

**SUSTAINABLE FOREST MANAGEMENT AND POVERTY ALLEVIATION:THE
CASE OF SOME SELECTED FOREST COMMUNITIES IN THE OFFINSO SOUTH
MUNICIPALITY, GHANA**

KNUST

BY

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DECLARATION

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ABSTRACT

Forest resources have been considered important for the well-being of people, particularly the poor in society because of their economic values. As a result there has been growing concern on how to manage forest resources sustainably for the sake of the world's poorest subsistence communities living at forests margins. In the Offinso South Municipality, deforestation rates has remained high for decades with its consequential effects on the economic and livelihood activities including the collection of Non-timber Forest Products (NTFPs). This study therefore examined the prospects of sustainable forest management for poverty alleviation in the Offinso South Municipality in the Ashanti Region of Ghana. Focus group discussions, key informant interviews and questionnaire were the methods and tool respectively used for gathering data from 150 households which were selected randomly from four forest-adjacent communities by virtue that their livelihoods activities are dependent on the forest resources. Both SPSS and Excel softwares were used to analyze the quantitative data while content analysis was used to analyze the qualitative data. Moreover, remote sensing analyses of satellite images were employed to determine forest loss in Municipality in 1986, 2003, and 2007 respectively. The sustainable forest management policies of the Municipality were analyzed based on their Strengths, Weaknesses, Opportunities and Threats (SWOT). Results indicate that about 45 percent of the households are poor and a little over 15 percent are extremely poor. Also the average income that is saved from the consumption of NTFPs was estimated at 33 percent of the total monthly income of the households. The available NTFPs also supplement household food and medicinal needs. Moreover, the communities are not adequately and practically involved in sustainable forest management practices though they are purported to be the beneficiaries of the policies. It was also discovered that sustainable forest management policies of the Municipality are focused more on sustainable timber harvest other than the management of all forest resources. The study therefore recommends the adoption of the community forest model, which is seen as a bottom-up approach that engages and empowers local communities and also enables them take ownership of both native forests and plantations, in the Municipality. The model gives greater control to local people who are historically dependent on forests to improve their livelihoods. The community forest model therefore has the prospects for sustainable forest management and poverty alleviation in forest regions.

TABLE OF CONTENT

Title page.....	i
Declaration page.....	ii
Abstract.....	iii
Table of content.....	iv
List of tables	vii
List of figures, images and plates.....	viii
Acronyms.....	ix
Dedication.....	xi
Acknowledgement.....	xii
CHAPTER ONE: FOREST RESOURCES AND LIVELIHOODS	1
1.1 Introduction	1
1.2 Problem Statement.....	7
1.3 Objectives of the Study	9
1.4 Hypothesis and Proposition.....	9
1.4.1 Hypothesis	9
1.4.2 Propositions	9
1.5 Materials and Methods	10
1.5.1 Types, Sources and Methods of Data Collection	10
1.5.2 Sampling Procedure	11
1.5.2.1 Target Population	11
1.5.2.2 Sampling Technique	12
1.5.2.3 Sampling Design.....	12
1.5.2.4 Sampling Frame.....	13
1.5.2.5 Sample Size.....	13
1.5.3 Data Analysis and Presentation.	14
1.5.3.1 Household Data Analysis	14
1.5.3.2 Satellite Imagery Processing.....	15

CHAPTER TWO: CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT AND THE CONCEPT OF POVERTY	16
2.1 Introduction	16
2.2 Conceptual Clarification of Sustainable Forest Management	17
2.3 Criteria and Indicators (C&I) for Sustainable Forest Management in the Tropics... 23	
2.3.1 Introduction	23
2.3.2 International Tropical Timber Organization Initiative (ITTA)	24
2.3.3 The Amazonian/ Tarapoto Process (TARA).....	25
2.3.4 The African Timber Organization Process (ATO)	26
2.3.5 Centre for International Forestry Research (CIFOR).....	26
2.3.6 Bhopal India (B-I) process	27
2.4 Efforts towards Sustainable Forest Management in Ghana	28
2.5 Conceptual Clarification and Measurement of Poverty	31
2.5.1 Definitions and concept of poverty	31
2.5.2 Measuring Poverty.....	37
2.5.2.1 Defining Indicators of Well-being	38
2.5.2.2 Choosing and Estimating a Poverty line	39
2.5.2.3 Choosing and Estimating Poverty Measures	41
2.6 Poverty Trends and Incidences in Ghana	43
2.7 Sustainable Forest Management and Poverty Alleviation Nexus	46
2.8 The Theoretical Perspective of the Study	48
2.8.1 Reconceptualising Community Participation for Sustainable Forest Management	49
CHAPTER THREE: BIOPHYSICAL AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF OFFINSO	53
3.1 Introduction	53
3.2 Location and Size	53
3.3 Physical Features	56
3.3.1 Climate	56
3.3.2 Vegetation.....	56
3.3.3 Geology and Soil	58
3.3.4 Relief and Drainage.....	59
3.3.5 Interactions between Climate, Soil, Vegetation, Relief and Geology	60
3.4 Demographic Characteristics and the Built Environment	60
3.5 Economic and Livelihood Activities	64

3.6 Poverty Level and Vulnerability	66
CHAPTER FOUR: PROSPECTS OF SUSTAINABLE FOREST MANAGEMENT FOR POVERTY ALLEVIATION	68
4.1 Introduction	68
4.2 Perceptions and Manifestation of Poverty in the Forest Communities of Offinso.....	69
4.2.1 Perception of Poverty	69
4.2.2 Manifestation and major coping strategies of Poverty	72
4.3 Non-Timber Forest Products and Food Crops from the Forest	74
4.4 Measurement of Poverty and Forest Products in Offinso	77
4.4.1 Monetary indicator of poverty in the communities.....	77
4.4.2 NTFPs as Income/Consumption Supplement in the forest communities of Offinso	81
4.4.3 The relationship between NTFPs and the Income/Consumption of Households	87
4.5 The Level of Deforestation in the Offinso South Municipality	89
4.6 The role of Stakeholders in Sustainable Forest Management.....	96
4.6.1 Local involvement in sustainable forest management in Offinso South Municipality .	97
4.6.2 SWOT Analysis of SFM Policies and the Role of the Forest Services Division	100
CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS	103
5.1 Summary..	103
5.1.1 Household Poverty Levels.....	104
5.1.2 The Contribution of NTFPs to income and the implication of Deforestation.....	105
5.1.3 Local Involvement and the role of the FSD in Sustainable Forest Management.....	105
5.2 Conclusion	106
5.3 Policy Recommendations.....	108
5.3.1 Commercialization of NTFPs for Poverty Alleviation.....	108
5.3.2 Local Involvement and the role of the FSD in Sustainable Forest Management	109
5.3.3 SFM policies in the Municipality should focus more on Forest Management	109
5.3.4 The adoption of the Community Forest model for SFM and Poverty Alleviation.....	110
REFERENCES.....	112
APPENDIX.....	120

List of Tables

Table 1.1 Sample Size Determination for each study community.....	13
Table 2.1 Subset of Criteria Common to CIFOR's Tropical Test Sites	27
Table 2.2 The specific objectives of the Forest and Wildlife Policy, 1994 in Ghana	30
Table 2.3 Poverty Rates by Administrative Regions in Ghana	46
Table 4.1 Perception of Poverty in the Forest Communities of Offinso.....	70
Table 4.2 Manifestations of Poverty by Male and Female-headed Households.....	73
Table 4.3 Coping Strategies by the Male and Female Heads of Household.....	74
Table 4.4 NTFPs and Food Crops from the Forest.....	75
Table 4.5 Poverty Rates in the Offinso Forest Communities	78
Table 4.6 The Spatial Distribution of the Poverty Rates	79
Table 4.7 Proportion of Households' Consumption of NTFPs	82
Table 4.8 Contribution of NTFPs to Households Consumption Needs.....	82
Table 4.9 Poverty Reduction Estimates from NTFPs.....	88
Table 4.10 Description of land cover type in Offinso South Municipality	89
Table 4.11 Percentage change of Forest cover and Built-up Environment	91
Table 4.12 Impacts of Deforestation on Food products and Income derive from the Forest	94
Table 4.13 Sustainable Forest Management Practices.....	97
Table 4.14 Effectiveness of the Agro-forestry and Tree Plantation programme.....	98
Table 4.15 The Long-term Impacts of the Agro-forestry and Tree plantation	100
Table 4.16 Sustainable Forest Management Policies in Offinso South Municipality.....	100
Table 4.17 SWOT Analysis of the Sustainable Forest Management Policies.....	101

List of Figures

Fig. 2.1 The Partnership Model	51
Fig. 2.2 The Modified Partnership Model.....	51
Fig.3.1 Study Area in National context.....	54
Fig.3.2 Map of Offinso South Municipality showing study communities.....	55
Fig.4.1 Relationship between Responses on Importance and Dependence of NTFPs.....	85
Fig.4.2 The Salient Causes of Deforestation in Offinso South Municipality.....	92

List of Images

Image 4.1 Forest cover in 1986.....	90
Image 4.2 Forest cover in 2003.....	90
Image 4.3 Forest cover in 2007.....	90

List of Plates

Plate 4.1 Firewood on Sale at Ahwerekrom.....	76
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ACRONYMS

ACT	Amazon Cooperation Treaty
ATO	African Timber Organization Process
B-I	Bhopal India
C&I	Criteria and Indicators
CBOs	Community Based Organizations
CFM	Collaborative Forestry Management
CIFOR	Center for International Forest Research
DANIDA	Danish International Development Assistance
ETM	Enhanced Thematic Mapper
FAO	Food and Agriculture Organization
FSD	Forest Services Division
FC	Forestry Commission
FD	Forestry Department
FGDs	Focus Group Discussions
FMU	Forest Management Unit
FWP	Forest and Wildlife policy
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GH¢	Ghana Cedis
GLSS	Ghana Living Standards Survey
GNP	Gross National Product
GPRS	Ghana Poverty Reduction Strategy
GSS	Ghana Statistical Service
HIV	Human Immune Virus
IIFM	India Institute of Forest Management
IISD	International Institute for Sustainable Development
ISSER	Institute of Statistical, Social and Economic Research
ITTA	International Tropical Timber Organization Initiative
ITTO	International Tropical Timber Organization
KVIP	Kumasi Ventilated Improved Pit
MDGs	Millennium Development Goals
MLF	Ministry of Land and Forestry
MTS	Modified Taungya System
NDPC	National Development Planning Commission
NFPDP	National Forest Plantation Development Programme
NGO	Non-Governmental Organization
NNFPDP	New National Forest Plantation Development Programme
NRMP	Natural Resource Management Project
NTFPs	Non-Timber Forest Products

OSM	Offinso South Municipality
OSMP	Offinso South Municipal Profile
PLHIV	People Living with Human Immune Virus
PPP	Purchasing Power Parity
RMSE	Root Mean Square Error
SFM	Sustainable Forest Management
SPSS	Statistical Package for Social Scientists
TM	Thematic Map
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Conference on Sustainable Development
UNCTAD	United Nation Commission on Trade and Development
UNDP	United Nations Development Programme
UNFF	United Nations Forum on Forests
UNSD	United Nations Statistical Division
US	United States
USDA	United States Department of Agriculture
UTM	Universal Traverse Mercator
WHO	World Health Organization



DEDICATION

I dedicate this thesis to everyone who contributed in one way or the other to its success.

KNUST



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CHAPTER ONE

FOREST RESOURCES AND LIVELIHOODS

1.1 Introduction

Sustainable forest management (SFM) currently attracts a great deal of attention globally. Sustainable forest management became predominant following its recognition by the United Nations Conference on Environment and Development (UNCED) as the most significant contribution to sustainable development by the forestry sector in any country (UNCED, 1992). This concern is probably due to both the value and usefulness of forest resources in sustaining livelihoods and to the environmental effects of their use. Geographically, the tropical rainforests are the world's most important repository of biological diversity, and are a natural reservoir of genetic diversity, which offers a rich source of medicinal plants, high-yield foods and a myriad of other useful products (Panayotou and Ashton, 1992). Forest resources are very important to many people throughout the world. Globally, millions of people in rural areas derive products such as wild fruits, vegetables, nuts, edible roots, honey, palm leaves, medicinal plants, and bush meat from the forest for income generation and household consumption (Andel, 2006).

It is also apparent that the destruction of tropical forests in developing countries attracts much more attention today than similar cases of forest destruction in developed countries. This is because the majority of people in developing countries depend directly or indirectly on forest resources for their livelihoods. Also, the threat is that forest degradation in these countries may aggravate the problems of the poor in forest fringe communities. Over the past 20 years, the perception of forestry and how it can contribute to economic growth and poverty alleviation has changed markedly (World Growth, 2009). It is now widely argued that greater economic gains are available if forests are managed primarily for environmental purposes. Currently, these

arguments are focused on ceasing forestry and trading carbon stored within forests. It is also generally argued that forests should be preserved for the sake of the world's poorest subsistence communities living in the forests or at its margins (World Growth, 2009).

Despite significant advances in addressing global poverty over the last 100 years, alleviating poverty continues to remain a real challenge in many parts of the world. One area that has been the focus of much research and initiative is exploring the intersection between poverty and the environment (Street and Price, 2009). Judging from this premise, it is apparent that rural livelihood in forest fringe communities generally hinges on agricultural production and direct dependence on forest ecosystem services. There is therefore the need to maintain a balance between the competing demands for survival of forest dwellers on the one hand, and the sustainability of forests on the other hand (Aduse-Poku *et al.*, 2003). The wellbeing of humans and forest cover should be considered as joint problems because of their causal links. In this connection, Vedeld *et al.* (2004) contend that the poor rely on forests to maintain their well-being and in some cases as a source of income generation. Forests provide goods and services that are needed for the survival of people (Anderson *et al.*, 1991). These goods and services include a wide variety of products for home consumption and sale, new agricultural lands, restoration of soil fertility on fallow lands used for cultivation cycles, and access to fresh water through the watershed function of forests (Sunderlin *et al.*, 2005). Thus, forests can fulfill various roles in the livelihoods of the rural poor. For example a source of regular subsistence for people who live in and near forests in the form of food, fuel, forage, building materials, and medicines (Byron and Arnold, 1999).

Forestry is being redefined, with a growing emphasis on poverty alleviation and the improvement of livelihoods (Belcher, 2005). Concepts such as social forestry, community forestry, joint forest management, conservation, and development projects are meant to reflect this emphasis (Carter and Gronow, 2005). Lately, many studies have provided more evidence on the role of forests in rural people's livelihoods. Scherr *et al.* (2003) indicate that about one billion of the world's poor depend on forest resources to sustain their livelihoods. Estimate suggests that 1.6 billion people depend on forests for their livelihoods, and as many as 1.2 billion people in developing countries use forests to generate food, fuel, medicines, and cash. In 2003, the World Bank estimated that a substantial proportion of the world's poor live in or near forests. Moreover, 90 percent of the world's 1.2 billion extreme poor who live on \$1 or less a day depend on forest resources for livelihood and sustenance (Scherr *et al.*, 2003). Forests also provide important goods and services for 1.2 billion people of whom approximately 90 percent live below the poverty line including wood energy, food and other non-wood products, (FAO, 2004a cited in FAO, 2005).

Following the declaration of the Millennium Development Goals by the United Nations, attention has been focused more on the link between poverty alleviation and incomes from forests (Shackleton *et al.*, 2007). The underlying arguments linking forest management and poverty alleviation examine the relationship between poverty and natural forests (Sunderlin *et al.*, 2005), the role of forest products in filling seasonal shortfalls, and as safety nets in times of emergency. However, the main dilemma is whether forest resources can be made more pro-poor to provide pathways out of poverty in forest-dependent communities across the world.

In Africa, an estimated 635 million hectares (21.4 percent) of the total land area is covered with forest and account for 16.8 percent of the global forest cover (Gondo, 2010). Africa's forests can be classified into nine categories: tropical rain forests, tropical moist forests, tropical dry forests, tropical shrubs, tropical mountain forest, sub-tropical humid forests, sub-tropical dry forests, sub-tropical mountain forests and plantations (Gondo, 2010). The distribution of these forests varies from one sub-region to another, with the southern extremes of the Sahara desert having the least forest cover while Central Africa has the densest cover (*ibid*). It is widely recognized that forests and trees are at the centre of socio-economic development in Africa. They provide a wide range of forest products upon which rural communities depend for their livelihoods and subsistence. The forest products include wild foods such as honey, mushrooms and fruits, medicines, wood fuel, construction poles, and browse and fodder for livestock (Gondo, *undated*). More than 90 percent of the people in Africa rely on forests and trees for their energy needs, mostly for fuel wood and charcoal which are generally classified as non-timber forest products (NTFPs) (FAO, 2009). In some countries, forests also provide an important economic resource with tropical wood trade making up an average 6 percent of the Gross Domestic Product (GDP) and 10 percent of foreign trade in the Congo Basin countries (FAO, 2009). Moreover, in sub-Saharan Africa, forest resources are income sources for the rural poor. Both wood and non-wood forest products such as sawn wood, building materials, wood-based fibres, furniture, foodstuffs, medicines, baskets, mats, dyes are sold on the local, national, and in some cases, international markets. An estimated 15 million people in sub-Saharan Africa earn income from forest and related activities, and several million people derive their main source of income from forest-based micro enterprises such as fuel wood sales, charcoal making, small-scale sawmilling, carpentry, furniture making, handicraft and commercial hunting (Oksanen *et al.*, 2003).

Africa has the highest number of people living on less than a dollar a day, nearly half of the population (46.5 percent in 2001). In contrast, in South Asia, the next poorest region, the figure is 30 percent (CIFOR, 2005). A greater concern is that the number of poor people in Africa has increased over the period 1990–2001 while in Asia it dropped by 10 percent (CIFOR, 2005). It is certainly true that in most African countries poverty is predominantly a rural phenomenon. Estimates suggest that more than two-thirds of Africa's population directly or indirectly rely on forests for their livelihoods including food security (CIFOR, 2005). All these forest related income activities are crucial in reducing poverty among the poor and vulnerable in forest fringes of sub-Saharan Africa where poverty is rife.

The commercialization of the forest sector in Africa has boosted the contributions of the sector to the Gross National Product (GNP). In a number of forest rich sub-Saharan African countries, the commercial forest sector is an important contributor to export earnings and some activities of macroeconomic benefits including government revenue and employment. For example, in South Africa, the commercial forestry sector directly or indirectly employs some 135,000 people. Commercial logging and sawmilling companies in the rest of sub-Saharan Africa provide some 200,000 to 300,000 jobs with a similar number provided by activities associated with the forest industry (Oksanen *et al.*, 2003). Despite sub-Saharan Africa's great dependence on forest resources for economic development, particularly income generation, it appears not to be contributing to, or benefiting from, the general debate on how to achieve sustainable forest management, which is a priority in most forest-rich countries in Europe and America (Okali and Eyog-Matig, 2004).

Ghana is divided into three forest zones: the high-forest zone in the south, covering approximately 8 million hectares, the savanna zone in the north covering close to 4.7 million

hectares and a transition zone in the middle belt accounting for approximately 1.1 million hectares of land area (ITTO, 2005). These forests provide many goods and services valuable to society, ranging from wood-based to non-wood based enterprises namely industrial wood, fuel wood to non-wood forest goods such as plant and animal products. Ultimately, forest-dependent communities in Ghana rely on these goods and services for their livelihoods especially for adaptation during events like droughts, floods and crop failures. These goods and services are also beneficial to forest and tree-dependent sectors such as livestock, water, energy and agriculture, which contribute to overall national economic development. For example, the forest sector contributes 6 percent, to the Gross Domestic Product (GDP) of Ghana (CARE International, 2004). It has also been estimated that chainsaw milling and related activities have employed about 94,000 people in 2009 and still provide livelihood for many Ghanaians (Marfo and Acheampong, 2011). Moreover, the Bobiri forest in the Ashanti region of Ghana plays important roles in households' livelihood strategies through the provision of fuel wood, bush meat, medicinal and other plants, arts and craft materials and income (Antwi, 2009). Generally, in Ghana, people in forest communities engage in chainsaw operation as a secondary source of income with a few depending on it as their primary source of income. Furthermore, the livelihoods of these communities are predicated on the availability, access, and the utility the forest biodiversity offers (Asamoah *et al.*, 2007; Appiah, 2009). In addition, aggregate employment generation in forest product extractive activities in Ghana is estimated to be growing at 6.9 percent per year (FAO, 2003). These products contribute significantly to household food security, nutrition, health, and income, especially during the lean farming seasons (Ahenkan and Boon, 2008). Regardless of these contributions by forest resources, sustainable management of Ghana's forest resource base is a great challenge.

1.2 Problem Statement

Ghana's overall poverty rate has declined from 51.7% in 1991-92 to 28.5% in 2005-06 while the percentage of the population living below the extreme poverty line has also declined from 36.5% to 18.2% over the same period (GSS, 2007; NDPC and UNDP, 2010). Therefore Ghana has achieved the first Millennium Development Goal (MDG1) target of reducing by half the proportion of the population living in extreme poverty ahead of the anticipated date of 2015. However, this achievement is only applicable at the national level while the situation is quite different at the household level in the rural areas including forest fringe communities. The geographical locations of forest-fringe communities along or in the forests, give them the opportunity to cope with the severity of poverty by depending directly or indirectly on the forest resources, especially the non-timber forest products (NTFPs). The situation is quite similar in the Offinso South Municipality in the Ashanti Region of Ghana where about 20 percent of the population live below an average annual income of GH¢126.52 (OSMP, 2010). The forest in Offinso provides a source of livelihood for the communities along its margins. Products from the forest are recognized by the local people as products that constitute their direct livelihood (Hapsari, 2010). Despite the contributions of NTFPs to livelihoods in the Municipality, there has not been any quantitative measure of how much NTFPs contribute to the total monthly income of households, which will enable the estimation of the resource needed from NTFPs to lift the poor households out of poverty. This has also not been given attention in pro-poor policy discourse of the Municipality. The lack of statistical information on NTFPs and information on their potential role in supporting rural livelihoods are some of the challenges hindering the mainstreaming of NTFPs in forest policies of Ghana (Ahenkan and Boon, 2010).

Moreover, regardless of the significant contribution of the forest resources to the livelihood of people in the forest communities of Offinso, deforestation remains high. The forest has been subjected to various forms of anthropogenic disturbances leading to its fragmentation and degradation (Baatuuwie and Leeuwen, 2011). The high rate of deforestation is probably because of inadequate involvement of the communities in sustainable forest management (SFM) practices through the integration of their livelihood activities into the SFM initiatives of the Municipality. In addition, it could be attributed to the ill role of the Forest Services Division in sustainable forest management in the Municipality. This therefore poses a threat to the sustainability of the forest resources especially the NTFPs, which provide an income and consumption supplement for most households in the forest communities.

The major concern of the study is that the households in the forest communities of the Municipality are gradually losing their source of livelihood due to the overexploitation of the forest resources without corresponding management practices, making them unable to cope with the severity of poverty any longer. This calls for sustainable management of the forest in the Municipality. The study, therefore, seeks to find answers to the following questions: What is the contribution of NTFPs to the total monthly income of households in the Offinso South Municipality? What is the extent of deforestation and what are its effects on the availability of NTFPs in the Municipality? How are the local people involved in sustainable forest management practices in the Municipality? What specific role does the Forest Services Division play in sustainable forest management in the Municipality?

1.3 Objectives of the Study

The main aim of the study is to examine the involvement and prospects of sustainable forest management for poverty alleviation by the people in the Offinso South Municipality.

Specifically, the study seeks:

- i. To determine the contribution of NTFPs to the total monthly income/consumption of households in the Municipality.
- ii. To examine the extent of deforestation and its effects on NTFPs in the Municipality.
- iii. To assess the involvement and role of the communities in sustainable forest management practices in the Municipality.
- iv. To examine the role of the Forest Services Division in sustainable forest management in the Municipality.

1.4 Hypothesis and Proposition

The study was guided by a hypothesis and two propositions.

1.4.1 Hypothesis

H_0 : No significant difference exists between the number of the poor households that consume NTFPs and the number of the non-poor households that consume NTFPs.

H_1 : A significant difference exists between the number of the poor households that consume NTFPs and the number of the non-poor households that consume NTFPs.

1.4.2 Propositions

- i. NTFPs contribute to a proportion of the total monthly income/consumption of households in the Offinso South Municipality.
- ii. Deforestation in Offinso South Municipality is mainly caused by illegal logging activities.

1.5 Materials and Methods

The study was conducted in the forest communities in the Offinso South Municipality of the Ashanti Region. The target groups were households in the Municipality. Households' monthly consumption levels were used to measure poverty in the communities. The simple random sampling technique was used to select one hundred and fifty (150) households for the survey. Focus group discussions (FGDs), in-depth interviews with key informants and questionnaire were the methods and tool respectively for data collection. Both the quantitative and qualitative data gathered were edited to ensure accuracy and analyzed with the aid of SPSS and Excel software and content analysis respectively.

1.5.1 Types, Sources, and Methods of Data Collection

Both quantitative and qualitative data on demographic and socio-economic status of the heads of households were gathered. Both primary and secondary sources of data were used. The methods for gathering the primary data were through questionnaires administration, FGDs and in-depth interviews. The questionnaire was made up of both closed and opened ended questions. Eight (8) FGDs were conducted; two in each of the study communities. The heads of households were grouped into male and female. The maximum and minimum number of discussants was 8 and 5 respectively. Moreover, the quantitative data gathered included demographic data, income and consumption levels, and forest cover loss while qualitative data included type and uses of forest products, economic activities, and gender of household heads, perceptions, manifestations and coping strategies of poverty.

The monthly consumption levels of households were the main monetary indicator used for measuring poverty in the communities. The study therefore adopted the World Bank's 2005

international extreme and less extreme poverty lines of \$38 and \$60 a month respectively (World Bank, 2008). The international poverty lines were converted into the local currency unit (Ghana Cedis) using the 2010 *purchasing power parity*¹ (PPP) conversion factor of \$1.15 reported for Ghana by the World Bank. This placed the extreme poverty line approximately at GH¢ 43 and the less extreme at GH¢ 69 a month.

In addition, key informant interviews with the Municipal Forester and Assembly members on the state of the forest in the Municipality were conducted. Secondary data and information from secondary source were used to supplement the primary data from the field. This includes information from articles, journals, periodicals, and textbooks. Moreover, satellite images from Landsat TM (Thematic map) (1986, 2003 and 2007) were used.

1.5.2 Sampling Procedure

In keeping with the objectives, the study followed the required sampling procedures that enabled valid generalizations of the major findings.

1.5.2.1 Target Population

The target population for the study was heads of households in the Municipality, majority of who are farmers. As per the 2010 population estimate by the Municipal Assembly, the number of households in the selected study communities are as follows: Aborfour (3174), Kyebi (405), Kwapanin (369) and Ahwerekrom (119). Hence, the total household population in the selected communities, from which the final sample was taken, is 4,067.

¹ *Purchasing power parity* (PPP) conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States. Accessed online at: <http://data.worldbank.org/indicator/PA.NUS.PPP>

1.5.2.2 Sampling Technique

The simple random sampling of the probability sampling technique was employed to select the households for the survey. This was to ensure that each household in each of the study communities has an equal chance of selection. The selection processes were done manually by the use of the lottery approach. The random sampling method was employed because the population of these communities is homogeneous in terms of economic activities, demographic characteristics, and income/consumption levels. Also, this technique reduced biases and at the same time enabled the study to draw general conclusions from the sampled households from the four study communities. The heads of the selected households were the unit of inquiry. Thus, the households constituted the sampling unit while the heads of households and forest products constituted the unit of analysis.

1.5.2.3 Sampling Design

The main units of inquiry for the study were the heads of households in the Municipality. The selected communities included Aborfour, Kyebi, Anhwerekrom, and Kwapanin. This was to give the geographic perspective of the study in terms of the spatial spread of selected communities. These communities were selected based on their proximity to the forest and the dependence of the households on the forest resources for livelihoods. Thus, forest products are recognized by the people as constituting their direct source of livelihood (Hapsari, 2010). In order to ensure generalization and a fair representation in each of the four selected communities, the proportionate sampling method was used to select 117 households at Abofour, 15 at Kyebi, 13 at Kwapanin and 5 at Ahwerekrom. This was derived by the computation of a percentage for each community based on the total number of households in the four communities and the number of households in each community. Hence, the number of households selected in each community is

proportional to the total number of households in that community in relation to the final sample size.

1.5.2.4 Sampling Frame

The 2010 population estimate of the Offinso South Municipality put the number of households in the selected study communities as follows: Aborfour (3174), Kyebi (405), Kwapanin (369) and Ahwerekrom (119). Hence, the total household population in the selected communities, from which the final sample was taken, is 4,067. The sampling frame then consisted of all heads of households and key informant respondents in the persons of the Municipal Forester and Assembly member for Kyebi and Ahwerekrom.

1.5.2.5 Sample Size

A total of 150 households were randomly selected to constitute the sample size for the household survey. This was determined using the formula: $n = N / 1 + N(e)^2$ (Gomez and Jones, 2010), where n is the sample size, N is the total number of households in the four selected communities and e is the margin of error. With 8 percent margin of error representing 92 percent confidence level. The final sample size for the study was determined, as presented in Table 1.1.

Table 1.1 Sample Size Determination for each study community

COMMUNITY	HOUSEHOLDS	PERCENTAGE	SAMPLE SIZE
Aborfour	3174	78	117
Kyebi	405	10	15
Kwapanin	369	9	13
Ahwerekrom	119	3	5
Total	4,067	100	150

Source: Offinso South Municipal Assembly, 2010.

1.5.3 Data Analysis and Presentation

1.5.3.1 Household Data Analysis

Data analysis was done by the use of both qualitative and quantitative methods. Quantitatively, both descriptive and explanatory statistical tools of the Statistical Product for Social Scientists (SPSS) and Excel software were used. These tools were used to analyze the quantitative data such as income/expenditure levels, demographic data, and household size among others that were obtained through the closed-ended questions of the questionnaire. A chi-square statistical tool was used to test the differences between the number of poor households that consume NTFPs and the number of non-poor households that consume NTFPs. The results are presented in tables and displayed on charts. The statistical presentation helped identify the frequencies of the study's findings, distributions and the relationships between the variables measured. In addition, the qualitative data were analyzed by the use of *content analysis*² (Gomez and Jones, 2010). Thus, systematic conclusions were drawn from the focus group discussions and in-depth interviews. The sustainable forest management policies in the Municipality were analyzed based on their Strengths, Weaknesses, Opportunities, and Threats (SWOT) to determine their efficacy and impacts on the forest resource sustainability and poverty alleviation.

² *Content analysis* refers to the way in which particular meanings expressed by an object of the body can be discerned and concluded.

1.5.3.2 Satellite Imagery Processing

The study also employed remote sensing analyses of Landsat images to determine forest cover and loss in respective years in the Offinso South Municipality. The satellite images included: Landsat TM image of 1986, image of 2003, and Landsat ETM image of 2007. A map of Ghana was geo-referenced to WES 84 geoid and UTM zone 30 ellipsoid. An image of Offinso South Municipality was then digitized. A Root Mean Square Error (RMSE) of 0.34 was recorded and accepted as the positional accuracy of the study. The digitized image was superimposed on the satellite images in the Arcmap environment of the ArcGIS software. The area of Offinso South Municipality was then clipped out of the Satellite images. The ERDAS imagine 10.1 software was used for image pre-processing, classification and accuracy assessment. Supervised classification was done following the three stages: training data sets, classification and output. The maximum likelihood classifier was used for the classification, which evaluated a particular class; a pixel is most likely to belong to depending on the pixel value. A land cover map of Offinso South Municipality was then obtained by visual interpretation. As a result three land cover classes were distinguished: Forest, Grasses/degraded areas and Bare/Built-up. This was because the study also aimed at analyzing the extent of forest cover and lost in respective years (1986, 2003, and 2007). The images were classified and labeled as: Dark green representing forest, light green representing grasses/degraded forest and white representing bare/built-up. This enabled easy comparison of the extent of forest cover/loss by visual interpretation of the images. Also quantitative analyses of these images were done to derive in hectares the area of forest cover in the respective years

CHAPTER TWO

CRITERIA AND INDICATORS FOR SUSTAINABLE FOREST MANAGEMENT AND THE CONCEPT OF POVERTY

2.1 Introduction

This chapter of the study aims at reviewing related literature that placed the study in a scholarly framework. The chapter delves into the criteria and indicators (C&I) for measuring sustainable forest management in the tropics and the concept of poverty. Related works by researchers, scholars, and authors on forest and poverty alleviation nexus is critically analyzed to unveil the various explanations of the concepts. This has offered the study an opportunity to adopt some of their methods to place it in an erudite perspective. The chapter is categorized into seven main sections with the first section looking at the conceptual clarification of deforestation, forest degradation, forest fragmentation and sustainable forest management. The second section comprehensively deals with criteria and indicators (C&I) for measuring sustainable forest management in the tropics. These include the Amazon process, the International Tropical Timber Organization Initiative, the African Timber Organization Process, the Bhopal India (B-I) process, and the Centre for International Forestry Research testing of criteria and indicators (C&I). The third section looks at efforts towards sustainable forest management in Ghana, and the fourth section focuses on the definition, concept and measurement of poverty. The fifth section reviews poverty trends and incidences in Ghana while the sixth section reviews the synergy between sustainable forest management and poverty alleviation. The seventh, which is the final section of the chapter, describes the theoretical perspective of the study.

2.2 Conceptual Clarification of Sustainable Forest Management

In order to explicitly understand the meaning and concept of sustainable forest management, it is imperative to understand first of all *deforestation*, *forest degradation* and *forest fragmentation*. Deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below the 10 percent threshold (FAO, 2004). Deforestation can be either deliberate or unintentional; when deliberate it involves the removal of forest cover for agricultural purposes or urban development. When unintentional it involves uncontrolled grazing, which prevents the natural regeneration of young trees. Forest degradation on the other hand is a process leading to a temporary or permanent deterioration in the density or structure of vegetation cover or its species composition. It is a change in forest attributes that leads to a lower productive capacity caused by an increase in disturbances (FAO, 2007). Finally, forest fragmentation refers to any process that result in the conversion of formerly continuous forest into patches of forest separated by non-forested lands. That is, it is the conversions of large areas of contiguous native forest to other types of vegetation or land use leaving remnant patches of forest that vary in size and isolation (FAO, 2007). To further understand these concepts, it is also important to comprehend the concept of sustainable forest management.

Sustainable forest management (SFM) is a concept in continuous development, the interpretation of which varies over time, as well as among countries, regions and even local landscapes. Consequently, the knowledge required to realize sustainable forest management (SFM) is heterogeneous and dependent on sets of values with different spatial and temporal scale dimensions (Angelstam and Elbakidze, 2006). The definition and concept of sustainable forest management varies among researchers, scholars, authors, and from one geographical area to

another. This sub-section therefore explored the various definitions, explanations, and notions of sustainable forest management.

The concept of sustainability is vague; as such there have been several arguments and perspectives on its definition. A definition given by Wackernagel *et al.* (2005) states that “Sustainability is securing people’s quality of life within the means of nature”. In addition, the United Nations Conference on Environment and Development Principle 1 pointed out “Human beings are at the centre of concern for sustainable development. Therefore, they are entitled to a healthy and productive life in harmony with nature”. Similarly, the World Commission on Environment and Development (1987) defines sustainable development as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Thus, from this premise sustainability involves satisfying present needs without compromising future options. This concept has been incorporated into all dimensions and sectors of development including the forestry sector. Therefore, the concept of sustainability has consequently become pivotal to policy arrangements within the forestry sector in recent years. In this connection, everyone agrees that sustainability is good and should be applied to natural resource management (Noss, 1993). Hence, in the context of forest management, Sayer *et al.* (1997) clearly states that sustainability is not merely an issue of natural forests versus plantations, or clear felling versus selection logging systems, but involves more fundamental questions about the functions and services provided by forests, and about stakeholders, equity and expectations. Walia (2007) reiterates that sustainability is maintaining healthy productive forests both in terms of ecosystem services and goods to meet the needs of the present generation, as a steady natural asset nurtured for perpetuity. Thus, from the perspective of forest

management the elements of sustainability are the following: maintaining the forest and its resources for longevity and perpetuity, concern for future generations and reasonable estimates of future needs, estimates of current rates of use and regeneration along with a widely accepted view of the appropriate rate of use. Coufal (1999) also defines sustainable forestry as the act of managing forests to provide the necessities of life. The basic necessities of life include food, water, and shelter coupled with the supply of oxygen for human survival. Forests therefore play an essential role in ensuring these life necessities. Forests protect water bodies and also provide natural manure for the cultivation of crops. Furthermore, forest products, namely timber, are the basic units for the construction of houses. It is therefore necessary to manage forest resources sustainably. In a related development, the United Nations Forum on Forests (2007) stresses that sustainable forest management can contribute to economic development by providing income, employment, food security and shelter where it is most urgently needed. That is, finding ways of balancing human needs with concerns over the long-term sustainability of forest resources is the very essence of sustainable forest management (UNFF, 2007).

Noss (1993) explains the concept of sustainable forest management from a different perspective. He recognizes that sustainable forest management is only possible within the ultimate constraints and limits imposed by the ecosystem. Sustainability should be viewed as the degree of overlap between ecological possibilities and the socially desirable benefits of forests. In the context of forests, “ecological possibilities” are the services and products that can be derived from forests. In addition, forests offer products and services that satisfy the social needs of the poor. According to Noss, forest sustainability is nothing more than looking at the common characteristics of what forests are capable of offering and the social benefits that are derived

from forest products and services. Therefore sustainable forest management embraces the view that forests yield many products and provide many ecological services. It will therefore produce a range of products and services that may or may not include timber. Pearce *et al.* (1999) therefore relate the concept of sustainable forest management to the multiple uses of forest.

In a similar explanation, the United States Department of Agriculture (USDA) defines sustainable forestry as sustaining the full range of services and benefits, namely environmental, social, and economics that people desire from forests that usually require a diverse mosaic of ownerships, forest conditions and capacities across the landscape, as well as a variety of management emphases (USDA, 2004). In contrast, Thompson *et al.* (2009) and Rebugio (2000) have different views. Thompson *et al.* (2009) argued that sustainable forest management refers not just to the flow of goods and services but also to maintaining the forests' ecological processes that are essential for maintaining ecosystem resilience and the capacity of a forest ecosystem to recover following disturbance. In an agreement with Thompson, Rebugio (2000) also indicates that sustainable forest management is a management system that maintains the forest's critical ecological functions and biological diversity, and minimizes the adverse impacts of human activities so as to ensure the availability of forest goods and services in perpetuity for the use of present as well as future generations.

The Food and Agriculture Organization (2005) defines sustainable forest management as the Stewardship and use of forests and forest lands in a way, and at a rate that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global

levels, and that does not cause damage to other ecosystems. This definition affirms the fact that sustainable forest management is multidimensional and needs to be tackled from many perspectives. It is therefore laudable to integrate all aspects of forests management to ensure their sustainability. Thus, sustainable forest management implies management that pays equal attention to the productive, protective, social and environmental aspects of forestry (Okali and Eyog-Matig, 2004). In a related definition, The Canadian Forest Products LTD (2006) defines sustainable forest management as the balanced, concurrent sustainability of forestry-related ecological, social and economic values for a defined area over a defined time frame .To further expatiate on the environmental, social and economic aspects of sustainable forest management, The Non-legally Binding Instrument on All Types of Forests maintains that sustainable forest management is a dynamic and evolving concept, that is aimed at maintaining and enhancing the economic, social and environmental values of all types of forests, for the benefit of present and future generations (UNFF, 2007).

The concept of sustainable forest management has become a common topic in the history of professional forestry. The professional foresters have variant views about the concept. For sustainable forestry has meant the assurance of a “permanent forest estate”. That is a forest with unfringeable physical boundaries that is not subject to change over time (Hyde, 2007). According to this group of foresters, sustainable forestry is likened to a permanent flow of resources from forests. In the same way, environmentalists with modern concerns on the environmental sustainability emphasizes sustainable forestry as meaning a “permanent forest estate”, but this also suggests special attention to tropical and developing countries forests, where the greatest threats to a permanent estate seem to exist (Hyde, 2007). There has also been a

growing concern from international forestry institutions and organizations about the concept of sustainable forest management. For instance the International Tropical Timber Organization (ITTO) defines sustainable forest management as the process of managing permanent forest land to achieve one or more clearly specified objectives of management with regards to the production of a continuous flow of desired forest products and services without undue reduction in its inherent values and future productivity and without undue undesirable effects on the physical and social environment (ITTO, 2005 cited in ITTO, 2006). An elaboration of this definition indicates that sustainable management of forests need concerted efforts towards improving their quality to ensure a continuous flow of abundant forest products for forest-dependent communities. In addition the definition recommends the management of forests to sustain their full range of environmental, social and, particularly, economic values.

On the other hand, it is very important to recognize that the concept of sustainability in forest management has evolved from sustained yield and single-use management for timber, to one reflecting the wide range of goods, ecosystem services and values generated or otherwise provided by forests (ITTO, 2011). The concept of sustainable forest management can also be seen in a more generic way. This is the involvement of a variety of stakeholders, including institutions, and the ardent application of both scientific and indigenous knowledge and practices in ensuring the sustainability of forest management. The ITTO (2011) reiterates that sustainable forest management (SFM) involves the application of the best available practices based on current scientific and traditional knowledge that allow multiple objectives and needs to be met without degrading the forest's resources. The organization also emphasized that sustainable forest management requires efficient and accountable governance and the protection of the rights

of forest-dependent people. This implies that people along forest-fringes have the right to depend on forest resources both directly and indirectly to satisfy their needs materially. However, protecting their right in this case may mean, ensuring a perpetual flow of forest resources to satisfy their needs by concerned individuals and institutions in the forestry sector. Another way to protect their right is to give forest-dependent communities management responsibilities. To further explain the concept of sustainable forest management, criteria and indicators for measuring sustainable forest management in the tropics is treated in the next subsection.

2.3 CRITERIA AND INDICATORS (C&I) FOR SUSTAINABLE FOREST MANAGEMENT IN THE TROPICS.

2.3.1 Introduction

Geographically, tropical forests are forests that lie between the Tropic of Cancer (23° north of the equator) and the Tropic of Capricorn (23° south of the equator). They are found in South and Central America, Africa, and Asia. In their distribution, South America has the largest area of tropical forests (810 million hectares), followed by Africa (627 million hectares) and Asia (489 million hectares) (Gunter *et al.*, 2011).

Criteria and indicators towards adopting pragmatic sustainable forest management framework were pioneered by the ITTO. Since the ITTO pioneering work in the early 1990s, several international and regional initiatives on criteria and indicators for sustainable forest management have emerged, following the United Nation's declaration on sustainable development in 1992. Many countries embraced these initiatives including countries of the Euro-zones in protecting their forests with a follow-up Ministerial Conference on the protection of Forests in Europe in 1993 in Helsinki, which culminated in a political declaration and initiation of Pan-European Helsinki Process. Also a working group on criteria and indicators for the conservation and management of temperate and boreal forests was initiated in September 1993 in Montreal called

the Montreal Process. In addition, the 8 signatories' countries of the Amazon Cooperation Treaty (ACT) launched the Tarapoto Proposal for the sustainable management of the Amazonian forest. Finally, at the regional level, Dry-Zone Africa, the Near East, Central America and the African Timber Organization were launched and adopted. The United Nations Commission on Sustainable Development and Intergovernmental Panel on Forests have endorsed the concept of criteria and indicators for sustainable forest management and called on all countries to be involved in implementing them. It is also essential to recognize that, forest reserves; functions of forest, socio-economic needs, and legal and institutional frameworks are the thematic areas common to all these initiatives and processes. The review will be limited to selected criteria and indicators for sustainable management of tropical forests after the United Nations declaration in 1992.

2.3.2 International Tropical Timber Organization Initiative (ITTA)

The ITTO first provided guidelines for forest management. Despite the numerous criticisms leveled against the guidelines as being business oriented, they were accepted and adopted internationally for sustainable forest management. In 1990, the ITTO launched 'Target 2000' which was later called the 'ITTO Year 2000 Objective' (IISD, 1996). In this, member countries are to trade in tropical timber and timber products from sustainably managed sources by the turn of the century. The criteria and indicators were recognized as a checklist for a partnership agreement by the consumer member countries of the ITTO to achieve sustainable management of their forests (boreal, temperate and non-tropical) by the year 2000. Later, the International Tropical Timber Agreement (ITTA) was negotiated in 1994, which was concluded at the United Nations Conference on Tropical Timber under the auspices of the United Nation Commission on Trade and Development (UNCTAD) in Geneva, Switzerland.

2.3.3 The Amazonian/ Tarapoto Process (TARA)

The Amazon Basin is the part of South America drained by the Amazon River and its tributaries. The Basin is located in the following countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela. The Amazon Basin countries contain an estimated 744 million hectares of closed tropical forest, most of which is in the Amazon Basin itself, where only about 30 million people live (ITTO, 2006). The Amazon has the largest area of the tropical forest of about 810 million hectares (FRA, 2010). The concept of sustainability became the core of development agenda including forestry in many countries after the United Nations Conference on Environment and Development in 1992. The concept is not new in this regard but became the core of development agenda including forestry after the United Nations declaration in 1992. Sustainable forest management was recognized by the United Nations as the most important contribution that the forestry sector can introduce into any sustainable development initiative in forest endowed nations. In order to intensify sustainable management of the Amazon forest and respond to international calls for sustainability, the 8 signatory countries of the Amazon Cooperation Treaty (ACT) have identified 7 national level criteria and 47 indicators within the Tarapoto Proposal for the sustainable management of the Amazonian forest, which was launched in Tarapoto, Peru in 1995. At the forest management unit (FMU) level, 4 criteria and 22 indicators were identified while 1 criterion and 7 indicators were promoted at the global level (Castañeda, 2000). This joint initiative by the Amazon countries is recognized to be the most comprehensive and pragmatic set of criteria and indicators for the sustainable management of tropical forests particularly the Amazon since it offers solution to specific sustainable management challenges confronted in tropical countries.

2.3.4 The African Timber Organization Process (ATO)

African tropical forests have suffered a serious decline because of over-exploitation to meet the growing socio-economic needs of the population whose impacts are felt much more at the regional level. It therefore became significant to address issues of sustainable forest management from the regional level. The African Timber Organization (ATO) implemented the development of principles, criteria and indicators for the sustainable management of African natural tropical forests in 1993 with a follow-up Ministerial Conference in 1996, which culminated in a political declaration of the process. In order to conform to the international standards, particularly by the Intergovernmental Panel on Forests, the 13 member countries developed 5 principles, 2 sub-principles, 28 criteria and 60 indicators for sustainable forest management, for application at the regional, national and forest management unit levels. The 14 African Timber Organization member countries synchronized its principles, criteria and indicators with the International Tropical Timber Organization's criteria and indicators for African tropical forests management in 2001.

2.3.5 Centre for International Forestry Research (CIFOR)

The Centre for International Forestry Research (CIFOR) is the first international organization to carry out a wide testing of proposed criteria and indicators. It has undertaken field-testing at forest sites in both tropical (Indonesia, Côte d'Ivoire, Brazil) and temperate (Germany and Austria) countries. The results of the test indicated a high level of similarity in the criteria and indicators in all the tropical and temperate testing sites. One major observation is that a core subset of criteria and indicators at the tropical sites (see Table 2.1) was also found and applicable at the temperate sites. The CIFOR then concluded that it is possible to develop generic global

criteria and indicators for sustainable forest management. It was further concluded that core criteria and indicators apply as much to management processes as to site-level performance measures of sustainability. One recent priority of the organization is to identify relevant stakeholders in forests and how to rank different groups. In addition a system for scoring stakeholder groups was proposed along six dimensions: proximity to the forest, preexisting rights, forest dependency, indigenous knowledge, and forest/culture link and power deficit.

Table 2.1 Subset of Criteria Common to CIFOR's Tropical Test Sites.

NO.	INDICATORS	CRITERIA
1	5	There is sustained and adequate funding for the management of forests
2	4	Ecosystem function is maintained
3	4	Impacts to biodiversity of the forest ecosystem are minimized
4	2	The capacity of the forest to regenerate naturally is ensured
5	3	Stakeholders/forest actors' tenure and use rights are secure
6	2	Stakeholders/local populations participate in forest management
7	1	Management objectives are clearly and precisely described and documented
8	4	A comprehensive forest management plan is available
9	4	The management plan is effectively implemented
10	4	An effective monitoring and control system audits management's conformity with planning

Source: IISD, 1996.

2.3.6 Bhopal India (B-I) process

India is one of the tropical countries in Asia endowed with forest resources, however as a developing nation, livelihoods are dependent on forest resources. This dependence has subjected the forest to anthropogenic disturbances leading to its degradation (IIFM-ITTO, 2004). Following international and national objectives of achieving sustainable forest management, the Indian Institute of Forest Management (IIFM) pioneered the development of criteria and indicators for measuring sustainable forest management in 1998. This initiative has been named as the Bhopal - India Process. The criteria and indicators initiative draws support from technical group on sustainable forest management and the government. At a workshop by the IIFM in

collaboration with the State Forest Department in 1999, a three-tier hierarchical structure was adopted as appropriate for India, involving 8 national level criteria, 43 related indicators and a set of principles for sustainable forest management. This set of criteria and indicators were seen as not only relevant for the 4 major forest types of India, but also for the Dry Forests of South and South East Asia which include, Sri Lanka, and Bangladesh. India, by this process, has been actively operationalizing sustainable forest management since 1998.

2.4 EFFORTS TOWARDS SUSTAINABLE FOREST MANAGEMENT IN GHANA

Ghana's forest and resource management policies date back to 1906 when legislation was passed to regulate the commercial felling of tree species. The Forestry Department (FD) was established in 1908 to regulate these activities. The delineation and reservation of the forestland was completed in 1939 and a forest policy was finally adopted in 1948 (FC, 1994). Unfortunately, sustainable supply of timber for the wood industry was the focus of the earlier forest policies rather than sustainable forest management. This however, promoted and encouraged over exploitation of commercial tree species from both on and off reserves which eventually led to the demise of the off-reserves. This prompted the government to place 3,267,250 hectares of forestlands under permanent forest estate in 1978 (FC, 1994).

Ghana became more environmentally concerned following the recognition of forests as the largest, most complex and self-perpetuating of all ecosystems at the 1972 United Nations Conference in Stockholm. The outcome of the conference emphasized the need for sound land and forest use policies, ongoing monitoring of the state of the world's forests and the introduction of forest management planning (UNCSD, 1978). In the early 1990s, Ghana's forests

were excessively exploited by illegal chainsaw activities coupled with the blatant neglect of the prescribed harvesting procedures (Donkor and Vlosky, 2003). In addition, forestry institutions had become demoralized and inefficient because of continued underfunding (Donkor and Vlosky, 2003). Consequently, concerns raised by major stakeholders along with increasing international attention on deforestation stirred the revision of the old forest policy and the adoption of the new Forest and Wildlife policy in 1994 (MLF, 1994). The overall aim of the Forest and Wildlife Policy, 1994, is conservation and sustainable development of the nation's forest and wildlife for maintenance of environmental quality and perpetual flow of benefits to all parts of society. The numerous criticisms of this new policy indicate that it represents only a temporary set-back to resource plunder and it also fails to engage sector-specific problems to the extent that forest regulators and politicians pay no attention and the policy is seen as a license to continue their usual business (Opoku, 2006). Despite the limitations, it clearly commits to collaborative forestry management (CFM) and enhancing the role of communities in forestry at policy, managerial and implementation levels (Opoku, 2006). In addition, forestry researchers have described this as a more responsive policy towards collaborative and sustainable forest management, which has as its core objective the strengthening of a national commitment towards sustainable forest management based on its national standards and thresholds limits. The two-fold aim of environmental quality and sustainable benefits has the following specific objectives;

Table 2.2 The specific objectives of the Forest and Wildlife Policy, 1994 in Ghana

OBJECTIVES	
1.	Management and improvement of Ghana's permanent forest estate for preservation of soil and water, conservation of biological diversity, environmental stability and sustainable production of domestic and commercial products.
2.	Promotion of efficient forest-based industries, in secondary and tertiary processing, to use timber and other products from forests and wildlife and satisfy domestic and international demand with competitively priced products.
3.	Promotion of public awareness and involvement of rural people in forest and wildlife conservation to maintain life-sustaining systems, preserve scenic areas and enhance potential for recreation, tourism and income generating opportunities.
4.	Promotion of research-based and technology-led forestry and wildlife management to ensure forest sustainability, socio-economic growth and environmental stability.
5.	Development of effective capacity and competence at district, regional and national levels for sustainable management of forest and wildlife.

Source: MLF, 1994.

In 1996 a Forestry Sector Master Plan was developed as recommended by the policy, which detailed concrete issues on forests, wildlife, and biodiversity. Again in 1997 an overextended program framework to implement the Forest and Wildlife Policy, called the Natural Resource Management Project (NRMP), was formulated. The NRMP provided a basis for achieving sustainable utilization and development of forest and wildlife resources in an integrated manner with funding support from the Global Environmental Facility (GEF) and Danish International Development Assistance (Taklo and Danso, 2007). In 1996, a "Forest Certification" workshop was organized which identified the need for a certification scheme as one of the tools for ensuring sustainable forest management (NCFC, 1996). As a country committed to ensure sustainable forest management, Ghana is also a signatory to the International Tropical Timber organization (ITTO) and the African Timber organization (ATO) processes, which have influenced national policy measures on sustainable forest management (Asare, 2011). The ITTO and ATO synthesized their processes, and settled on 1 principle, 5 criteria and 33 indicators for national level assessments (ITTO, 1999). Since mid 90s all these initiatives, laws, and

programmes, have been formulated and implemented to reform the forestry sector to achieve sustainable forest management. However, in spite of these efforts, the extent and quality of forests in Ghana has been declining as manifested by continuous deforestation and massive illegal timber harvesting (Birikorang, 2001 cited in Asare, 2011). There are also the questions of whether forest-fringe communities in Ghana derive the maximum benefits from forests and whether such activities are sustainable? As a result, this study focuses on exploring the prospects of sustainable forest management for poverty alleviation in the Offinso South Municipality in the Ashanti region of Ghana.

2.5 CONCEPTUAL CLARIFICATION AND MEASUREMENT OF POVERTY

2.5.1 Definition and concept of poverty

Poverty is nebulous; the lack of a consensus definition of poverty has stimulated several definitions and ideas from researchers and institutions, all in the quest to influence poverty discourse. Interestingly, these definitions have similar ideas, however, they do not add to a single synthesis of a definition of poverty. It is therefore imperative for researchers into poverty to appreciate and analyze the diversity of these ideas and perceptions of poverty to ensure a coherent body of knowledge in poverty discourse. In support of this, the FAO (2005) agree that poverty is not a self-defining concept and that experts and academics have suggested many definitions over time. The FAO illustrates that poverty could be the lack of command over commodities in general; alternatively, it could be the lack of command over some basic goods, for example food and housing. Generically, Sen argues that poverty is the lack of capability to function in a given society (Sen, 1985 cited in FAO, 2005). Thus, harmonizing these definitions, poverty is seen as a status in which individuals in society do not achieve a reasonable standard of

living. In a related definition, the World Bank (2001) indicates that poverty is an unacceptable deprivation of well being which exists when there is lack of the means to satisfy critical needs. It could be inferred from these definitions that poverty can be regarded as the status, objective or subjective, of an individual or a society. It is in the light of this that Boccanfuso, (2004) cited in Obayelu and Awoyemi (2010) emphasizes that poverty will have an objective definition once observable and measurable indicators exist that are used to approach the material or other aspects of the lives of individuals. On the other hand, the subjective definition of poverty applies judgment (including value judgment) of individuals in order to investigate their welfare. The United Nations Committee on Economic, Social and Cultural Rights equally expounds on the concept of poverty. The committee, in 2001, defined poverty as a sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights. This definition actually emphasizes on all the dimensions in poverty discourse, crystallizes more than a century of research on poverty and shows a clear understanding of the concept. However, operationally this definition seems broad and demands sectoral approaches that can tackle all these aspects.

Historically, poverty has been synonymous to the ‘lack of income’, which has remained at the center of the concept until today. This is probably because research attempting to comprehend poverty focuses on the income dimension with the implicit assumption that the lack of income is synonymous with poverty. Townsend (2006) explicitly states that income is itself no less problematic a concept than poverty and has to be carefully and precisely elaborated. He further explains that people are said to be poor when they are deprived of income and other resources

necessary to obtain the conditions of life that constitute diets, material goods, amenities, standards and service that enable them to play the roles, meet the obligations and participate in the relationships and customs of their society.

In explaining the concept of poverty from the income perspective, it is important to make reference to absolute and relative income approaches. In his book '*Multidimensional Poverty Measurement*' Wagle (2008) emphasizes that the notion of absolute poverty is the most fundamental level of economic well-being. The well-being perspective defines poverty in terms of basic needs, usually the amount of income required to acquire a minimum level of food calorie intake, a minimum basket of consumption goods, or a level of individual welfare or utility needed to live a basic life. In addition, the absolute income approach attracted a lot of attention from international organizations. The World Bank (2000) defines absolute poverty based on per consumption of US\$1 a day. By this standard, a person is considered to be absolutely poor if he/she lives on less than US\$1 a day. The International Labor Organization estimates poverty line in terms of the minimum requirements for food, shelter, clothing, and other essential services such as transportation, sanitation, health, and education (ILO, 1976 cited in Wagle, 2008). Even though income is not directly mentioned in this definition, it could be deduced that "the minimum requirement" refers to the minimum income required to satisfy food, shelter, clothing, transportation, sanitation, health, and education needs of life. This is because the lack of income will render anybody unable to meet these needs of life. In a related discourse, the UNDP (2000a) cited in Wagle (2008) defines extreme poverty as the lack of income required to meet basic food needs, which represent absolute poverty. Thus, extreme poverty and absolute poverty from the viewpoint of the UNDP connote similar things. One major advantage of

defining poverty from the income perspective, and the use of international poverty lines, is that they present common standards and platforms through which poverty could be measured across the world. This also allows for easy comparison of poverty figures across the globe, which could trigger a generic international poverty reduction strategy.

However, regardless of the wide adoption of these international poverty lines to define and measure poverty, they have also attracted contrary views, particularly the World Bank consumption threshold of US\$1 below, which people are considered to be living in absolute poverty. Rowson (2001) argues that this threshold does not consider the differences in the cost of living within countries. For instance US\$1 will purchase different quantities of goods in different places. Defining poverty in terms of income has been criticized as a narrow approach. From these grounds, the non-income approach, which focuses on social disadvantage, vulnerability, and powerlessness (World Bank, 2001a), is currently gaining attention in poverty literature. This further invokes the issues of defining and measuring quality of life with perhaps such indicators as health, nutrition, household environment, and adequate physical and mental development (Wagle, 2008). This advancement in poverty analysis is reflected in the shift of the World Development Reports on poverty from a focus on low-consumption (income) and achievement in human capital in 1990, to a wider approach which has indicators, namely opportunity, security, and empowerment in 2000 (World Bank, 2001a).

Another significant concept of poverty is social exclusion, which defines poverty as the lack of access to assets and markets, and participation in society. Social exclusion is associated with discrimination on the basis of age, ethnic origin, or gender, among other characteristics, and thereby with poverty (World Bank, 2001b). The reason why some tend to be poorer than others,

from this perspective, has to do with those social processes and institutions that support or inhibit household participation in economic, political, and civic/cultural activities (Cannan, 1997). Thus, this approach considers people to be poor if they lack the opportunity to participate in the decision-making processes of society. It is important to note that people in the category of income poverty are victims of social exclusion because lack of income is likened to powerlessness, which subsequently leads to social exclusion. Social exclusion and lack of income should therefore be seen as characteristics of poor people in society. One setback of this approach is that levels of participation vary among countries, which make it difficult for social exclusion to be used as a standard for measuring and defining poverty globally.

The World Bank (2000) defines poverty as a pronounced deprivation in well-being. This has prompted an essential question of what is meant by well-being. In their quest to further illustrate what constitutes “well-being” the World Bank Institute (2005) indicates that one way to think of people’s well-being is command over commodities in general, so people are better or worse off if they have a greater or less command over resources respectively. The second way is to ask whether people are able to obtain specific type of needs, namely food, shelter, healthcare, and education. Sen (1987) cited in World Bank Institute (2005) argues that “well-being” is derived from the “capability” to function in society. This implies that one is considered poor when he or she lacks key capabilities, which is the same as having no or limited of the following: income, education, good health, security, self confidence, power, and freedom of speech. The absence and inadequacy of any one of these indicators renders people incapable of functioning in the society. In a nutshell, poverty is defined as capabilities deprivation from the perspective of social exclusion.

Poverty has also been related to the state of vulnerability, which could exacerbate the plight of the poor or even put others into the state of poverty. Vulnerability and poverty nexus have been explored by researchers such as Hulme *et al.* (2001). They argued that the poor are more concerned about the persistent decline in their income and consumption levels that would make them vulnerable to premature death rather than low income and consumption levels. With vulnerability, poverty is seen as the likelihood that a household will suddenly reach a point at which it will be unable to cope, leading to catastrophes such as hunger, starvation, family breakdown, destitution or even death (Hulme *et al.*, 2001). External threats to livelihood security and internal risk management are the twofold aspects of vulnerability identified by Ellis (2000a) cited in Hulme *et al.* (2001). It is also important to differentiate between the two categories of people that form the vulnerable group. First, people who are not poor but experience a persistent decline in income and consumption levels could become poor. On the other hand, the plights of the poor could worsen when they are faced with internal or external shock. Seasonality, changes in weather patterns, loss of job and livelihood, ill health and civil unrest are some of the factors that give rise to vulnerability.

These various definitions make poverty a multidimensional concept, which refers to various forms of deprivation in society. This is why Clark and Hulme (2005) indicate that poverty is a difficult concept to encapsulate for the purpose of research, especially cross-national, comparative research. However, in harmonizing the various definitions, one key element that is central to the definitions is “lack or deprived of”. Efforts by the World Bank to synthesize the various definitions of poverty culminated in a definition of poverty as the lack of, or the inability to achieve, a socially acceptable standard of living (World Bank, 2001 cited in FAO, 2005).

Lack, has become the basis for defining poverty. For instance an individual may be considered poor if he or she “lacks” income to acquire basic needs such as food and shelter. For the purpose of this study, poverty was defined as the lack of income to acquire the basic needs of life.

2.5.2 Measuring Poverty

Much literature has emerged to offer explanations to the concept of poverty. The diverse understanding of poverty has led to the adoption of many approaches of measuring it. As one of the definitions of poverty is a state of deprivation, with a living standard below some minimal level, much debate has centered on finding appropriate ways to address the multidimensionality in measuring living standards and poverty (Bourguignon and Chakravarty, 2003). The reason for these debates is the search for a consensus on a measurement approach that will inform poverty reduction policies both at the national and international levels. As a result, researchers and institutions have proposed approaches for measuring poverty. Each of these approaches has its own strengths and weaknesses, as there is no single acceptable approach. The World Bank (2002) outlined three main ingredients that are required in estimating a poverty measure. First, one has to choose the relevant dimension and indicator of well-being. Second, one has to select a poverty line, that is, a level below which a household or individual will be classified as poor. Finally, one has to select a poverty measure to be used for reporting for the population as a whole or for a population subgroup only. This subsection of the review focuses on the three main processes required for measuring poverty.

2.5.2.1 Defining Indicators of Well-being

The indicators for poverty measurement are obvious and can be broadly grouped into monetary and nonmonetary indicators (World Bank, 2002). The World Bank made reference to income or consumption (expenditure) when estimating poverty using monetary measures and indicated that one has the choice to use either income or consumption (expenditure). In a related assertion, the FAO (2005) indicates that two natural monetary indicators for measuring poverty are income and consumption expenditure. According to the World Bank (2002), analysts argue that, consumption is a better indicator for poverty measurement than income provided detailed information from a household survey is enough. One reason given is consumption (expenditure) is directly related to a person's well-being of having enough to meet current basic needs. The second reason is that income is only one of the factors of consumption of goods. The other factors are the availability and accessibility of the goods. Moreover, consumption expenditures is not only the goods and services that a household can acquire based on its current income, but also whether that household can access credit markets or household savings at times when current income is low or even negative, probably due to seasonal changes, harvest failure, or other unfavorable circumstances that cause income to reduce.

The FAO (2005) also argues that total expenditure (consumption) is often used as an indicator of poverty because consumption better reflect the state of permanent income of an individual or household. On the other hand the use of income for poverty measurement may have advantages as it allows for a distinction to be made between different income sources and when such distinctions can be made, income may be more easily compared with data from other sources, such as wages, thereby providing a check on the quality of data in the household survey (World

Bank, 2002). Measuring poverty using only monetary indicators (income and consumption) has been criticized as narrow, as such the use of nonmonetary indicators has also attracted a great deal of attention. The World Bank (2002) identifies insufficient outcomes with respect to health, nutrition, and literacy, and with deficient social relations, insecurity, and low self-esteem and powerlessness as the indicators for poverty measurement from the nonmonetary perspective.

2.5.2.2 Choosing and Estimating a Poverty line

As a process, once a monetary or nonmonetary measure is defined at the individual or household level, it is now appropriate to choose one or more poverty lines. Poverty lines are cutoff points separating the poor from the non-poor (World Bank, 2002). Poverty lines can be monetary indicators such as a certain level of income or consumption, or nonmonetary indicators such as a certain level of education. According to the World Bank (2002) the two main ways of setting poverty lines are absolute and relative. Absolute poverty lines are based on some absolute standard of individuals or households to be able to meet their basic needs. In monetary measures, absolute poverty lines are often based on minimum diet cost, which includes the minimum cost, for each household to achieve a given energy intake (FAO, 2005). Thus, if income is considered as an absolute poverty line, individuals are considered to be poor if they have inadequate income to meet basic food needs. It is important to note that the use of an absolute poverty line does not identify a person as being absolutely poor, instead the term ‘absolute’ refers to the fact that the poverty line is to remain fixed during the time frame under consideration (Addison *et al.*, 2009). The two main pitfalls of absolute poverty lines as argued by FAO (2005) are that minimum diet costs may vary among households because of the differences in nutrition patterns, and they also failed to consider non-food items.

On the other hand, relative poverty line refers to a standard of living defined in relation to the position of other people in the income or expenditure distribution (World, Bank 2002: FAO, 2005). For instance, relative poverty line defines poor individuals as having incomes below some percentage (for instance, 50 percent) of the average income of the society (World Bank, 2002: Addison *et al.*, 2009). Hence if the average income grows because the rich gain more, the number of people in relative poverty might increase. In short, inequality in income levels is the basis for relative poverty lines. The main disadvantage of relative poverty line is that poverty can be reduced but never eradicated unless income equality is fully achieved (UNSD, 2005).

The subjective approach has also been noted as an alternative poverty line, which involves asking members of the public directly about the adequacy or inadequacy of different income levels (Townsend and Kennedy, 2004). Addison *et al.* (2009) further indicates that subjective poverty lines consider information from surveys that ask participants how much it takes to get along. With the subjective poverty line, poverty is understood from the viewpoint of the poor, which can inform policy formulation. However, the main problem with this line is that the poor are asked to assess needs outside their own experience (Townsend and Kennedy, 2004). A further issue is that subjective approaches have tended to result in poverty lines substantially higher than those derived from other approaches (Deleeck *et al.*, 1992 cited in Townsend and Kennedy, 2004).

2.5.2.3 Choosing and Estimating Poverty Measures

The last ingredient in measuring poverty is choosing and estimating poverty measures. The actual poverty measure is a function of statistics that translates the comparison of the indicators of household well-being and the chosen poverty line into one aggregate number for the population as a whole or a population subgroup (World Bank, 2002). There exists many different measures of poverty, but the three most commonly used are incidence of poverty (headcount index), depth of poverty (poverty gap), and poverty severity (squared poverty gap) (World Bank, 2002).

The simplest and most widely used measure is the incidence of poverty (headcount ratio), which refers to the percentage of a given population whose income or consumption is below the poverty line, that is, the percentage of the population who cannot afford a minimal set of goods (World Bank, 2002; Addison *et al.*, 2009). In order to clearly explain this technique, Addison *et al.* (2009) further illustrate the headcount ratio measure with values. They state that it is sometimes helpful to view the headcount ratio as a specific population average; undeniably, if every person identified as poor is assigned a value of '1' while every person outside the set of the poor is assigned a value of '0', then the headcount ratio is simply the mean of the resulting '0–1' vector.

The United Nations (2005) also argues that the headcount index gives a quick and simple to understand first look at the incidence of poverty in a particular area. However, being a discrete measure, it does not indicate anything about how poor the poor are and how income is

distributed inside the group living below the poverty line. Thus, the headcount ratio only focuses on the number of people below the poverty line.

Depth of poverty (poverty gap) is the second measure of poverty, which provides information regarding how far off households are from the poverty line. Thus, it refers to the aggregate amount by which the poor's incomes fall short of the poverty line, measured in poverty line units, and averaged across the entire population (Addison *et al.*, 2009). Mathematically, it is obtained by summing up all the shortfalls of the poor and dividing the total by the population. This can estimate the total resources needed to bring all the poor to the level of the poverty line (World Bank, 2002). The World Bank further recommends that the poverty gap can be used as a measure of the minimum amount of resources necessary to eradicate poverty, that is, the amount needed by the poor under perfect targeting to bring them out of poverty.

Finally, poverty severity (squared poverty gap) focuses on the inequality among the poor. That is, attention is placed on those households and individuals whose incomes or consumption levels fall further below the poverty line. The mathematical calculation of this measure includes both headcount and poverty gap measures where P_0 is the headcount ratio and P_1 is the poverty gap measure. The squared poverty gap measure P_2 from these measures takes the square of each normalized shortfall, which has the effect of diminishing the relative importance of very small shortfalls and augmenting the effect of larger shortfalls. Thus, this measure emphasizes the conditions of the poorest among the poor in society (Addison *et al.*, 2009). These three measures can be computed on a household basis by assessing the percentage of households that fall below the poverty line in the case of the headcount index. However, it will be important to estimate the

measures on a population basis in order to take into account the number of individuals within each household (World Bank, 2002). The incidence of poverty (headcount index), depth of poverty (poverty gap), and poverty severity (squared poverty gap) measures divulge the statistical estimating of poverty and are important for the assessment of pro-poor programs and policies. For instance a pro-poor policy that is focused at reducing the incidence of poverty (number of poor) will aim at lifting up the income of those who are close to the poverty line. On the other hand other pro-poor policies might focus on addressing the situation of the very poor but have a little impact on the overall incidence of poverty.

The three orderly processes, namely, defining indicators of well-being, choosing and estimating a poverty line, and choosing and estimating poverty measures of measuring poverty are essential in poverty studies. These processes are very important to the formulation and implementation of poverty alleviation and eradication programmes and policies at the regional, national, and international levels. The indicators and poverty lines for this study are outlined and discussed in the method of study.

2.6 POVERTY TRENDS AND INCIDENCES IN GHANA

Since Ghana became independent in 1957, there have been progressive efforts by successive governments to improve the well-being of Ghanaians through poverty reduction. Successively, the fourth round of the Ghana Living Standards Survey (GLSS-4) was carried out in 1998/99. In order to accurately analyze poverty quantitatively in this survey, per annum consumption was chosen as the monetary indicator followed by two poverty lines. A lower poverty line (extreme poverty) of GH¢70 consumption per adult per annum focused on the minimum required to meet

basic food needs. The general assumption was that the lower poverty line was the level below which individuals were unable to meet their minimum food (nutrition) requirements, even if they had allocated their entire budget to food. Thus, individuals whose total annual consumption fell below this line were considered to be in extreme poverty (GSS, 2000). In addition to this, an upper poverty line of GH¢ 90 consumption per adult per annum focused on what was required to meet both basic food and nonfood needs. This implies that the upper poverty line was the level above which individuals were able to meet their both minimum food (nutrition) and nonfood requirements (GSS, 2000). Using the upper poverty line, the percentage of Ghanaians who were poor (headcount ratio) declined from about 51.7 percent in 1991/92 to 39.5 percent in 1998/99 whereas extreme poverty (Lower poverty line) reduced from 36.5 percent to 26.8 percent within the same period (GSS, 2000; Canagarajah and Pörtner, 2003). However, the decline was not evenly distributed geographically. With the use of the upper poverty line, rural poverty declined from 63.6 percent in 1991/92 to 49.5 percent in 1998/99 while urban poverty declined from 27.7 percent to 19.4 percent within the same period. The report indicated that extreme poverty essentially followed the same pattern (Canagarajah and Pörtner, 2003).

Following the United Nations declaration of the Millennium Development goals in 2000, Ghana mainstreamed the Millennium Development Goals into the country's successive medium term national development policy framework, the Ghana Poverty Reduction Strategy (GPRS I), 2003 – 2005, and the Growth and Poverty Reduction Strategy (GPRS II), 2006 – 2009 (NDPC and UNDP, 2010). To measure the efforts of Ghana towards poverty reduction, the fifth round of the Ghana Living Standard Survey was conducted in 2005/06. The report indicates that the overall poverty rate declined from 39.5 percent in 1998/99 to 28.5 percent in 2005/2006, while the

proportion of the population living below the extreme poverty line declined from 26.8% to 18.2% over the same period (GSS, 2007; NDPC and UNDP, 2010). However, the fall in poverty has not been experienced equally around the country. The Ashanti, Central, Eastern, Western, Brong Ahafo, Volta, Northern, and Upper East regions experienced a decline in poverty since 1991/92. The Greater Accra and Upper West however experienced an upward trend.

In comparing the regions, the three regions in the north; Northern, Upper East, and Upper West remains the poorest with high poverty rates of 52, 70, and 88 percent respectively in 2005/06 (GSS, 2007). Also, the proportion of the rural population living below the poverty line also declined nationally. However, the national trend indicates that rural savannah has over 50 percent of the poor in Ghana. Occupationally, food crop farmers remain the poorest, while the situation of women in the country has not changed significantly (GSS, 2008 cited in NDPC and UNDP, 2010). The current extreme poverty rate indicates that Ghana has achieved the first Millennium Development Goal ahead of the anticipated date of 2015. Nonetheless, a critical analysis of the national poverty facts and trends divulges that poverty is a rural phenomenon and remains significant in the rural areas of Ghana. This justifies the need to tap resources on a sustainable basis to improve the living conditions of the poor in the rural areas, particularly areas endowed with forest resources. Table 2.3 provides poverty rates by administrative regions of Ghana in the respective years of the Ghana Living Standard Survey.

Table 2.3 Poverty Rates by Administrative Regions in Ghana

REGION	GLSS (1991/92)	GLSS (1998/99)	GLSS (2005/06)
Greater Accra	26%	5%	12%
Ashanti	41%	28%	20%
Eastern	48%	44%	15%
Volta	57%	38%	31%
Western	60%	27%	18%
Brong Ahafo	65%	36%	29%
Central	44%	48%	20%
Northern	63%	69%	52%
Upper East	67%	88%	70%
Upper West	88%	84%	88%
Total	52%	40%	29%

Source: GSS, 2007

2.7 SUSTAINABLE FOREST MANAGEMENT AND POVERTY ALLEVIATION NEXUS

Exploring the direct relationship between sustainable forest management and poverty alleviation in the wake of the international community objectives of halving extreme poverty and ensuring environmental sustainability by 2015 is laudable and very important in this decade. However, it is a challenge, as a direct relationship may not exist. On the other hand, it is quite easy to establish a direct link between forest resources or forestry and livelihoods. The World Bank (2004) estimated that 60 million indigenous people globally are almost totally dependent on forests and some 350 million people who live within or adjacent to dense forests depend on them to a high degree for subsistence and income.

Most researchers including Angelsen and Wunder have defined forestry in terms of poverty alleviation. Angelsen and Wunder (2003) cited in Belcher (2005) reviewed the definitions of poverty as they relate to forestry. Using income and consumption as indicators for a poverty measure they identified three main components that explain the role of forests and forestry in

poverty alleviation. Foremost, forest resources are used to meet current consumption needs, as a regular part of subsistence level livelihoods. Secondly, forests are used as ‘safety nets’, which is the perspective that the poor extract available resources to satisfy some urgent needs and also to serve as a resort in times of need. Both the current consumption and safety net roles are important of reducing the severity of deprivation, as poverty has been defined to be, and in keeping the poor from getting into deeper poverty. This is technically known as a ‘poverty mitigation’ component of poverty alleviation (Angelsen and Wunder, 2003 cited in Belcher, 2005). In both of these roles, forest products may be consumed directly or sold for income or even bartered in exchange for other consumable goods. The final component of poverty alleviation is ‘poverty reduction’, which refers to the reduction of the number of households below the poverty line. This is the actual lifting of the poor out of poverty where income earned through the sale of forest products or employment in the forest resource production or processing sector raises total income and consumption above the poverty level (Angelsen and Wunder, 2003 cited in Belcher, 2005). These three definitions of forest and poverty nexus emphasize the operational synergy between forest resources and poverty alleviation.

In the context of forest resources and poverty alleviation nexus, Belcher (2005) further asserts that the accessibility of the poor to forest resources needs to be protected. He emphatically indicates that, the ability of forest resources to alleviate poverty may be augmented through management that increases the quality and the quantity of the resource available to the poor. The continual dependence on forest resources by the poor to alleviate poverty from this assertion depends on sustainable forest management through community forestry.

2.8 THE THEORETICAL PERSPECTIVE OF THE STUDY

This section aims at placing the study in a scholarly perspective by describing the theoretical foundation that guided it. Several theories and concepts have emerged to explain sustainable forest management in developed and developing countries. Their weaknesses rendered them inadequate in offering the best explanation for sustainable forest management in these countries. This study on the other hand views community participation as a key element for sustainable forest management especially in regions where community forest ownership right does not exist. The theory of community participation was adopted and explained in the context of community forestry as a tool for sustainable forest management.

The concept of community participation is debatable; this has triggered several streams of explanation and discussions on it. To fully comprehend the tenets of this concept, it is important to explain the two words “community” and “participation” in isolation. A community, according to Wates (2000) is a group of people sharing common interests and living within a geographically defined area. The study therefore views a community from the perspective of a geographical location. Participation on the other hand, can be defined as the act of being involved in something (Wates, 2000). Again, the study views participation from this perspective. Therefore, community participation can be defined as a process where a community gets an active role in programmes and improves conditions that directly affect it (Abrams, 1971). The advocates of community participation believe that it brings long-term benefits to communities since they play an active role in the projects’ planning and implementation. Thus, it is always important to have people direct projects that influence and affect their lives. Community participation has many lasting benefits in reality including sustainable development. However it

is still an evolving concept in many developing countries like Ghana. It has the following objectives: to ensure ownership and partnership; to ensure relevance/need-based/ sustainability; to share project costs; to increase project efficiency; to increase project effectiveness; to build beneficiary capacity; to increase empowerment/competence/capacity (Kassie, 2011).

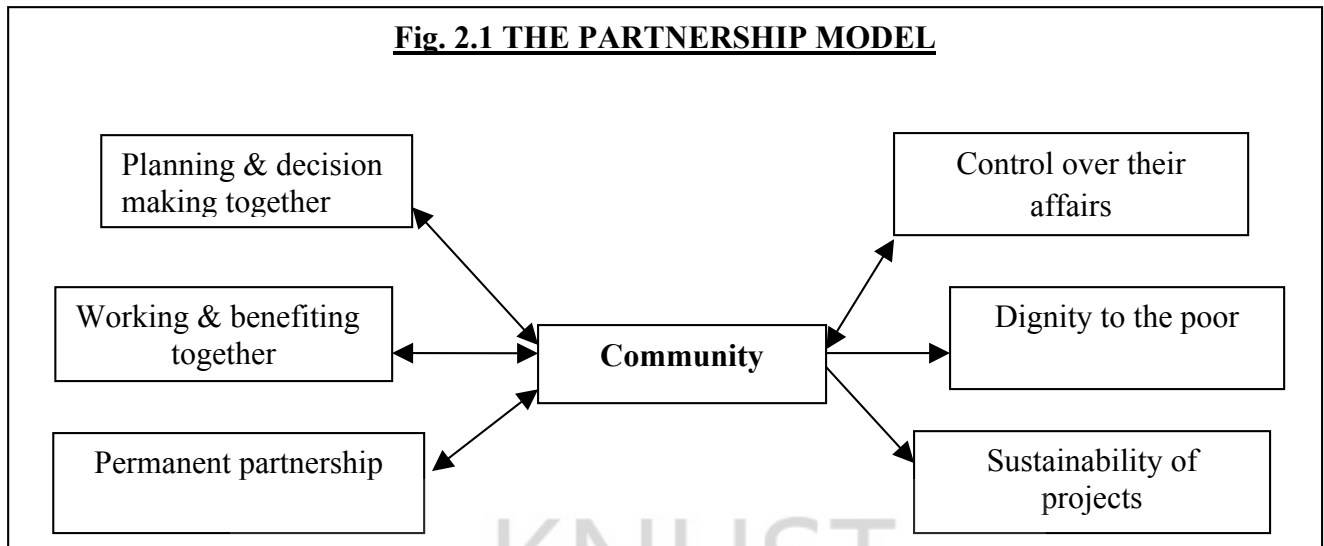
2.8.1 Reconceptualising Community Participation for Sustainable Forest Management

The proponents and advocates of community participation believe that it contributes to sustainable development in the long-term. Sustainable forest management has also been recognized by the United Nations as the only contribution that the forestry sector could introduce into sustainable development in forest endowed regions (UNCED, 1992). Thus, it is important to view sustainable forest management as a collective effort from all stakeholders. In this connection, the theory of community participation has been redefined for sustainable forest management by adopting the community forestry model. Community forestry connotes different things in different locations, although there is a consensus on some of its features. Community forestry is an old concept in most developed forest-rich countries like Canada, but perhaps a new and an evolving concept in the developing counterparts like Ghana. The term community forestry has also attracted many explanations from academics and practitioners. However, Duinker *et al.* (1994) define community forest as “a tree-dominated ecosystem managed for multiple community values and benefits by the community”. This definition therefore considers a community forest as an investment opportunity from which the community could derive benefits. In a similar way, Masses (1995) defines community forestry as “the control of forestlands by a community to provide local benefits”. This implies forest communities owning

forestlands or at least having management responsibility through the decentralized approach of participation.

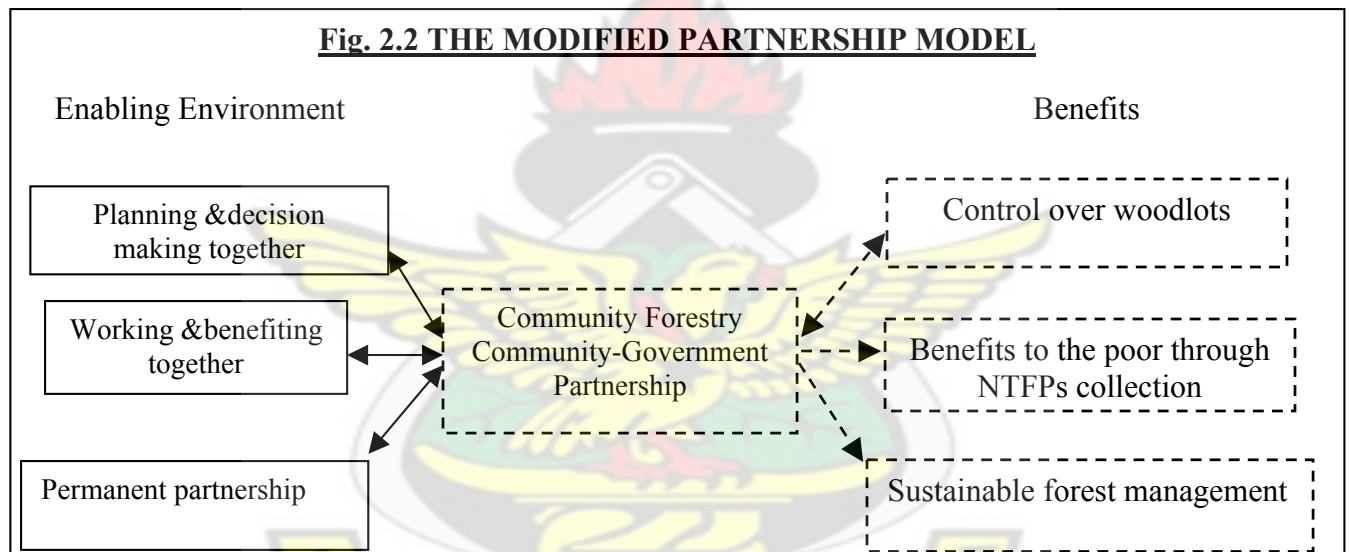
The levels of participation in community forestry also vary among regions. For instance, in the province of British Columbia in Canada, individuals, communities and organizations could have tenure right to own woodlots (Ambus *et al.*, 2007). This level of community forestry could be juxtaposed with the “citizen control” level of participation postulated by Arnstien (1969). In this level, citizens have full managerial power and command over resources. However, in most places in developing countries like the Offinso forest district in Ghana, where community tenure rights do not extend to the ownership of woodlots, the level of participation would be limited to “partnership”. This would enable the communities in the district to negotiate and engage in management responsibilities with the government. This is also another level of community forestry found in most developing countries. Community participation has the prospects for sustainability of projects and local level benefits (WHO, 2002). Community-government partnership for resource management would enable sustainable forest management in the Offinso Forest District in Ghana where local apathy hinders forest management policies. This partnership would also address the lack of benefit sharing in forest management. To further illustrate the concept of community-government partnership in forest management in Ghana, a partnership model was adopted and modified from Narayana (2002).

Fig. 2.1 THE PARTNERSHIP MODEL



Source: Narayana (2002).

Fig. 2.2 THE MODIFIED PARTNERSHIP MODEL



Source: Narayana (2002).

Figure 2.1 is a schematic partnership model postulated by Narayana (2002) to explain the benefits that could be derived from partnership agreement by governments and communities in executing and managing development projects. This model according to him is an alternative to the top-down model of participation where governments decide and provide for the communities, which consequently develop a sense of dependency and lethargy among the people in the communities. With the partnership model governments and communities work together in

planning and decision-making with long-lasting results. Figure 2.2 on the other hand is a modified version of the partnership model which seeks to explain partnership in the context of forest management. The broken lines used in Fig. 2.2 indicate that the original model has been modified based on the objectives of the study.

The partnership for forest management would create the following enabling environment in the Offinso forest district; the communities and government would plan and take forestry decisions together, both partners would work and derive forest benefits together leading to equity. Also it will promote a permanent partnership between the government and communities for forest management. Besides, it has several benefits including the control over woodlots by the communities. Moreover, the benefits would trickle down to the marginalized and the poor in the communities through the collection of and dependence on NTFPs which have many economic values. This is also the pragmatic way of tackling deforestation in the Offinso Forest District since the communities will realize the need to protect the forest, as protection of the forest implies safeguarding their own livelihoods. Finally, the long term benefit of this partnership is that forest resources would be managed sustainably in the Offinso Forest District.

In a nutshell, the theory of community participation in forest management is linked to community forestry. It is also important to highlight that community forestry through community-government partnership is a new paradigm in sustainable forest management particularly in countries where community tenurial right does not extend to ownership and management of forest. In a broader context, the community forest model is applicable in Ghana to give greater control to forest communities to own and manage forest for their own benefits. In this connection, a replication of the model in Ghana is relevant in the quest to manage forest sustainably.

CHAPTER THREE

BIOPHYSICAL AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF OFFINSO

3.1 Introduction

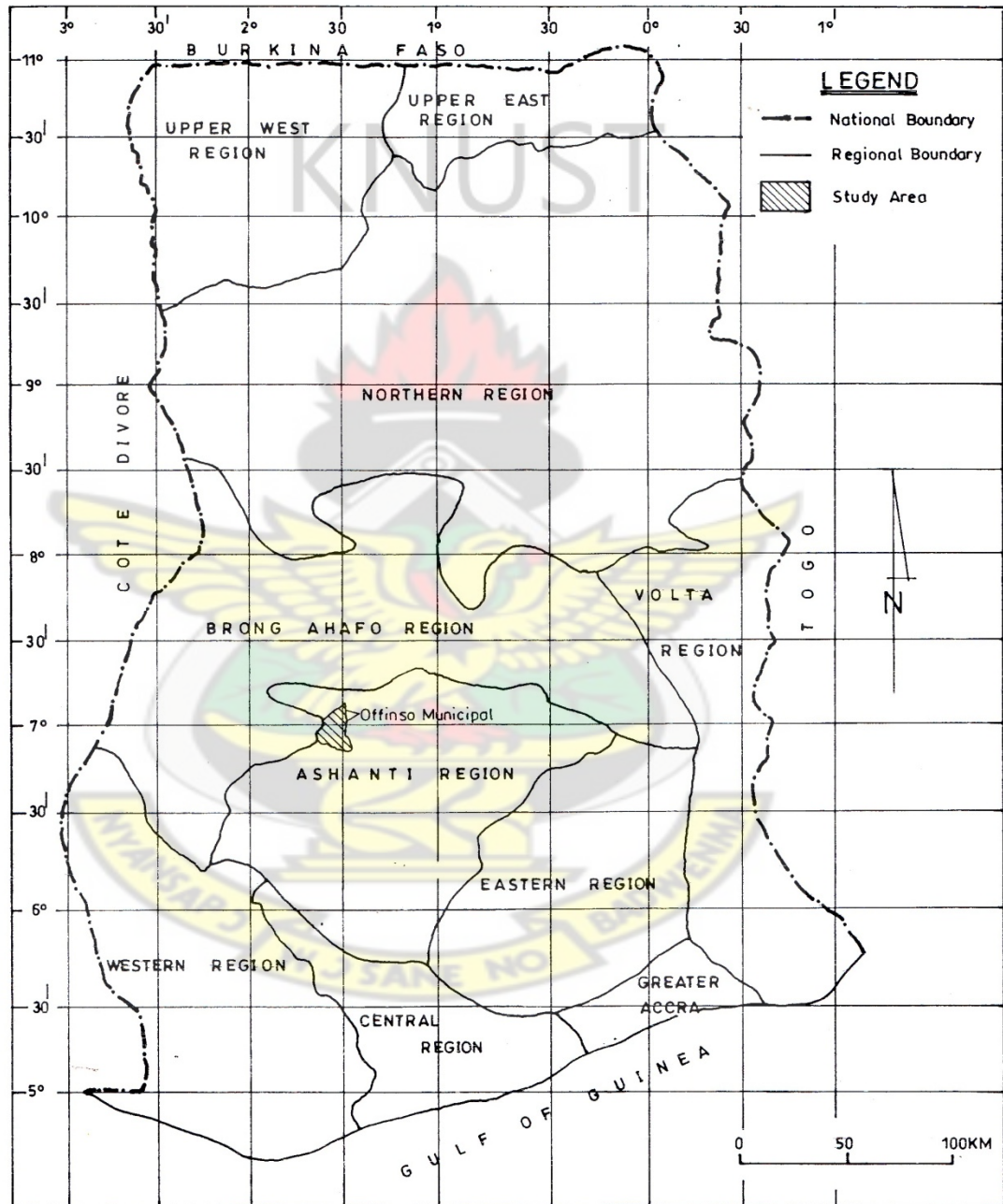
This chapter gives detailed background information on the study area. This analysis is categorized into geographical and socio-economic characteristics, as pertinent to the objectives of the study. The chapter also contains maps showing the Offinso South Municipality in the national context and the geographical locations of the four selected study communities. Analyses of this data indicate the incidence of poverty in the Municipality and the dependence on forest resources for livelihoods. Regardless of the dependence, the forest has been subjected to various forms of anthropogenic disturbances leading to its fragmentation and degradation. The interconnection between forest resources and poverty in the Municipality is somewhat clearly established in this chapter. The main source of this information is secondary and was obtained from the Physical Planning Department of the Municipal Assembly.

3.2 Location and Size

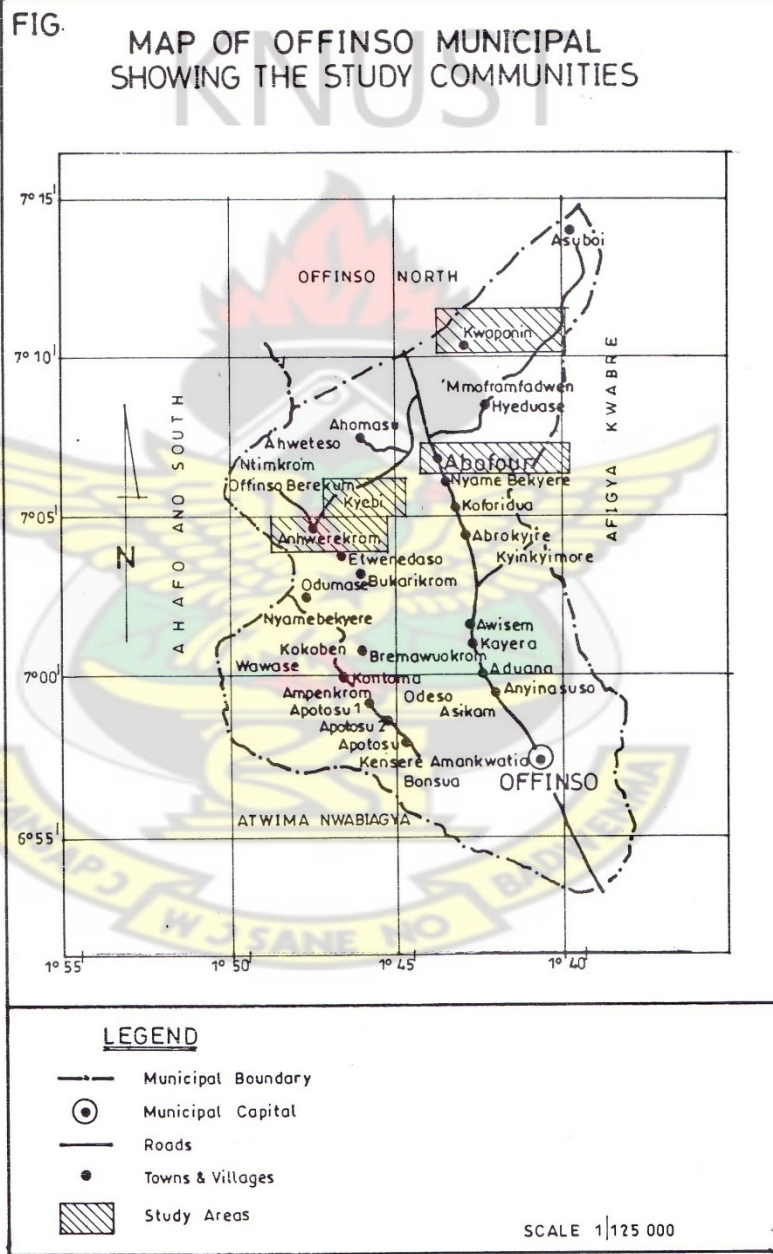
The Offinso South Municipal Assembly is one of the new Municipalities created in Ashanti Region in 2007 as part of the decentralized policy of the Kufuor led government. It was part of the then Offinso District Assembly that was divided into two: Offinso North District Assembly and Offinso South Municipal Assembly. The Municipality shares common boundaries with Offinso North District Assembly in the North, Afigya Kwabre in the East and South, Atwima Nwabiagya and Ahafo Ano South District Assemblies in the West. It lies within latitude $7^{\circ}15'N$ and $6^{\circ}95'S$ and longitude $1^{\circ}35'E$ and $1^{\circ}50'W$ and has a total land area of about $600km^2$. The Municipality comprises 22 suburbs with New Offinso as its capital (OSMP, 2010).

FIG.

STUDY AREA IN NATIONAL CONTEXT



SOURCE : Survey Dept of Ghana (1994)



3.3 Physical Features

3.3.1 Climate

The Municipality experiences a Wet Semi-Equatorial type of climate, characterized by moderate to heavy rainfall annually with temperature ranging between 21°C and 32°C. The rainfall regime is double maxima with annual rainfall between 125 and 175 centimeters. The double maxima of rainfall in the Municipality are due to the green vegetation, made up of tall trees. The average annual rainfall is 953.40mm (OSMP, 2010). The major rainy season usually occurs between May and June, followed by a dry spell between August and September. Relative humidity is high during the major rainy season, reaching its peak of 90 percent between May and June. The minor rains occur between September and November followed by dry Harmattan until February. Due to the dry conditions during the Harmattan season the Municipality experiences perennial bush fires, which are very destructive to the vegetation, especially the forests in the Municipality. The climate, however, largely supports farming activities in the Municipality.

3.3.2 Vegetation

The predominant vegetation type in the Municipality is moist semi-deciduous forest, which is interspersed with a thick vegetation cover. The moist semi-deciduous forest zone alternate with a thick vegetation cover (Hoogenbosch, 2010). Tree species found in the forest are wawa, cedar, odum, ofram, emire among others. It is characterized by sparsely woody understory and well illuminated forest floor. Original forest, degraded forest, forest plantations of Teak (*Tectona grandis*) and agro-forests of the *Taungya*³ system are mainly the remains of the present vegetation cover (Hapsari, 2010). There are six forest reserves in the Municipality. These are,

³ *Taungya* involves the establishment of forest plantations in deforested and degraded areas by the Forest Services Division in partnership with farmers.

namely: Asufu East, Asufu West, Giamaian, Kwamisa, Opro and Afram Headwaters (OSMP, 2010). Part of Opro and Afram headwaters share boundaries with the Offinso North District.

The natural environment of the Offinso South Municipality has changed markedly due to human activities. The forest, rivers, and soils among others, have all been negatively affected. The activities of human that have impacted on the environment take the form of land degradation. The slash and burn practice in the shifting cultivations method of farming leave the farming land bare and exposed to sunshine and erosion. The method is also rapidly destroying the natural vegetation and altering the ecology of the Municipality. It has reduced most of the original evergreen forest to a secondary forest. The use of wood and charcoal as the main source of energy has also contributed greatly to the depletion of the tree species. The proportion of the household that use firewood and charcoal for cooking is about 85 percent (OSMP, 2010). Lumbering and chainsaw operations contribute immensely to the reduction of the original forest. Clearing of the vegetation along riverbanks by way of farming has resulted in the aeration of most of the rivers and streams. Hoogenbosch (2010) attributed the vast emergence of savannah to specific farming practices such as slash and burn. This has rapidly destroyed the natural vegetation of the Municipality. To press home this point, the occurrence of bushfires, which mainly occur in the northern part of the forest, contributes to the expansion of grassland and savannah (Hoogenbosch, 2010). Fire is set into the bush during the dry season to hunt grass-cutters and rats. All these factors have contributed to the reduction of the natural forest in the Municipality.

In order to reverse deforestation in the Municipality, both the Forest Services Division and private plantation developers are undertaking tree plantation. The Plantation programmes engage the services of farmers in the Municipality. Farmers are given parcels of degraded forest reserve to produce food crops and to help establish and maintain timber trees. The timber trees are interplant with agricultural crops, particularly the local people's main food crops such as plantain, cocoyam and vegetables. The main aim of the *Taungya* system is to establish plantation of fast-growing useful timber species, while addressing the shortage of land for farmers. The main timber species are Teak (*Tectona grandis*) and cedrela (*cedrella odorata*). All stakeholders, who include farmers, the Forestry Commission, landowners and forest-adjacent communities, will be eligible for a share of the benefits from the plantation (Agyemang *et al.*, 2003 cited in Hapsari, 2010),

3.3.3 Geology and Soil

The land area in the Municipality is underlain by Voltain, Birimian, and the Ceranite rocks formation. The Voltain rocks are found in the northeast around Kwapanin. The Birimian rock types are mainly schist and gneiss and are found in the southwestern part of the Municipality in Bonsua, Kensere, Gambia, and Wawase. Granite is found in the southern and southeastern portions of the Municipality, stretching from Nyamebikyere through Anyinasuso to Tutuase. Soils in the Municipality are developed from the parent materials of Voltain, Birimian and Granites rocks. Irrespective of their parent rock material, soils in the Municipality are generally rich in humus, accounting for the presence of forests. The farmers, therefore, take an advantage of the rich soil to cultivate a wide range of food, namely cereals, vegetables, and cash crops. These food and cash crops include plantain, cocoyam, cassava, cocoa, oil palm, and maize among others. The farmers cultivate enough to feed themselves. They also sell the remaining

produce for income. However, lack of credit facilities to purchase farm inputs and over dependence on rain for farming are the main obstacles to increasing farm productivity in the Municipality.

3.3.4 Relief and Drainage

Topographically, the land in the Municipality is generally undulating with the highest elevation of about 300 feet (ft) above sea level. The Offin, Anyinasu, Ode, Pro Rivers and their tributaries drain the Municipality. The rivers and the streams depict a dendritic pattern. The presence of the rivers and streams make it possible for the people to engage in fishing as a means of income supplement and also for household consumption. However, others engage in fishing as a full time job. This is evident among communities along the Offin river basin. The forests in the Municipality serve as a protective cover for the rivers and streams. However, the rapid deforestation is gradually exposing the rivers and streams basins to the direct rays of the sun (OSMP, 2010). Immediate forest management measures are therefore needed to avert its short and long-term effects of deforestation. The topography of the Municipality makes it possible for the local population to engage in both large and small-scale farming. This is an added advantage for them to increase their incomes and improve their living conditions. However, due to the various challenges of farming that include: lack of credit facilities for farm inputs, storage facilities, lack of ready market for farm products and the overdependence on rainfall for farming make it difficult to boost farm production in the Municipality. Consequently, farmers earn inadequate income from their farming activities, thereby finding it difficult to meet their basic needs.

3.3.5 Interactions between Climate, Soil, Vegetation, Relief, and Geology

The combined result of the favourable climatic conditions, such as rainfall, temperature, and fertile soil in the Municipality, calls for the adoption of appropriate farming methods to increase agricultural production and income that would lead to improved living standards of the local population. The existence of forest reserves in the Municipality could provide timber for the building and construction industry. The Municipality also earns revenue in royalties (stool lands) and from legal timber firms operating in the forest as concessions and from saw millers. As regards geology, granite rocks form the basis of high potentials for quarry stones. The Municipality is endowed with large deposits of sand and clay. These potentials have promoted sand winning and stone quarrying as economic activities in the Municipality. This implies that the activities of the sand winners and stone quarrying could lead to environmental hazards and to some extent forest degradation.

3.4 DEMOGRAPHIC CHARACTERISTICS AND THE BUILT ENVIRONMENT

The 1960, 1970, 1984, and 2000 population censuses put the population of the then Offinso District Assembly at 43,972, 56,319, 104,815, and 138,190 respectively (OSMP, 2010). The growth rate was 5 percent. Based on the 2000 population census, the population of the Offinso South Municipality in 2010 was estimated at 120,585 with a growth rate of 3.5 percent (*ibid*). The 2000 population census indicated that about 48 percent of the population were males as against 52 percent females. This resulted in a male-female ratio of 1:1.01. The 2000 census also revealed that children under 15 years account for about 46.6 percent of the total population. The economically active population (15-64 years) accounts for 47 percent and the (elderly 65 years and above) account for 6.4 percent of the total population. This analysis shows that less than 50 percent of the people were working making a higher economic dependency ratio. The average

household size was 5.5. The composition of the households is comprised of persons from the nuclear family, the extended family, and persons outside the extended family. Heads of the households were mainly male. In the other households, where females were heads, it was either a single or single parent household. Children constitute about 37 percent of the average household. About 68 percent of the populations are Christians. Islam and traditional religion constitute 15.9 and 8.5 percent respectively. About 6.8 percent of the population do not belong to any of the above-mentioned religious denominations. The high population growth rate of the Municipality can be attributed to in-migration as the result of the favorable climatic conditions and fertile soil, which supports the cultivation of diverse food and cash crops. The migration of people from the rural areas to the urban centres is a means out of poverty, but increases the existing unemployment situations in urban centres and reduces agricultural productivity and income generation in the rural areas.

The population density for the Municipality in 1970, 1984, 2000, and 2010 were estimated at 45, 64, 110, and 201 persons respectively. The 2000 population density was higher than the national figure of 79.3 (OSMP, 2010). The continuous increase in the population densities signifies that there is pressure on the agricultural land. The high population density imposes serious strains on the available Municipal resources and infrastructure. The Municipality contains about 39 settlements. Most of the major settlements are located along the main roads. Abofour and Offinso New Town are the only urban settlements. The 2000 population census puts the population of Offinso New Town at 12,327 and Abofour at 11,177. The rest of the settlements could be described as rural, as each settlement has a population less than 5000 (OSMP, 2010).

The implications of the demographic characteristics on the natural resources, particularly the forest and land cannot be overemphasized. The high level of forest degradation is dependent on the population dynamics in the Municipality. Over the past decade, the then Offinso District experienced a high level of population growth. This resulted in a keen competition over natural resources, chiefly forest and agricultural land for cultivation. The consequences have been the encroachment and degradation of off-reserve forests in the Municipality. There have been many instances where portions of the forests have been cleared for the cultivation of crops. The high demand for charcoal by the increasing population has also resulted in the indiscriminate felling and burning of trees for charcoal production. The proliferation of chainsaw operation and milling is stimulated by the high demand for timber for construction. The hunting for bush meat by the population has subjected the forest to perennial forest fires. The population has outgrown the limited job opportunities resulting in a high rate of unemployment and incidence of poverty. Despite the fact that most of the people derive their livelihoods from farming, forest resources are an income supplement during the lean farming season. Due to the uncontrollable impact of the population hike on the forest resources, it is imperative to manage forest resources sustainably to alleviate poverty in the Municipality.

The majority of the settlements do not have planned layouts, which have led to haphazard infrastructural development. The only settlement that has a layout is the Municipal capital, Offinso New Town. Even there, building regulations are not adhered to, and this is posing serious consequences on the land use pattern. The housing environment in the Municipality, especially Offinso New Town and Abofour townships is characterised by poor drains, heaps of surface dumps, unkempt surroundings, exposed foundations due to pronounced erosion and

cracked walls. Only about 6 percent of the houses in the Municipality have internal toilet facilities. About 85 percent of the occupants mainly depend on public toilets such as the Kumasi Ventilated Improved Pit (KVIP) and pit latrines (OSMP, 2010). Most of the houses, especially in the rural areas are constructed with mud with a few with bricks. They are roofed with iron sheet, which are wearing away with a few of them in thatch. Most of the houses in the Municipality are of poor quality, an indication of poverty. The high level of improper waste disposal by households, especially in Offinso New Town and Abofour has very serious financial and health implications. The Assembly uses large sums of money for cleaning the gutters, which could have been channelled to other developmental areas of the Assembly. The prominent method of liquid waste disposal is throwing it in an open space, bushed areas and gutters. Indiscriminate disposal of solid and liquid wastes tend to create waste related diseases, namely malaria, typhoid fever, diarrhoea, and cholera. Potable water supply in the Municipality is highly inadequate. Apart from New Offinso that has access to pipe-borne water, all the other communities rely on boreholes, wells, ponds, and streams for drinking and domestic use. The fact that the local people rely on streams, which are very seriously affected by water borne diseases, is adversely affecting their normal economic and social activities.

Electricity coverage in the Municipality is about 53 percent. The Volta River Authority (VRA) and Electricity Company of Ghana are responsible for power supply in the Municipality. Internal circulation of electricity in Offinso New Town and Abofour is not well developed. The main Kumasi-Tamale highway passes through the Municipality. The housing problem in the Municipality is more qualitative than quantitative. This is depicted by a household size of 5.5, which is in conformity with the national average of 6.

3.5 ECONOMIC AND LIVELIHOOD ACTIVITIES

The presence of humus from the decay of leaves and trees that support the cultivation of both food and cash crops for local and international markets and both small and large scale keeping of livestock has made agriculture the giant of the economy in the Municipality in terms of employment creation and income generation. The sector employs about 62 percent of the active working population and contributes about 55 percent from food crops and 20 percent from livestock in terms of household income in the Municipality (OSMP, 2010). The major forms of produce in the Municipality are plantain, maize, yams, cocoyams, and vegetables such as pepper, garden eggs, and tomatoes. The industrial (cash) crops cultivated are cocoa, oil palm and teak. Sheep, goats, cattle, and poultry are the livestock being reared in the Municipality. Cocoa is the predominant cash crop cultivated due to its economic importance, internationally. The major farming methods are slash and burn while bush fallowing and mixed cropping are the main farming practices adopted by the farmers. The average farm size per farmer in the Municipality is 1.0 hectare.

The most recent lucrative economic activity in the Municipality is agro-forestry and tree plantation. This is mainly the cultivation of teak and other economic trees in the depleted forest reserves. The Forestry Services Division and other private plantation developers are promoting this. Besides, the community forestry management project pioneered by the adjacent forest communities has the aims of plantation development, providing livelihood sources, and economic capacity building of the local people. Portions of the degraded forests are given to farmers to make farms in which teak and other economic trees are planted. Tree planting on

farms (agro-forestry) is encouraged mainly as a source of energy and income generation. In addition to the agro-forestry, other ongoing plantation projects have employed a sizable number of people in the Municipality.

In addition, about 15 and 4 percent of the people work in the services and industry respectively. The major reason for the low participation in the industrial sector is that the Municipal economy is agrarian. Few of these manufacturing firms are operating on a large scale while the majority are small-scale firms. The industries include a wood treatment plant, saw milling, dressmaking, oil palm processing, corn milling, carpentry, and pito brewing among others. Despite the fact that chainsaw milling is illegal, there appears to be a strong economic incentive to keep it in place in the Municipality. It contributes to the household income of those who are directly or indirectly involved. There is a quarry industry at Abofour, which is operating on a small-scale and the products are used for construction works such as roads in and outside the Municipality. Commerce is an important activity in the Municipality. About 21 percent of the people work that sector. Various products ranging from agricultural to industrial are traded in the Municipality with agricultural products dominating. The major marketing centres are Abofour, Anyinasusu, Kokote, and Offinso New Town. Industrial goods that are mostly traded include provisions, clothing, building materials, farm inputs, and textiles all of which are usually brought into the Municipality from places as Kumasi and Accra. The food crops produced in the Municipality include maize, yams, cassava, and plantain.

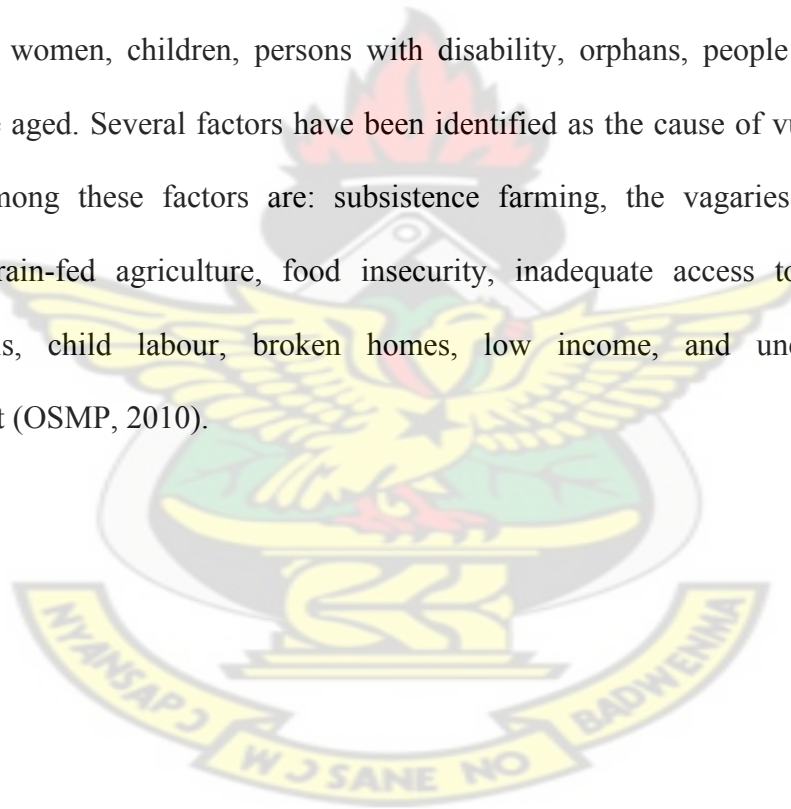
Despite agriculture being the mainstay of the economy and employing a large proportion of the population, there are many challenges confronting the sector making it unprofitable as compared to other livelihood activities. The majority of the farmers are engaged in subsistence production with a few of them engaged in commercial production. In reality, cocoa is the only cash crop that most of the farmers produce in commercial quantities. However, challenges such as the inaccessibility of most of the rural communities, the lack of credit to acquire agrochemicals, the lack of a ready market for produce, over dependence on rain, and the absence of storage facilities decreasing potential agriculture income generation. Consequently, the farmers in the Municipality earn low incomes from their produce. With regard to this, the people are resorting to other livelihood activities as a means of income supplement. This is evident in the extraction of forest resources from the forest in the Municipality. Timber or non-timber forest products (NTFPs) are extracted from the forests. Most of the people, particularly women migrants from the northern part of Ghana are engaged in the commercial production of charcoal. The forests resources play a significant role in the livelihoods of the people in the Municipality; therefore, there is the need for sustainable management of the forest resources to guarantee continual livelihood for the inhabitants.

3.6 POVERTY LEVELS AND VULNERABILITY

Poverty is expressed at two levels in the Municipality: the poverty line and hard-core poverty. The former is defined as living on an income that is less than two-thirds of the national average. The average annual income of the municipality is estimated as GH¢126.52. The Municipal poverty is estimated at 20 percent of the population. This means, 20 percent of the population earn below GH¢126.52 a year, which is largely inadequate to meet their basic needs. Those found below the hardcore poverty line are estimated at 8.5 percent of the population (OSMP,

2010). There is therefore the need for the Municipal Assembly, the private sector, NGOs, CBOs, donors, and all major stakeholders in the Municipality to develop policies, programmes and projects that are geared towards poverty alleviation in the municipality, especially in the rural areas (OSMP, 2010).

Vulnerability is defined as a lack of capacity (of a household) to cope with adverse shock or resilience against a shock. Groups that have been identified in the Municipality as vulnerable and excluded include women, children, persons with disability, orphans, people living with HIV (PLHIV), and the aged. Several factors have been identified as the cause of vulnerability in the Municipality. Among these factors are: subsistence farming, the vagaries of the weather, dependence on rain-fed agriculture, food insecurity, inadequate access to credit, lack of employable skills, child labour, broken homes, low income, and unemployment and underemployment (OSMP, 2010).



CHAPTER FOUR

PROSPECTS OF SUSTAINABLE FOREST MANAGEMENT FOR POVERTY ALLEVIATION

4.1 Introduction

This chapter is divided into qualitative and quantitative analyses and discussions of data gathered on sustainable forest management, poverty, non-timber forest products (NTFPs), and income generation from the study communities. A total of 150 heads of households were randomly selected from four forest communities. Focus group discussions, in-depth interviews and questionnaires were respectively the main methods and the tool for data collection. The consumption level of households was the main monetary indicator used to measure the incidence of poverty in the study communities. In addition, the Participatory Poverty Assessment (PPA) approach through focus group discussions was employed to explore the meaning of poverty from the perspective of the local people. This method was to enable the people in the study communities to describe and analyze their own poverty situations. Descriptive and explanatory statistical tools of the SPSS and Excel software were used for the quantitative analyses while content analysis was employed for the qualitative analyses.

Furthermore, forest products were measured based on the quantity and monetary value of non-timber forest products (NTFPs) derived from the forest. These products are used at the household level as food and income supplements. Besides, sustainable forest management policies in the study communities were critically examined coupled with an assessment of the role of stakeholders namely, the Forest Services Division, communities and their representatives.

4.2 PERCEPTIONS AND MANIFESTATION OF POVERTY IN THE FOREST COMMUNITIES OF OFFINSO.

4.2.1 Perception of Poverty

The concepts of subjectivism and relativism of poverty make the study of poverty diverse. As defined by many, poverty has no consensus definition. The perceptions of poverty among the male and female groups in the study communities revealed certain similarities and uniformities in their understanding of poverty. However, while the male heads emphasized lack of income as the first meaning of poverty, the female heads highlighted having no food as their first understanding of poverty. The reason given by the female heads was that having enough to eat without income is enough to be called non-poor. According to the male heads having enough income will enable one to meet his basic needs including food. Arguably, income is a major determinant of food; however the fact is that those who lack both income and food are poor. The responses were synchronized and presented in Table 4.1.

It is important to stress that both the male and female heads defined poverty as lack of income and food respectively. The perception of poverty by the male heads buttresses the assertion by Townsend (2006) that poverty is income deprivation. Deviating from this view, a woman among the female heads of households at Kyebi during a focus group discussion distinctly indicated *“poverty is the persistent inability of one to satisfy a particular need”* (Fieldwork, 2012). She also made reference to lack of resources as what will render anybody unable to satisfy a particular need. It is therefore imperative to note that the rural folks have different perceptions of poverty despite the fact that they all live in the same communities and experience similar deplorable conditions. It should also be highlighted therefore that, sickness, lack of job, physical weakness, and laziness are the main causes of poverty between both sexes in the study communities. The

reason given was that when a person is sick or physically weak, that person is unable to work to earn income since their main occupation, farming, involves a lot of physical work.

Table 4.1 Perception of Poverty in the Forest Communities of Offinso

MALE HEADS	FEMALE HEADS
Lack of income	Having no food
Having no food	Lack of income
Lack of opportunities	Having no children
Having no access to basic needs	Lack of helpers on farm
Having no shelter	Low farm productivity
Inability to provide basic needs	Inability to meet basic need
Poverty is hardship	Living in dilapidated house
Lack of access to basic social amenities	Wearing tattered cloths
Low harvest from farm	Having no land
Having no buyers for farm produce	Lack of rain

Source: Author's Fieldwork, 2012.

It is also important to highlight that poverty has been personified in the study communities. This was evidenced by a female head of household at Abofour, who said;

“For us here we are living with hardship and poverty” (Fieldwork, 2012).

To confirm this, a male head in the same community reiterated;

“Poverty is part of our lives here” (Fieldwork, 2012).

These different expressions indicate that poverty has no single definition even from the poor themselves despite the fact that they experience similar deplorable conditions in the rural areas.

It was found that farming is the major occupation in the communities. About 60 percent of the heads are farmers but most of them do not regard it as an occupation. They complained that farming is seasonal and does not bring income all year round. Besides, the deplorable condition of the roads leading to Kyebi, Ahwerekrom and Kwapanin from Abofour during the wet seasons makes it difficult for them to transport their farm produce to Abofour on market days. In

addition, both groups of male and female heads in all the study communities complained profoundly that the recent erratic weather pattern has aggravated their hardship in terms of poverty and food insecurity. They also indicated that the 2011 farming season has been the worst of all the previous years for low and no farm harvest due to the low rains. As a result, most of them travel to Abofour on market days to buy foodstuff. For instance a female head at Kyebi said:

“My son, I have to travel to town (Abofour) to buy some food stuffs despite the fact that I live in the village. This should tell you how severe our problem is” (Fieldwork, 2012).

Due to these challenges, the rural folks see the farming sector as not lucrative, do not regard it as attractive employment and associated poverty with it. This was manifested by a member of the male heads of households at Ahwerekrom who showed his brittle palms indicating poverty. Thus, it is also important to highlight that the poor do not only feel emotional about their conditions but also have something to show when expressing their conditions. In spite of these challenges farming still remains the largest employment sector in the communities.

In order to restore the depleted forest and boost food production in the Offinso South Municipality, the Forest Services Division leased portions of degraded forestlands for the cultivation of both tree and food crops. Most of the male and the female household heads have received their portions of the land and have cultivated or are still cultivating food and tree crops, namely plantain, cassava maize, cocoayam, pepper, okro, tomatoes and teaks. They evacuate the land after one or two years when the trees start growing. However, at Ahwerekrom, all the available degraded forestland has been exhausted. Due to this, both sex groups complained that they are unable to raise enough food and income to support their families.

4.2.2 Manifestation and major coping strategies of Poverty

Poverty is visible in the communities as discovered by the study. The manifestations of poverty in the study communities are similar among both male and female heads of households. However, while the male heads highlighted homelessness, living in a dilapidated house, always isolated from peers, wearing tattered clothing, and drunkenness as the major manifestations of poverty within their households, the female heads indicated frequent ill health, always borrowing and begging from others, eating without meat/fish, always quiet with hands on jaw, inability to pay during communal contributions and hunger as the major manifestations of poverty within their households (refer to Table 4.2). These manifestations of poverty in the study communities confirm those indicated by the United Nations (2010), which states that poverty has different manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion. On the other hand, poverty is manifested in different ways among the groups, as revealed during the focus group discussions.

One major finding from the discussions with both sex groups at Ahwerekrom was that living in a rural community where there is no electricity, motorable road, good drinking water and a health center with farming as the only job opportunity incapacitates them to engage in viable economic activities that could enable them to escape poverty.

Table 4.2 Manifestations of Poverty by Male and Female heads of Households

MALE HEADS	FEMALE HEADS
Homelessness	Frequent ill health
Living in dilapidated house	Always borrowing and begging
Always in isolation from peers	Wearing tattered clothes
Wearing tattered clothes	Eating without meat/fish
Drunkenness	Always hungry
Always hungry	Always quiet with hand on jaw
Buying things on credit	Living in a dilapidated house
Inability to pay bills	Inability to pay during contributions

Source: Author's Fieldwork, 2012.

It was discovered that most households have been living in poverty for quite some time therefore; poverty is seen as part of their lives, as a female and male head at Abofour indicated. The study therefore sought to find out the strategies that the households have adopted to cope with the severity of poverty. The male heads of household indicated the following as the immediate coping strategies to their impoverishment, working for others on their farms (by day); borrowing and begging from relatives and friends; logging illegally; hunting for bush meat, honey and snails; selling of pestles; using of herbs to cure diseases; and cultivating vegetables. On the other hand, the female heads indicated the following as the major coping strategies to poverty, fetching and selling of firewood; producing charcoal; borrowing and begging from friends and relatives; trading in petty goods; and cultivating vegetable. It was further established that the youth display another coping strategy; they would rather migrate to Kumasi as a means of escaping the deplorable conditions in the study communities. It was also discovered that the female heads at Abofour are better able to cope with poverty than their male counterparts by

engaging in the selling of fruits and food along the main road during off-farming seasons, which the male heads cannot do due to the feminism of such jobs.

Table 4.3 Coping Strategies by the Male and Female Heads of Household

MALE HEADS	FEMALE HEADS
Engaging in “by day”	Fetching and selling firewood
Borrowing from others	Charcoal production
Hunting for Bush meat, honey and snails	Borrowing from others
Selling of pestles	Selling of fruits by the road
Using traditional medicine (Herbs)	Petty trading
Cultivation of Vegetable	Cultivation of vegetables
	Reduce quantity of food
	Using tradition medicine (Herbs)

Source: Author’s Fieldwork, 2012.

4.3 NON-TIMBER FOREST PRODUCTS AND FOOD CROPS FROM THE FOREST.

Forests have both products and services on which forest communities depend for both economic and social gains (Lindberg *et al.*, 1997). There are two main categories of forest products, namely, timber and non-timber forest products (NTFPs). The timber products include sawn wood, pulp, and panel boards normally for industrial uses. The non-timber forest products (NTFPs) includes, roots, fruits, bush meat, medicinal plants, resins, fibres such as bamboos, rattans and other palms used for weaving , fuel wood and carving wood (Belcher, 2003; 2005). The study communities showed a level of dependence on these forest products especially the non-timber type for livelihood.

During the focus group discussions, both sex groups in the study communities indicated some non-timber forest products that are derived from the forest, namely firewood, pestle, mushroom, bush meat, snails, honey, leaves/grasses, canes, chewing sticks, and medicinal herbs. This

substantiates the finding of Hapsari (2010) who indicates that some of the products derive from the Offinso forests, include bush meat, grass, fuel wood, medicinal plants and lumber. These products are recognized by the people as products that constitute their direct livelihoods. The responses indicated that these products are derived more in Abofour than in the other study communities because Abofour has the largest portion of the forest. It was further revealed that the male heads are able to hunt for bush meat, snails, honey and pestle while the female heads are engaged in the collection of firewood, mushrooms, leaves and medicinal herbs. The products are collected with the aims of earning income and for meeting household food needs. Mostly, the male heads sell some of the products to supplement their incomes from farming while the female heads consume theirs at the household level. Both sex groups highlighted that apart from these products, they also derived food crops from the forest. This is because of the agro-forestry programme by the Forest Services Division, where degraded areas are leased to farmers in the communities for the cultivation of both food and tree crops. Both the NTFPs and food crops derived from the forest are presented in Table 4.4.

Table 4.4 NTFPs and Food Crops from the Forest

NTFPs	FOOD CROPS
Firewood	Cassava
Pestle	Maize
Mushroom	Plantain
Bush meat	Cocoyam
Honey	Pepper
Medicinal herbs	Garden eggs
Leaves/grasses	Tomatoes

Source: Author's Fieldwork, 2012

Generally, the two main categories of products derive from the forest according to the heads are non-timber forest products (NTFPs) and food products. It was divulged that the quantities of the non-timber forest products (NTFPs) available in the forest have dwindled over the years primarily because of deforestation. A study by Bosu *et al.* (2010) at some forest communities in Offinso show that the availability of most non-timber forest products such as mushrooms, medicinal plants and snails has recently declined and that rural dwellers have to travel long distances into the forest to access some of these products. The Assemblywoman of Kyebi and Ahwerekrom confirmed this assertion. She emphatically stated that high population growth; perennial forest fires and illegal logging are the salient causes of deforestation in Kyebi and Ahwerekrom. However, it is only firewood, which is still collected in large quantities. This confirms why most of the female heads are engaged in the selling of firewood.

Plate 4.1 Firewood on Sale at Ahwerekrom



Source: Author's Fieldwork, 2012.

4.4 MEASUREMENT OF POVERTY AND FOREST PRODUCTS IN OFFINSO

4.4.1 Monetary indicator of Poverty in the Communities

Despite the enormous criticisms, the most widely used concept of poverty relates to the lack of economic well-being, focusing on the quantifiable ways of defining and measuring it (Wagle, 2008). The monetary measure of poverty has been the most accurate quantifiable means since the search for poverty measures began. The two main indicators of the monetary measure of poverty are income and consumption. Even though income level is a major determinant of poverty since it enables people to meet their basic needs; consumption is more indicative of a person's well-being, because it includes both incomes and the availability and accessibility of goods (World Bank, 2002). The study on the other hand adopted consumption levels to estimate poverty at the Offinso forest-fringe communities. This is because one major definition of poverty by the male and female heads of households in the study communities is the inability to meet basic needs. The study therefore adopted the World Bank's 2005 extreme and less extreme international poverty lines of \$38 and \$60 a month respectively (World Bank, 2008). The international poverty lines were converted into the local currency unit (Ghana Cedis) using the 2010 purchasing power parity (PPP) conversion factor of \$1.15 reported for Ghana by the World Bank. This placed the extreme poverty line at GH¢ 43 and the less extreme at GH¢ 69 a month.

Generally poverty rates in Ghana have declined recently; despite this rural poverty rate remains higher than the urban poverty rate. The persistent high rate of rural poverty in Ghana is as the result of a multiplicity of factors. Prominent among these factors is the lack of viable economic

activities apart from farming which is faced with many challenges such as the vagaries of the weather. The poverty rates from the study communities are presented in Table 4.5.

Table 4.5 Poverty Rates in the Offinso forest communities

Monthly Poverty Lines	Poverty Headcount Ratio (%)		
	Female Headed Households	Male Headed Households	Total
< \$38/GH¢43	61	39	15
< \$60/GH¢69	52	48	45
Total	54	46	60

Source: Author's Fieldwork, 2012.

It could be inferred from Table 4.5 that 45 percent of the households are poor and another 15 percent are extremely poor. This means that 15 percent of the households live below \$38/GH¢43 a month while 45 percent of them live above \$38/GH¢43 but below \$60/GH¢69 a month; thus less extremely poor. Notably, the extremely poor households were mostly single person households. This is because the incomes of the heads of single-person households are not supplemented by anybody unlike the multiple households where the average monthly income is derived from the contributions of household members. However, 40 percent of the households live above the poverty line, an indication that they are not poor according to the poverty lines used in this study. This category is mostly multiple households where each household member who is working contributes towards the total monthly income of the household. It is also significant to highlight the gender dimension of the poverty rates. It is evident from Table 4.5 that 61 percent of the female-headed households are extremely poor. In all, 54 percent of the female-headed households are poor relative to 46 percent of the male-headed households.

Generally, a greater number of the female-headed households are poor than the male-headed households are. This further elucidates the concept of feminization of poverty (Bridge, 2001), which connotes the high incidence of poverty among females. Occupationally, 71 percent of the heads of the extremely poor households are farmers. This also verifies that food crop farmers remain the poorest occupational group in Ghana (GSS, 2008).

Geographically, the distribution of the poverty rates in the communities support the assertion that poverty is endemic in the rural areas of Ghana (GSS, 2008). The situation is similar in the Offinso forest communities, where more than half of the households are poor. Table 4.6 presents the spatial variation of the poverty rates.

Table 4.6 The Spatial Distribution of the Poverty Rates

Monthly Poverty Lines	Poverty Headcount Ratio (%)				Total
	Abofour	Kyebi	Kwapanin	Ahwerekrom	
< \$38/GH¢43	78	9	10	3	15
< \$60/GH¢69	76	8	11	5	45
Total	76	8	11	6	60

Source: Author's Fieldwork, 2012

Spatially, about 78 and 76 percent of the households are extremely and less extremely poor respectively in Abofour. This is because Abofour has attained the status of township which attracts the rural dwellers from Kyebi, Kwapanin, and Ahwerekrom. Also Abofour has the largest market in the Offinso South Municipality which attracts traders from the surrounding

communities including Kumasi. Most of the tradable goods are seasonal; this therefore does not provide jobs for the inhabitants all year round. It is imperative to highlight that Kyebi, Ahwerekrom, and Kwapanin are small communities close to Abofour; as such the assumption is that most of the people in these communities have relocated to Abofour to find better jobs, compounding the incidence of poverty. This explains why Abofour has the highest number of poor households. However, the fact is that there are limited jobs in Abofour contrary to what may be expected by the rural dwellers. It was further revealed that the high incidence of poverty in the study communities is the result of the lack of viable economic activities other than farming which only brings seasonal income. Exacerbating the problem is the inability of the heads of households to transport their farm products to the market at Abofour due to the bad nature of the roads. As a result they earn low income from their produce rendering them unable to meet their basic needs.



4.4.2 NTFPs as Income/Consumption Supplement in the forest communities of Offinso.

The significance of forest resources to the livelihoods of people living at forest margins has been recognised during the last three decades (Yemiru *et al.*, 2010). There is also evidence on the role of forests in rural people's livelihoods. It is indicated that about 1 billion of the world's poor depend on forest resources to sustain their livelihoods (Scherr *et al.*, 2003 cited in Yemiru *et al.*, 2010). On the other hand the rural poor are limited to the collection and usage of non-timber forest products (NTFPs) as the harvesting of timber requires a concession. The top ten non-timber forest products (NTFPs) derived from the forest were revealed during the focus group discussions. These products include firewood, pestles, bush meat, mushrooms, medicinal herbs, leaves, snails, chewing sticks, honey and cane. The study therefore employed a quantitative assessment method to measure more accurately the quantity of these products that are being consumed at the household level. This method involved the measurement of the average quantities of non-timber forest products collected, the average amount consumed measured by months. It was also revealed that most of the non-timber forest products are consumed at the household level rather than sold for income because of the reduction in quantity in recent times. Monetary values were assigned to the quantities consumed at the household level.

Generally, the findings indicate that most households depend on non-timber forest products as livelihood supplement in the communities. However, this has not been given the necessary attention in pro-poor policy discourse. The results are presented in Tables 4.7 and 4.8.

Table 4.7 Proportion of Households' Consumption of NTFPs

NTFPs	Extreme poverty		Above extreme poverty		Above the poverty line		Average Quantity	GH¢	% of NTFP
	15%		45%		40%				
	Yes	No	Yes	No	Yes	No			
Firewood	97	3	95	5	93	7	5 bundles	20	34
Pestle	97	3	96	4	95	5	1 stick	5	8
Bush meat	78	22	72	28	80	20	2 pounds	10	17
Mushroom	83	17	78	22	70	30	4 heaps	4	7
Medicinal Herbs	80	20	73	27	70	30	-	2.50	4
Leaves	65	35	58	42	42	58	-	5	8
Snail	48	52	28	72	27	73	6 pieces	2	3
Chewing sticks	43	57	25	75	32	68	-	2	3
Honey	13	87	16	84	13	87	300ml	5.50	9
Canes	11	89	9	91	9	91	-	4	7
Total								60	100

Source: Author's Fieldwork, 2012. $\chi^2 = 0.90$ df = 1, Confident level = 90%, P = 2.71.

Table 4.8 Contributions of NTFPs to Households Consumption Needs

GH¢	Extreme poverty	Above extreme poverty	Above the poverty line
	15%	45%	40%
0.0	4	2	2
< 20	8	0	5
20-39	9	28	30
40-60	79	70	63
Total	100	100	100

Source: Author's Fieldwork, 2012.

It is evident from Table 4.8 that the majority of the households, especially those below the poverty line, depend on NTFPs from the forest all year round particularly during the lean agricultural seasons. Firewood is the most important NTFP for all the households but most

especially for the extremely poor households. It constitutes the highest percentage, about 34 percent, of the total monetary value of NTFPs consumed monthly. A significant number of the extremely and the less extremely poor households, about 97 and 95 percent, use firewood as the main source of energy for cooking. Moreover, 93 percent of households above the poverty line depend on firewood for their household energy demands. The result confirms that of ISSER (2007) that the majority of households in the Offinso forest District use firewood for cooking and other household energy demand.

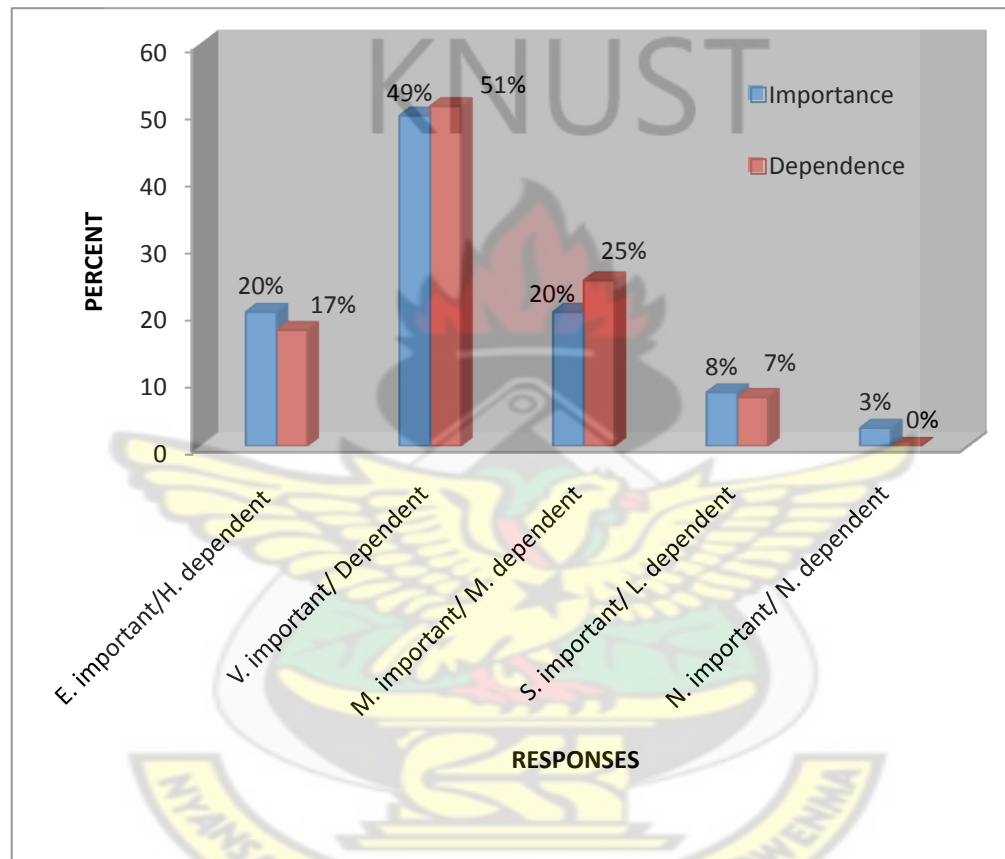
It is important to highlight that bush meat constitutes a major source of animal protein in the study area. In this connection, bush meat is the second most important NTFP to all the households. It constitutes approximately 17 percent of the total monetary value of NTFPs consumed by the households. Notably about 80 percent of the households above the poverty line depend on bush meat as compared to 78 percent of the extremely poor households. Bush meat plays a significant role in household dietary and food supplement and thereby contributes to household food security and nutritional needs. The result is in contrast to that of Hapsari (2010) who from his findings indicates that it is a base of argument that bush meat is not significant in income generation of local communities. On the other hand, the result validates that bush meat is considered by local people in Ghana as one of the most important forest products that contribute to their income (Appiah *et al.*, 2009). Mushrooms, snails, leaves and honey (refer to Table 4.7) also constitute edible NTFPs that are being collected from the forest. These products, except for honey, are harvested and collected mainly during the wet seasons. Mushrooms, snails and bush meat constitute essential ingredients for food preparation.

It is important to emphasize that, the collection of firewood, mushrooms, medicinal herbs, and leaves are female dominated, while hunting for game (bush meat), honey and snails is male dominated. Generally, there is a strong relationship between the female-headed households and the consumption of NTFPs. This is because the majority of the female-headed households are below the poverty lines as compared to the male-headed households (refer to Table 4.5). These edible NTFPs, even though they are collected in small quantities, are considered as products that sustain the households during the lean farming seasons and times of need. Thus, to a minor extent NTFPs contribute to household food security. The total average monthly consumption of the household is low with, NTFPs contributing the highest percentage. On the average, 79 percent of the extremely poor households consume NTFPs at a monetary value between GH¢ 40 to 60 a month relative to 63 percent of the non-poor households (see Table 4.8). This contributes a large proportion of their total monthly consumption. The dependence on NTFPs is a major mechanism for coping with the severity of poverty especially, for the female-headed households.

The study posits that no significant difference exist between the number of poor households that consume NTFPs and the non-poor counterpart. A chi-square statistical analysis $\chi^2 (1, N=150,) = 0.90, p > 0.10$ confirmed that there is no significant difference between the number of poor households that consume NTFPs and the number of non-poor households that consume NTFPs. Thus, it could be concluded that NTFPs serve as livelihood supplement for all the households irrespective of their income and consumption levels. NTFPs therefore supplement the consumption needs of the households in the Offinso Forest District.

In order to further assess the importance of non-timber forest products and the level of dependence in the study communities the Likert scale was employed. Also the relationship between the responses was established to assess how they are related.

Fig.4.1 Relationship between responses on importance of and dependence on NTFPs



Pearson's Chi-square = 2.225, Spearman's correlation = 0.774, sig = 0.000

Source: Author's Fieldwork, 2012.

Figure 4.1 is a descriptive presentation of the relationship between the response on the importance of and level of dependence on non-timber forest products. It is clear that while 20 percent of the households indicated that non-timber forest products are extremely important to their households, 17 percent also indicated that their households are highly dependent on non-

timber forest products either for food or income supplement. It is also evident that the 49 percent of households that indicated that non-timber forest products are very important to them comprise 51 percent of households that depend on non-timber forest products. On other hand, only 3 percent of heads indicated that non-timber forest products are not important to them. However, the result shows that almost every household depends on non-timber forest products either directly or indirectly. Also the result verifies the assertion that non-timber forest products are important to poor people in the forest fringes of the world (Belcher, 2005). To further test the relationship between the responses, the Pearson's Chi-square and Spearman's correlation were used. The results of the Pearson's Chi-square and Spearman's correlation are 2.225 and 0.774, respectively. This implies that there is a very strong relationship between the households' responses on the importance of and level of dependence on non-timber forest products.

Geographically, about 19 percent of the households in Abofour highly depend on non-timber forest products while at Kyebi, Kwapanin and Ahwerekrom the figures are 6, 7 and 20 percent respectively. This was attributed to the recent changes in consumption levels of households due to the reduction in the quantity of non-timber forest products. Notably, 9 percent of the male-headed households highly depend on non-timber forest products as against 8 percent of the female-headed households. This was because the average size of the male-headed households is higher than the female-headed households. It was discovered that the female-headed households are without elderly men or husband. This is also, because the male heads are physically more able to harvest and collect non-timber forest products than the female heads. For instance, it was realized that the harvesting of honey and hunting for bush meat are male dominant. For most

households in the communities, it could be deduced that non-timber forest products represent their primary source of food, income and security as also indicated by Appiah *et al.*, in 2009.

4.4.3 The relationship between NTFPs and the Income/Consumption of Households.

Previous studies on forestry have tried to establish the relationship between forest and income generation in forest adjacent communities in developing countries. For instance, according to Vedeld *et al.* (2004) forest products contribute between 20 to 40 percent of the total income of households in forest areas and that poor households tend to be disproportionately dependent on forest products especially fuel wood and fodder.

Generally, income that is saved from the consumption of NTFPs is estimated at 33 percent of the total monthly income of households that depend on them. Thus, 33 percent of the total monthly income of households is income that is saved from the consumption of NTFPs. The study therefore concludes that there is a weak relationship between the monthly income of the households and the income that is saved from the consumption of NTFPs. However, the result confirmed that of Vedeld *et al.* (2004) who found that forest products contribute between 20 to 40 percent of total income of households in forest areas.

It also significant to estimate the resources needed to bring the poor households close or above the extreme and less extreme poverty lines and also how much non-timber forest products can contribute. In this regard, the average shortfalls of the households' incomes below the poverty lines were estimated. Statistically, it was obtained by summing up all the shortfalls of the poor households below each poverty line and dividing the total by the number of households below that poverty line. The results are presented in Table 4.9.

Table 4.9 Poverty Reduction Estimates from NTFPs

Monthly Poverty Lines	Household Poverty rates (%)	Average Shortfall below poverty lines	33% contribution from NTFPs
< \$38/GH¢43	15	GH¢ 10	GH¢ 3.30
< \$60/GH¢69	45	GH¢8	GH¢2.64
Total	60	GH¢ 18	GH¢ 6

Source: Author's Fieldwork, 2012.

With reference to Table 4.10, it could be deduced that, at the extreme poverty line, the average shortfall of the households is approximately GH¢10, thus this is needed to bring the household close or above the extreme poverty line. Also, non-timber forest products could contribute only GH¢3.30 of the GH¢10. In addition, the average shortfall of the less extremely poor households is GH¢8 of which non-timber forest products could contribute only GH¢ 2.64. The total average shortfall below the poverty line is GH¢18 of which NTFPs can contribute approximately GH¢ 6. This is the estimated resource needed to lift the poor households out of poverty (World Bank, 2002). Arguably, non-timber forest products have the prospects of increasing the income of households in the forest communities. This is possible through reducing the current rate of deforestation in the Municipality to increase the quantity of non-timber forest products derived from the forest. It could also be inferred from the analysis that NTFPs from the Offinso forest represent a considerable natural resource base for poverty alleviation in the communities. Thus, NTFPs represent an alternative resource for poverty alleviation through sustainable forest management in the Municipality. This could also be realized when the local people are given greater control to own and management the forest as it was emphasized in the conceptual framework adopted for the study (refer to Fig. 2.2).

4.5 THE LEVEL OF DEFORESTATION IN THE OFFINSO SOUTH MUNICIPALITY

Deforestation is the conversion of forest to another land use or the long-term reduction of tree canopy cover below the 10 percent threshold (FAO, 2004). For the purpose of this study the above definition of deforestation was adopted. Rapid tropical deforestation, forest fragmentation and degradation have remained a huge challenge at both the national and global levels (Porter-Bolland *et al.*, 2011). Deforestation in the tropical is the highest globally (FAO, 2011). In Ghana, the forest is declining at a faster rate than other developing tropical countries (Yiridoe and Nanang, 2001). Similar conditions prevail at the Offinso forest district of the Ashanti region where the forest has been subjected to various forms of anthropogenic disturbances leading to its fragmentation and degradation (Baatuuwie and Leeuwen, 2011). The study employed remote sensing analyses of Landsat images to determine forest cover and loss in respective years in the Municipality. The satellite images included Landsat TM image of 1986, image of 2003, and Landsat ETM image of 2007. The interest of the study was to analyze the extent of forest cover and loss in respective years; therefore the images were distinguished into only three classes namely: forest, grasses/degraded areas and bare ground/built-up. Table 4.10 gives detail descriptions of the classes.

Table 4.10 Description of land cover type in Offinso South Municipality

Land Cover Type	Description
Forest	Forest areas depicting the features of natural vegetation with canopy of tree species
Grasses/degraded area	All forms of grasses from creeping to tall, farm areas and degraded portions with sparsely distributed trees.
Bare ground/Built-up	Areas of exposed soil surface, rocky areas and high intensity of infrastructure/ settlements

Source: Author's Construct, 2012.

Forest cover map of Offinso South Municipality in respective years (1986, 2003, 2007)

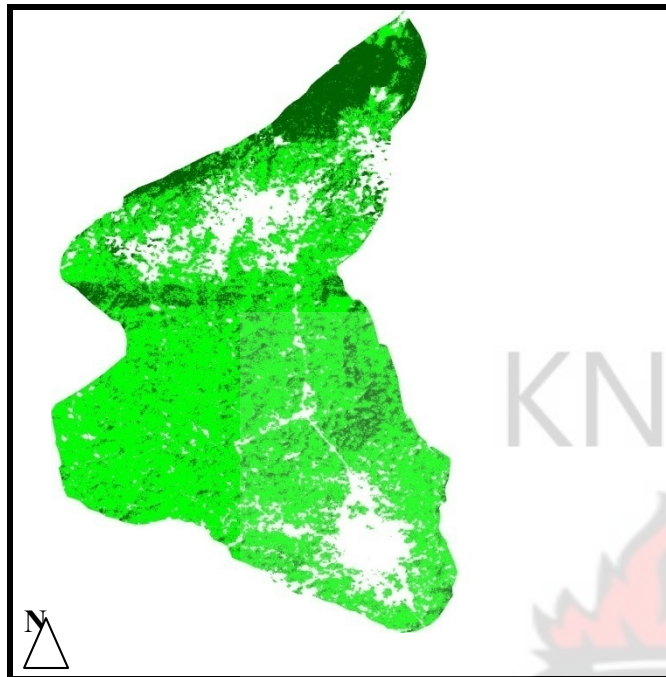


Image 4.1 Forest cover in 1986 (9,666.54 ha)

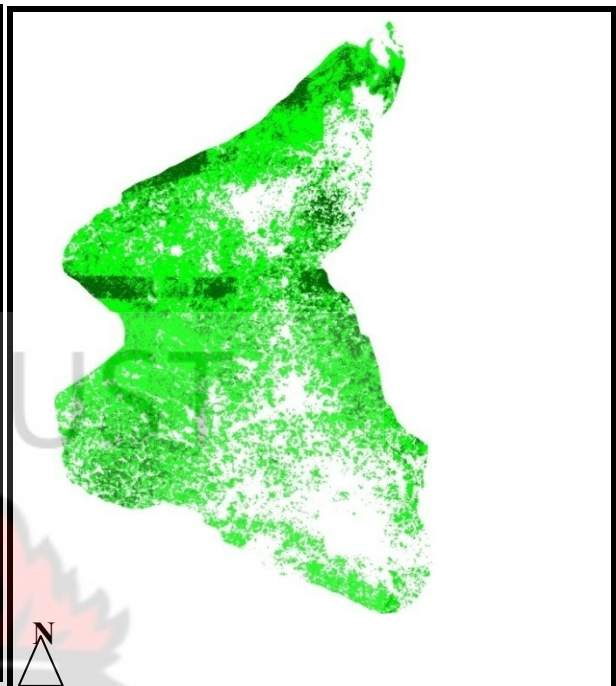


Image 4.2 Forest cover in 2003 (5,651 ha)

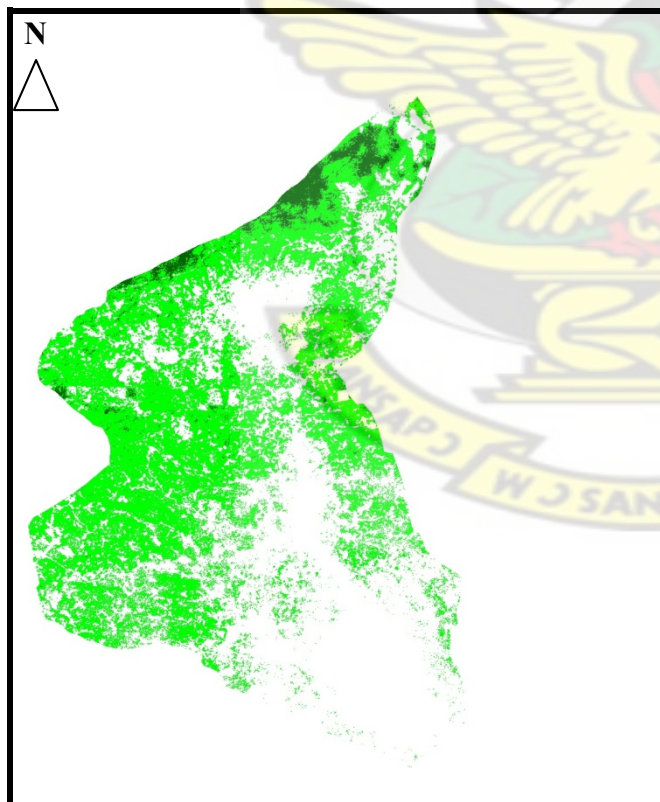


Image 4.3 Forest cover in 2007 (1,584 ha)

Legend

- Forest
- Grasses/ degraded
- Bare/Built-up

Scale 1: 125000

Source: Landsat (1986, 2003 and 2007)

Visually, it can be deduced from image 4.1 that, in 1986 Offinso South Municipality in Ghana had an extensive area of forest cover, sparsely distributed in the southern part and densely concentrated at the extreme end of the northern part of the Municipality, covering about 9,667 hectares. However, by 2003, the forest cover had reduced to 5, 651 hectares accounting for about 42 percent loss in forest cover. Again, in 2007 forest cover in the Municipality further reduced to 1,584 hectares. Approximately 72 percent of forest has been lost between 2003 and 2007 while there has been a loss of 84 percent of forest from 1986 to 2007. It is also imperative to highlight that there is an inverse relationship between the built environment and forest cover. In 1986, while the bare ground and built environment accounted for 89,195 hectares, forest covered 9,666 hectares. Again in 2003, while the bare ground and built environment covered 100,019 hectares forest covered only 5, 651 hectares and in 2007 while the bare ground and built environment covered 107,592 hectares, forest covered only 1, 584 hectares.

Notably, the bare ground and built environment according to this classification are soil surface, degraded portions of the forest and high intensity of infrastructure including settlement. It can therefore be concluded that the expansion of settlements and farmlands to meet the demands of the increasing population coupled with untold human activities such as illegal logging are the factors responsible for the high rate of deforestation in the Municipality.

Table 4.11 Percentage change of Forest cover and Built-up Environment

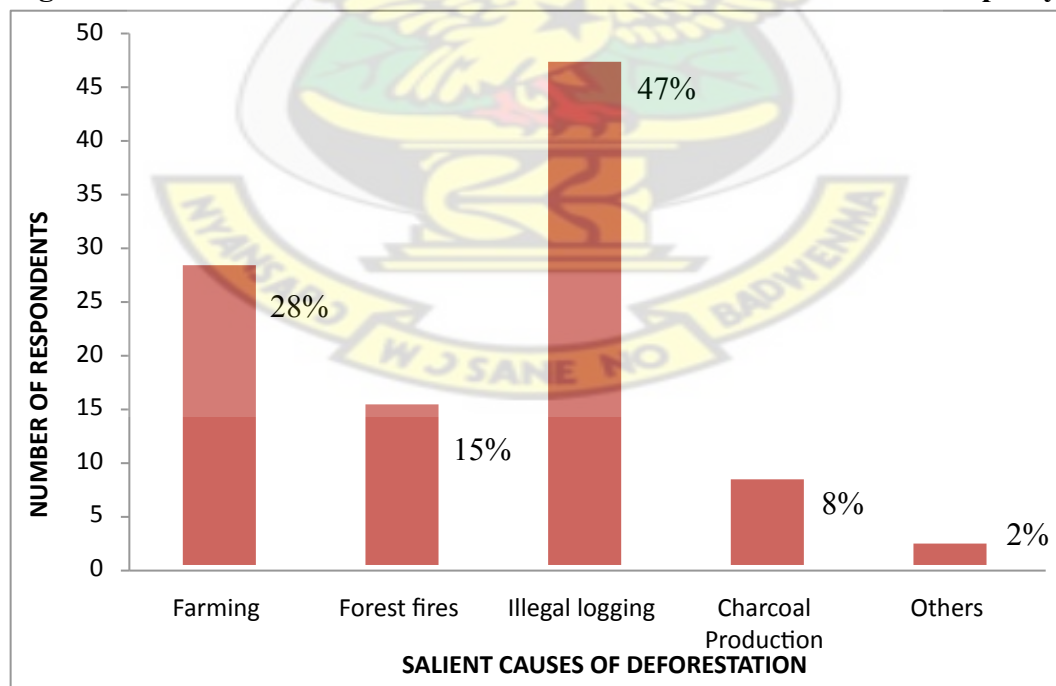
YEAR	FOREST COVER (ha)	PERCENTAGE CHANGE OF FOREST COVER		Rate of change	BARE/BUILT-UP (ha)
		Year	%	%	
1986	9,667	1986-2003	42	2	89,195
2003	5, 651	2003-2007	72	18	100,019
2007	1, 584	1986-2007	84	4	107,592

Source: Landsat images 1986, 2003, and 2007.

The heads of households were also asked to assess the level of deforestation and its salient causes. The Likert scale was employed to rank their views. Undoubtedly, 51 percent said the level of deforestation is high. This confirms the remote sensing analyses, which indicate a drastic reduction of forest cover from 1986 to 2007. Surprisingly, no head said deforestation is low, and only 3 percent of them indicated that they do not know the extent of deforestation. These are migrants who have recently settled in the Municipality and never saw the density of the forest in the past.

The salient causes of deforestation in the Municipality are obvious. The study also proposed that deforestation in the Municipality is a direct result of illegal logging activities. A descriptive analysis of the views of the household heads on the major causes of deforestation in the Municipality was employed. The results are presented in Figure 4.2.

Figure 4.2 The Salient Causes of Deforestation in Offinso South Municipality



Source: Author's Fieldwork, 2012.

It is clear from Figure 4.2 that 47 percent of the heads attributed the high rate of deforestation to illegal logging. Even though this activity is illegal, they added that it provides jobs for some of the youth in the communities. The youth engage in illegal logging as a substitute for farming which has been tagged as not lucrative due to its seasonality. The Assembly member for Kyebi and Ahwerekrom also confirmed this by attributing deforestation to illegal logging activities. Unfortunately, illegal logging in the Municipality is male dominant, while the females who are disproportionately poor are not involved in it due to the high physical demands involved. The result is comparable to the findings of Marfo and Acheampong (2011) who stated that the illegal chainsaw sector provides jobs for a good number of people and cannot be wished away in policy discourse. Therefore illegal logging activities in the Municipality could be described as a “*necessary evil*”⁴. In addition, 28 percent of the heads attributed the high rate of deforestation to farming practices while 15 percent attributed it to forest fires. Also 8 percent of the heads indicated that charcoal production is also a cause of deforestation. Finally, 2 percent of them attributed it to other causes, which include the activities of timber companies.

The variations in the responses established the fact that all the above factors are responsible for deforestation in the Offinso South Municipality; however, it could be inferred that illegal logging and uncontrolled farming practices account for much of the deforestation. The high number of farmers in the communities validate that farming is the second major cause of deforestation in the Municipality. This is also evident from the analyzed satellite images showing grasses/degraded areas, which also consist of farmlands expanded over the years. Irrefutably, deforestation is a direct result of illegal logging in the Municipality as proposed by the study.

⁴ “*Necessary evil*” in this regards refers to the fact that illegal logging causes deforestation at the same provides jobs and income for a good number of people in the communities and should given a human face in policy discourse of the Municipality.

The impacts of deforestation in the Municipality are enormous and cannot be overemphasized. The heads lamented profoundly on its impacts on their economic and livelihood activities. This is obvious when 89 percent of them confirmed that deforestation has great impacts on their livelihood and economic activities, mostly constituting of farming and the collection of non-timber forest products (NTFPs). The quantity of non-timber forest products has decreased over the years due to deforestation. Some of the heads who are cocoa farmers indicated that cocoa does well in forested areas. However, since the advent of deforestation there has also been a corresponding reduction in the quantity of cocoa harvest. Some also complained that sometimes newly planted cocoa seedlings die because of too much exposure to the sun. This consequently affects their income levels. In addition, the heads blamed the recent low rainfall in the Municipality for the level of deforestation. During a focus group discussion, a man emphatically indicated that a dense forest attracts more rains than a sparse one. In order to measure precisely the opinions of the heads on the impacts of deforestation on NTFPs the Likert scale was employed. The results are presented in Table 4.12.

Table 4.12 Impacts of Deforestation on Food products and Income derive from the Forest

Item	Strongly Agree		Agree		Don't Know		Disagree		Strongly Disagree		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
NTFPs	49	33	63	42	18	12	11	7	9	6	150	100
	44	29	63	42	11	7	22	15	10	7	150	100

Source; Author's Fieldwork, 2012

The results from Table 4:12 indicate that 33 percent of the heads strongly agreed that deforestation has reduced the quantity of NTFPs derived from the forest. In addition, 42 percent of them agreed, while 7 percent of them disagreed that deforestation is the cause of the reduction.

Finally, 6 percent of them strongly disagreed. The study also deemed it right to assess the future consequences of further deforestation in the communities. About 29 percent of the heads strongly agreed that there would be further reduction in the quantity of NTFPs if the current rate of deforestation continues. Also 42 percent of them agreed, while 15 and 7 percent disagreed and strongly disagreed respectively. From these grounds, it could be concluded that the quantity of NTFPs has reduced due to the high level of deforestation in the Municipality. In addition, projections suggest that the quantity of these products will continue to reduce if deforestation is not tackled.

Indeed deforestation has remarkable effects on the quantity of non-timber forest products harvest either for income or consumption in recent times in the study area. Evidently the heads travel long distances in search for non-timber forest products. Foli and Makungwa (2011) also acknowledged that with increasing deforestation of a previously forested landscape, the ecosystem is fast becoming a forest-savannah eco-tone and the vegetation is becoming predominantly savannah grassland. In a similar way Bosu *et al.* (2010) remarked that the availability of most non-timber forest products such as mushrooms, medicinal plants and snails have recently declined and that community dwellers have to travel long distances into the forest to collect some of these products. The decline in the quantity and quality of non-timber forest products is attributed to the reduction of forest cover.

4.6 THE ROLE OF STAKEHOLDERS IN SUSTAINABLE FOREST MANAGEMENT

The United Nations Conference on Environment and Development (UNCED) has recognized Sustainable Forest Management (SFM) as the most important part of sustainable development in any country (UNCED, 1992). However, the global objective of sustainable forest management has not been realized in most developing countries. In Ghana, the situation is quite similar where forest policies tend to focus on timber production rather than sustainable forest management (Baffoe, 2009). The study also aims at measuring efforts towards sustainable forest resource management by stakeholders in the Municipality with specific emphasis on the role of the Forest Services Division and the communities. The study assessed the role of the Forest Services Division in the Municipality through an in-depth interview with a Municipal forester. Moreover, sustainable forest management policies in the Municipality were critically assessed based on their Strengths, Weaknesses, Opportunities, and Threats (SWOT). The study further assessed the communities' involvement in sustainable forest management practices. The aim was to find out how the local people are integrated into the sustainable forest management policies of the Municipality. The views of the heads were first sought to determine their understanding of sustainable forest management.

The responses reflect the notion that the heads have ideas of what sustainable forest management means in practice. However, about 39 and 25 percent of the responses are skewed towards tree plantation and agro-forestry respectively. This is predominantly because of the just ended Modified Taungya System (MTS) and the New National Forest Plantation Development Programme (NNFPDP) through agro-forestry and tree plantation underway in the Municipality. The NNFPDP is aimed to restore the lost forest cover in the Municipality. As a result portions of

the degraded forestland were leased to the communities to cultivate both food (see Table 4.4) and tree crops. The agro-forestry and tree plantation programme fall under the concept of “*reforestation*”⁵. Though reforestation is a practice of sustainable forest management it remains a fragmented component of the complete practice of sustainable forest management. Forest sustainability according to Sayer *et al.* (1997), is not merely an issue of natural forests versus plantations, or clear felling versus selection logging systems, but involves more fundamental questions about the functions and services provided by forests. The views are presented in Table 4.13.

Table 4.13 Sustainable Forest Management Practices

SFM Practices	Frequency	Percent
Reforestation	19	13
Agro-forestry	37	25
Tree Plantation	58	39
Continue use of forest resources	10	6
Protecting forest reserves	19	13
Others	6	4
Total	149	100

Source: Author’s Fieldwork, 2012.

4.6.1 Local involvement in Sustainable Forest Management in Offinso South Municipality.

The involvement of local people in sustainable forest management has been recognized as the most effective way of implementing sustainable forest management policies in the forest regions of the world. It is evident from previous studies that proper integration of the local people into sustainable forest management frameworks in Ghana is a great challenge. It was discovered that about 53 percent of the heads of households were involved in the Modified Taungya System

⁵ *Reforestation* is the process of planting tree in previously degraded and deforested areas.

(MTS) and currently the New National Forest Plantation Development Programme (NNFPDP) through agro-forestry and tree plantation. With the MTS, which was abrogated in 2009, the farmers, government, landlords and forest-adjacent communities own shares of the plantations (NFPDP, 2008). However, it is not clear how the management of the plantations is shared among these shareholders.

The study further sought to find out the effectiveness of the agro-forestry and tree plantation programme through the Likert ranking. The results are presented in Table 4.14.

Table 4.14 Effectiveness of the Agro-forestry and Tree Plantation programme

Effectiveness	Community involvement in Sustainable Forest Management	
	Frequency	Percent
Very effective	9	12
Effective	37	47
Moderately effective	24	31
Not effective	7	9
Don't know	1	1
Total	78	100

Source: Author's Fieldwork, 2012

The effectiveness of the agro-forestry and tree plantation programme was measured by how the responsibilities of the community and the Forest Services Division are being carried out. For instance the farmers are to clear the land and plant their crops and the Forest Services Division supplies the seedlings to be planted. It is therefore clear from Table 4.14 that 47 percent of the heads who are involved indicated that the programme is effective, while 9 percent of them

lamented the ineffectiveness of the programme. The ineffectiveness is based on the fact that sometime the Forest Services Division delays in supplying the seedlings, which subsequently delays the planting. Therefore the overall assessment of the programme in the Municipality according to the responses is that, it is moderately effective. The Municipal forester has also confirmed this.

Significantly too, the long-term impact of the programme was assessed from the view- points of the heads. This was to solicit their views to assess whether the agro-forestry and tree plantation programme will enable the Forest Services Division to achieve its objective of sustainable forest management. About 35 percent indicated that the programme would restore the lost forest in the long run. This is because most of the degraded portions of the forest are being planted with trees. Interestingly, 22 percent of them could not assess the long-term impact of the programme. These are probably not involved in these activities and have no idea of what is happening in the Municipality with regard to forestry initiatives. Only 19 percent of them affirmed that sustainable forest management would be the long-term impact of the programme. The primary reason given was that the planting of trees would enable the flourishing and development of the natural forest. Moreover, activities of illegal loggers will be reduced due to the presence of the farmers in the forest. Unequivocally, 11 percent of the heads indicated that the agro-forestry and tree plantation programme is not likely to have any impact on the forest in the Municipality. This is because illegal loggers have started felling the trees under cultivation. Due to this the anticipated aims in the long run such as forest restoration, the development of a sustainable forest resource base and the enhancement of environmental quality may not be achieved. The results are further presented in Table 4.15.

Table 4.15 The Long-term Impacts of the Agro-forestry and Tree plantation

Long-term Impact	Frequency	Percent (%)
Forest Restoration	52	35
Sustainable Forest Management	29	19
Forest Management only	19	13
None of the above	17	11
Don't know	33	22
Total	150	100

Source: Author's Fieldwork, 2012.

4.6.2 SWOT Analysis of SFM Policies and the Role of the Forest Services Division

The sustainable management of the Offinso forest is important due to the high rate of deforestation. Therefore the efficacy of the sustainable forest management policies in the Municipality was assessed based on their Strengths, Weaknesses, Opportunities, and Threats (SWOT). An in-depth interview with the Municipal Forester whose duties include the supervision of implemented pro-forestry policies and programmes in the Municipality revealed the following: He defined sustainable forest management as the continual usage of forest resources now and in the future. The sustainable forest management policies in the Municipality are presented in Table 4:16.

Table 4.16 Sustainable Forest Management Policies in Offinso South Municipality

POLICY	DESCRIPTION
Allowable cut	This policy regulates the quantity and species of tree to be harvested
Zoning of forest area	This enables the identification of areas and trees harvestable or not harvestable.
Wildfire management	This policy curtails forest fires through fire campaigns /education and the establishment of fire volunteers for fire prevention.
Forest forum	This policy involves the communities to discuss forest issues to ensure concrete sustainable forest management practices.
Protection of forest resources	This policy prosecutes illegal timber harvesters to deter others from harvesting timber illegally.

Source: Author's Fieldwork, 2012.

Table 4.17 SWOT Analysis of the Sustainable Forest Management Policies

STRENGTHS • Regulation of timber harvest • Protection of the ecosystem • Community participation • Prosecution of illegal loggers • Informed by the 1994 Forest and Wildlife Policy	WEAKNESSES • Mostly focused on timber harvest • Inadequate involvement of the communities • Relegate the management of NTFPs • Business oriented
OPPORTUNITIES • Increases revenue from timber exportation • Ensures sustainable timber harvest • Stakeholders involvement (community, forest guides, court, resource managers)	THREATS • Deforestation • Fragmentation/ degradation the forest • Extinction of NTFPs • Exacerbation of poverty • Logging illegally • Apathy of communities in forest management • Destruction of farms

Source: Author's Fieldwork, 2012.

The specific role of the Forest Services Division involves policy implementation and monitoring while the Forestry Commission at the national level designs the policies. Despite, these stringent policies in the Municipality to curb illegal timber harvesting, the study revealed that illegal logging still remains the major cause of deforestation in the Municipality. This further substantiates that forests in Ghana have been declining as manifested by continuous deforestation and massive illegal timber harvesting (Birikorang, 2001 cited in Asare, 2011). Besides, SWOT analyses of the policies (see Table 4.17) revealed that, they are focused on sustainable timber harvest rather than sustainable forest management. This affirms the assertion that forest policies in Ghana focus on sustainable timber production rather than sustainable forest management (Baffoe, 2009).

As a country committed to ensure sustainable forest management, Ghana is also a signatory to the International Tropical Timber organization (ITTO) and African Timber organization (ATO) processes towards sustainable forest management (Asare, 2011). That means SFM policies at both the national and local levels are supposed to be informed by these international criteria and indicators. However, it was also revealed that at the Municipal level, these international criteria and indicators towards sustainable forest management frameworks are not known. The Municipal forester indicated that, the Forestry Commission at the national level formulates the policies while the Forest Services Division at the local level does the implementation. Also critical analyses of the policies revealed that the communities are not adequately and practically involve in sustainable forest management in the Municipality. However, Sayer *et al.* (1997) argued that forest sustainability is also about stakeholders, equity and expectations. The Municipal forester recommends an effective collaboration between all stakeholders (the Police, the court and the beneficiary communities) in order to ensure sustainable forest management in the Municipality.

It is important to emphasize that contemporarily, SFM is gradually moving from silviculture to community forestry where local people are given greater control over the ownership and management of forests. It is indicative from the findings that the local people are not adequately involved in the management of the forest. However, the 1994 FWP of Ghana emphasized adequate local involvement in forest management, which the conceptual framework seeks to reemphasize (refer to Fig. 2.2). The variables explained in the framework therefore reinforce the global call for SFM through adequate local involvement in the forms of community, social and village forestry, which seem inadequate in the study communities.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 SUMMARY

This concluding chapter provides a summary of the underlying key issues and major findings of the study as well as policy recommendations. The importance of sustainable forest management in poverty alleviation has gained recognition in pro-poor policies discourse. However, researchers treat forest sustainability and poverty alleviation separately. This is because sustainable forest management could not be measured precisely as an indicator of poverty alleviation. The linkages between the two have been ill explored through research over the years. Against this background, the study aimed at establishing the linkages between sustainable forest management and poverty alleviation in the Offinso South Municipality.

In order to justify the need for sustainable forest management for poverty alleviation, the study was guided by four specific objectives. First, the study sought to determine the contribution of NTFPs to the total monthly income of households in the Offinso South Municipality. Secondly, it also sought to examine the extent of deforestation and its effects on NTFPs in Offinso South Municipality. Thirdly, the study assessed the involvement and role of the communities in sustainable forest management practices of the Municipality. Finally, it examined the role of the Forest Services Division in sustainable forest management in the Municipality.

In order to achieve these objectives, a total of 150 households were randomly selected for the household survey with the heads of households as the units of inquiry. Focus group discussions, in-depth interviews and questionnaires were the main methods and tool for data collection respectively. Both descriptive and explanatory statistical tools of the SPSS and Excel software

were used for the analyses of the quantitative data gathered; whereas content analysis, drawing systematic conclusions from the focus group discussions and in-depth interviews, was the method used for the analyses of the qualitative data gathered. In addition, a remote sensing analysis of satellite images was employed to determine the extent of forest cover and loss respectively in the years 1986, 2003, and 2007. The World Bank's 2005 international extreme and less extreme poverty lines of \$38 and \$60 a month respectively were used to measure poverty in the study communities. The major findings of the study are summarized below.

5.1.1 Household Poverty Levels

It was revealed that poverty is very significant in the communities and that the rural dwellers have expressed their views on its severity. Among the perceptions are lack of income and access to basic social amenities, having no access to basic needs and food. Significantly, farming is associated with poverty in that farming does not bring year round income due to its seasonality and unfavorable farming conditions. Moreover, the manifestations of poverty discovered include homelessness, frequent ill health, living in a dilapidated house and wearing tattered clothes. Quantitatively, about 45 and 15 percent (refer to Table 4.5) of the households are poor and extremely poor respectively. A total of 60 percent of the households are poor in the study communities. It was subsequently revealed that more of the female-headed households are poor than the male-headed households. Notably, farmers were found to be the poorest occupational group in the study communities.

5.1.2 The Contribution of NTFPs to income and the implication of Deforestation

Paramount too, income that is saved from the consumption of NTFPs is estimated at 33 percent of the total monthly income of households who depend on them. However, this is small to enable the poor households to meet their basic needs. It was also discovered that the small percentage contribution of non-timber forest products to the total monthly income of households was due to the quantity reduction of non-timber forest products in recent years, which is attributable to the high rate of deforestation in the Municipality. Again the high rate of deforestation in the Municipality is attributed to many factors; prominent among them is illegal logging (refer to Figure 4.2). This has accounted for a greater loss of the forest than other causes. As a result the quantity of NTFPs available has been reduced over the years.

5.1.3 Local Involvement and the role of the FSD in Sustainable Forest Management

The role of stakeholders in sustainable forest management in forest regions cannot be overemphasized. However, at the Offinso South Municipality, the communities who are purported to be the direct beneficiaries of the sustainable forest management policies are not adequately and practically involved in sustainable forest management practices. On the other hand the communities are rather involved in the National Forest Plantation Development Programme (NFPDP) through agro-forestry and tree plantation. This is a livelihood programme, which involves farmers through agro-forestry and tree plantation in the Municipality. It is imperative to note that the Forest Services Division as a decentralized department of the Forestry Commission in the Offinso South Municipality only has the role of policy implementation where formulation remains with the Forestry Commission at the national level. Besides, an assessment of the sustainable forest management policies in the Municipality indicates that they are focused

on sustainable timber harvest rather than sustainable forest management. More importantly, it was revealed that the Forest Services Division in the Municipality does not know if the sustainable forest management policies correspond to any of the international conventions (example ITTO and ATO) that Ghana is a signatory to.

5.2 CONCLUSION

The study provides the basis for further explorative studies on sustainable forest management and poverty alleviation in a broader context. As explained earlier, the linkages between these variables have been inadequately explored over the years. This study has therefore laid a foundation through the application of appropriate quantitative and qualitative research methods. The quantitative assessment of NTFPs provides the basis for further assessment of the contribution of these products to the total monthly income of households in forest regions. The study estimated the percentage of contribution of NTFPs to the total monthly income of households and subsequently estimated how much NTFPs could contribute to reduce poverty rates in the study communities. This also forms the basis through which forest resources could be assessed in terms of poverty alleviation. The findings are also relevant in achieving the first Millennium Development Goal (MDGs) of reducing poverty and hunger by half by 2015. The study therefore provides the quantitative role of NTFPs in poverty alleviation.

The objectives, hypothesis and propositions of the study were sufficiently validated by the findings and results. Through both qualitative and quantitative assessment of poverty, the poverty rates, the perceptions, the manifestations and the coping strategies were identified in the study communities. In addition, the use of a quantitative assessment of the contribution of NTFPs to the total monthly income of households in the Offinso South Municipality was

realized. This is relevant in forest-based poverty alleviation policies. Also, the reduction of the income that is derived from the forest products was identified as the main effects of deforestation in the study communities.

Moreover, through the in-depth interviews and focus group discussions, it was realized that the communities are not adequately and practically involved in sustainable forest management practices in the Municipality; whereas the Forest Services Division is also limited in role.

Clearly, the hypothesis and propositions were verified by the findings of the survey. The study hypothesized that no significant difference exists between the number of poor households that consume NTFPs and the number of non-poor households that consumes NTFPs in the Offinso South Municipality. The result of the chi-square indicates that there is no significant difference between the number of poor households that consume NTFPs and the number of non-poor households that consume NTFPs (refer to Table 4.7). Moreover, it was proposed that deforestation is mainly caused by illegal logging in the Municipality. Considering the findings on the salient causes of deforestation, it was realized that almost half of the households' heads attributed deforestation to illegal logging (refer to Figure 4.2). This verifies that illegal logging is the major cause of deforestation in the Municipality.

5.3 POLICY RECOMMENDATIONS

This concluding and final section of the thesis aims at providing and discussing appropriate policies that policy makers and institutions should consider when designing sustainable forest management and poverty alleviation nexus policies in the Offinso forest district in Ghana. There is a consensus from the field that NTFPs provides income and food supplements for most households and need to be considered in pro-poor policy discourse. Based on the findings of the study and other suggestions from the heads of households and key informants, the following are recommended to the appropriate institutions for consideration.

5.3.1 Commercialization of NTFPs for Poverty Alleviation

The role of NTFPs in livelihood sustenance in the Offinso forest district cannot be overlooked. NTFPs contribute about 33 percent of the total monthly consumption of the households. Besides, it also contributes enormously to household food security by supplementing the food needs of the households during the lean farming seasons. Regardless of these, NTFPs have not been given the necessary attention in poverty alleviation discourse by the Municipal Assembly. Moreover, the 33 percent contribution is small considering the economic value of NTFPs in other forest-endowed countries in the developed world. The Ministry of Food and Agriculture in partnership with the Forest Services Division and the local government desk on Trade and Industry should commercialize the production of NTFPs through the adoption of a nation wide policy on NTFPs. In this way, NTFPs could be considered as an alternative resource base for lifting the poor out of income poverty and household food insecurity especially in the current vagaries of the weather, which do not support agricultural production. In addition, sustainable forest management policies

by the Forest Services Division should include the management of NTFPs to regulate their collection on a sustainable basis.

5.3.2 Local Involvement and the role of the FSD in Sustainable Forest Management

Communities are usually the purported beneficiaries of forestry initiatives. Therefore their contributions at the decision making level cannot be excluded. Involving communities in decision-making regarding forestry initiatives requires an integration of the economic and livelihood activities of the people in sustainable forest management policies. Thus, the Forest Services Division should make sustainable forest management initiatives in the Offinso forest district more pro-poor. Evidently poverty and deforestation in the district are interrelated. That is, any deforestation policy should tackle poverty first and then promote local interest in forest management. To promote local interest in forest management means integrating their livelihoods into forest management initiatives. The benefit of this is that the communities will realize the need to protect the forest resources; as protection of the forest implies safeguarding their livelihoods. In addition, the Forestry Commission should extend the role of the Forest Services Division as a decentralized institution to policy formulation.

5.3.3 SFM policies in the Municipality should focus more on Forest Management

Ghana is a signatory to some international conventions particularly those of the ITTO, ATO and European Union such as Forest Law Enforcement Governance and Trade (FLEGT) and the Reducing Emission from Deforestation and Forest Degradation (REDD) for sustainable forest management. However, the findings indicate that the SFM policies of the Municipality focus more on sustainable timber harvest rather than forest management. It is therefore recommended to the Forest Services Division that sustainable forest management policies should include the

management of all forest resources. Thus, the SFM policies at both the national and local levels should also be informed by these international conventions. If not, the current sustainable forest management policies in the Municipality could promote deforestation, illegal logging, destruction of farms and extinction of some NTFPs (refer to Table 4.17).

5.3.4 Adoption of the Community Forest model for SFM and Poverty Alleviation

The major findings of the study indicate that the overall poverty rate is about 60 percent with NTFPs contributing about 33 percent of the monthly consumption of households. In addition, deforestation is high with sustainable forest management policies focusing on sustainable timber harvest. Also the local people are not adequately involved in the sustainable forest management practices. Synchronizing all these major findings coupled with the challenges faced in the forest sector in the Municipality, the study recommends, to the Forestry Commission, for the adoption of the community forest model. This is because the model empowers the local communities in forest management for sustainable forestry and poverty alleviation.

This model so recommended, is seen as a more participatory or bottom-up approach that engages and empowers local communities and also enables them to take control, even through ownership, of both native forests and plantations (Harrison and Suh, 2004). It also grants forest management rights to communities as a tenure arrangement and promoting local interest and participation in forest management. This model promotes the adoption of the theory of community participation in forest management (refer to Figures 2.1 and 2.2). Community forestry posits that giving greater control to local people who are primarily dependent on forests would improve their livelihoods and reduce deforestation (Blay *et al.*, 2008). Through this model, there is evidence of

job creation, livelihood improvement and sustainable forestry in British Columbia and Ontario in Canada, and The Gambia and Cameroon in sub-Saharan Africa (UNCCD, 2000; Beauchamp and Ingram, 2011; BCCFA, 2012). Perhaps Ghana, where community forest ownership rights do not exist, can learn from the regional experiences, which actually represent the new paradigms in sustainable forest management throughout the world. The community forest model therefore has the prospects for sustainable forest management and income generation in forest regions. Finally, this would promote local interest and participation in forest management, which most sustainable forest management policies in Ghana have failed to address adequately.



REFERENCES

- Abram, C. (1971). *Language of Cities*. Viking Books. ISBN: 0670417823.
- Addison, T., Hulme, D. and Kanbur, R. (2009). *Poverty Dynamics. Interdisciplinary Perspectives*. Oxford university press. P. 61.
- Aduse-Poku, K., Nyinaku, F., Atiase, V., Awuah, R., Mensah, E.O., Nyantakyi, D., Owusu, H.K., Agyenim-Boateng, B. (2003). *Improving rural livelihoods within the context of sustainable development: case study of Goaso Forest District*. Tropenbos international Ghana.
- Ahenkan, A. and Boon, E. (2010). *Assessing the Impact of Forest Policies and Strategies on Promoting the Development of Non-Timber Forest Products in Ghana*. *Journal of Biodiversity*, 1(2): 85-102. Available at: <http://www.krepublishers.com/02-Journals/JBD/JBD-01-0-000-10-Web/JBD-01-2-000-10-Abst-PDF/JBD-01-2-085-10-009-Ahenkan-A/JBD-01-2-085-10-009-Ahenkan-A-Tt.pdf> (Retrieved 28th, July, 2012).
- Ahenkan, A. and Boon, E. (2008). *Enhancing Food Security, Poverty Reduction and Sustainable Forest Management in Ghana through Non-timber Forest Products Farming: Case Study of Sefwi Wiawso District*, published online by GRIN publishing to www.grin.com/de/preview/.html (Retrieved 15th, May, 2010).
- Ambus, L., Davis-Case, D. and Tyler, S. (2007). *Big expectations for small forest tenures in British Columbia*. *BC Journal of Ecosystems and Management* 8(2):46–57. Available at: http://www.forrex.org/publications/jem/ISS41/vol8_no2_art4.pdf
- Andel, T. V. (2006). *Non-timber forest products; the value of wild plants*. Available at: http://journeytoforever.org/farm_library/AD39.pdf.
- Angelstam, P. and Elbakidze, M. (2006). *Sustainable forest management in Europe's East and West: Trajectories of development and the role of traditional knowledge*. International Union of Forest Research Organizations (IUFRO). Conference proceedings. Volume II. P. 76
- Antwi, P. K. (2009). *Assessing the livelihood dependence of local communities on ecosystem services in Bobiri forest area of Ghana*. MSc. Thesis in Environmental Sciences Wageningen University and Research Centre. The Netherlands.
- Appiah, M., Blay, D., Damnyag, L., Dwomoh, F.K., Pappinen, A. and Luukkanen, O. (2009). *Dependence on Forest Resources and Tropical Deforestation in Ghana*. *Environment Development and Sustainability*, 11: 471-487.
- Appiah, O. D. (2009). *Personifying sustainable rural livelihoods in forest fringe communities in Ghana: A historic rhetoric?* *Journal of Food, Agriculture & Environment* Vol.7.
- Arnold, J. E. M. and Bird, P. (1999). *Forests and the poverty-environment nexus*. Prepared for the UNDP/EC Expert Workshop on Poverty and the Environment, Brussels.
- Arnstein, S. (1969). *A ladder of citizen participation*. *American Institute of Planners Journal*.
- Asamoah, A.K., Pinard, A.M., Cobbinah, R.J., Damnyag, L., Nutakor, E., Nketiah, S.K., Kyere, B. and Nyarko, C. (2007). *Chainsaw milling and trade in West Africa. Socio-economic impact of chainsaw milling and the lumber trade in Ghana*. DFID, Renewable Natural Resource Research Strategy (RNRRS) (FRP) PMP 05-08. Natural Resource International, UK.
- Asare, A. (2011). *Challenges to Sustainable Forest Management in Ghana: Analysis of Initiatives and the Way Forward*. International Seminar on Challenges of Sustainable Forest Management – Integrating environmental, social and economic values.
- Baatuuwie, N. B. and Van Leeuwen, I. L. (2011). *Evaluation of three classifiers in mapping forest stands types using medium resolution imagery: A case study in the Offinso Forest District, Ghana*. *African Journal of Environmental Science and Technology* Vol. 5(1).

- Baffoe, A. (2009). Certification: implications for sustainable forest management and timber export trade in Ghana. Unpublished Msc thesis. Louisiana State University and Agricultural and Mechanical College. P.14.
- BCCFA. (2012). Status of Community Forestry in BC. Available at:
http://www.bccfa.ca/index.php?option=com_k2&view=item&layout=item&id=98&Itemid=3
- Beauchamp, E. and Ingram, V. (2011). Impacts of community forests on livelihoods in Cameroon: Lessons from two case studies. *International Forestry Review* Vol.13 (3), 1. Available at: <http://www.commdev.org/userfiles/AIngram1101.pdf>
- Belcher, B. M. (2005). Forest product markets, forests and poverty reduction. *International Forestry Review* Vol. 7 (2). P.3.
- Blay, D. B., Duran, E., Ramos, V.H., Mas, J.F., Velazquez, McNab, A. R., Barry, B.D. and Radachowsky, J. (2008). Tropical deforestation, community forests, and protected areas in the Maya Forest. *Ecology and Society* 13(2): 56. Available at: <http://www.ecologyandsociety.org/vol13/iss2/art56/>
- Bosu, P. P., Foli, E. G., Djagbletey, G., Ametsitsi, G., Addo-Danso, S.D., Cobbinah, J.R., Nkrumah, E. E. and Bandoh, P.K. (2010). Assessment of coping and adaptation strategies to the effects of climate change in the Offinso North and South districts, Ashanti Region, Unpublished report.
- Bourguignon, F. and Chakravarty, S. R. (2003). The Measurement of Multidimensional Poverty. *Journal of Economic Inequality*, 1(2): 1569–721.
- BRIDGE (2001). Briefing paper on the ‘feminisation of poverty’ Prepared by BRIDGE for the Swedish International Development Cooperation Agency (Sida). BRIDGE (development - gender) Institute of Development Studies.
- Byron, R. N. and Arnold, J. E. (1999). What futures for the people of the tropical forests? *World Development*.
- Canadian Forest Products Ltd. (2006). Sustainability: Sustainable Forest Management <http://www.canfor.com/sustainability/management.asp>.
- Canagarajah, S. and Pörtner, C.C. (2003). Evolution of Poverty and Welfare in Ghana in the 1990s: Achievements and Challenges. *Africa Region Working Paper Series* No. 61.p 12.
- Cannan, C. (1997). The Struggle against Social Exclusion: Urban Social Development in France. *IDS Bulletin*, 28(2), 77–85.
- CARE International (2004). Study of Ghana’s forest sector policies, laws, rules and regulations. CARE International.
- Carney, D. (1998). Implementing the Sustainable Rural Livelihoods Approach. *Sustainable Rural Livelihoods: What contribution can we make?* D. Carney. London, DFID: 3-23.
- Carter, J. and Gronow, J. (2005). Recent experience in collaborative forest management: a review paper. CIFOR Occasional Paper.
- Castañeda, F. (2000). Criteria and indicators for sustainable forest management: international processes, current status and the way ahead. *Unasylva* 203, Vol. 51, p
- Castañeda, F., Palmberg-Lerche C., and Vuorinen, P., (2001). Criteria and Indicators for Sustainable Forest Management: A Compendium. Unpublished forest Management Working Papers, Working Paper 5. Forest Resources Development Service, Forest Resources Division. FAO, Rome.
- Center for International Forest Research (CIFOR) (2005). Contributing to Africa’s development through Forests Strategy for Engagement in sub-Saharan Africa, Center for International Forestry Research, Bogor, Indonesia 35 pp.

- Chauhan, R. N. (2007). *Global Forest Resources (Geographical Approach)*. Oxford Book Company.
- Clark, D. and Hulme, D. (2005). Towards a unified framework for understanding the depth, breadth and duration of poverty. Working Paper No. 20, Global Research Group, Institute for Development Policy and Management, University of Manchester, UK.
- Coufal, J. (1999). "Sustain, sustainable, sustained" *New York Forest Owner* 37(3):9.
- Decent Work Pilot Programme (DWPP) (2005). Working out of poverty in Ghana: A case study of the Ghana Decent Work Pilot Programme. National Policy Group. Decent Work Pilot Programme.
- Donkor, B. N. and Vlosky, R. P. (2003). A review of the forestry sector in Ghana. Louisiana Forest Products Development Center Working Paper no.61 .August 20, 2003.
- Duinker, N.P., Matakala, P.W., Chege, F. and Bouthillier, L. (1994). Community forests in Canada: An overview. *The Forest Chronicle*, Vol.70. No.6.
- Elias, E. (2004).The Tarapoto processes: Establishing criteria and indicators of the sustainable management of the Amazon forest. *Unasylva* 218, Vol. 55.p 1.
- Ellis, F. (1998). Livelihood Diversification and Sustainable Rural Livelihoods. *Sustainable Rural Livelihoods: What contribution can we make?* D. Carney. London, DFID: 53-65.
- Ennals, A. M., Jørgensen, I. and Day, C. (2003).The Emerging Role of Forestry as an Important Tool in Poverty Alleviation: A role for Norwegian development assistance? *Noragric Report* No. 11.
- FAO (2009). State of the world's forests 2009. Available online at: <ftp://ftp.fao.org/docrep/fao/011/i0350e/i0350e.pdf>.
- FAO (2005). Impacts of Policies on Poverty. The Definition of Poverty. Food and Agriculture Organization of the United Nations, FAO. Italy.
- FAO (2005). State of the World's Forests 2005. FAO, Rome, Italy. Available at: <http://www.fao.org/docrep/007/y5574e/y5574e00.htm>. Accessed on 4th May, 2011.
- FAO (2004). FAO Global forest resources assessment update 2005 Terms and definitions (Final version), Food and Agriculture Organization of the United Nations, Rome. Available at: <http://www.fao.org/docrep/007/ae156e/AE156E00.htm#TopOfPage>. Accessed on 20th. Nov.2011
- FAO (2003). Workshop on Tropical Secondary Forest Management in Africa: Reality and Perspectives. FAO, Rome, Italy. Available at: <http://www.fao.org/DOCREP/006/J0628E/J0628E00.HTM>.
- FAO (2002). Forest-based Poverty Reduction: A Brief Review of Facts, Figures, Challenges and Possible Ways Forward. Paper prepared for the International Workshop on "Forests in poverty reduction strategies: Capturing the potential. Tuusula, Finland.
- FAO (2000). Global forest resources assessment main report. FAO Forestry Paper. Available at: <ftp://ftp.fao.org/docrep/fao/003/Y1997E/FRA%202000%20Main%20report.pdf>.
- FAO (2011). Measuring forest degradation. *Unasylva* No. 238. Vol. 62, 2011/2. Available at: <http://www.fao.org/docrep/015/i2560e/i2560e00.htm>
- Fearnside, P. M. (2008). Amazon Forest Maintenance as a Source of Environmental Services. *Annals of the Brazilian Academy of Sciences*. (2008) 80(1): 101-114.
- Foli, E. and Makungwa, S. (2011). Enhancing adaptation of forests and people in Africa. Development of Pilot Cases for Selected Forest Ecosystems in Ghana and Malawi. Forestry Research Network of sub-Saharan Africa (FORNESSA).

- Forestry Commission of Ghana (FC) (1994). Forest and Wildlife Policy, 1994, Forestry Commission, Accra, PP 1-7.
- FRA (2010). Global forest resources assessment updates 2010. FAO Forestry Paper 163. FAO, Rome. Available at: <http://www.fao.org/docrep/013/i1757e/i1757e.pdf>;
- Ghana Poverty Reduction Strategy (2003-2005). Available at: http://www.pdaghana.com/images/stories/ReferenceMaterials/ghana_prsp.pdf
- Ghana Statistical Service (2000). Poverty trends in Ghana in the 1990's pp. 1- 10. Available at <http://siteresources.worldbank.org/INTLSMS/Resources/3358986-1181743055198/3877319-1190217341170/PovProf.pdf>
- Ghana Statistical Service (GSS) (2007). Key social economic and demographic indicators. www.statsghana.gov.gh/keySocial.html, Accessed on 8th August, 2011.
- Ghana Statistical Service (GSS) (2007). Pattern and Trends of Poverty in Ghana 1991-2006. Ghana Statistical Service, Accra.
- Ghana Statistical Service (2008). Ghana Living Standards Survey Report of the Fifth Round (GLSS 5), GSS, Accra. Ghana. Available online at http://www.statsghana.gov.gh/docfiles/glss5_report.pdf
- Gomez, B. and Jones, P.J. (2010). Research methods in Geography. John Wiley & Sons Ltd.
- Gondo, P.C. (*undated*). The role of micro-financing in sustainable forest management. Available: <http://staging.globalmechanism.org/dynamic/File/THE%20ROLE%20OF%20MICROFINANCE%20first%20draft220609%5B1%5D.pdf>
- Gondo, P. C. (2010). Financing of sustainable forest management in Africa: An overview of the current situation and experiences. Southern Alliance for indigenous resources (SAFIRE).
- Government of Ghana (2006). Offinso District Assembly Medium-Term District Development Plan (2006-2009), District Planning Coordinating Unit, Offinso District.
- Gunter, S., Weber, M., Stimm, B., and Mosand, R. (2011). Silviculture in the Tropics. Springer-Verlag Berlin Heidelberg. P 4.
- Gutman, P. (2001). Forest conservation and the rural poor: A call to broaden the conservation agenda. WWF Macroeconomics for Sustainable Development Program Office, Washington, D.C.
- Hapsari, A. (2010). Assessing and Mapping Ecosystem Services in Offinso District, Ghana. Msc thesis, International Institute for Geo-information and Earth Observation, Netherlands.
- Hoogenbosch, L. (2010). Forest plantations and livelihoods in Ghana's High Forest Zone. Msc thesis, University of Amsterdam. Netherlands.
- Harrison, S.R. and Suh, J. (2004). Progress and Prospects of Community Forestry in Developing and Developed Countries. Small-scale Forest Economics, Management and Policy, 3(3): 287-302, 2004.
- Hulme, D., Moore, K. and Shepherd, A. (2001). Chronic poverty: meanings and analytical frameworks. Chronic Poverty Research Centre (CPRC) Working Paper 2. P 9.
- Hyde, W. F. (2007). Limitations of sustainable forest management: an economics perspective. Centre for International Forestry Research, Bogor, Indonesia. P.1
- IIFM-ITTO (2004). Criteria and Indicators India update, Quarterly Newsletter of IIFM-ITTO project on Criteria and Indicators for Sustainable Forest Management in India. Volume 2, No. 3, March 2004. ISSN 0972 – 6314.
- IISD (1996). Countdown Forests 97. A briefing series of the International Institute of Sustainable Development. Available online at: <http://iisd1.iisd.ca/forests/countdown/>. Accessed on 4th. Nov. 2011.

- Institute of Statistical, Social, and Economic Researches (ISSER) (2007). Offinso District Human Development report 2007. UNDP Ghana.
- ITTO (2006). Status of tropical forest management 2005. ITTO Technical Series No 24.
- ITTO (2007). Strengthening Monitoring, Assessment and Reporting (MAR) on Sustainable Forest Management (SFM) in Asia (GCP/INT/988/JPN). MAR-SFM Working Paper 5 / 2007.
- ITTO (2011). Revised ITTO guidelines for the sustainable management of natural tropical forests. International Tropical Timber Council committee on reforestation and forest management. ITTO paper. Available at:
http://www.itto.int/direct/topics/topics_pdf_download/topics_id=2783&no=0
- ITTO (1999). Tropical forest update. Yokohama, Japan. International Tropical Timber Organization.
- ITTO (2005). Status of Tropical Forest Management 2005, ITTO Technical Series No 24, 2006. Available at:
http://www.itto.int/direct/topics/topics_pdf_download/topics_id=2645&no=0&disp=inline
- Kassie, W. (2011). Building Community Competence for Public Health. Prepared for a panel discussion at the 139th APHA Conferences in Washington DC. Available at:
<https://apha.confex.com/apha/139am/webprogram/Handout/Paper253741/BUILDING%20COMMUNITY%20COMPETENCE.pdf>
- Lindberg, K., Furze, B., Staff, M. and Black, R. (1997). Ecotourism and other services derived from forests in the Asia-Pacific Region: Outlook to 2010. Asia-Pacific Forestry Sector Outlook Study Working Paper Series No: 24.
<ftp://ftp.fao.org/docrep/fao/W7714E/W7714E00.pdf>
- Lui, K. and Lu. C. (1992). Sustainable Land Use and Sustainable Development: Critical Issues. Issues in Agricultural Development. Bellamy, Greenshields, Bruce, editors. IAAE Occasional Paper, no. 6. Aldershot, U.K.
- Marfo, E. and Acheampong, E. (2011). Estimating the Number of Jobs created by chainsaw activities in Ghana. Ghana Journal of Forestry. Vol. 27.
- Masses, S. (1995). Community forestry: concept, application and issues. Natural Resources Canada, Canadian Forest Service. Ste-Foy
- Ministry of Land and Forestry (1994). Forest and wildlife policy, Republic of Ghana, 24th November 1994. Ministry of Lands and Forestry, Accra – Ghana.
- Narayana, G. R. (2002). Empowering communities through participatory methods. Manak Publications, ISBN8178270501, 9788178270500
- National Development Planning Commission (NDPC) and United Nations Development Programme (UNDP) (2010). 2008 Ghana Millennium Development Goals report. p.3.
- NCFC (1996). National Working Group on Forest Certification on Forests in Ghana. Case Study No. 4. Ministry of Lands and Forestry, Kumasi.
- Noss, R. F. (1993). Sustainable forestry or sustainable forests? In: Defining Sustainable Forestry. G. H. Aplet, N. Johnson, J. T. Olson, and V. A. Sample, eds. Washington, D.C.: Island Press. pp. 17, 43.
- Obayelu, O. A. and Awoyemi, T. T. (2010). Spatial dimension of poverty in rural Nigeria. Journal of Development and Agricultural Economics Vol. 2(6), pp. 231-244.
- Offinso South Municipal Profile (OSMP): The 2010-2013 Medium-Term Development Plan.

- Okali, D. and Eyog-Matig, O. (2004). Rain forest management for wood production in West and Central Africa; Lessons Learnt on Sustainable Forest Management in Africa KSLA/AFORNET/FAO PROJECT.P.3
- Oksanen, T., Pajari, B., Tuomasjukka, T. (2003). Forests in Poverty reduction strategies: Capturing the Potential. European Forest Institute (EFI) Proceeding No.47.
- Opoku, K. (2006). Forest Governance in Ghana, An NGO perspective. A report produced for FERN by Forest Watch Ghana, March 2006.
- Osei-Tutu, P., Nketiah, K., Kyereh, B., Owusu-Ansah, M. and Faniyan, J. (2010). Hidden forestry revealed: Characteristics, constraints and opportunities for small and medium forest Enterprises in Ghana. IIED Small and Medium Forest Enterprise Series No. 27. Tropenbos International and International Institute for Environment and Development, London, UK.
- Panayotou, T. and Ashton, P.S. (1992). Not by Timber Alone: Economics and Ecology for Sustaining Tropical Forests. Washington, DC: Island Press.
- Pearce, D., Putz, F.E., and Vanclay, J.K. (1999). A sustainable forest future? Final Draft July.
- Porter-Bolland, L., Ellis, E. A., Guariguata, M. R., Ruiz-Mallén, I., Reyes-García, V. (2011). Community managed forests and forest protected areas: An assessment of their conservation effectiveness across the tropics. *Forest Ecology and Management*. P.1.
- Prabhu, R., Colfer, C. J. P. and Dudley, R. G. (1999). Guidelines for Developing, Testing and Selecting Criteria and Indicators for Sustainable Forest Management. A C&I Developer's Reference, CIFOR. The Criteria & Indicators Toolbox Series.
- Rebugio, L. L. (2000). Role of Forestry Education in Sustainable Forest Management. Proceedings of the Workshop on Sustainable Forest Management and People to People Exchange Between Asia and Europe, University of Joensuu, Finland, 5-6 July 1999.
- Rowson, M., (2001). Poverty and health. *Student British Medical Journal*, Vol. 9. p2.
- Sayer, J.A. Vanclay, J.K. and Byron, N. (1997). Technologies for Sustainable Forest Management: Challenges for the 21st Century: Center for International Forestry Research (CIFOR). Commonwealth Forestry Congress. Occasional Paper No. 12, p 5.
- Scherr, S. J., White, A. and Kaimowitz, D. (2003). Making markets work for forest communities. *International Forestry Review*.
- Shackleton, C. M., Shackleton, S. E., Buiten, E. and Bird, N. (2007). The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa. *Forest Policy and Economics* 9:558-577.
- Spilsbury, M. J. (2005). The sustainability of forest management: assessing the impact of CIFOR's Criteria and Indicators research. Center International Forest Research, 126p
- Street, W. V. and Price, S. (2009). Advancing poverty reduction and rural livelihoods through sustainable commercial forestry. A TFD Publication No. 4.
- Sunderlin, W. D. Angelsen, A. Belcher, B. Burgers, P. Nasi, R. Santoso, L. and Wunder, S. (2005). Livelihoods, forests, and conservation in developing countries: an overview. *World Development*.
- Thompson, I., Mackey, B., McNulty, S., and Mosseler, A. (2009). Forest Resilience, Biodiversity, and Climate Change. A synthesis of the biodiversity/resilience/ stability relationship in forest ecosystems. Secretariat of the Convention on Biological Diversity, Montreal. Technical Series no. 43, 67 p.
- Tokle, S. and Danso, E.Y. (2007). Joint Evaluation of the GEF Small Grants Programme. Country Program Case Study: Ghana. GEF Evaluation Office. UNDP Evaluation Office

- Townsend, I. and Kennedy, S. (2004). Poverty: Measures and Targets. Home of commons research paper 04/23.p.13.
- Townsend, P. (2006). What is poverty? Concepts and measures: An historical perspective. International Poverty Centre. Poverty in Focus.
- Tropenbos International (2005). Alternative Livelihoods and Sustainable Resource Management. Proceedings of a workshop held in Akyawkrom, Ghana, on the 1st of April 2005. Tropenbos International Ghana Workshop Proceedings 4, edited by D. K. B. Inkoom, K. Okae Kissiedu and B. Owusu Jnr. Wageningen, the Netherlands.
- UNCCD (2000). National Action Programme To Combat Desertification (NAP). The Government of The Gambia. United Nations Convention to Combat Desertification (UNCCD). Available at: <http://www.unccd.int/ActionProgrammes/gambia-eng2000.pdf>
- United Nations (2010). Rethinking Poverty. Report on the World Social Situation 2010. Department of Economic and Social Affairs. United Nations publication. P.8.
- United Nations Conference on Environment and Development, (UNCED) (1992). United Nations Conference on Environment and Development document: Combating Desertification. U.N Doc. A/CONF. 151/26 (Vol.1) (1992).
- United Nations Economic Commission for Africa (2005). Poverty profiles. A methodological note on measuring poverty. Working Paper. P3.
- United Nations Forum on Forests (2007). Enabling Sustainable Forest Management: Strategies for equitable development, for forests, for people. United Nations Forum on Forests Secretariat Publication. New York. P.4.
- United Nations General Assembly Resolution 62/98, New York, December (2007). http://www.un.org/esa/forests/pdf/session_documents/unff7/UNFF7_NLBI_draft.pdf. Accessed on 20th November, 2011.
- United Nations Statistics Division (UNSD) (2005). Handbook on poverty statistics: Concepts, methods and policy use special project on poverty statistics.
- United States Department of Agriculture (USDA). (2004). National Report on Sustainable Forests 2003. United States Department of Agriculture.
- Vedeld, P., Angelsen, A. Sjaastad, E. and Kobugabe, B. G. (2004). Counting on the environment: forest incomes and the rural poor. Environmental Economics Series Number 98. World Bank, Washington, D.C., USA.
- Verweij, P., Schouten, M., Beukering, P., Triana, J., Leeuw K. and Hess, S. (2009). Keeping the Amazon forests standing: a matter of values. WWF-Netherlands, Zeist. P. 9.
- Wackernagel, M., Kitzes, J. Cheng, D. Goldfinger, S. Espinas, J. Moran, D. Monfreda, C. Loh, J. Gorman, O. D. and Wong, I. (2005). Asia-Pacific 2005 - The Ecological Footprint and Natural Wealth. WWF, Global Footprint Network, Kadoorie Farm and Botanic Garden.
- Wagle, U. (2008). Multidimensional poverty measurement. Concepts and applications. Springer Science +Business Media, LLC.
- Walia, J. S. (2007). Sustainable Forest Management in Himachal Pradesh: Balancing conservation, production and use of forest goods and services for livelihood options and poverty alleviation. World Forest Institute. World forest center. P. 16.
- Wates, N. (2000). The Community Planning Handbook: How people can shape their cities, towns & villages in any part of the world Hastings, United Kingdom. Earthscan, London.
- World Bank (1990). World Development Report 1990: Poverty. New York: Oxford University Press.
- World Bank (2000). Attacking Poverty: World Development Report, 2000.

- World Bank (2001). World development report. Oxford: Oxford University Press.
- World Bank (2002). A Sourcebook for poverty reduction strategies. Volume 1: Core Techniques and Cross-Cutting Issues. The World Bank. Washington DC
- World Bank (2008). 2008 World development indicators. Poverty data a supplement to World Development Indicators 2008. The World Bank, Washington DC.
- World Bank Institute (2005). Introduction to poverty analysis. Poverty Manual, All, JH Revision of August 8, 2005.p 9.
- World Bank (2001a). Attacking Poverty. World Development Report 2000/2001. Washington, DC: World Bank.
- World Bank (2001b). Measurement and Meaning. Combining Quantitative and Qualitative Methods for the Analysis of Poverty and Social Exclusion in Latin America World Bank. Technical Paper no. 518. P1
- World Bank (2003). World Development report 2003,” World Bank and Oxford University Press, Washington DC.
- World Bank (2004). Sustaining Forests: A Development Strategy. Washington, DC: World Bank. Available at:
<http://siteresources.worldbank.org/INTFORESTS/Resources/SustainingForests.pdf>
- World Commission on Environment and Development (WCED). (1987). Our common future. New York: Oxford University Press.
- World Growth (2009). Forestry and The Poor: How forestry reduces poverty. A World Growth Report August 2009.
- World Health Organization (2002). Community participation in local health and sustainable development. Approach and Techniques. Available at:
http://www.euro.who.int/_data/assets/pdf_file/0013/101065/E78652.pdf
- Yemiru, T., Roos, A., Campbell, B. M. and Bohlin, F. (2010). Forest incomes and poverty alleviation under participatory forest management in the Bale Highlands, Southern Ethiopia. International Forestry Review Vol.12 (1).
- Yiridoe, E. K. and Nanang, D. M. (2001). An Econometric Analysis of the causes of tropical deforestation: Ghana. Selected paper presented at the American Agriculture Economics Association conference, Chicago.

APPENDIX
SAMPLE QUESTIONNAIRE

DEMOGRAPHIC CHARACTERISTICS OF HOUSEHOLD HEADS

1.Respondents's relation with head of household	1.Head		
	2.Spouse		
	3.Daughter/son		
	4.Parents		
	5.Other (specify)		
2. Gender of household head	1.Male		
	2. Female		
3. Age of household's head	1. 15-25 years		
	2. 26-35 years		
	3. 36-45 years		
	4. 46-55 years		
	5. 56-65 years		
	6. 66+ years		
4a). Were you/she/he born here	1. Yes [] 2. No []		
4b). If no where were you/she/he born	Hometown	Region	
.....			
5. Head of Household's educational level	1. No formal education		
	2. Primary		
	3. JHS/Middle Sch.		
	4. SHS/Tec/voc		
	5. Tertiary		
	6. Other, (specify)		
6.Marital Status of head of household	1. Married		
	2. Single		
	3. Widow/widower		
	4. Divorced		
7. Size of Household <i>(A household is a person living alone or a group of people who eat from the same pot) GLSS, 2005/06.</i>	1. 1-5		
	2. 6-10		
	3. 11-15		
	4. 16		
	5. 20+		
8. Type of Household	1. Single Household		
	2. Multiple Household		

If a multiple household, which of these members constitute your household?	1.Couple only	☐
	2.Parents with children	☐
	3.Couple and other relatives	☐
	4.Parents, children and other relatives	☐

HOUSEHOLD POVERTY ASSESSMENT

9. Main (Primary) occupation	1.Farming	
	2.Teaching	
	3.Wood processing	
	4.Chainsaw operation	
	5.Carpentry	
	6.Dressmaking	
	7.Charcoal Production	
	8.Herbal Medicine production	
	9.Trading	
	10.Food vending	
	11.None	
	12.Others (specify)	
10. Secondary occupation 1. Yes ☐ 2. No ☐ If NO move to Q12	1.Farming	
	2.Teaching	
	3.Wood processing	
	4.Chainsaw operation	
	5.Carpentry	
	6.Dressmaking	
	7.Charcoal Production	
	8.Herbal Medicine production	
	9.Trading	
	10.Food vending	
	11.None	
	12.Others (specify)	
11. What type of crops do you cultivate? If farming is your primary/secondary occupation	1.Food crops (yam, vegetable, plantain,)	
	2.Cocoa	
	3.Agro-forestry (Teak, etc)	
	4.Food crops and Agro-forestry	
	5.Cocoa and Agro-forestry	
	6.Food crops and Cocoa	
	7.Food crops, cocoa and Agro-forestry	
	8.Other (specify)	
12. What is the average monthly income of the household? <i>Amount could be asked in seasons or years and convert into monthly income</i>	GH¢.....	

13. Which member of the household contributes much to the household income and how much? <i>This refers to the members of the household present at the time of the survey.</i>	<table border="1"> <thead> <tr> <th>Relative</th><th>Amount GH¢</th></tr> </thead> <tbody> <tr><td>1.Head</td><td></td></tr> <tr><td>2.Spouse</td><td></td></tr> <tr><td>3.Daughter/son</td><td></td></tr> <tr><td>4.Parents</td><td></td></tr> <tr><td>5.Nephews</td><td></td></tr> <tr><td>6. Others (specify)</td><td></td></tr> </tbody> </table>	Relative	Amount GH¢	1.Head		2.Spouse		3.Daughter/son		4.Parents		5.Nephews		6. Others (specify)											
Relative	Amount GH¢																								
1.Head																									
2.Spouse																									
3.Daughter/son																									
4.Parents																									
5.Nephews																									
6. Others (specify)																									
14. How will you describe your monthly income?	<table border="1"> <tbody> <tr><td>1. Adequate</td><td></td></tr> <tr><td>2. Inadequate</td><td></td></tr> </tbody> </table>	1. Adequate		2. Inadequate																					
1. Adequate																									
2. Inadequate																									
15. Do you receive (daily, monthly, yearly) remittances from relatives who are not part of your household?	1. Yes [] if yes how much..... Monthly 2. No []																								
16. How will you describe the frequency of your income?	<table border="1"> <tbody> <tr><td>1. Regular</td><td></td></tr> <tr><td>2. Not regular</td><td></td></tr> </tbody> </table> If not regular why..... 	1. Regular		2. Not regular																					
1. Regular																									
2. Not regular																									
17. How much does your household spend on these items monthly and what percentage of your monthly income is spent on each of them? Total monthly expenditure GH¢..... <i>All expenses on the listed items plus the all other expenses should add up to the total monthly expenditure.</i> <i>Total monthly expenditure should not be greater than total monthly income range in Q12.</i>	<table border="1"> <thead> <tr> <th>Item</th><th>Amount</th><th>%</th></tr> </thead> <tbody> <tr><td>Food (rice, maize, meat, fish, vegetable milk, egg oil etc)</td><td></td><td></td></tr> <tr><td>Water (for cooking, drinking and bathing)</td><td></td><td></td></tr> <tr><td>Rent and Bills (Electricity, etc)</td><td></td><td></td></tr> <tr><td>Energy(charcoal,firewood,LPG)</td><td></td><td></td></tr> <tr><td>Education (fees,books,uniform)</td><td></td><td></td></tr> <tr><td>Health care (Orthodox & Herbal NHIS inclusive)</td><td></td><td></td></tr> <tr><td>All other expenses</td><td></td><td></td></tr> </tbody> </table>	Item	Amount	%	Food (rice, maize, meat, fish, vegetable milk, egg oil etc)			Water (for cooking, drinking and bathing)			Rent and Bills (Electricity, etc)			Energy (charcoal,firewood,LPG)			Education (fees,books,uniform)			Health care (Orthodox & Herbal NHIS inclusive)			All other expenses		
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Education (fees,books,uniform)																									
Health care (Orthodox & Herbal NHIS inclusive)																									
All other expenses																									
18. Are you able to meet all these expenses monthly?	1. Yes [] 2. No. [] Give reason (s) 																								
19. If No, how do you meet them?	<table border="1"> <tbody> <tr><td>1. Borrow from relatives and friends</td><td></td></tr> <tr><td>2. Beg from relatives and friends</td><td></td></tr> <tr><td>3. Purchase item on credit (food, water, energy, etc)</td><td></td></tr> <tr><td>4. Stay without item</td><td></td></tr> <tr><td>5. other specify</td><td></td></tr> </tbody> </table>	1. Borrow from relatives and friends		2. Beg from relatives and friends		3. Purchase item on credit (food, water, energy, etc)		4. Stay without item		5. other specify															
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2. Beg from relatives and friends																									
3. Purchase item on credit (food, water, energy, etc)																									
4. Stay without item																									
5. other specify																									

20. How will you describe the current financial situation of your household?	1. Very poor	
	2. Poor	
	3. Not poor	
	Give reason (s).....	
21. How will you describe your household financial situation over the past 2 years? Give reason (s).....	1.Improving	
	2.Worsening	
	3. Same	

FOREST PRODUCTS AND INCOME GENERATION

22. How will you describe your dependency on forest products?	1.Directly only				
	2.Indirectly only				
	3.Both direct & Indirect				
	3.None				
Give reason (s)					
23. How long has your household been depending on forest products?	1.less than a year				
	2.1-5 years				
	3.6-10 years				
	4.11-15 years				
	5.16+ years				
	6. Other (specify)				
24. Which category of forest products does your household mostly depend on?	1.Timber products				
	2.Non-timber forest products (NTFPs)				
	3. Both				
	Give reason (s).....				
25. Identify and quantify in terms of income the types of forest products your household depend on all year round ?			Products	Quantity	GH¢
	1		Mushroom		
	2		Bush meat		
	3		Snails		
	4		Honey		
	5		Leaves		
	6		Chewing sticks		
	7		Canes		
	8		Medicinal Plants		
	9		Pestle		
	10		Fuel wood		

26. What would you say about the quantity of these forest products for the past 5-10 year	<table border="1"> <tr><td>1.Reduction in quantity</td><td></td></tr> <tr><td>2.Increase in quantity</td><td></td></tr> <tr><td>3.The same</td><td></td></tr> <tr><td>4. Can't assess</td><td></td></tr> </table>	1.Reduction in quantity		2.Increase in quantity		3.The same		4. Can't assess			
1.Reduction in quantity											
2.Increase in quantity											
3.The same											
4. Can't assess											
27. What does your household use these forest products for?	<table border="1"> <tr><td>1.Household uses (food products)</td><td></td></tr> <tr><td>2. Income generation</td><td></td></tr> <tr><td>3. Construction (Building)</td><td></td></tr> <tr><td>4. All the three</td><td></td></tr> <tr><td>5.Other uses</td><td></td></tr> </table>	1.Household uses (food products)		2. Income generation		3. Construction (Building)		4. All the three		5.Other uses	
1.Household uses (food products)											
2. Income generation											
3. Construction (Building)											
4. All the three											
5.Other uses											
28. When does your household mostly depend on these forest products?	<table border="1"> <tr><td>1. Off-farming (dry) season</td><td></td></tr> <tr><td>2. Farming (rainy) season</td><td></td></tr> <tr><td>3. Anytime Available</td><td></td></tr> </table> Give reason(s)..... 	1. Off-farming (dry) season		2. Farming (rainy) season		3. Anytime Available					
1. Off-farming (dry) season											
2. Farming (rainy) season											
3. Anytime Available											
29. What is your overall assessment of forest products to your household?	<table border="1"> <tr><td>1. Extremely important</td><td></td></tr> <tr><td>2.Very important</td><td></td></tr> <tr><td>3. Moderately important</td><td></td></tr> <tr><td>4.Slightly important</td><td></td></tr> <tr><td>5.Not important at all</td><td></td></tr> </table> Give reason (s)..... 	1. Extremely important		2.Very important		3. Moderately important		4.Slightly important		5.Not important at all	
1. Extremely important											
2.Very important											
3. Moderately important											
4.Slightly important											
5.Not important at all											
30. How will your describe the relationship of forest products and income generation to your household?	<table border="1"> <tr> <td>1.V.Strong</td> <td>2.Strong</td> <td>3.Don't Know</td> <td>4.Weak</td> <td>5. V. weak</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	1.V.Strong	2.Strong	3.Don't Know	4.Weak	5. V. weak					
1.V.Strong	2.Strong	3.Don't Know	4.Weak	5. V. weak							
31. Which of the following best describes the relationship of your household with forest products?	<table border="1"> <tr><td>1.Highly dependent</td><td></td></tr> <tr><td>2.Dependent</td><td></td></tr> <tr><td>3.Mild dependent</td><td></td></tr> <tr><td>4.Low dependent</td><td></td></tr> <tr><td>5. Don't depend</td><td></td></tr> </table> Give reason (s)..... 	1.Highly dependent		2.Dependent		3.Mild dependent		4.Low dependent		5. Don't depend	
1.Highly dependent											
2.Dependent											
3.Mild dependent											
4.Low dependent											
5. Don't depend											

DEFORESTATION AND FOREST DEGRADATION

32. How do you perceive Deforestation?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1.Loss of forest cover</td> <td style="width: 20%;"></td> </tr> <tr> <td>2.Felling of tree</td> <td></td> </tr> <tr> <td>3.Extinction of tree</td> <td></td> </tr> <tr> <td>4.Changing forest to savanna</td> <td></td> </tr> <tr> <td colspan="2">5.Other (Specify)</td> </tr> </table>	1.Loss of forest cover		2.Felling of tree		3.Extinction of tree		4.Changing forest to savanna		5.Other (Specify)	
1.Loss of forest cover											
2.Felling of tree											
3.Extinction of tree											
4.Changing forest to savanna											
5.Other (Specify)											
33. Is your answer in Q 32 occurring or taking place here?	1. Yes [] 2.No [] Give reason (s).....										
34. What has been the major cause of deforestation in this area for the past 10 years? <i>Please chose only (one answer) what you think has been the major cause of deforestation</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1.Farming (Slash/Burn)</td> <td style="width: 20%;"></td> </tr> <tr> <td>2.Forest fires/ Bush burning</td> <td></td> </tr> <tr> <td>3.Illegal logging/chainsaw operation</td> <td></td> </tr> <tr> <td>4.Charcoal production</td> <td></td> </tr> <tr> <td colspan="2">5.Other (specify)</td> </tr> </table> Give reason(s).....	1.Farming (Slash/Burn)		2.Forest fires/ Bush burning		3.Illegal logging/chainsaw operation		4.Charcoal production		5.Other (specify)	
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3.Illegal logging/chainsaw operation											
4.Charcoal production											
5.Other (specify)											
35. In your own opinion, what is the rate of deforestation in this area?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1.Very High</td> <td style="width: 20%;"></td> </tr> <tr> <td>2.High</td> <td></td> </tr> <tr> <td>3.Low</td> <td></td> </tr> <tr> <td>4.Very low</td> <td></td> </tr> <tr> <td>5.Don't Know</td> <td></td> </tr> </table> Give reason (s).....	1.Very High		2.High		3.Low		4.Very low		5.Don't Know	
1.Very High											
2.High											
3.Low											
4.Very low											
5.Don't Know											
36. Has there been a reduction in the forest cover for the past ten years?	1. Yes [] 2.No [] Give reason (s).....										

37. Do you think in one way or the other your activities may contribute to the decline in size of forest cover?	1.Yes [] 2.No [] Whether YES or NO what activities do you engage in? 																		
38. In harvesting proceeds from the forest do you have in mind leaving some for your children unborn?	1.Yes [] 2.No [] Give reason (s) 																		
39. To what extent do you agree that there has been a reduction in the following?	<table border="1"> <thead> <tr> <th></th> <th>1.Strongly Agree</th> <th>2.Agree</th> <th>3.Don't know</th> <th>4.Disagree</th> <th>5.Strongly disagree</th> </tr> </thead> <tbody> <tr> <td>Income from forest product</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Foods from forests</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		1.Strongly Agree	2.Agree	3.Don't know	4.Disagree	5.Strongly disagree	Income from forest product						Foods from forests					
	1.Strongly Agree	2.Agree	3.Don't know	4.Disagree	5.Strongly disagree														
Income from forest product																			
Foods from forests																			
40. To what extent do you agree that if the current rate of deforestation continues your household will loss income and foods products derived from the forest?	<table border="1"> <tbody> <tr> <td>1.Strongly Agree</td> <td></td> </tr> <tr> <td>2.Agree</td> <td></td> </tr> <tr> <td>3.Don't Know</td> <td></td> </tr> <tr> <td>4. Disagree</td> <td></td> </tr> <tr> <td>5. Strongly disagree</td> <td></td> </tr> </tbody> </table>	1.Strongly Agree		2.Agree		3.Don't Know		4. Disagree		5. Strongly disagree									
1.Strongly Agree																			
2.Agree																			
3.Don't Know																			
4. Disagree																			
5. Strongly disagree																			
41. Do you think deforestation is having effects on other economic activities here (crop farming)	1. Yes [] 2. No [] Give reason (s)..... 																		

THE ROLE OF STAKEHOLDERS TOWARDS SFM

42. What do you understand by sustainable forest management? <i>Please chose only one answer</i>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1. Reforestation</td><td></td></tr> <tr><td>2. Agro-forestry</td><td></td></tr> <tr><td>3. Tree plantation</td><td></td></tr> <tr><td>4. Continue use of forest resource</td><td></td></tr> <tr><td>5. Protecting forest reserves</td><td></td></tr> <tr><td>6. Other (specify)</td><td></td></tr> </table>	1. Reforestation		2. Agro-forestry		3. Tree plantation		4. Continue use of forest resource		5. Protecting forest reserves		6. Other (specify)													
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6. Other (specify)																									
43. How often does the forestry commission talk to you about managing forest resources sustainably?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1. Every year</td><td></td></tr> <tr><td>2. Every 6 months</td><td></td></tr> <tr><td>3. Every 3 month</td><td></td></tr> <tr><td>4. Every month</td><td></td></tr> <tr><td>5. None</td><td></td></tr> </table>	1. Every year		2. Every 6 months		3. Every 3 month		4. Every month		5. None															
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44. How many times have you or any member of your household participated in such activities over the past 10 years?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1. 1- 5 time</td><td></td></tr> <tr><td>2. 6-10 time</td><td></td></tr> <tr><td>3. 11-15 times</td><td></td></tr> <tr><td>4. Over 16 time</td><td></td></tr> <tr><td>5. Never</td><td></td></tr> </table>	1. 1- 5 time		2. 6-10 time		3. 11-15 times		4. Over 16 time		5. Never															
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45. Which of the following participatory forest management activities have you actually engaged in over the last 5 years?	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th><th style="text-align: center;">YES</th><th style="text-align: center;">NO</th></tr> <tr><td>1. Environmental education</td><td></td><td></td></tr> <tr><td>2. Forest policy and legislative reforms</td><td></td><td></td></tr> <tr><td>3. Bush fire management</td><td></td><td></td></tr> <tr><td>4. Timber harvesting</td><td></td><td></td></tr> <tr><td>5. Plantation development</td><td></td><td></td></tr> <tr><td>6. Forest reserve management</td><td></td><td></td></tr> <tr><td>7. Voluntry FM committee</td><td></td><td></td></tr> </table>		YES	NO	1. Environmental education			2. Forest policy and legislative reforms			3. Bush fire management			4. Timber harvesting			5. Plantation development			6. Forest reserve management			7. Voluntry FM committee		
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46. Do you have thresholds and standards for harvesting forest resources in this area?	1. Yes [] 2. No [] If Yes what are the standards and thresholds for harvesting..... 																								
47. Are you or any member of the household involved in any institution's forest management activities (tree plantation, agro-forestry etc) IF NO MOVE TO Q51	1. Yes [] 2. No [] If YES what is the name of the institution (s) 																								

48. What specific forest management activities are you or any member of the household involved? <i>You can choose more than one answer.</i>	<table border="1"> <tr> <td>1.Tree Plantation</td> <td></td> </tr> <tr> <td>2.Agroforestry (crops & trees)</td> <td></td> </tr> <tr> <td>3.Nursery of seedlings</td> <td></td> </tr> <tr> <td>4. All the above</td> <td></td> </tr> <tr> <td>5. Other (specify)</td> <td></td> </tr> </table>	1.Tree Plantation		2.Agroforestry (crops & trees)		3.Nursery of seedlings		4. All the above		5. Other (specify)	
1.Tree Plantation											
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4. All the above											
5. Other (specify)											
49. How long have you or any member of the household been involved in these activities?	1..... 2. Don't Know []										
50. How much do you or any member of the household earn from these activities monthly? <i>Amount could be asked in seasons or years and convert into monthly income.</i>	GH¢.....										
51. How will you describe the forest management activities of the institution in this area?	<table border="1"> <tr> <td>1.Very effective</td> <td></td> </tr> <tr> <td>2. Effective</td> <td></td> </tr> <tr> <td>3.Moderately effective</td> <td></td> </tr> <tr> <td>4.Not effective at all</td> <td></td> </tr> <tr> <td>5. Don't know</td> <td></td> </tr> </table>	1.Very effective		2. Effective		3.Moderately effective		4.Not effective at all		5. Don't know	
1.Very effective											
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5. Don't know											
52. How will you describe the cooperativeness of the institution?	<table border="1"> <tr> <td>1.Very cooperative</td> <td></td> </tr> <tr> <td>2. Cooperative</td> <td></td> </tr> <tr> <td>3.Moderately cooperative</td> <td></td> </tr> <tr> <td>4.Not cooperative at all</td> <td></td> </tr> <tr> <td>5.Don't Know</td> <td></td> </tr> </table>	1.Very cooperative		2. Cooperative		3.Moderately cooperative		4.Not cooperative at all		5.Don't Know	
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53. How will you assess the long-term impact of the activities of the institution on the forest?	<table border="1"> <tr> <td>1. Sustainable forest management</td> <td></td> </tr> <tr> <td>2. Forest management without sustainability</td> <td></td> </tr> <tr> <td>3.Forest preservation without management</td> <td></td> </tr> <tr> <td>4. None of the above</td> <td></td> </tr> <tr> <td>5. Don't know</td> <td></td> </tr> </table>	1. Sustainable forest management		2. Forest management without sustainability		3.Forest preservation without management		4. None of the above		5. Don't know	
1. Sustainable forest management											
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3.Forest preservation without management											
4. None of the above											
5. Don't know											
54. To what extent do you agree that community participation in managing forest resources will safeguard the resources on sustainable basis?	<table border="1"> <tr> <td>1.Strongly Agree</td> <td></td> </tr> <tr> <td>2.Agree</td> <td></td> </tr> <tr> <td>3. Don't Know</td> <td></td> </tr> <tr> <td>4. Disagree</td> <td></td> </tr> <tr> <td>5. Strongly disagree</td> <td></td> </tr> </table>	1.Strongly Agree		2.Agree		3. Don't Know		4. Disagree		5. Strongly disagree	
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55. To what extent do you agree that forest management currently in the community focuses too much attention on timber resources than Non-timber resources?	<table border="1"> <tr> <td>1.Strongly Agree</td> <td></td> </tr> <tr> <td>2.Agree</td> <td></td> </tr> <tr> <td>3. Don't Know</td> <td></td> </tr> <tr> <td>4. Disagree</td> <td></td> </tr> <tr> <td>5. Strongly disagree</td> <td></td> </tr> </table>	1.Strongly Agree		2.Agree		3. Don't Know		4. Disagree		5. Strongly disagree	
1.Strongly Agree											
2.Agree											
3. Don't Know											
4. Disagree											
5. Strongly disagree											

56. In your own opinion what should be done to ensure sustainable forest management of the forest?			
57. To what extent do you agree that sustainable management of forest will increase your income levels and alleviate income poverty in this community?	1.Strongly Agree 2.Agree 3. Don't Know 4. Disagree 5. Strongly disagree	 	
58. To what extent do you agree that sustainable forest management practices produce positive results for forest dependent communities?	1.Strongly Agree 2.Agree 3. Don't Know 4. Disagree 5. Strongly disagree	 	
59. To what extent do you agree that providing long-term security to forest and forestland and involvement of the local people in formulating forest policies will promote sustainable forest management?	1.Strongly Agree 2.Agree 3. Don't Know 4. Disagree 5. Strongly disagree	 	

THANKS FOR YOUR TIME AND COOPERATION!!



SAMPLE INTERVIEW SCHEDULE FOR INSTITUTIONS

Name of institution.....

Name of respondent.....

Rank of Respondent.....

1. How will you describe the incidence of income poverty in the Municipality?

.....
.....
.....
.....

2. How will you describe the relationship between forest products and income generation in the Municipality? 1. Very strong [] 2.Strong [] 3. Weak. [] 4.Very weak [] 5.Not at all []

Explain.....

.....
.....
.....
.....

3. What is the level of deforestation and how much of the forest cover is lost in the Municipality?

1. Very High [] 2. High [] 3.Mild High [] 4. Low [] 5. Very Low []

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.....
.....

4. What are the salient causes of deforestation and forest degradation in the Municipality?

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5. What has been the effect of deforestation on forest resources in the Municipality?

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6. What has been the effect of deforestation on the income levels of the people depending on forest resources for the past 5 to 10 years?

.....

.....

.....

.....

7. Is your institution doing something to avert deforestation in the Municipality? 1. Yes ☐ 2. No ☐

8. If yes what is your institution doing or has done to avert deforestation and to restore the lost forest?.....

.....

.....

.....

9. Give details of your institution's activities?

.....

.....

.....

.....

10. Are the local people involved in the activities of the institution and how are they involved in such activities? 1. Yes ☐ 2.No ☐

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.....

11. What benefits are the local people deriving from such cooperation?

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.....

.....

12. How will you describe the cooperativeness of the local people with your institution's activities?

1. Very cooperative [] 2. Cooperative [] 3. Low cooperative [] 4. Not cooperative at all []

13. In your own opinion what is sustainable forest management?

.....

.....

.....

.....

14. From this definition will you describe your institution's activities as geared toward sustainable forest management? 1. Yes [] 2.No []

Explain

.....

.....

.....

.....

15. Criteria and Indicators (C&I) have become a global tool by which forest resources are now managed on sustainable basis. Does your institution share the same views? 1. Yes [] 2. No []

If 'Yes' can you mention any three (3) set of standards that have been developed at the national level for sustainable forest (SFM)?

.....

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.....

16. Does your institution have **thresholds** and **standards** for harvesting forest resources in the Municipality? 1 Yes [] 2.No []

If **Yes** what are the standards and thresholds for harvesting?

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If **No** why don't you have?

.....

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17. What is your take on the future of the forest in the Municipality?

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18. What are the future plans of your institution to ensure sustainable forest management in the Municipality?.....

.....

.....

.....

.....

THANKS FOR YOUR TIME AND COOPERATION!!

