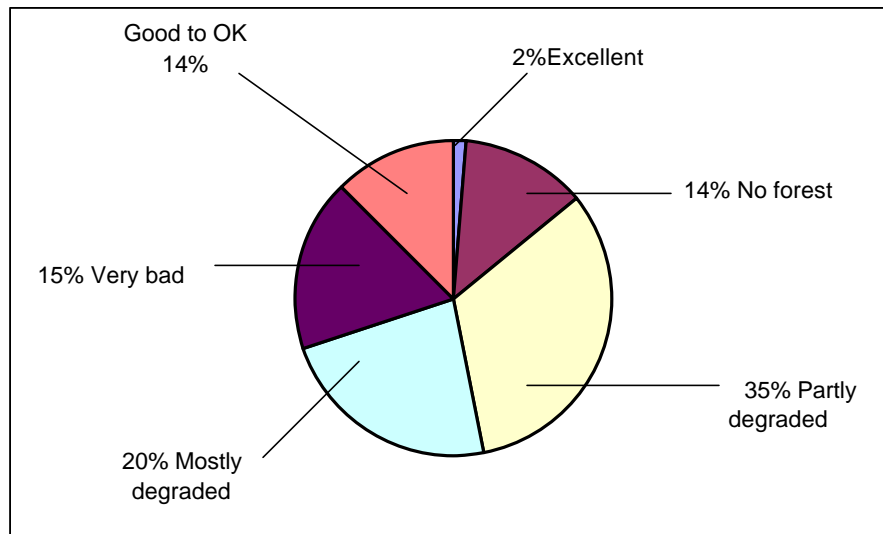
However, with 80% of the forest area having been cleared for agriculture, settlements, etc, the forest reserves now represent the only permanent forest estate and therefore the most important source of forest produce (Agyeman *et al.*, 1999).

2.2 Forest Produce and Other Benefits

Forest areas may be managed for major products such as timber, poles, firewood, fodder, bamboo and rattan and minor products such as extractives (dyes, gums, latexes, oils, resins), and food (fruits, honey, nuts, spices, snails) as well as services such as water,

recreation and tourism, erosion control, and protection against high and low temperatures

Figure 2.1 Condition of forest reserves



Source: Hawthorne and Abu Juam (1995)

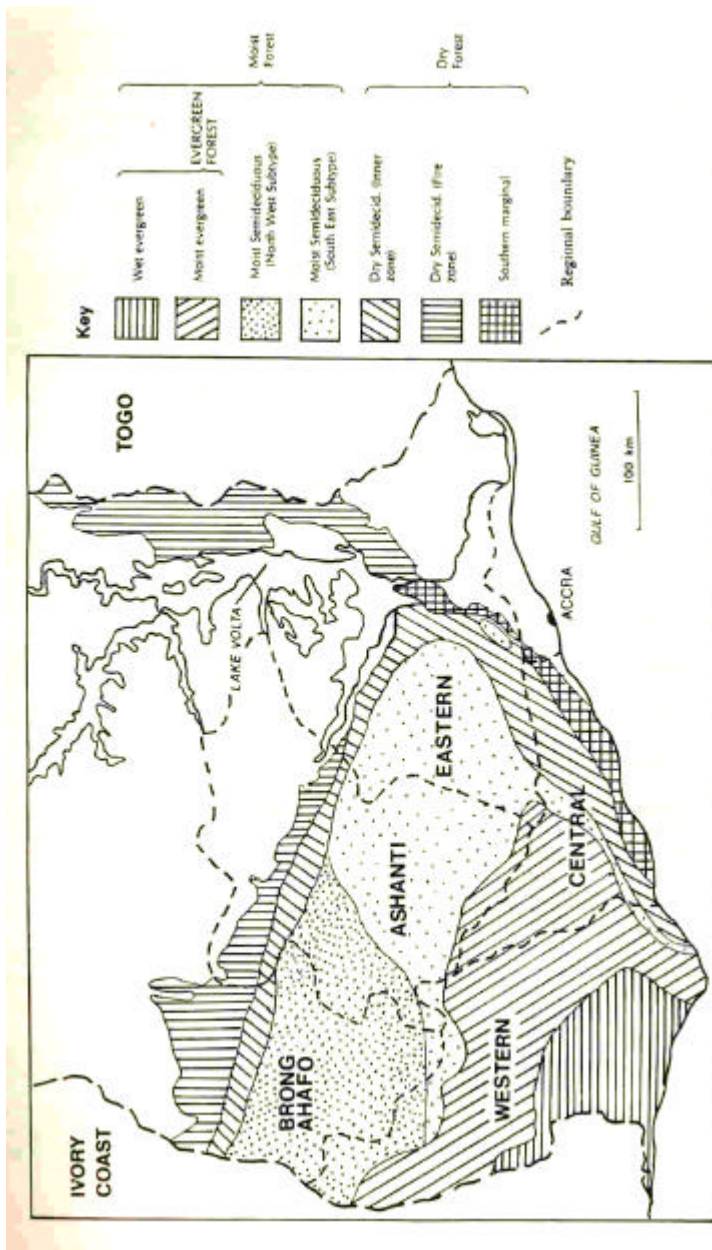
2.2.1 Economic Benefits

The forests of Ghana contain many valuable timber species and non-timber forest products, the exploitation of which has supported the economy considerably. The forestry sector has for many years been ranked the fourth most important foreign exchange earner for Ghana after minerals, cocoa and tourism. The sector contributes 11% of Ghana's foreign exchange earnings. The timber industry alone contributes 6% of GDP and provides employment to 104,000 persons and livelihood for about two million people (Appiah, 1998; Gene-Birikorang *et al*, 2001).

2.2.2 Environmental and Ecological Benefits

Forests and trees are important environmental resources. They provide valuable environmental services and help maintain local, regional, and global natural ecosystems. Forest and trees protect watersheds from drying out, provides habitat for numerous flora and fauna and generally maintain biodiversity. They retard soil loss and erosion, especially in areas of high rainfall, and retain moisture in the soil, ensuring a gradual supply of water to streams and rivers. Trees outside forest areas also provide.

Figure 2.2. Southern Ghana with forest zones and regions



environmental services. For example, a shelterbelt of trees across farmlands protects the soil against the drying effects of winds. In Ghana most farmers leave trees on their farms to maintain soil fertility by preventing erosion of the topsoil and by recycling nutrients through litterfall.

2.2.3 Social and Cultural Benefits

The forests of Ghana contribute significantly to both rural and urban life, providing food, medicine, building materials, cultural symbols, ritual artifacts, sacred sites, etc.

In many parts of Ghana forest products feature in many cultural practices and ceremonies. For instance, stools, the symbol of Asante chieftancy, are generally carved with particular sacred-tree woods. Drums are also made from specific woods and skins of animals; for example, duiker skin is widely sought after (Falconer, 1992a).

2.2.4 Biodiversity

Over 2,100 plant species have been found in the high forest zone, 23 of them endemic (Hall and Swaine, 1981). In total 730 tree species have been recorded from the closed forests (Hawthorne, 1989). The Wet Evergreen Forest is floristically the richest while the drier Southern Marginal Forest is the poorest. The Moist Evergreen and Moist Semi-deciduous Forest types are the most important for commercial timber species. The fauna of the forest zone includes over 200 species of mammals, many of which are rare or endangered (Mensah-Ntiamoah, 1989). The high forest zone also supports 74 species of bats, 37 species of rodents, a variety of reptiles and over 200 species of birds (IUCN, 1992).

2.3 Conclusion

Even with the current rate of deforestation and the present forest cover the forests of Ghana still possess a considerable amount of natural resources. These resources have the ability to produce timber, poles, food, medicine and services such as watershed protection, recreation and tourism, cultural values, erosion control, etc. This underscores the importance of managing the forest resources for multiple benefits. The potential of these forest resources for forest-based livelihoods is discussed in section 7.0.

MULTIPLE USE OF FOREST LANDS

3.1 Introduction

People have very different interests in tropical forests. Whilst some assert that forests are needed to store carbon, others are looking to carve off a piece of forests to convert into farm. Interests in forests range from those which are central to an individual's livelihood or a corporations viability, to the opinions and aesthetic preferences of those who live far away from the forest. Interests in the forests may be backed by strong political influence, legal rights and resources, or by none of these.

In many countries, forest management strategies have often concentrated on timber production to the detriment of non-timber forest benefits. The result has been a gradual loss of cultural assets and knowledge and loss of livelihood of forest dependent groups, particularly poorer groups who depend on forests for their social security. Today, this trend can no longer be continued in forest management because we have moved from a time of natural resources abundance and a low population to a time of resource scarcity and a rapidly growing population. Getting forest management right is to manage the forest resources for multiple benefits to meet the demands and needs of the rapidly growing population on sustainable basis. Integrated natural forest management for multiple use of natural forests therefore becomes important to the natural resource manager.

3.2 Definition and Concept of Multiple Use of Forest Lands

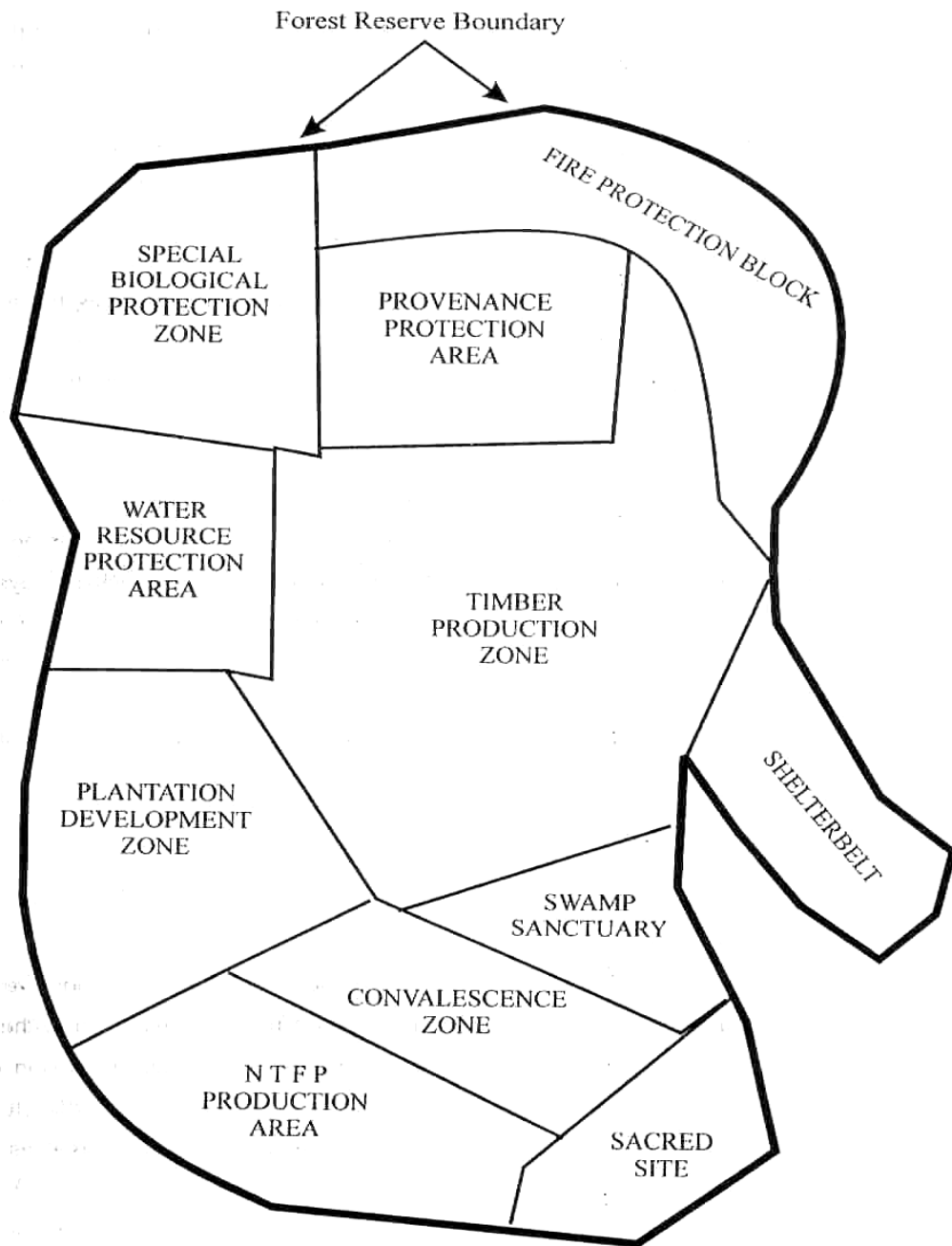
Multiple use is the conscious and deliberate use of forest land for the concurrent production of more than one product or service (Gregory, 1955). Bernard (1960) defines it as the accommodation of maximum of other compatible uses with the highest single use of the forest land. The concept of multiple use as applied to forests is based on the recognition that a variety of goods and services can be produced from the same land, either simultaneously or serially, and that such management can greatly increase the net value of the forest. Multiple use management does not imply that all possible forest uses

should occur in the same place at the same time. Forest management involves encouraging some uses, while discouraging conflicting ones (Panayotou and Ashton, 1992). In situations where potential conflict exists between incompatible uses, the forests could be zoned to avoid the conflicts. Examples of major management zones are Timber Production Zone, Plantation Development Zone, Fire Protection Zone, Water Resources Protection Zones, etc. (figure 3.1).

Multiple use of forests began in the United States (US) when recreational use of the national forests grew steadily during the pre-World War II years but never reached parity with timber production as an objective of forest management. The Forest Service adopted the multiple use concept to manage the forest lands for several uses including grazing, wildlife, recreation and timber. The vehicle for the concept was the Multiple Use-Sustained Yield Act of 1960. Through this act the US Congress directed that the national forests should be managed for *outdoor recreation, range, timber, watershed protection, and wildlife and fish purposes*. Accordingly, these five categories came to be known as *multiple uses* and the degree to which forestlands are managed for any one of these multiple uses depends on the goals of ownership (Guldin, 1990). However, the concept of multiple use of natural forests is not new in Ghana having been practiced by traditional communities who derived food, medicine, building materials, water, etc. from the forests.

All natural forests are to some extent, potentially multiple use forests, as they yield a variety of products and services. The problem lies in assigning values to these potential uses in order to determine to what extent each of them should be planned for and encouraged when different uses compete with or enhance each other. Determining the optimal mix of differing uses on a single forest land requires that the costs and benefits of each be considered when designing management practices. Management problems can arise because multiple uses of the same forest area may also involve multiple users, multiple and conflicting management objectives, multiple time frames, and negative interactions among uses (Panayotou and Ashton, 1992).

Figure 3.1 Management Zones inside Forest Reserves



In devising a multiple use management plans for natural forests, several factors need to be considered. Knowledge concerning the ecology and economics of a forest is necessary, but not sufficient. Information about relevant institutions, customs, and political factors is equally important in assuring the overall success of multiple-use forest management (Panayotou and Ashton, 1992). Thus multiple use forest management

should be based on complete understanding of all the social, economic, political, environmental, and ecological parameters that are involved.

In multiple use of natural forests water protection and biodiversity conservation functions of forests should also be given similar priority as other uses of the forests. Management objectives should indicate the desired ecological state the forest should attain and be maintained, for optimal benefits.

The right of access to the forest is an important requirement for multiple-use of forestlands. This important requirement needs to be addressed in policies affecting the natural resources. The 1994 Forest and Wildlife policy recognizes the need for multiple-use of the forest resources and thus provides the platform for forest managers to develop and integrate management practices to derive multiple benefits from the forests. The response of the Forest and Wildlife Policy document to multiple forest use of natural forests is highlighted in section four.

3.4 Multiple-Use Potential of Forests in Ghana

Ghana's natural forests have the potential resources that could be managed to provide multiple benefits to both the Ghanaian populace and the international community. The Wildlife Protected Areas have tremendous potential for tourism. Some forest reserves have been managed and are still being managed to provide multiple benefits in this regard (see section 6.2.6). Other potentials include waterfalls areas and monkey sanctuaries in the forest areas that could be managed to provide multiple uses.

Multiple use of sacred groves has become possible in Ghana as a consequence of the relationship that local residents have with their environment. An example is the establishment of a monkey sanctuary at Boabeng-Fiema in Brong-Ahafo Region. The mona monkey *Cercopithecus mona* and western black-and-white colobus *Colobus polykomos* are revered and protected. These species cannot be hunted, access to and use of their habitat is restricted and offences are dealt with by the traditional council (Nuhu,

1986). This harmonious relationship between the local residents and the environment has resulted in a stable ecosystem and an area of growing interest to national and international visitors alike as an ideal site for tourism.

The distribution and strategic locations of the forests in Ghana enhance its potential to be used for multiple benefits. The permanent protection areas consist largely of hill sanctuaries, but also include swamp sanctuaries, shelter belts, special biological protection areas, intact forest sanctuaries, provenance and fire protection areas. Of this area, 69% is inaccessible for logging (except at very high cost) and 16% is degraded. Only 15% (which is protected on grounds of genetic diversity) is well stocked and accessible (Kotey *et al.*, 1998). Hawthorne (1990) estimated that less than 1% of forest cover is found outside forest reserves, much of it in small, scattered patches in swamps and sacred groves. In view of this, certain forests present the opportunity to be managed for watershed protection, biodiversity conservation, erosion control, etc.

The forests support a wide diversity of plant and animal species (see section 2.2.4) making it possible to derive multiple benefits from them. Most people living in and around forests rely on the forest resources for food, medicine, fuel, fodder, building materials and household items. To meet these needs will be to manage the forests on sustainable basis.

3.5 Conclusion

Though the forest resources have great potential to be managed for multiple benefits, forest management strategies need to integrate these benefits on the same management unit. To be successful, multiple-use forest management requires sound judgment, an intimate knowledge of the resources being managed and the relationship between them, infinite patience in dealing with people (Edward, 1960), and a clearly defined property rights and security of tenure.

THE FOREST AND WILDLIFE POLICY, THE FORESTRY DEVELOPMENT MASTER PLAN AND MULTIPLE FOREST USE

4.1 Introduction

The forests of Ghana are important assets both to the nation and to a wide variety of individuals and communities, local and international. The forests are potentially useful, even essential to people for economic, ecological/environmental and socio-cultural reasons. Policies affecting forests thus also affect national development, sustainable livelihood, poverty alleviation (Kotey *et al.*, 1998; Owusu, 1989) and environmental stability. Wise use should not therefore be interpreted in terms of sustainable use alone but also the extent to which these diverse uses are integrated and managed for optimization of each use and corresponding flow of benefits to stakeholders. The role of policy in this direction is to provide the mandate and framework within which forest managers could achieve multiple benefits through integrated natural forest management.

Forest policies are also essential because the resources are potentially scarce in terms of their distribution across the nation and people's ownership and tenurial rights raise the problem of access to the resources. Secondly, the resources are potentially destructible through unwise utilization. Forest policies are, accordingly, formulated to address conflicts between different interest groups and conflicts between present and future generations (Owusu, 1989).

The aim of this section is to identify the strengths, weaknesses, opportunities and constraints in the current forest and wildlife policy and the Forest Development Master Plan for multiple uses of forests in Ghana.

4.2 Background to the 1994 Forest and Wildlife Policy

In the 1980s, government commentators increasingly drew attention to their perceptions of failings in the then forest policy and legislation system. These included the excessive centralisation of forest management, the "acceptance" of the ultimate demise of off-

reserve forests and the absence of a role for communities and industry in forest management (Smith *et al*, 1995; Tuffour, 1996).

In 1989, the Ministry of Lands and Forestry (MLF) in collaboration with the Forestry Commission (FC) initiated a consultative process that attempted to put in place a new policy framework for forest resource use. In 1994, a Forest and Wildlife Policy was promulgated. This policy reflected the realities and development needs of Ghana (Smith, 1999). The overall aim of the Forest and Wildlife Policy is “*conservation and sustainable development of the nation’s forest and wildlife resources for the maintenance of environmental quality and perpetual flow of benefits to all segments of society.*”

The objective of the policy is clear on the benefits to be derived from managing the forest and wildlife resources. It states that these resources will be managed by the institutions of state, in collaboration with local people, in order to ensure the “*preservation of vital soil and water resources, conservation of biological diversity and the environment and the sustainable production of domestic and commercial produce*” (MLF, 1994).

4.3 The 1994 Forest and Wildlife Policy and Multiple Use of Forest Resources

4.3.2 Forest and Forest Resources Tenure and Ownership

Forest reserves are owned by the landholding communities (represented by their chiefs). By statute, they are managed by the FSD on behalf of the government of Ghana. While the establishment of forest reserves does not affect landownership as such, management and control of land on reserves is by law exercised by the FSD. Outside reserves, all timber resources are vested in the state in trust for the owners (Kotey *et al*, 1998).

The establishment of the forest reserves severely curtailed the rights of the indigenous peoples and adjoining communities to both timber and non-timber products (FD/IIED, 1994). But, the 1994 Forest and Wildlife Policy recognizes the importance of “community rights.” This has paved way for various initiatives to be explored in implementing strategies and mechanisms for enhancing the benefits that local people

derive from the forest reserves. Notable among the initiatives are those steered by the CFMU of the FSD.

In the off reserve forests, the previous law and practice marginalized farmers and local communities, was a disincentive to tree planting, and constrained sustainable management of the resource (FD/IIED, 1994). The recent policy and legislation aims at substantially enhancing the rights of farmers and local communities to the off-reserve resource (CFMU, 1995b; Smith *et al.*, 1995; Smith, 1997), although this is yet to be manifested in practice.

4.3.2 Strengths and Opportunities

According to Owusu (1989), sustainable and optimum utilization of the forest resources is possible only if it is guided by enlightened policies that on the one hand recognize the forest as a living- therefore renewable, destructible as well as dynamic – resource and, on the other, acknowledge the multiple claims and influences of a variety of people on the resource.

Thus a very effective forest policy should highlight efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental/ecological, cultural and social benefits. It must avoid dependence on a single forest product whilst ensuring that the rate of harvest of the forest products do not exceed levels that can permanently be sustained. The policy should also clearly define, document and legally establish tenure and use rights of land and forest resources.

The 1994 Forest and Wildlife Policy emphasizes the importance of managing forests to achieve multiple benefits. Among the “Guiding Principles” that highlight the need to manage forests for multiple benefits are:

- The rights of people to have access to natural resources for maintaining a basic standard of living and their concomitant responsibility to ensure the sustainable

use of such resources;

- The wise use of the forest and wildlife resources as part of an integrated land use policy, because of their contribution to the economy in maintaining vital ecological and life-sustaining processes and conserving pools of genetic material that offer development options and opportunities for tourism, scientific, cultural and educational advancement;
- The need to incorporate traditional methods of resource management in national strategies where appropriate.

In view of the importance attached to local peoples' involvement in pursuing these principles, the government proposes to place particular emphasis on the concept of participatory management and protection of forest and wildlife resources and will seek to develop appropriate strategies, modalities and programmes in consultation with relevant agencies, rural communities and individuals (MLF, 1994).

In pursuit of the objectives of the policy, a number of 'strategies' have been outlined for development and achievement in the policy. Those relating to multiple uses of forest resources include:

- Development of an integrated national land use plan aimed at the sustainable use of all natural resources, including particularly the dedication of various land categories with potential for nature protection and production of timber and other products;
- Encouragement of local community initiatives to protect natural resources for traditional, domestic and economic purposes, and support with the reservation of such lands to enable their legal protection, management and sustainable development;
- Promotion of agroforestry among farmers and cultivators to enhance food and raw material production and environmental protection;
- Development of consultative and participatory mechanisms to enhance land and

tree tenure rights of farmers and ensure access of local people to traditional use of natural products;

- Initiation of continued contract and liaison with the local authorities and communities to pursue integrated development activities related to sustainable resource management.

These strategies outlined in the current policy provide the opportunity for multiple uses of the forest by giving all the various stakeholders the right to access the forests for economic, scientific, cultural and educational advancement whilst ensuring the sustainability of the resources. The policy also enhances the provision of intangible benefits of the forest such as increasing soil fertility, protection of watersheds and environmental amelioration.

Attention has been given to rehabilitation of degraded forest reserves and the involvement of trained community members in sustainable management of protected areas. This objective therefore provides opportunity for the use of the wildlife resources of the forest for tourism and recreation as well as sustaining its utilization by local communities. Another main opportunity lies in the promotion of agroforestry among farmers and cultivators. This allows farmers the opportunity to integrate farm crops with forest trees or to cultivate NTFPs with food crops to provide food and other raw materials.

4.3.3 Constraints and Weaknesses

The current policy has certain constraints and weaknesses that could prevent the smooth integration or implementation of multiple-use of forests. In order to prevent conflicts among the different users of the forest these constraints and weaknesses would have to be addressed.

The strategies of the policy place particular emphasis on the use of market mechanisms to

determine realistic product prices and to stimulate specialisation and efficiency in resource utilisation. Among the strategies are *promotion and development of a well-structured local market as an essential component of the timber industry in order to satisfy domestic needs and to maximise utilisation of harvested timber*; and the *initiation of specialized training and apprenticeship schemes for wood processing operators and produce graders to improve productivity and quality*. The policy is silent on developing such market for NTFPs and other benefits from the forest, an important requirement for multiple-use of forests. The policy does not also provide any incentives and assistance in terms of training for people involved in NTFP business as it does for those in the timber industry. Although the rationale for seeking better efficiency in timber utilisation was the immediate need to reduce the huge losses associated with an inefficient timber industry, the NTFP sector would not have been immune to better utilisation either.

When timber is harvested from the off-reserve forests, Stools receive a share of revenue, as owners, but the farmers-who look after the trees- do not. This remains a big disincentive to protection of trees on farms. Farmers argue that they provide a service, and like the FSD, should get a share. Mechanisms for farmers to derive direct benefit need to be legitimized (Kotey *et al.*, 1998). This could be in the form of monies or other direct incentives paid to farmers on whose farms the trees are felled. What the loggers pay through the Social Responsibility Agreement goes to the community and not the individual farmers.

In addition to the above, the policy is silent on how to reward owners of forests zoned for permanent protection. Owners of production forests receive royalties but those whose forests have been designated for permanent protection and for environmental benefits do not receive royalties. There is an urgent need to develop mechanisms to capture and distribute the cost of environmental benefits. This will be a big incentive for owners to put their forests under protection when required.

Finally, mechanisms for resolving conflicts of interest among the sector institutions is not clearly defined in the policy. This makes it possible for unnecessary change of forest

management objectives whenever there is a change in the management of these institutions.

4.4 The Forest Development Master Plan and Multiple Use of Forest Resources

The forestry sector in Ghana has been subjected to various impacts and pressures which have threatened both the sustainability of timber resources and certain species and the sector's ability to contribute to the country's socio-economic development and maintenance of the environment. The present condition of the forest resource base is such that the annual allowable cut (AAC) has had to be restricted to a maximum of one million cubic metres. However, the AAC has to satisfy a timber industry that is characterized by excessive installed capacity and low recovery rates, and illicit logging. At the same time, environmental concerns have increased to the extent where wildlife and biodiversity conservation are demanding equal attention as timber. Meanwhile degraded and understocked areas occupy a third of the forest estate. The Forest Development Master Plan (FDMP) was therefore launched in 1996 as the strategic basis for the attainment of the aims of the 1994 Forest and Wildlife Policy, and its successful implementation is intended to maximize the contribution of forestry to the social and economic development of the country and secure optimum welfare and adequate means of livelihood for all Ghanaians.

The FDMP has taken note of the progress made and the current trend in the sector. It reviews the main factors concerned with conservation of wildlife and biodiversity and the whole question of involvement of people dealing with these issues. The FDMP further recognizes that success in management and sustainable development of renewable resources is dependent on effective institutions as well as an enabling environment in which all players can operate optimally. It also recognizes the dynamic interaction of socio-economic activities and environmental effects, within and impinging on the sector.

Within this framework, the goal of the FDMP is identical with the aims of the 1994 Forest and Wildlife Policy from which it has also derived the following objectives:

- 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 capability at national, regional and district levels for effective forest management and wildlife management.

The FDMP has scheduled these objectives into three time horizons, namely, Phase I (1996-2000), Phase II (2001-2010), and Phase III (2011-2020). In terms of integrated multiple use forest management, Phase I proposes implementation of a consolidated forest management system to ensure that timber can be certified as sourced from sustainably managed forests and implementation of a Protected Areas System Plan as well as development and launching of flexible schemes for investments in commercial forest plantations, tree farming and propagation of non-timber products and wildlife in coordination with ecotourism development.

In Phase II, it is envisaged that maintenance of sustainable forest management and protected areas management systems would continue, accompanied by related rural and tourism product development as well as maintenance of commercial production systems and development of product harvesting, handling and marketing facilities. Phase III would see these efforts proceeding in the long-term.

Recognizing the importance of organizing key functions for effective management, the FDMP spells out the details of development activities for the realization of various forest functions and benefits. For example, the Phase I goals will be effected through the implementation of four main development programmes namely, Sustainable Forest and Savannah Management, Propagation of Forest-Based Products, Forest Industry Rationalization, and Wildlife and Biodiversity Conservation. Each programme has its

development objectives and corresponding development activities to achieve the objectives. Each programme also provides for public participation, for capacity building of public, private and community capabilities and for disseminating the results of relevant applied research so as to ensure effective implementation of the respective components. The Forestry Development Master Plan thus provides an excellent guide for strategic planning and implementation of a series of long-term changes to meet policy objectives.

The major constraints of the FDMP include limited financial resources, the inability of forestry sector agencies to develop the enabling environment for the establishment of sustainable forest management, and lack of coordination between the various programmes.

Apart from timber plantations propagation of other forest products is not included in any of the other programmes. And under the forest rehabilitation programme, little or no concern has been given to biodiversity and wildlife. Each of the programmes has its development objectives and activities. There is, however, no coordination between the activities of the different programmes. This makes it difficult for an effective integrated management of the forests.

4.5 Conclusion

Forest policies affect not only forests but also national development, livelihood and poverty alleviation. Multiple use of forest resources therefore must be guided by enlightened policies. The government must be committed in implementing policies that encourage multiple use of forest lands for sustainable forest management.

With the 1994 Forest and Wildlife Policy and the Forestry Development Master Plan in place Ghana has advanced a step forward in the right direction in achieving sustainable forest management. However, more needs to be done. Appropriate actions must be taken to address the weaknesses of the policies and to ensure better-integrated forest management.

FOREST MANAGEMENT STRATEGIES AIMED AT INTEGRATING VARIOUS FOREST FUNCTIONS AND BENEFITS IN GHANA

5.1 Historical Developments of Multiple Use Forest Management in Ghana

With the intention to maintain climatic quality, protect watershed and ensure an environment conducive to cocoa production, the colonial government decided that a permanent forest estate must be established. Most of these reservations took place in the 1920s and 30s (Kotey *et al*, 1998). Barrier and shelterbelt reserves were also established to hold back fires, and to maintain local rainfall and humidity levels respectively.

As reservation progressed it became necessary for management purposes to demarcate the reserved forests into Protection, Production, and Research areas. This system of demarcation was an opportunity to manage the forests for multiple benefits. However, Kotey *et al*, (1998) reported that this system was ignored in practice for many years.

Planned management of the reserved forests later became operational in the 1950s after adoption of the first forest policy in 1948. This policy however failed to recognize the ecological importance of the forest in terms of genetic biodiversity and wildlife and while it provided for educating people on the value of the forests, it failed to provide for their participation in management. The implementation of sound management systems was also severely restricted due to lack of inventory data, both static and dynamic. Nevertheless, with commercial considerations dictating events, various management systems were adopted, which included the plantations and taungya system (Prah, 1994). Owusu *et al*, (1989), reported that the taungya system was unsuccessful due to conflicting interests between food crops production and tree planting, and that in 1987, the system was officially stopped.

A study by FAO in 1985 revealed that the management of the forest reserves was geared towards timber production with little attention given to the potential of minor forest products to stimulate rural industry and the use of branch wood and rejected logs for

fuelwood and charcoal. The concept of forestry for rural development was also ignored. It is however uncertain whether in those early days these issues were really important for successful forest management and even cost effective.

But in 1991, a study of non-timber forest products (NTFPs) was undertaken by the Forestry Department (FD) with the assistance of Overseas Development Administration (ODA) under the Forest Resources Management Project (FRMP) to determine the uses and significance of NTFPs in rural economies and the impact of forest degradation on their traded values (Falconer, 1992b). In the same year, the FD instituted a limited NTFP inventory alongside the timber inventory to provide basic information on the growth and productivity of NTFPs (Mayers and Kotey, 1996). According to Prah (1994), 'the incorporation of NTFPs in the timber inventories and forest management practices in Ghana was exceptionally far sighted and made Ghana's attempt at sustainable forest management a model to other countries.' However, these studies provided only limited information required for an effective integrated forest management of natural forest resources for multiple benefits.

The current management of NTFPs is through a permit system by which commercial gatherers apply for the right to exploit specific NTFPs within the forest reserves. However, after a review of the nature and dynamism of the NTFP resources and the operation of the NTFP permit system, the FSD's Collaborative Forest Management Unit (CFMU) has recommended the gradual abolition of the permit system and the development of specific NTFP management programmes and agreement with the NTFP users (CFMU, 1995a).

Apart from NTFP management, the FSD has, since 1994, been implementing a comprehensive set of Forest Protection strategies intended to restore degraded forest reserves to maintain their environmental protection functions and also to halt the erosion of genetic diversity (Agyeman *et al.*, 1999). Most of these strategies are found in the FSD's MoPs. Some communities in the forest zone of southern Ghana who have deliberately conserved and managed forests and sacred groves as well as watershed areas to promote social and cultural services, are now being offered assistance.

A review of the management practices in forestry shows that the concept of multiple use has been on the heart of forest managers but has not been fully exploited in resource management and planning in Ghana. The results of current strategies are also not very satisfactory. The current FSD's Manual of Procedures focus attention on the sustainable management of the high forest for protection, environmental, timber and NTFP production. However the timber and NTFPs values are often artificially separated in matters of forest management. The most direct connection between timber and NTFPs is when a single species has both timber and non-timber value. In many cases this results in a diminished availability of species for non-timber uses. For example, primary timber species such as *Nauclea*, *Milicia*, *Aucoumea*, *Terminalia superba*, *Alstonia boonei*, have significant medicinal and non-timber uses, which are often overlooked. The challenge to the resource manager is to make conscious and deliberate efforts at integrating management objectives to realize the full potential of our forest resources in providing environmental, ecological, cultural and economic benefits.

5.2 Present Management Strategies

Since the 1994 Forest and Wildlife Policy, forest management practices that hitherto had been largely timber driven are giving way to ecological and environmental management systems that seek to integrate various forest functions and benefits. The Forest Services Division (FSD) has conducted a number of studies to intensify its effort to develop and integrate timber and NTFP production and conservation of genetic resources at the Forest Management Unit (FMU) level. These will be highlighted below.

5.2.1 Strategic and Operational Forest Reserve Management Planning

Strategic and Operational planning are at the heart of the framework for the new forest reserve management initiatives. The majority of the forest reserves are expected to achieve multiple benefits concerning protection, production and benefits to the local people. These plans ensure that interests other than timber production are legitimised and addressed. Based on the strategic forest reserve management plan, it is expected that most forest reserves will be delineated into management zones; for instance Special Biological Protection Areas, Timber Production Areas, Plantation Development Zones, Fire

Protection Blocks, Sacred Sites and Water Resource Protection Areas (figure 3.1) (Smith, 1999). The FSD has produced Manual of Procedures (MoPs) on Strategic and Operational Planning.

5.2.2 Management Procedures for Timber Production

The MLF has embarked on a strategy through application of the Timber Resource Management Act (Act 547) to manage forests both on and off reserve through a process of competitive tender and the issue of Timber Utilization Contracts (TUCs). The TUC seeks to tighten the planning controls on timber utilization and at the same time ensure that interests of the communities and the landowners are fully taken into account through the implementation of the Social Responsibility Agreement (SRA).

A series of MoPs have been produced by the FSD for the management of the timber producing forests in Ghana. The range of strategies covered in the MoPs includes: forest protection including fine-grained protection, timber production, harvesting schedules and stock survey and yield allocation. In addition, a logging manual to promote sound harvesting techniques which minimize environmental damage to the residual forest and improves the regenerative capacity of the forest has been developed.

5.2.3 Biodiversity Conservation

The FSD has since 1994 been implementing a comprehensive set of forest protection strategies intended to restore degraded forest reserves to maintain their environmental protection functions and also to halt the erosion of genetic diversity within the forest reserves (Agyeman *et al.*, 1999). Thus the protection strategy is designed to ensure that the biological and environmental quality of the forest reserves is maintained.

A star rating system has been designed to assign each plant species to a category denoting its conservation priority. The stars range from Black Star species being the highest priority followed by Gold, Blue and Green Star species respectively. The star values are

manipulated to help forest managers to identify genetic hot spots in the high forest zone (Smith, 1999).

5.2.4 Environmental Protection

The Forest Protection Strategy also ensures that river sources, swamps, fire prone areas and steep slopes are removed from timber production. Fine-grained measures given in the Protection strategy to ensure environmental protection in production areas have been incorporated into the new MoPs on timber harvesting and into the new logging manual. An example is the prohibition of felling close to the banks of streams and rivers.

Once the protection needs have been met, the remaining forest reserve is earmarked for timber and non-timber forest resources production. All forest reserves have been grouped into 52 forest management units (FMUs), each of 500 km² for planning and management purposes.

Table 5.1 Current management regimes of forest reserve areas

Region	Timber production Area (ha)	Permanent protection area (ha)	Convalescence area (ha)	Conversion area (ha)
Ashanti	128,800	121,300	46,000	94,100
Brong-Ahafo	150,400	50,500	34,000	80,600
Central	87,600	14,100	4,800	5,900
Eastern	51,200	39,500	11,600	45,400
Western	344,400	127,100	25,600	171,400
Total	762,400	352,500	122,000	397,200

Source: FDMP, 1996.

The strategy for large-grained forest protection has meant putting about 352,000 ha (21%) of the forest estate into permanent protection (Table 5.1). More than 80% of this is to protect hills or swamps that are inaccessible to logging. Another 32% is already degraded and in need of protection for at least one felling cycle (Agyeman *et al.*, 1999).

5.2.5 Community Participation

The FSD has devised a strategy of forest reserve management in collaboration with local people. Collaboration will re-establish the local communities as the primary clients of the FSD with an absolute right to the wise stewardship of their resource. Collaboration will help to ensure that reserve management is equitable and more efficient and ultimately sustainable. Collaboration begins with strategic forest reserve management planning. Where it has been tried, the FSD found its new management strategies to be appreciated (Smith, 1999).

5.3 Conclusion

The discussion thus far has shown that forest management practices until the mid 1990s were timber driven. These have however, given way to ecological and environmental management systems that seek to integrate the various forest functions and benefits. The challenge is that management planning should be based on the principle of multiple-use management of forests, embracing both conservation and sustainable utilization to achieve an optimum combination of benefits from forests.

Again forest management planning should incorporate a zoning system to avoid conflict between different forest uses and should be based on entire forest ecosystems rather than administrative boundaries. Finally forest management plans should be updated periodically, to incorporate new information and to respond to changing environmental, ecological, social and economic circumstances.

RESEARCH INTERVENTIONS TOWARDS INTEGRATION OF MULTIPLE FOREST USES IN GHANA

6.1 Introduction

In its attempt to conserve the forest resources and at the same time use the resources to provide goods and services, the FSD has devised a strategy of forest resource management in collaboration with the local people. Most research works aimed at providing multiple benefits from the forest have been in this area of collaboration.

This section is in two parts. The first part will highlight some of the previous research interventions and their outputs, focusing on those that are relevant to the integration of multiple forest uses. The second part will draw attention to the present research needs for the integration of multiple uses of the forests.

6.2 Research Work that Integrate various Forest Functions and Benefits

6.2.1 Forest Protection in Ghana (Botanical Survey)

A botanical survey was undertaken and completed in 1992 to assess the botanical diversity of the forest reserves. The study provided detailed information of the biodiversity and the distribution of genetic “hot spots” within the permanent forest estate. The prominent output of the study was a multi-scale approach to forest protection: fine-grained protection and coarse-grained protection. The fine-grained protection concerns the protection of selected individual plants, especially trees, in a variety of circumstances; small clusters of trees and their understory in otherwise degraded forested areas; and all forest over sensitive parts of the landscape which are too small or impermanent to be catalogued on the national level. Under the coarse-grained protection, the categories proposed for protected areas are hill sanctuaries; fire protection belts; provenance protection area; convalescence protection areas; and special biological protection areas (Hawthorne and Abu-Juam, 1995).

The botanical survey has provided information required to re-establish and make

provision for the conservation and protection of areas based on their genetic and environmental importance within the permanent forest estates (Prah, 1994).

6.2.2 The Role of Collaborative Forest Management in Integrated Use of Forests in the Reserved Forests

In the forest reserves, collaborative forest management has involved field programmes pursuing a number of experiments, and an attempt to consolidate learning within the FSD on:

- The involvement of communities and user groups in the management of NTFPs
- Review of the taungya system and the possibilities of local people contributing to forest reserve rehabilitation
- The scope of community involvement in managing protected areas
- Involvement of local communities in forest planning and management.
- Development of collaborative processes and institutions (Kotey *et al*, 1998).

The Collaborative Forest Management Unit of the FD reviewed the nature and dynamism of the NTFP resources and the operation of the NTFP permit system. They recommended that the permit system should be abolished gradually and that specific NTFP management programmes and agreements with NTFP users be developed (CFMU, 1995a).

The CFMU has initiated programmes that involve helping communities to develop their capacity to manage forest resources. In Assin Fosu support has been provided to help communities manage ancestral forest groves. Livelihood pressures were eroding the value systems that have preserved those groves in the past. One option, which the CFMU developed is to manage the remnant forests as productive blocks in which the community can gain attractive incomes from the management of the forest resources. Techniques that have been introduced to help them manage their forest grove on sustainable basis include mapping, surveying, inventory, planting programmes and plans for the sustained harvesting of timber and NTFPs (FD, 1995).

Another programme has involved research into NTFP management in the Esen Forest Reserve at Akyem Oda. The aim of the project was to involve local communities in devising improved management of NTFPs. The programme has involved experiments in developing nurseries for the propagation of various NTFPs, using different methods including seed planting, root and stem cuttings, transplanting of wildlings, etc (FD, 1995).

The CFMU has carried out a survey of people's attitude in communities near those forest reserves which are proposed for different types of protection, namely: special biological protection areas, hill sanctuaries, convalescence and fire block areas. The survey showed considerable local support for the continued protection of the forest reserves, particularly for the protection of drinking water supplies, rehabilitation of degraded forests and fire protection belts. Protection of biodiversity was reported to be a source of pride in some communities- an acknowledgement that their forests are special (CFMU, 1995a).

6.2.3 The Role of Collaborative Forest Management in Integrated Use of Forests in the Off-Reserve Forests

Outside the forest reserves, the CFMU commissioned and published a study of trees on farms (Amanor, 1996). The book describes innovative tree and forest management techniques used by farmers. The CFMU has subsequently made proposals for district forest managers to assist farmers in tree conservation on farms and to help farmers derive benefits from the trees on their farms.

Since 1993, the CFMU has developed information and analysis in a range of areas, and has considerably strengthened the capacity of the FSD to address local people's needs in forest management activities. The CFMU has also explored and developed various collaborative approaches in the management of both timber resources and NTFPs and piloted the management of blocks of forest by landowning communities (FD, 1995). Some communities have been helped by the CFMU to write management plans for their forests.

6.2.4 Partnership for managing off-reserve forest resources

Some timber companies in Ghana have taken the initiative to address the future of timber resources in the country. The initiatives involve timber companies, farmers and landowners. One notable project is the Gwira Bansa Project.

This project is a forest management and marketing project of Ghana Primewoods Products Ltd (GAP), Dalhoff Larsen & Horneman A/S (DLH) of Denmark, and the chiefs and people of Gwira Bansa (Amanor, 1997). The project was conducted in a 16,000 ha off-reserve concession which includes areas of pristine wet evergreen forest (Prah, 1997). A major concern of the project was that the expansion of cocoa production threatens the stock of timber trees, and other forest goods and services. The project, therefore, sought to encourage participation of the farming communities in sustainable forest management by cultivating NTFPs that can improve local incomes. Seedlings of *Garcinia spp* were nursed for distribution to farmers. The wood of this small tree is traditionally used to produce chewing sticks for sale in urban areas. The wood of the tree is highly valuable and is becoming increasingly scarce, as specialized urban-based gathering firms harvest it with permit from the FSD (Kotey *et al*, 1998).

The project helped to develop a more sustainable forest-based agriculture, which enabled crops to be integrated with trees. According to Kotey *et al*, (1998), the project has worked with the Ministry of Food and Agriculture in developing an agricultural extension unit and has introduced black pepper cultivation into the area. The project further experimented with introducing new Cola varieties and income-generating activities such as fish culture, snail farming and mushroom cultivation, that can provide valuable incomes while relieving pressures to clear more forest land for agriculture.

6.2.5 Community Conservation Programme

The Government of Ghana and the World Bank agreed, within the context of the Forest Resource Management Programme, to undertake a comprehensive and systematic evaluation of the protected areas in Ghana. As part of the programme for the wildlife

sector, socio economic surveys were done in local communities in and around protected areas. This survey looked at the peoples' perceptions and attitudes to wildlife conservation, their economy, socio-cultural settings and their impressions about possible management initiatives. The information gathered has been factored into management plans that have been produced for eight protected areas (Agyare, 1997).

Strategies have been adopted to involve the local people in resources management and conservation. These include formation of community conservation groups in local communities to help identify and initiate community conservation projects, and promotion of identifiable alternative economic bases where available and practicable.

6.2.6 Non-Timber Forest Products Survey

In 1991, a study of NTFPs was undertaken by FSD with the assistance of ODA to determine their uses and significance in rural economies, and the impact of forest degradation on their uses and traded value (Falconer, 1992b). The study looked in detail at five NTFPs namely: bushmeat, chewstick, plant medicines, food-wrapping leaves and cane products.

The study concluded that:

- Forest food in the form of seeds, fruits, leaves, roots and tubers, mushrooms and bushmeat contribute significantly to the diet of many rural households
- There is a considerable degree of commercialization of NTFPs
- For many households, gathering, processing and trading in forest products provide significant sources of supplemental income
- Plant medicines are the main source of health treatments to a vast majority of rural and urban people. They are used for both curative and preventive treatments of many diseases and spiritual problems.

The study provided the needed motivation to broaden the study of forest sustainability beyond the sustained yield of timber resources alone. As a result of the study, management of NTFPs is to become one of FSD's major priorities. In addition, FORIG currently domesticates and cultivates selected NTFPs as means of reducing the pressure on the natural forest resources.

6.2.7 Bobiri Forest Ecotourism Project

The Bobiri Forest Ecotourism Project is being conducted by FORIG in the Bobiri Forest Reserve at Kubease near Kumasi. From its inception, the site has created special interest for tourists and researchers alike. There is a forest arboretum and a butterfly sanctuary located within the Bobiri Reserve. The natural forest is home to many butterfly species as well as, multitudes of other insects, birds, and a few mammals.

This community-based ecotourism project integrates conservation and rural development by helping to protect valuables, irreplaceable natural areas, scenic landscapes, sensitive rural sites and cultural practices. In addition it provides revenues for planning and management, stimulates economic development and creates jobs. Efforts have been made to ensure that a sufficient area surrounding the guesthouse is removed from production of forest products so that timber extraction will not be a hindrance to the development of ecotourism. This is just one of the many exploitable opportunities available to manage the forests for multiple uses.

6.2.8 Logging Impact Studies

Several studies have been conducted on the impact of logging on the residual forests. In 1993, the Forestry Department and ODA published the findings of a study in the Bia South Game Production Reserve on forest regeneration after logging. The report stressed that the quality of regeneration can be improved by optimizing the pattern of exploitation and thereby enhancing the forests of the future. It recommended that the diversity, economic value, and vegetation structure of natural regeneration is more vigorous in small rather than large gaps in the forest and therefore, the creation of large gaps should be avoided wherever possible.

It further recommended that elephants should be encouraged in the Game Production Reserve and should not necessarily be persuaded to return to the Nature Reserve. Elephants in the Bia South Game Production Reserve are almost certainly helping the regeneration of several species, notably *Nauclea*, *Ricinodendron* and *Parinari excelsa* (Hawthorne, 1993). Currently research is needed to determine the effects of logging on wild animal populations.

6.3 The Present Research Needs for Integration of Multiple Uses of Forest

As noted earlier rapid population growth and the push for accelerated economic development place an increasing pressure on existing forests. To meet this challenge, Ghana must improve her management of forest resources, recognizing the needs of present and future generations. This requires balancing use with availability of resources for economic goods and environmental services, and implementing sustainable management of forest resources for multiple uses. Thus the primary aim of the present research needs should be to develop sustainable management systems that integrate multiple uses of forests. The following looks at present research needs for multiple forest use.

6.3.1 Policy for Sustainable, Integrated Land use

There is the need to develop a broad-based multi-sectoral approach to forest management because key issues surrounding forest use and misuse involve other sectors. The government should ensure the participation of other sectors in meeting forest conservation objectives. Specific attention must be given to the needs and knowledge of all the stakeholders in order to assess what they need, how they utilize their resources and the requirement for local and regional socio-economic development. That is, management of the forest resources should form part of an integrated land-use planning through a multi-disciplinary approach and there should be strong government commitment to implement and sustain integrated land use management policies.

In this regard, research is needed to establish the links and interdependency of agriculture

and forest resources and the socio-economic, political and other circumstance affecting the decision making process in the sustainable management of agriculture and forest land uses.

Finally, mechanisms for resolving conflicts of interest among the sector institutions and for preventing arbitrary change of management objectives must be developed and clearly defined in the policy. This will prevent unnecessary change of forest management objectives whenever there is a change in the management of these institutions. In this regard the basis for setting management objectives will have to be re-examined.

6.3.2 Incentive mechanisms for integrating forestry and agriculture

Farming is the major economic activity in the high forest zone of Ghana. An integration of farming systems with forestry would be an important opportunity to achieve multiple use of the land. Such integration will encourage farmers to cultivate the forest resources on their farms. For a smooth integration, however, it is important to have an idea of the possible problems, solutions and potentials of integrating forest resources with farming systems. Mechanisms should be developed to help farmers to cultivate forest resources on farms. This could include development of planting strategies and propagation of planting materials as well as developing education/training programmes for the farmers and other incentive mechanisms to encourage tree planting on farmlands.

6.3.3 Land Administration reform and Access to land

Ghana has a complex land tenure system, which if not addressed properly could lead to misuse and mismanagement of the forest resources. Reform of land administration systems is therefore urgently required. Insecurity of tenure is endemic and has bearing upon both poverty reduction and economic growth. According to the GPRS (2002), failure to provide for the protection of land rights and prevention of abuse of traditional and institutional procedures place the poor, the illiterate and women the most at risk. Failure to provide legal security of tenure will inhibit any attempt to encourage plantations development and rehabilitation of degraded forestlands. While it is important

to protect the rights of landowners it is equally important that action be taken to make land a tradable asset to encourage private commercial plantation development.

Security of land tenure is pivotal to the development of rural environment, which is the catalyst for the transformation of the national economy. Land tenure reforms must be accompanied by close monitoring to detect adverse effects upon the poor for which safety nets may be required (GPRS, 2002). There is the need to establish legal and policy frameworks related to tenure rights and management responsibilities.

A national land use plan will be vital for clearly tackling the broad issue of land availability for various activities. In addition, legislative review of land and policies to increase access and security to land must be undertaken. These are important steps towards managing forests for multiple uses.

6.3.4 Data and Information Control Systems

A key problem of sustainable resource management is the lack of reliable records to show the actual volumes of forest resources other than timber that have been utilized from the forests in Ghana. Such information is essential for assessing the impacts of resource harvesting and the need to adjust rates of harvesting and for the future planning of resource use. To realize the full potential of the forest resources in providing multiple uses to meet the values and needs of the communities it is important to have not the 'basic' but a thorough information on the growth and productivity of all the forest resources. Therefore there is the need for inventory of the forest resources for effective planning and sustainable management of the forest.

6.3.5 Harmonised Timber and NTFP Harvesting

Management practices that integrate the optimum cultivation and production of NTFPs with either wildlife or timber production on the same management unit should be developed. The major challenge is to harmonise the harvesting of timber and non-timber

products from the same forest unit without reducing long-term productivity of the forest or forest diversity. This requires a high degree of management planning based on reliable available information and the cooperation of all stakeholders.

Secondly, the effect of logging on wild animal population and the effect of NTFP harvest on the structure and function of the forest could be studied to set up “a monitoring and control system that provides a constant flow of information about the ecological response of species to varying degrees of exploitation.” (Peters, 1994).

6.3.6 Promotion of Income Generation and Strategic Marketing of Products

Knowledge of the markets, market prices and consumer demand for forest products will reveal the extent to which forest products relate to income-earning potential. These activities would be essential to harnessing local communities involvement in conservation. Priority attention should be given to planning and promotion of local commercial activities based on the utilisation of forest resources. It would be necessary to provide adequate incentives for private sector to cultivate forest and wildlife resources for domestic consumption and export and provide training for local investors.

There is also the need to develop stable, well-structured local market channels for timber, NTFPs, recreation and tourism, and to set up a monitoring system to assess the impact of resource use on livelihood.

6.3.7 Resource-Based Enterprise Development

Supplementary livelihoods can be promoted with information on the demand for natural resource based products. Production and market information will help local communities invest in cottage industries. An effective legal framework that supports this will be government’s commitment to promote and create adequate awareness on both potential and production requirements to help village-based enterprises. The private sector must also be encouraged to set up enterprises in rural areas.

6.3.8 Establishment of Ecologically Representative Protected Areas

In order to ensure genetic and species biodiversity conservation, certain critical areas of forests should be given total protection through zoning. The Wildlife Division will have to train and involve communities in sustainable development of protected areas and to identify suitable areas for reservation. But as noted earlier in section 4.3.3, the first step will be the need to develop mechanisms to capture and distribute the cost of environmental benefits. This will be a big incentive for owners to put their forests under protection when required.

There is also the need to maintain a continuous inventory of wildlife resources, both in protected areas and outside, so as to monitor trends in population and distribution (Smith, 1997). There is the need to establish and maintain inter-agency collaboration with institutions within the renewable natural resource sector and then plan and implement infrastructural development projects for effective management of the protected areas.

6.3.9 Ecotourism Development

A survey has to be undertaken to identify potential tourist attractions, type of appropriate facilities and the management requirements of each location identified. The Ministry of Lands and Forestry will, based on the results of the survey, collaborate with the Ministry of Tourism to promote, market, and encourage investments in ecotourism.

6.4 Conclusion

In view of the rapid population growth and the associated rapid decline in the forest resources, it is imperative that the forest resources be managed for multiple functions and benefits. Research is, therefore, needed to develop sustainable management systems that integrate multiple uses of forests. The government as well as all the stakeholders must be committed to achieving this objective.

THE POTENTIAL FOR A RANGE OF FOREST BASED LIVELIHOODS, BENEFITS AND USES IN THE FOREST ZONE

7.1 Introduction

The world's forests constitute an important natural heritage for all mankind. Many of the 'world's poor depend directly on forests for food, medicine, fuel, fodder, building materials and household items' (Hamilton, 1992), as well as many more intangible benefits such as cultural symbols, ritual artifacts and sacred sites. From estimates timber and other forest products provide 350 million people living in or around tropical forests with 50 percent or more of their household needs and also directly provides 10 percent of jobs in developing countries (Ames, 1998). The importance of forests is however not limited to the poor. Forests provide a multitude of goods and services to the world at large, and being renewable they have the potential to provide these indefinitely, if they are managed effectively to that end.

This section will identify the potential for a wide range of forest-based livelihoods, benefits and uses in the forest zone of Ghana.

7.2 Forest Resources Potential for Forest-Based Livelihoods

7.2.1 Timber Resources

Timber resources play an indispensable role in the Ghanaian economy. According to Gene-Birikorang *et al* (2001) the forest industry in 1999 contributed approximately 470 billion cedis to the provisional estimate of nominal GDP of 20,580 billion cedis. In economic value terms, the report estimated the forest industry's contribution at 280 billion cedis. These figures do not include the contribution of illegal chainsaw activities. The industry also contributed approximately US\$ 179 million (8%) to Ghana's foreign exchange earnings. The timber industry provides employment to 104,000 persons and 'livelihood for about 2 million people' (Appiah, 1998). Table 7.1 below summarises the Forest Industry's contribution to GDP.

The ability of the timber industry to continually contribute its quota to the socio-

economic development of any country however depends on the availability of timber resources in the forest and on efficient utilisation of these timber resources. This calls for sustainable management of the forest resources.

Table 7.1 Forest industry's contribution to GDP

Industry	Million cedis (1999)
Small scale loggers	3,600
Logger/Processor	90,800
Sawmills	129,000
Sliced veneer mills	29,000
Rotary veneer/Plywood mills	71,900
Tertiary	144,500
Contribution to GDP	469,700

Source: Ghana Wood Industry and Log Export Ban study report (2001)

Sustainable timber production from the forest could provide employment, income and other livelihoods to the surrounding communities. This would be possible if logging companies employ labour from the surrounding communities during logging operations and also fulfill their social responsibility agreement as required by the Timber Utilisation Contract.

7.2.2 Non-Timber Forest Products

The interest in non-timber forest products (NTFPs) that has built up over recent decades in conservation and development circles has its origins in a number of propositions:

- NTFPs, much more than timber, contribute in important ways to the livelihoods and welfare of populations living in and adjacent to forests; providing them with food, medicines, other material inputs, and a source of employment and income, particularly in hard times.
- Exploitation of NTFPs is less ecologically destructive than timber harvesting and therefore provides a more sound basis for sustainable forest management.
- Increased commercial harvest of NTFPs adds to the perceived value of the tropical forest, at both local and national levels, thereby increasing the incentive

to retain the forest resource, rather than conversion of the land for agriculture or livestock (Arnold and Ruiz-Perez, 1998).

Valuations of forest sites indicate that the potential income from sustainable harvesting of certain NTFPs could be considerably higher than timber income as well as income from agricultural or plantation uses of the forest sites (Peters *et al.*, 1989). This has led to initiatives to expand and provide markets for more locally produced NTFPs, in order to tap an increasing share of this apparent cornucopia of sustainably harvestable wealth in tropical forests (Arnold & Ruiz-Perez, 1998).

Trade in NTFPs is an important economic activity in all corners of the high forest zone in Ghana, involving a great number of people including gatherers, producers, and wholesale and retail traders, often operating within complex trading channels (Falconer, 1992a). Commonly traded NTFPs include:

- Foods (snails, bushmeat, mushrooms, fruits and seeds);
- Spices
- Chewsticks
- Chewing sponge (made from the stems of forest climbers)
- Cola nut
- Charcoal/firewood
- Medicines
- Canes used in building and to make baskets, furniture and other products,
- Household goods (sponges, mortars, pestles, utensils, wooden trays and grinders, food wrapping leaves, and tool handles) (Abbiw, 1990; Falconer, 1992a).

These products supplement and complement what rural households obtain from agriculture, and also contribute to health and hygiene (Arnold & Ruiz Perez, 1998). There is also a group of NTFPs that are produced naturally by plants and emerge from injured

tissues, such as exudates, viscous liquid compounds or others, and which are mainly for industrial use. These include essential oils, tannins and dyes, which are often obtainable only with the aid of chemical solvents or steam distillation (Parren and de Graaf, 1995). The opportunity exists for local communities to gather and sell these products to industries.

7.2.2.1 Medicine

Medicinal usage of NTFPs tends to overlap with that of forest foods; indeed particular items added to foods serve both to improve palatability and act as a health tonic or prophylactic. There are also strong links between medicinal use and cultural values. For example, where illnesses are thought to be due to the spirits, plants have acquired symbolic importance as treatments. Such values often underlie the division between use of traditional and modern medicines that is widely observed at the present time (Falconer, 1994).

7.2.2.2 Bushmeat

Bushmeat is consumed regularly by a large portion of the Ghanaian population (Asibey, 1986). The Wildlife Division of the Forestry Commission estimated that game is the main source of meat for 80% of the rural population (Asibey, 1987). In the high forest zone, most species of mammals are eaten but the main bushmeat species in trade are all pests on farms (Kotey *et al.*, 1998). Falconer (1992b) estimated the bushmeat trade in Kumasi at 17,600kg of meat, worth 12.7 million cedis over a four-week period whereas the estimated annual bushmeat in Kumasi was estimated at 160,000kg.

7.2.2.3 Canes

Canes, which are derived from the stems of various climbing palm species, are widely used to produce household and commercial goods. The most common products are baskets (Kotey *et al.* 1998); Falconer (1992b) estimated that over 90% of all households in southern Ghana owned an average of 3.4 baskets. The market for cane furniture is ever increasing.

7.2.2.4 Fuelwood and charcoal

These account for more than 75 percent of all energy consumed in Ghana and an even higher percentage of energy for household cooking and water heating in rural and urban areas alike (Owusu *et al.*, 1989). Women collect most of the fuelwood in rural household in the high forest zone from farm and fallow lands. There is high demand for fuelwood for processing of palm oil or distillation of “akpeteshie” gin (Mayers & Kotey, 1996). The World Bank (1988) estimated that fuelwood consumption in Ghana was 15.9 million m³ in 1988. A study in Sierra Leone found that fuelwood selling provided the first cash income from land cleared for rice production. Subsequently fuelwood collection for the market was concentrated during the off-peak agricultural period, providing cash income in a period when food supplies were generally at their lowest (Kamara, 1986).

7.2.3 Other Potential Livelihoods

The Ghanaian forests have the potential to generate income from recreational facilities. For example, the Kakum National Park in the Central Region and Bobiri Forest Reserve in the Ashanti Region, have the potential to attract tourists. Kakum National Park is endowed with wildlife as well as ‘canopy walkway’ and the Bobiri Forest Reserve has a butterfly sanctuary and other rare species that could attract tourists to these sites (see section 6.2.6).

Maintenance of natural forest also helps to protect the soil and watershed areas. Most farming communities depend on this for increased productivity of their farm produce as well as their water supply.

7.3 Forest-Based Livelihoods and Poverty Alleviation

Non-timber forests products have attracted the attention in recent years for their potential to generate income through value-added processing and innovative marketing. There is the need for a systematic approach to assessing NTFPs as a basis for sustainable development (Belcher, 1998).

It is evident that the forest resources have the potential for a wide range of forest-based livelihoods to benefit local populations and to reduce poverty. These include income generation, employment and recreational opportunities, as well as providing support services for agriculture in the rural areas. The forests are also the source of a variety of foods that supplement and complement what rural households obtain from agriculture, and of a wide range of medicines and other products that contribute to health and hygiene. Over the years the communities have collected these NTFPs from the forests. It has now become important that the communities begin to cultivate some of these resources on their own to ensure their continued supply. This will provide self-employment for individuals who will cultivate and on a small scale collect NTFPs for sale.

7.4 Conclusion

Many of the worlds poor depend directly on forests for sustenance. Timber and other forest products provide 350 million people living in or around tropical forests with 50 percent or more of their household needs and also directly providing 10 percent of jobs in developing countries.

Forest resources have the potential for a wide range of forest-based livelihoods to benefit local populations and to reduce poverty. These include income generation, employment and recreational opportunities, as well as providing support services for agriculture in the rural areas. The forests are also the source of a variety of foods that supplement and complement what rural households obtain from agriculture, and of a wide range of medicines and other products that contribute to health and hygiene.

CONCLUSIONS

The importance and potential of Ghana's natural forests to provide multiple benefits and uses cannot be overemphasized. The forests have the potential to provide major products such as timber, poles, firewood, bamboo, rattan and minor products such as extractives, medicines, and food as well as services such as water, recreation and tourism, erosion control and other environmental benefits both for rural and urban dwellers as well as the international community.

For many years the results of Ghana's attempts at managing its forest resources have not been very satisfactory. To make it worse Ghana has moved from a time of natural resources abundance and low population to a time of resource scarcity and rapidly growing population. This means an increasing pressure on already dwindling forest resources. A sustainable integrated forest management strategy backed by effective forest policy is a key to achieving multiple benefits from the forests. The present 1994 Forest and Wildlife Policy with the accompanying FDMP provide the platform for achieving this. The challenge now is to be able to convert the existing arrangements into smooth management decisions and to fine-tune the plans and prescriptions for achieving multiple forest benefits on sustainable basis.

This report has discussed the principles for multiple use of forest lands and highlights several research needs for the integration of various forest functions and benefits. These are:

- Policy for integrated land use
- Land administration reform and access to land
- Incentive mechanisms for Agroforestry
- Data and information control systems
- Harmonizing timber and NTFPs harvesting
- Promotion of income generation and strategic marketing of forest produce

- Resource-based enterprise development
- Ecotourism development
- Establishing ecologically representative protected areas.

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