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Management of Timber Resources in Areas Outside Forest Reserves in Ghana: The Role of Stakeholders

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Role of Stakeholders

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Acronyms

AAC	Annual Allowable Cut
CRIG	Cocoa Research Institute of Ghana
DA	District Assembly
DACF	District Assemblies' Common Fund
FC	Forestry Commission
FSD	Forest Services Division
GTA	Ghana Timber Association
GTMO	Ghana Timber Millers' Organization
HFZ	High Forest Zone
LI	Legislative Instrument
NE	North East
NW	North West
NGOs	Non-Governmental Organizations
OASL	Office of the Administrator of Stool Lands
OFR	Off-Forest Reserve
RMSC	Resource Management Support Centre
SRA	Social Responsibility Agreement
SE	South East
SW	South West
TA	Traditional Authorities
TC	Traditional Council
TIDD	Timber Industry Development Division
TRF	Timber Rights Fee
TUC	Timber Utilization Contract
TUP	Timber Utilization Permit
WD	Wildlife Division
WITC	Wood Industry Training Centre

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Abstract

Forests outside the permanent forest estate (forest reserves) play significant role in the economic, social and environmental needs of Ghana. Over the last twenty years, timber outside forest reserves has consistently represented between one third and two thirds of the total annual recorded timber harvest in Ghana. In recent years timber harvest from off-reserve areas has declined to about 30%. One major cause of the declining is the lack of economic incentive for farmers who nurture, maintain and preserve timber resources. The lack of economic incentive is as a result of inequitable policy governing tree tenure and benefit sharing relating to naturally occurring timber resources in off-reserve areas. To safeguard the future and sustainability of the resources there is the need for policy revision that recognizes the input of stakeholders involved in off-reserve timber resources management. This study sought to determine farmers' timber tree management practices and the role, rights and responsibilities of stakeholders involved in off-reserve timber resources management. The study was conducted in the Asunafo North District of Ghana where a score of key stakeholders were interviewed and a total of eighty (80) farmers were selected using a stratified random sampling and subsequently interviewed. The study revealed weeding, thinning, pruning/pollarding, preservation of specific tree species (singling) and fire protection/prevention as specific management activities performed by farmers. Agricultural land use system was found to influence timber tree maintenance as well as species diversity, age composition, and density. Cocoa farming system hosted the highest number of timber species followed by fallow, oil palm farming system and the least was found to be food crop (annuals) farming system. The main factor influencing farmers' management activities is perceived beneficial attributes of tree to agricultural crops. Farmers and Forestry Commission performed direct roles while District Assembly and Traditional Authorities preformed indirect roles in timber resources management in areas outside reserves. The results further revealed that Farmers, Forestry Commission and District Assembly have been able to assert their roles and responsibilities while Traditional Authorities are yet to do so. Stakeholders' roles, rights and responsibilities were favoured as a basis for equitable benefit sharing scheme. It is concluded that there is a considerable potential for off-reserve timber resources management if tree tenure and benefit sharing arrangement can be weighed more in favour of farmers/land owners coupled with recognition of roles, rights and responsibilities of stakeholders. Stakeholders need to have tools to perform their roles and responsibilities, and that coordination and collaboration between stakeholders and transparency through information dissemination is very much important for sustainable timber resources management in areas outside reserves.

CHAPTER ONE

1.0 INTRODUCTION

This chapter provides the background and sets the objectives of the study. It introduces the structure of Ghana's forest resources, its contribution to socio-economic development, associated policies and practices governing it. The problem statement and objective of the study are made explicit. The organization of the thesis concludes.

1.1 Background

Forests outside the permanent forest estate (forest reserves) play significant role in the economic, social and environmental needs of Ghana. Key amongst these contributions is timber production supported by off-reserve timber resources. Today much of what constitutes off- reserve areas is mosaic of agricultural fields (farmlands), fallows, secondary forest patches and settlements (Kotey et al 1998)¹. Of these areas, farms and fallow lands host substantial timber resources (Kotey et al 1998; Amanor, 1996²). Richards and Asare, (1999)³ state that farms and fallow lands taken together contain more timber than the remaining area of natural forest outside reserves. According to the Planning Branch of the Forestry Commission (FC) of Ghana, 70- 90% of timber production in the 1990's was derived from the areas outside forest reserves (Planning Branch, 1994)⁴.

However in recent years timber harvest from off-reserve areas has declined to about 30%. A study conducted by the Resources Management Support Centre of the Forestry Commission compared the total timber standing volume within felling limit in 1996 (95.667 million m³) with that of the year 2005 (37.225 million m³) of timber species in 3-star groups (Scarlet, Red and Pink). The star group is a term categorizing timber species into level of exploitation and conservation needs. The Scarlet has the highest exploitation and conservation urgency followed by Red through to Pink- star species. The result revealed a difference of 55.442 million m³ in a nine-year period indicating that timber resources in areas outside reserves are declining at rate of 6.2 times the anticipated rate (i.e. taking national Annual Allowable Cut as 500,000 m³).

¹ Kotey, N.A., Francois, J., Owusu, J.G.K., Yeboah, R., Amanor, K.S., Antwi, L., 1998. *Falling into place. Policy that works for forests and people series. No. 4.* International Institute for Environment and Development, London.

² Amanor, K.S., 1996. *Managing trees in the farming system. The perspectives of farmers.* Forest Farming Series No. 1. Forest Department, Kumasi, Ghana.

³ Richards, M. & Asare, A., 1999. *Economic incentives for cocoa farmers to tend timber trees in southern Ghana.* Overseas Development Institute, London.

⁴ Planning Branch, Forestry Department., 1994. *Report on piloting collaborative forest management systems for off-reserve areas in southern Ghana project.* Unpublished

If current felling limits and AAC of 500,000 m³ could be enforced, the current economic tree stock in areas outside forest reserves could last for 43 years, assuming no replacement (Kotey et al 1998, *restatement mine*). However, current exploitation is about triple this figure in the recent past (current AAC: 1.5 million m³). The prospects for replacement and maintenance of timber trees in off-reserve areas seem the most obvious option if the future of the timber industry is to be safeguarded.

In view of the rapid decline of off-reserve timber resources, the question has arisen as to the cause of the decline. Illegal chainsaw logging, unsustainable timber harvesting by formal timber operators and increasing rate of wildfires are some causes of the decline (TBI, 2009)⁵. Another major cause of the disheartening declining is the lack of economic incentive for farmers who nurture, maintain and preserve timber resources due to inequitable policy governing naturally occurring timber resources management in off-reserve areas. Several authors have run commentaries on the situation (Dabrowska, 2009⁶; TBI, 2009; Ardayfio et al, 2007⁷; Amanor, 1996). Crystallizing the problem points to two main factors: the right to ownership of naturally occurring timber trees and inequitable sharing of economic benefits of the naturally occurring timber trees.

Problem Statement

In Ghana, people have exclusive rights to trees they have planted, the same cannot however, be said for naturally regenerated trees which have been nurtured, maintained and preserved by farmers on their farms and fallow lands. The right to ownership of naturally occurring timber trees is vested in the President (state) according to section 4 of article 16 of the concession Act of 1962⁸. Such ownership structure determining access to timber trees in turn alienates farmers from obtaining direct economic benefits from timber trees as well as material benefits such as wood on their farms and fallows though it is their hardwork that secure such resources. This certainly creates a disincentive for farmers to maintain naturally occurring timber trees.

⁵ Tropenbos International – Ghana, 2009. *Strengthening off-reserve timber management in Ghana*. Proceedings of a national workshop held in Accra, Ghana, on the 27th and 28th of September, 2007. Tropenbos International - Ghana Workshop Proceedings 7. Kumasi, Ghana.

⁶ Dabrowska, M., 2009. *Access to timber trees for commercial purposes in off-reserve areas in Ghana*. MSc thesis. Unpublished.

⁷ Ardayfio-Schandorf, E., Yankson, P.W.K., Asiedu, A.B., Agyei-Mensah, S. and Attua, E.M. 2007. *Socio-economic Perspectives of Off-Reserve Forest Management in the Goaso Forest District of Ghana*. Woeli.

⁸ Concessions Act, 1962. Act 124. The Government Printing Department, Accra, Ghana.

Another factor compounding the situation is the inequitable nature of the current benefit sharing arrangement pertaining to the distribution of revenue accruing from timber trees in off-reserve areas. The 1992 constitution of Republic of Ghana⁹ which guides the benefit sharing arrangement allocates percentages to the following stakeholders or actors: Forestry Commission (FC), Office Administrator of Stool Lands (OASL), and Traditional Council (TC), Stool and District Assemblies (DA). The constitution states:

“Ten per cent of the revenue accruing from Stool lands shall be paid into the office of the Administrator of Stool Lands to cover administrative expenses, and the remaining revenue shall be distributed in the following proportions: twenty five percent to the Stool through the Traditional Authority for the maintenance of the Stool in keeping with its status; twenty percent to the Traditional Authority; fifty-five per cent to the District Assembly, within the area of authority of which the Stool lands are situated” (Constitution of Ghana, 1992; 267 (6))

Conspicuously missing in the benefit arrangement is the farmer who works hard to nurture and maintain timber trees on his farm and fallows. Thus timber trees from off-reserve areas are raised by one group of people (farmers) but at maturity the trees are regulated and harvested by others who had little or no investments in the trees.

Additionally in the event of crop damage resulting from logging activities of timber operators, farmers receive no or meager compensation which is no match for the value of crops lost (Amanor, 1996). Regards Social Responsibility Agreement (SRA) which is meant to benefit communities (of which farmers are part), the least said about it the better. Though the concept has good intentions, its poor implementation has further worsened the plight of the farmer as projects carried under SRAs are not fully carried out and also are mostly insignificant to trickle down to farmers.

Farmers contest this situation in many diverse forms including deliberate killing of trees and conniving with illegal chainsaw operators to fell such timber trees thereby further eroding the already depleted resources (Amanor, 2005)¹⁰ and depriving the state of valuable wood resources and economic returns.

⁹The Constitution of the Republic of Ghana, 1992. Tema Press of Ghana Publishing Corporation, Tema, Ghana.

¹⁰ Amanor, K.S., 2005. *Equity in forest benefits sharing and poverty alleviation*. In: Tropenbos International 2005. Workshop proceedings 3 ‘Equity in Forest Benefit Sharing: Stakeholders’ Views’, 29th October 2004 (K.S. Nketiah, J.A.S. Ameyaw and B. Owusu Jnr.), Tropenbos International, Wageningen, and the Netherlands.

Justification

The situation described above does not only guarantee an uncertain future of off-reserve timber resources but also calls for pragmatic policy and legal framework acceptable to stakeholders involved in the management of timber resources in off-reserve areas. Such policy reforms targeting naturally occurring timber tree tenure and equitable benefit sharing toward farmers will to a large extent provide incentive for farmers to maintain timber trees in off-reserve areas thereby increasing the resource base. It will also serve to improve the livelihoods of farmers as timber tending will be seen as a legitimate livelihood strategy. In relation to this there is the need to determine an acceptable basis for policy reforms targeting off-reserve timber tree tenure and an equitable benefit sharing. One such basis is the inputs of stakeholders in off-reserve timber resources management. Therefore proceeding on such basis requires information on the roles, rights and responsibilities of stakeholders involved in off-reserve timber resources management.

Although many an author have acknowledged the importance of such information, however most research efforts have focused on highlighting the need for tree tenure reform and a more equitable benefit sharing toward farmers as a means for sustainable off-reserve timber resources management. Therefore it is in relation to filling such knowledge gaps and research needs that this study sets out to accomplish.

Hence the objective of this study is to determine stakeholders' roles, rights and responsibilities in the management of timber trees in areas outside forest reserves as has been conceived by several stakeholders.

Objective of the Study

The overall objectives of the study are to:

- Contribute to the efforts of sustainable off-reserve timber resources management.
- Provide information for policy consideration on naturally occurring timber tree tenure and framework for economic benefit sharing.

Specific objectives:

1. Determine what constitute farmers' management of timber trees on farms.
2. Determine the roles, rights and responsibilities of stakeholders involved in off- reserve timber tree resources management.
3. In relation to the second objective, determine an objective basis for an equitable benefit sharing.

Structure and organization of Chapters

This publication is based on the socio-economic study of off-reserve forest management in the Asunafo North Municipal of Ghana. It is divided into six (6) chapters.

Chapter 1 introduces the study and provides the rationale and objectives of the study. Chapter 2 focuses on the review of literature and concepts related to the study. It deals with such subjects as land and tree tenure, equity in benefit sharing and stakeholder involvement in off-reserve timber resources management, as well as roles rights and responsibilities of stakeholders. Chapter 3 is concerned with the methodological framework and design of the study as well as description of the characteristics of the study area. Chapter 4 focuses on what informs farmers' decision to maintain timber trees, how these trees are managed and the costs associated with such management activities and timber tree maintenance. It also provides information on the role of various stakeholders involved timber tree management in areas outside forest reserves. In chapter 5, various information received on the roles and contribution of various stakeholders involved in off- reserve timber resources management are discussed and precipitated into roles, rights and responsibilities of the stakeholders. This provides a platform for policy consideration in the area of tree tenure (farmers' right to naturally occurring timber trees on their farm lands) and economic benefit sharing. Chapter 6 concludes the thesis with statements pooled from chapters 4 and 5.

CHAPTER TWO

2.0 THEORETICAL FRAMEWORK

This chapter sets out the conceptual framework within which the study is defined. Various subjects relating to timber resources management are discussed. The chapter opens with the description of the structure of Ghana's forest resources, zeroing on off-reserve timber resources and policies governing its access and management. It is followed by an overview of such related concepts as land and tree tenure, equity and benefit sharing, rights, roles and responsibilities of stakeholders associated with use and management of timber resources.

2.1 General Characteristics of Ghana's Forest Sector

Ghana covers an area of about 23.9 million ha spanning two major ecological zones. The south-western third of the country is the High Forest Zone (HFZ) with the other zone dominated by savannah to north and east of the country. The HFZ produces the bulk of Ghana's timber resources covering an area of 8 million ha (34% of the total land area) out of which 1.76 million ha (20% of HFZ) are permanently protected and referred to as Forest Reserves. The forest reserves are managed by the Forest Service Division of the Forest Commission. All the areas outside the reserved forests in the HFZ constitute the off-reserve embracing a total area of 5.482 million ha (80% of HFZ). Aside the social, ecological and environmental functions of the country's forests, it also plays a significant part in the economy. The forest is the support of Ghana's timber industry which contributes 6% of the country's GDP making it the fourth largest foreign exchange earner, having provided around 12% of Ghana's foreign exchange between 1990 and 2000. Employment in the timber sector in Ghana was estimated at 104,000 people in 1999 at a total population of roughly 20 million (Bird et al, 2006)¹¹.

2.1.1 Ghana's Forest Sector: Off-Reserve Areas

The areas constituting the off-reserve areas trek through different vegetation zones ranging from evergreen rainforest of the western coast through to the dry semi-deciduous forest of the forest-savannah zone. Today much of the off-reserve areas are a mosaic of agricultural fields, fallow lands, secondary forest patches and settlements dominated by farms and fallows (Kotey et al 1998). Nonetheless it is the farms and fallow lands that are the major host of these timber resources (Amanor, 1996; Kotey et al, 1998).

¹¹ Bird, N., Fometé, T. and Birikorang, G. (2006). *Country Case Study 1: Ghana's experience in timber verification system design*. VERIFOR.

This is so because cash and food crops farming (an agro-forestry system) dominating the HFZ seek to preserve trees thereby resulting in the maintenance of the resource base.

In the 1980s and 1990s 70-80% of the country's timber production was derived from the off-reserve areas (Planning Branch, 1994). Though the resource base is heavily depleted, still more than half of the nation's annual timber exploitation comes from the off-reserve areas (TBI, 2009). However in recent years timber harvest from off-reserve areas has declined to about 30%. A study conducted by the Resources Management Support Centre of Forest Commission compared the total timber standing volume within felling limit in 1996 (95.667 million m³) with that of the year 2005 (37.225 million m³) of timber species in 3-star groups (Scarlet, Red and Pink)¹². The result revealed a difference of 55.442 million m³ in a nine-year period indicating that timber resources in areas outside reserves are declining at rate of 6.2 times the anticipated rate (i.e. taking national Annual Allowable Cut as 500,000 m³). If current felling limits and AAC of 500,000 m³ could be enforced, the current economic tree stock in areas outside forest reserves could last for 43 years, assuming no replacement (Kotey et al 1998, *restatement mine*). However, current exploitation is about triple this figure in the recent past (current AAC: 1.5 million m³). The prospects for replacement and maintenance of timber trees off-reserve areas seem the most obvious option if the future of the timber industry is to be safeguarded.

2.2 Management of Timber Resources in Areas Outside Forest Reserves

Off-reserve forest resources unlike those in the forest reserve are not strictly under the management of Forest Service Division (FSD) but under the control of individuals (farmers), communal and traditional authorities who own such lands.

Farmers recognize the environmental and ecological importance of trees on their farms hence proceed to nurture, tend and preserve them. They incorporate trees in their farming systems to avoid exposing the soil to excessive sunlight and by so doing minimize desiccation which reduce soil fertility and crop yield. They are knowledgeable of trees' role in the prevention of windstorms and erosion. Other benefits include nutrient cycling and provision of shade to raise crops (Amanor, 1997)¹³.

¹² The star group is a term categorizing timber species into level of exploitation and conservation needs. The Scarlet has the highest exploitation and conservation urgency followed by Red through to Pink-star species.

¹³ Amanor, K.S., 1997. *The potential for tree certification and labelling in farming systems in Ghana*. Unpublished paper to IIED, London

Interestingly several of the trees preserved by the farmers are timber species that are of great interest to the forest sector. Thence it can be said that the ultimate destiny of the trees outside forest reserves depends on the decision and management strategies of farmers and land owners.

The Forestry Commission recognizing this and other reasons provoked the enactment of policy that sought to bring the management of unreserved forest resources under the control of FSD as captured by the 1994 Forest and wildlife Policy. Though the policy has good intention, however FSD is yet to undertake any effective management of timber trees in areas outside forest reserves after nearly two decades that the policy came into being. There are several factors responsible for such poor show by FSD evidenced by fleeting decline of timber resources in areas outside the reserves. One prominent factor is the scattered nature of or the distribution of off-reserve areas ranging from private, communal, public lands and individual farms. Therefore management is difficult and more challenging compare to forest reserves which occur in unit blocks though may stretch over a large area.

From the foregoing it is clear that timber resources in areas outside forest reserve are not under any formal management of FC. At best they only undertake monitoring of the resources in the form of occasional resource inventory mostly in the run up to allocation of areas for timber utilization permits (TUPs) or timber utilization contracts (TUCs)¹⁴ for logging. Therefore the real management activities (nurturing, tending, pruning, thinning and protection) is carried out largely by farmers and some land owners.

2.2.1 Management of Timber Resources in Areas Outside Forest Reserves: Farmers' Management Strategy

In the past timber trees were preserved by growing crops under selectively thinned forest leaving big mature trees in the farm and on the land. This was to allow enough space for crop cultivation and open the closed canopy to admit light to the floor of the farm. It is noteworthy that this kind of farming was more appealing because at the time only axes were available to clear forest for crop cultivation (TBI, 2009).

¹⁴ TUPs are areas allocated for the non-commercial exploitation of timber usual in small areas for community projects.

TUCs are areas allocated for commercial exploitation of timber mostly covering large areas having gone through competitive bidding processes

Today, the practice is somewhat different as clear felling is more popular due to the availability of chainsaw machines. In spite of that timber trees are being preserved and maintained. Now, farmers nurture seedlings, saplings and coppices from stumps to provide shade and benefits such as nutrient cycling and conservation of soil moisture necessary for crop growth (TBI, 2009). For instance in the orchard farming system, forest trees are preserved as shade crops to nurture the cultivation of the orchard crops (cocoa, citrus, food crops). As the orchard crops mature the density of the trees are reduced so as to open up space for the growing crops and for sunlight. This practice corresponds to the conventional silvicultural practice of thinning and pruning. In the bush fallow system, a plot of land is left to fallow for about 3-6 years after cultivation to allow it to recuperate soil nutrients and also regenerate forest trees.

Farmers have built up considerable and well-developed knowledge of the ecological processes and are able to manipulate effectively these processes to achieve their farming objectives. Though such management strategies are not the last stop of effective management of the off-reserve timber resources, however it constitutes the basis for the sustained timber resources up to now. Hence collaborative efforts by FC making use of such knowledge will to a large extent help in the struggle for sustainable management of the timber resources in areas outside the reserves.

Such collaboration is critical as in recent years, new hybrids of crops which have the lure of high yield have been developed and promoted, sparking wide adoption by farmers though incompatible with tree preservation on farms. The phenomenon is gradually leading to fewer trees being maintained on farmlands with negative consequences on off-reserve timber resources hence calling for a critical look at the situation.

2.3 Role of Trees on Farms

The soil and crop-enhancing role of trees is recognized by farmers hence knowledge about which category of tree species favourable for soil conservation, soil fertility enhancement, shading out of pan tropical weeds and crop growth are well developed and established by farmers. Farmers preserve these trees and build a stock of these in farms and fallows. Some of these include light demanding pioneer species such as *Milicia excelsa*, *Triplochiton scleroxylon*, and *Terminalia* spp. Other non-pioneer species include: *Khaya* spp., *Cola gigantea*, and *Funtumia elastia*. For soil enhancement purpose, the following tree species are preserved: *Ceiba pentandra*, *Daniellia oliveri* and *Ficus exasperate* (Amanor, 1997).

However in spite of the positive role of trees on farms, farmers are still faced with cost of maintaining trees. Often a balanced decision has to be reached on tree density required for optimum growth of crops.

Some of the cost include: the taking up space for additional crop cultivation, shade cast over crops preventing them from gaining adequate sunlight, competition for soil nutrient and water through rooting systems, trees serving as host for pests and diseases, risk of crop damage and injury to/loss of human life resulting from the breaking of whole or parts of trees and ultimately crop damage and disruption of soil structure caused by logging. In view of these the ultimate destiny of the timber trees and forest resources outside reserves is contingent on the decision of farmers and their management strategies.

2.4 Stakeholders Involved In Off-Reserve Timber Resources Management: Characteristics, Roles, Rights and Responsibilities

Stakeholders are a number of persons and institutions that have a statutory, customary or moral *right* to use or benefit from a resource (example: forest). It also includes such persons who exercise *control or regulate* conduct and behaviour which has an effect on the resources. Unarguably it includes persons or institutions whose acts or omissions *impact* on the resources. In simple words, stakeholders are persons or entities who have stake in a resource and in this case off-reserve forest resources. There are different “levels” of stakeholders. Some may be in close contact with the forest (primary stakeholders), others may not (secondary stakeholders). However proximity or directness is not the sole determinant of legitimate interest, nor is the impact of a person’s actions on the forest (kotey et al, 1998).

In Ghana, primary stakeholders involved off-reserve timber resources management include traditional land- and forest-holding authorities, forest fringe communities, farmers, the state and its agencies [(forestry sector: sector ministry, FC and its affiliates,) and (office of administrator of stool lands, district/municipal/metropolitan assemblies)], timber industry, and chainsaw operators.

The following sections describe the characteristics of the stakeholders, their roles, rights and responsibilities in relation to management of timber resources in areas outside forest reserves. It also includes those who receive direct economic benefits from the resources as well those whose activities impact on the resources.

2.4.1 The Forestry Commission

The Forestry Commission (FC) was established in 1999 with the Forestry Commission Act (Act 571) as its legal backing. It is the lead executing and operational agency responsible for forest management, protection and development. It is responsible for “...the regulation and utilization of forest and wildlife resources, the conservation and management of those resources and the co-ordination of policies related to them” (Forestry Commission Act, 1999, s. 2).

It is a corporate body consisting of a corporate Headquarter and three divisions: the Forest Services Division (FSD), the Timber Industry Development Division (TIDD) and the Wildlife Division (WD). Moreover, there are two units: the Resource Management Support Centre (RMSC) and the Wood Industry Training Centre (WITC).

FSD is responsible, with technical support from RMSC, for the planning, management, monitoring and control of timber utilization in the forest reserves and in the off-reserves areas. Approximately 60% of the FC’s total income is made up of internally generated funds (Forestry Commission, 2005)¹⁵. The main sources are the export levies and the share of the stumpage fees. The remaining 40% comes from government subvention and from donor agencies. As a stakeholder in relation to benefit sharing of timber revenues, the key entities within FC are FSD and to a lesser extent TIDD and RMSC.

2.4.2 Metropolitan/Municipal/District Assembly

Ghana has 138 districts, municipalities and metropolitans. Each district, municipality and metropolis is governed by a District/ Municipal/Metropolitan Assembly (DA) as stipulated in the 1992 Constitution of Ghana (sections 240-256) and the Local Government Act, 1993 (Act 462). DAs range in size from 54 to 130 members, depending on the district. DAs have both elected members (70%) and members appointed by the President (30%) with the elected member representing an electoral area (Crawford, 2004)¹⁶. Since 1988, district assemblies have been the main decision making body of local government. The Constitution and the Local Government Act accord the DAs with extensive powers and functions. The DA is to give political and administrative direction, and to supervise all other administrative authorities within the district.

¹⁵ FC/OASL, 2005. *Stumpage revenue distribution report 1 January – 31 July 2004*. Forestry Commission and the Office of the Administrator of Stool Lands, Accra, Ghana

¹⁶ Crawford, G., 2004. *Democratic decentralisation in Ghana. Issues and prospects*. POLIS Working Paper No. 9. School of Politics and International Studies, University of Leeds, Leeds.

In relation to forests and trees, DAs typically are involved in: i) enforcement of bush-fire laws, ii) initiating tree planting campaigns, iii) regulating chainsaw operators, iv) establishing district reserves and reforestation of denuded areas, v) monitoring and control of illegal logging (timber task forces). For instance, in some districts, the assembly has been active in preventing the continuing operation of those timber companies which have significant royalty arrears, and monitoring trucks and machinery (Mayers & Kotey, 1996)¹⁷. However, the Forestry Commission has maintained ultimate control over central functions such as the allocation of timber rights, collection of revenues as well as monitoring and control of forest reserves and timber extraction. Moreover, the Forestry Commission has also maintained a centrally controlled forest district structure.

The districts have three main sources of revenue: i) the District Assemblies' Common Fund (DACF); ii) ceded revenues, and iii) own revenue-raising (local taxes) (Crawford, 2004; Inkoom, 1999)¹⁸. In addition to the above sources of revenues, are "specialized funding" and "grants-in-aid" (Inkoom, 1999). Specialised funding includes the revenues accruing to the districts from timber stumpage and minerals (Inkoom, 1999) and this is allocated to DAs by the Office of Administrator of Stool Lands. It is earmarked for development projects, and cannot be used for normal running costs (administrative costs) of the district (Mayers and Kotey, 1996). For districts with rich forest resources, revenues from timber are significant for the development programme, constituting up to 20-30% of the entire district development budget (Asante, 2005¹⁹; Mayers and Kotey, 1996).

¹⁷ Mayers, J., & Kotey, N.A., 1996. *Local institutions and adaptive forest management in Ghana*. Forestry and Land Use series. No.7. International Institute for Environment and Development, London.

¹⁸ Inkoom, D.K.B., 1999. *Management of non-reserve forests in Ghana. A case study of Mpohor Wassa East District*. PhD Dissertation. Faculty of Spatial Planning, University of Dortmund, Dortmund, 251 pp.

¹⁹ Asante, M.S., 2005. *Deforestation in Ghana. Explaining the cronical failure of forest preservation policies in a developing country*. University Press of America, Lanham, Maryland, USA.

2.4.3 The Office of the Administrator of Stool Lands

The Office of the Administrator of Stool Lands (OASL) was established in 1994 under the MLFM under Act 481. It has three main functions (Kasanga and Kotey, 2001²⁰) as follows:

- Establishment of a stool land account for each stool into which shall be paid all rents, dues, royalties from the stool lands;
- Collection of all the above types of revenues and account for them to the beneficiaries;
- Disbursement of revenues according to the provision of the Constitution.

In relation to timber revenues, it appears the OASL has little stake in the collection of revenues, which is carried out by the FC. The main role of the OASL is the disbursement for which it attracts a 10% management fee. Disbursement reports are published jointly by FC and OASL.

2.4.4 Traditional Authorities (Traditional Council and Stool)

Traditional councils are bodies composed around a paramount chief and consist of a number of stool chiefs and divisional chiefs²¹. The traditional councils and stools, through a combination of customary and statutory law, are generally the landholding authorities in the high forest zone. As described earlier, government has by legislation assumed the right to exercise control of timber trees exploitation, despite customary and common law “ownership” of timber trees resting with the stools. Successive pieces of legislation have left traditional authorities with little formal decision-making powers in forest management despite their legal position as owners.

²⁰ Kasanga, K., Kotey, N.A., 2001. *Land management in Ghana: Building on tradition and modernity*. International Institute for Environment and Development, London.

²¹ In Ghana chiefs are organized in hierarchy. At the lowest level, is the Village Chief/Caretaker Chief (Odikro), who is heading a village encompassing a number of families and clans, each of them headed by a family or clan head (Boateng, 2003; Assimeng, 2003). The Village Chief is normally not controlling any Stool Land directly. Village Chiefs refer and report to the Divisional Chief (Ohene). He is the real caretaker of the land belonging to the Stool. A number of such Stool Lands make up a “kingdom” headed by the Paramount Chief (Omanhene). The Omanhene is selected from a specific family that heads the paramountcy. The Divisional Chiefs are the councillors of the Paramount Chief and together constitute the Traditional Council. There are a significant number of “independent” Stools, i.e. Stools which do not fall under a Traditional Council.

The role and power of traditional authorities vis a vis government has been evolving continuously. While the colonial government actively used the chieftaincy institution to implement its policy under the system known as “indirect rule” (Amanor, 1996), post-independent governments have limited the role and power of the traditional authorities. However, Chiefs still play a major factor via their role as caretaker of Stool lands and traditional authorities (at various levels) play a major role in mediating and settling conflicts (forest-agriculture related conflicts) as well as enforce forestry by-laws.

The Traditional Councils and Chiefs receive shares of revenues accruing from Stool Lands, e.g. shares of timber and mineral revenues, due to the fact that they are recognized by law as land and forests owners.

2.4.5 Farmers

Farmers in many areas are active managers of trees. Trees are preserved in the farming system primarily for their positive effects on crops or on soil conditions. Farming in southern Ghana (HFZ) is predominantly oriented towards a bush fallowing system which relies on the regeneration of forest through the maintenance of a root mat of pioneer forest species. Farmers’ farm management system traverses through recycling of nutrients of the soil to regeneration of woody vegetation and back. Trees are integrated into the farming system through cycles of pollarding and light burning to encourage coppice regrowth (Amanor, 1996).

There is an important difference in the perspective of foresters and farmers in that foresters are concerned with primary forest species that have economic value whilst farmers’ main focus is on pioneer forest species often with much less economic (timber) value (CFMU, 1995)²². In addition, as a result of recent developments in the tree ownership situation, farmers are moving from being tree conservators to destroyers either by deliberate killing or prevention of growth of timber trees on their farms. This is in protest to the little rights and benefits they are assigned. The few rights left for farmers are the ones captured under usufructuary rights which include use of parts of trees as stakes for creeping crops, bark and foliage for medicine and fodder, etc.

²² CFMU., 1995. *A framework for collaboration outside reserves*. Unpublished paper presented at the Workshop on Forest Plantation Development in Ghana, Ejisu, Ghana, 27 February 1996. Collaborative Forest Management Unit, Planning Branch, Forest Department, Kumasi.

In the more moist areas (HFZ), orchard crops cultivation (cocoa, oil palms and citrus) together with shade-tolerant root and tuber crops like plantain, cassava and cocoyam are dominant farming systems. The main crops cultivated in the transition, dry semi-deciduous forest zones are maize, cassava, vegetables and yams together with oil palms (Amanor, 1996).

2.4.6 Logging and Wood Processing Industry (Formal timber operators)

The term “formal timber operators” is here used as a description for the diverse group of companies holding formal timber rights. This includes both logging and wood processing firms (sawmills and furniture manufacturers) operating both in forest reserves and off-reserve areas. The FSD customer database lists more than 1,100 registered companies (i.e. registered property marks) (FSD, 2006)²³. The number of active companies is probably somewhat lower because not all the property marks may be in use. Likewise, there is anecdotal information on companies, which have registered new property marks to evade payment of stumpage fees in arrears. Nevertheless, given the available resources, it seems the number of companies is too huge to support their activities.

The logging companies undertake logging, hauling and transport operations to mills, but do not have facilities for wood processing. The companies are typically small and have fairly restricted level of (formal) technical/managerial expertise. Some 120 logging companies are organized in the Ghana Timber Association (GTA). Most of the logging companies are facing severe financial problems, and are operating at low (or even negative) profit margins (Birikorang *et al.*, 2007)²⁴. It is suspected that a main share of the outstanding stumpage payments rests with the logging companies.

Sawmills have an integration of logging operations and wood processing (processed lumber, veneer or plywood). They have raw materials from own timber concessions and may procure additional raw material from logging companies and the informal sector. They are export oriented and approximately 75% of their product (volume) is exported. The statistics on exports of wood products for 2005, list more than 300 exporting companies, with the top ten companies providing 60% of the export (value) (TIDD, 2005). The larger processing companies are organized in the Ghana Timber Millers’ Organization (GTMO).

²³ FSD, 2006. *List of extant leases and concessions*. Forest Services Division, Accra, Ghana, unpublished.

²⁴ Birikorang, G., Hansen, C.P., Treue, T., 2007. *Review of the current taxation system relevant to the forest sector in Ghana*. VLTP Background Paper No. 1. Validation of Legal Timber Programme, Forestry Commission, Accra, Ghana.

The efficiency of the processing companies is generally low, in relation to international standards. However, this differs between companies. Larger firms have improved efficiency in recent years (Birikorang et al., 2001)²⁵. Sawmills focus on primary and secondary processing (sawmilling, veneer and plywood production), while tertiary processing focuses on furniture manufacturing for the domestic market and a few producing flooring, doors and profile boards (General Woods, 1993²⁶; GB Forestry Commission, 1995²⁷).

2.4.7 Chainsaw operators

Chainsaw operators are persons trained in the use of chainsaw machines illegally logging and/or processing wood. The operations are “illegal” in the sense that the operators do not hold formal timber rights in the form of TUCs, leases or permits. They pay no forest fees.

The informal sector is very large and its production in terms of raw round-wood volume is probably exceeding that of the formal sector. Hansen & Treue (2008)²⁸ estimates that chainsaw operators currently harvest approximately 1.7 million m³ annually, compared to a total harvest by the formal sector estimated at 1.3 million m³. The informal sector is fulfilling approximately 75% of the domestic demand for lumber.

Chainsaw operators have existed for decades, and legislation has fluctuated between recognition and non-recognition (Kotey et al., 1998). However, their importance, organization and way of operation have changed in recent years (Odoom, 2004²⁹; Amanor, 1996; and Amanor, 2005). First, with economic development, and urban development, the size of the informal sector has increased. Second, the above sources also point towards a changed organization. Previously, they were typically small-scale, local operations, but are now more well-organized entities backed by “urban-based businessmen”, who organize transport and ensure their safety from task force seeking their arrest. Lately they operate in the night and with arms as and when necessary.

²⁵ Birikorang, G., Okai, R., Asenso-Okyere, K., Afrane, S., Robinson, G., 2001. *Ghana Wood Industry and log export ban study*. Forestry Commission report to the Ministry of Lands and Forestry. Forestry Commission, Accra, Ghana.

²⁶ General Woods., 1993. *Technical and financial audit of the Ghana timber industry*, Volumes 1-6. Unpublished report: prepared for Ministry of Lands and Forestry, Ghana General Woods and Veneers Consultants International Ltd., Quebec.

²⁷ GB Forestry Commission., 1995. *Policy recommendations for sustainable management of the forest resource in Ghana*. Unpublished paper: Overseas Consultancy Service, Forestry Commission of Great Britain, Edinburgh.

²⁸ Hansen, C.P., Treue, T. (2008) *Assessing illegal logging in Ghana*. *International Forestry Review* 2008 10 (4), 573-590

²⁹ Odoom, F.K., 2004. A study of chain sawing in the natural forests of Ghana. Food and Agriculture Organization of the United Nations (FAO), Rome.

For the farmer, chainsaw operators are necessary evil as they may be a nuisance, but may in other situations provide more benefits and services to farmers than formal timber operators. Amanor (1996) and Kotey et al. (1998) mention that:

- Chainsaw operators undertake less damage on the farm than concessionaires, because they process boards on the site (at the stump) rather than hauling logs out of the farm;
- Chainsaw operators may perform useful functions in rural areas, e.g. felling unwanted trees on farms, or trees needed for local use. For this reason, farmers may invite chainsaw operators to the farm;
- Chainsaw operators normally provide the farmer with some direct remuneration, in cash or a share of boards. Because chainsaw operators do not have a legal right to the trees, the farmer may be in a better position to arrange for remuneration or compensation payment.
- Chainsaw operators often offer relatively well-paid employment opportunities in the local communities as they need man-power to carry the boards to the road side (Odoom, 2004).

Previous efforts to clamp down on chainsaw operators have involved setting up of local timber task forces with participation of local people, district assemblies, police, FC staff and military, but so far without much effect (Kotey et al., 1998). Efforts to create alternative employment opportunities for chainsaw operators, e.g. in forest reserves, have also not had the desired effect.

2.5 Past and Present Policies Governing Timber Trees outside forest reserves

This section introduces the main laws and laws statements which make up formal government policies over the years as well as policy position and legal instruments or acts of parliaments in relation to forest resources governance. It starts with a general description and later focuses on those policies, laws, acts and legislative instruments relating to off-reserve forest resources management.

As of now there have been two formal government forest policy statements in Ghana: one formulated in 1946 and approved by the Governor in Council in 1948; and the second announced in 1994 as the Forest and Wildlife Policy (Kotey et al, 1998). The Forest Policy of Ghana, 1948 remained in force for nearly half a century and unarguably had a pronounced impact on forests and people. The policy provided for the progressive utilization of off-reserve timber resources without replacement and assumed the confinement of forestry practices to the permanent forest estates (forest reserves). However later development in the timber industry as well as off-reserve forest decline called for the formulation of a new forest policy, the 1994 Forest and Wildlife Policy.

The new policy encourages sustainable management of tree resources outside reserves including that on farms and fallow lands as espoused in section 5.3.2 and 5.3.3 of the policy³⁰. Though the intention of the policy is laudable, sadly there is no effective long-term plan in place to ensure the realization of such policy objective hence the continuous exposure of timber resources to the mercy of persons who care less about sustainability. Adam et al, (2006)³¹ point out that; there is ambiguity in the interpretation of the new policy and that plans by FC seem to point towards a strategy of stretching the harvesting of timber for the longest possible time rather than attempting sustained yields in perpetuity.

After nearly one and half decade following the enactment of the policy, FC's involvement or role in achieving the policy objective and statement in relation to off-reserve timber resources management is only seen in the regulating of timber harvesting and sharing of benefits (a large part of which is used for administrative purposes tagged as internally generated funds). The situation is a clear indication of how FC has no long term commitment toward on-farm tree resources management but taking advantage of the policy to expand its control and influence in an area best reserved for others (TBI, 2009). The increase in off-reserve AAC from 0.5 million m³ to 1.5 million m³ in order to salvage valuable timber from being destroyed (Boateng, 2009)³² is a sad reflection of FC's lack of confidence in the sustainable management of the off-reserve timber resources.

2.6 Land and Tree Tenure in Ghana

Tenure describes the nature of property rights under which land is held and utilized (Boamah, 1986)³³. Land and tree tenure systems (*emphasis mine*) in Ghana are the result of three main influences: traditional; colonialism and the political, social and economic dynamic that it engendered; and post colonial policy (Mayers and Kotey, 1998). It can be inferred from the above that the land and tree tenure in Ghana have a long history.

³⁰ MLF (1994). *National Forest Policy of the Republic of Ghana*. Ministry of Lands and Forestry, Accra.

³¹ Adam K A., Pinard M., Cobbinah J., Damnyag L., Nketiah K.S. Nutakor, E. Kyereh B. Nyarko C. (2006). *Corruption in the chainsaw milling and lumber trade in Ghana*. Report submitted to the Natural Resource Institute, UK. Forestry Research Institute of Ghana, Tropenbos International Ghana, University of Aberdeen.

³² Boateng, K., 2005. *Equity in forest benefit sharing and poverty alleviation*. In: Tropenbos International 2005. Workshop proceedings 3 'Equity in Forest Benefit Sharing: Stakeholders' Views', 29th October 2004 (K.S. Nketiah, J.A.S. Ameyaw & B. Owusu Jnr.), Tropenbos International, Wageningen, and the Netherlands.

³³ Boamah, A.S., 1986. *A study of indigenous tenures relating to trees and forests in some parts of Ghana*. IRNR, KNUST.

This work does not attempt to retell the history but touches on relevant aspects of the development of the tenure system and its implication for timber resources management in areas outside forest reserves. Concerning land, Klutse (1973)³⁴ observed that interest in land is distinct from the interest in things on or attached to it (for example trees, *emphasis is mine*). This shows that land ownership does not necessarily imply tree ownership.

In this section both land and tree tenure is described and also laws and policies establishing tenural rights or interests related to these resources are highlighted.

2.6.1 Land Tenure

The term land tenure implies the various laws, rules and obligations governing the holding, and/or ownership of rights and interests in land (kassanga, 1988)³⁵. All lands in Ghana are governed by customary laws (Olennu, 1962: in Boamah, 1986) particularly with reference to transfer of title (Boni, 2005)³⁶. Thence the customary system has been the most robust system in practice estimated to hold 80-90% of all undeveloped lands in Ghana though with varying tenure management systems (kassaga and Kotey, 2001). However for all practical purposes when the state machinery is used and enforced, the customary system becomes weakened (kassaga and Kotey, 2001).

Nonetheless, land in Ghana except public lands is held by various stools (skins)³⁷, or families or clans. Having established this, customary and public land tenure is described below.

Customary land tenure

The Ghana Law Reform Commission identified four categories for land interests, under Land Title Registration Law, 1986, PNDCL 152. The four categories are: allodial title, freehold title, leasehold title, lesser interests in land.

³⁴ Klutse, A.K.P., 1973. *Ghana 1: Ewe law of property. Restate of African law*. Sweet and Maxwell: London.

³⁵ Kasanga, K., R., 1988. *Land tenure and the development dialogue: the myth concerning communal landholding in Ghana*. Occasional paper 19. Department of Land Economy, University of Cambridge.

³⁶ Boni, S., 2005. *Clearing the Ghanaian forest: Theories and practises of acquisition, transfer and utilisation of farming titles in the Sefwi-Akan area*. Institute of African Studies, University of Ghana, Accra.

³⁷ A stool means the seat of a chief of an indigenous state (sometimes of a head of family) which represents the source of authority of the chief (or head of family). It is a symbol of unity and its responsibilities devolve on its living representatives, the chief and his councilors. Land owned by such a state is referred to as stool land (National Land Policy, Ministry of Lands, Accra, 1999). The equivalent of stool in northern Ghana is the skin

Allodial title is the highest interest known to customary law and, in some traditional areas of Ghana, is recognized as being held or vested in traditional stools or skins. In other traditional areas, this interest is acknowledged to be held by subgroups such as substools, clans and families as well as individuals. Allodial owners hold their interest under customary law and are not subject to any restrictions on their user rights or any obligations in consequence of their holding except for those imposed by the laws of Ghana. Stool/skin ownership means corporate ownership and not ownership under the personal fiat of an individual ruler. The only ways to acquire an allodial title if at all by persons other than the state is by transfer through purchase or gift (DaRocha & Lodoh, 1993; in Marfo, 2009³⁸).

Freehold title is broken down into *customary law freehold* and *common law freehold*.

Customary law freehold, also called “usufructuary title”, is an interest held by substool, subgroups, lineage, family and individuals in land acknowledged to be owned allodially by a larger community that acquired it either by being the first to cultivate it or by succession from the first owning group of which they are members. Originally, under customary law, subjects of a stool had an inherent customary right to a portion of the allodial land. Exercising this right by occupying or cultivating any portion of the allodial land was enough to establish their usufructuary interest without the necessity of a grant from the stool/skin.

In addition, it is perpetual and continues as long as the owning group or subject or successors acknowledge the superior title of the stool. The interest is also inheritable and devolves to the holder’s family upon the death, intestate, of an individual holder. Holders of the usufruct have the right to relinquish their interest by sale, lease, mortgage or pledge, or to grant agricultural tenancies or shareholder agreements such as *abunu* (a half share) or *abusa* (a third share), but the recipient is obliged to recognize the superior authority of the stool and to perform customary services due from the subject grantor to the stool/skin.

They have unrestricted use of the land but have no rights to minerals or “treasure trove” found on the surface of the land. However, they are required to perform certain services to the stool that owns the allodial title.

³⁸ Marfo, E., 2009. *Security of tenure and community benefits under collaborative forest management arrangements in Ghana: A country report*. CIFOR and RRI.

Common law freehold is an interest in land acquired through a freehold grant made by the allodial owner, either by sale or gift. The holder of a customary law freehold can create a common law freehold through a grant to another person out of his interest. This grant requires the parties to agree that their obligations and rights under such a grant will be regulated by common law and that common law and common law rules will govern any dispute that may arise over the land.

Immigrant or migrant farmers are able to acquire land by this means. Marfo, (2009) points out that many immigrant or migrant farmers have common law freehold interest to their farmlands. The state law does not distinguish between native or migrant communities nor does it discriminate farmlands under customary or common law freehold.

Leaseholds are rights granted to a person to occupy a specified land for a specified term. A lease may be granted either by the holder of the allodial title or a customary freeholder. Under leasehold, the lessee pays for the right to occupy the land, usually with an annual rent, and has covenants covering the manner in which the land is used.

Lesser interests in land

For the purposes of agriculture, various lesser interests in land can be created by owners of allodial titles or customary freeholds. The two most widely used are *abunu* and *abusa*, which are usually sharecropping arrangements by which the tenant tills the land and, at harvest, gives a specified portion of the produce to the landlord. In general, the tenant farmer is entitled to a third of the produce from the land under *abusa* and half of the produce under *abunu*. This practice exists in various forms or arrangements in the farming communities and is gaining importance as a way of gaining access to scarce land.

2.6.2 Public land tenure

In addition to customary tenure arrangements, the state has powers granted through legislation such as the 1962 Administration of Lands Act, the 1962 State Lands Act, the 1963 Lands Act and the 1965 Public Conveyancing Act. These allow the government to acquire and hold land in the public interest or for public purposes. Although the 1992 Constitution left the state's powers to acquire and hold land intact, they are subject to constitutional limitations.

In general, land ownership is perceived as a corporate trust, belonging not only to the living, but the dead and countless generations of yet unborn.

The Constitution acknowledges the corporate nature of land ownership and states (Article 36-8) that the state recognizes that ownership and possession of land carry a social obligation to serve the larger community and, in particular, recognizes that the managers of public, stool, skin and family lands are fiduciaries charged with the obligation to discharge their functions for the benefit of, respectively, the people of Ghana and the stool, skin or family concerned and are accountable as fiduciaries in this regard (Sarpong, 2006) ³⁹.

2.6.3 Some Constitutional Developments in Land Tenure

The 1992 Constitution vested all public lands in the President in trust for the people of Ghana (Article 257) as well as vested all stool lands in the appropriate stools or skins on behalf of and in trust for the subjects of the stool. For instance all pre-existing public lands in the three northern regions were freed from the clutches of state control and were once again vested in any person who had been owner of the land before it was vested in the state or the appropriate skin without further assurance (Article 257-4). The effect of these provisions has been to make customary law the predominant basis for land tenure as is the case in southern Ghana.

Under Article 20 of the 1992 constitution, the government no more exercises the right to compulsorily acquire land for public use without paying adequate and effective compensation as was the case sometime ago.

2.6.4 Tree Tenure

Tree tenure has been defined by Fortmann (1985) ⁴⁰ as a bundle of rights over tree and tree products, each of which may be held by different people at different times. These rights include right to own, inherit, dispose, use and exclude others from using trees and tree products. In general terms, these rights can be categorized into use rights (access, withdrawal or exploitation), control (manage, exclude others from accessing it), alienation (rent, sell, transfer right to others).

³⁹ Sarpong G. A., 2006. *Improving Tenure Security for the Rural Poor; Ghana Country Case Study*. FAO, Rome.

⁴⁰ Fortmann, L. 1985. *The tree tenure factor in agroforestry with particular reference to Africa*. *Agroforestry Systems* 2, pp. 229-251.

In Ghana there are differences in tree tenure governing naturally occurring or growing trees and trees planted and even the nature of tree (commercial/economic trees or those of ordinary usage). Regard planted trees, the planter holds exclusive rights over the trees (access/use, management, alienation, exclusion). This is espoused in the Timber Resources Management (Amendment) Act, 2002⁴¹.

Unlike planted trees, tenural rights over naturally occurring trees whether in reserves or areas outside reserves are vested in the President (central government) on behalf of the stools as established by section 16 of the Concession Act, 1962. Consequently, timber right is granted by central government through its designated agency to interested persons or groups (timber companies) for timber exploitation after going through a competitive bidding process. Granting of timber rights this way takes place with little or no inputs from stools, communities or persons on whose lands the logging takes place. As of now exclusive right to naturally occurring timber trees can be acquired from central government through two main processes: timber utilization contract or timber utilization permit.

Thus far, it is clear that a combination of forestry laws and policies has resulted in a situation where individuals (farmers i.e. native or migrant), communities and traditional authorities have no rights (control, alienation) over naturally occurring timber trees on their lands and farms, though these ones particularly farmers continue to exercise judgment over which trees to maintain on their farms and fallow lands during land clearing and cultivation (Amanor, 1999)⁴².

It is interesting that the only access (rights) they have apart from extracting parts of trees for stakes, firewood, and use as props for erecting shelter is to destroy or illegally sell timber trees to illegal chainsaw operators. Ribot & Peluso (2003)⁴³ termed the latter two accesses as illicit access. The existing tree tenure pertaining to naturally occurring timber trees is major disincentive to off-reserve (farm, fallow lands) timber tree maintenance as acknowledged by Mayers & Kotey (1998).

⁴¹ Timber Resources Management (Amendment) Act, 2002

⁴² Amanor, Kojo (1999). *Global Restructuring and Land Rights in Ghana: Forest food chains, timber and rural livelihoods*. Uppsala: Nordiska Afrikainstitutet.

2.6.5 Granting of Timber rights to Farmers: A Window Dressing?

Largely, the farmer has been denied the right to enjoy economic benefits from timber trees by various forest laws and policies, however significant tenure reform was chalked with passage of the Timber Resources Management (amendment) Act 617⁴⁴. This Act granted farmers the right to deny or grant rights to concessionaires prior to allocation of TUC when the allocated area includes their farms. The law required written authorization from the farmer before logging can proceed. Nonetheless how has the law fair so far? Well, to say the law is a window dressing may sound too critical but to be charitable, then it is fair to say the law is yet to gather momentum.

A critical look at the provision shows that the farmers' right to veto felling of trees is recognized prior to the allocation of timber rights by the FC. This means if the farmer is satisfied with the arrangement (including compensation payment in case of crop damage) as presented by the timber operator or company, his consent is given. But note that, if the arrangement is breached or poorly executed to the disadvantage of the farmer, he loses the legal ground to veto as he has already given his consent and the timber operator who has already acquired the logging rights can and would go ahead with logging with the farmer unable to veto. The only option left for the farmer is court action in case of adamant timber operators which can be protracted and too expensive for the farmer to pursue. This nonetheless gives a field day to greedy timber operators who care less about sustainability. Additionally it is known that in most cases pre-felling inspections are carried out without farmer involvement. Hence farmers only discover later the logging activities on their farms and fallow lands after logging had already taken place and timber been hauled out. This makes the identification of timber operators more difficult for farmers to trace and to demand compensation or veto the process.

⁴³ Ribot, J.C., & Peluso, N.L. 2003. *A theory of access*. Rural Sociology 68 (2), 153-181

⁴⁴ Timber Resources Management (Amendment) Act, 2002. Act 617. Printer, Accra, Ghana.

2.7 Rights to economic Benefits of Timber trees

Generally obtaining environmental, ecological, and esthetic benefits from trees is unregulated and can be obtained freely by anyone who does not trample the rules governing the use or access to the trees. However regard the economic benefits of timber trees, strict customary and formal laws regulate access to the trees. It is worth noting that rights to benefits from timber trees have changed over time as a result of revisions of the laws governing them.

In the past, farmers had right to fell trees for personal use or for sale in a pitsaw, normally by providing a share of the timber products to the stool as a contribution towards it expenses (Amanor, 1996). Gordon, 1995 [in England (1992)⁴⁵] mentioned that the sale of a tree from farm was usually the prerogative of the stool, though the merchant may find that first he must purchase the right from the chief and then pay the farmer for permission to exercise the right. All these afforded the farmer some economic benefits from maintaining timber trees. Nonetheless, farmers have over time lost their right to convert trees to lumber for own use and for selling trees standing on their land. The alienation of farmers reached its final stage in 1962 with the vesting of all trees in the President, and depriving farmers from any share of the timber revenue. The 1962 legislation obviously also reduced the rights of the landowners, the Stools, who had their right to grant timber rights removed and formal timber revenues at the discretion and control of the Government. Finally, the 1962 legislation introduced the local governments as the key beneficiary of timber revenues, a right that has been cemented by the 1992 Constitution.

2.8 Present Benefit Sharing Arrangement

The present benefit sharing arrangement is guided by the Constitution of Ghana of 1992⁴⁶. Though the Constitution does not define “stool land revenue”, presumably it refers to the stumpage fee and concession rent. This can be inferred from the Timber Resources Management (Amendment) Regulation, LI 1721⁴⁷, which defines the stumpage fee (Section 21(3)) and the concession rent (Section 27) as “revenue accruing from Stool lands”.

⁴⁵ England, P. 1992. *Environmental protection and conservation of natural resources in Ghana*. Contrasting studies of the law in action. PhD dissertation, University of London, London, United Kingdom.

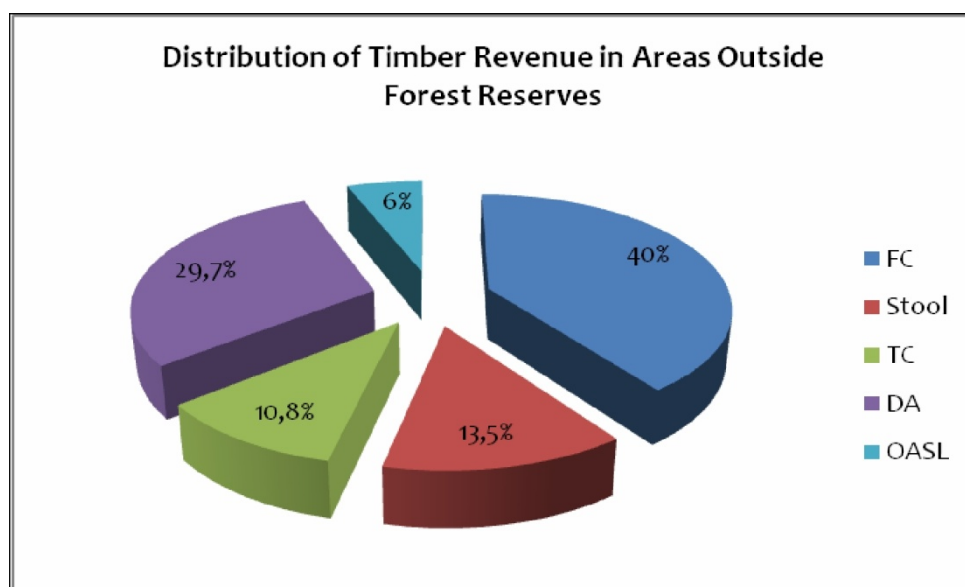
⁴⁶ “Ten per cent of the revenue accruing from Stool lands shall be paid into the office of the Administrator of Stool Lands to cover administrative expenses, and the remaining revenue shall be distributed in the following proportions: twenty-five percent to the Stool through the Traditional Authority for the maintenance of the Stool in keeping with its status; twenty percent to the Traditional Authority; fifty-five per cent to the District Assembly, within the area of authority of which the Stool lands are situated” (Constitution of Ghana, 1992; 267 (6)).

“There shall be paid to the Forestry Department [now Forestry Commission] for timber management services, such amounts as shall be determined by the Minister in consultation with the Forestry Commission, Forestry Department and the Administrator of Stool Lands in respect of Stool lands” (Timber Resources Management Regulations, 1998 (LI 1649); s. 26 (1)).

⁴⁷ Timber Resources Management Regulations, 2003. L.I. 1721. Government Printer, Accra, Ghana.

It is worth noting that the legislation is remarkably silent about the sharing of the proceeds from the Timber Rights Fee (TRF), introduced with competitive bidding for timber rights through the Timber Resources Management (Amendment) Regulations (LI 1721) in 2003 for TUCs. For unknown reasons, TRF revenues have not been considered as stool land revenue and the proceeds have not been shared in accordance with the Constitution. The stumpage fee is a species-specific volume based fee, charged on each cubic meter of timber felled. The concession rent is a fixed annual hectare based fee, (ref. Timber Resources Management Regulations, Schedule 4)

The distribution of gross stumpage revenue from off-reserves timber resources is summarized in Figure 2.1. FC's share of 40% is assigned on the basis for regulatory and management functions. The management fee derives its legal basis from the Timber Resources Management Regulations, 1998⁴⁸.



Note: Forestry Commission (FC), Stool, Traditional Council (TC), district assembly (DA),
Office of Administration of Stool Lands (OASL).

Figure 2.1: Distribution of Timber Revenue in Areas Outside Forest Reserves

⁴⁸ Timber Resources Management Regulations, 1998. L.I. 1649. Government Printer, Accra, Ghana.

2.8.1 Other supposed Benefit to Farmers: Social Responsibility Agreements (SRA) and Compensation

From the foregoing it is clear that farmers do not receive direct economic benefits from timber trees on their farms and fallow lands. However, some stakeholders and authors contend that farmers receive indirect benefits such as those under the Social Responsibility Agreements (SRA) ⁴⁹ and compensation in case of crop damage during logging activities. The argument has been that farmers as part of the community derive benefits from keeping timber trees since projects under SRAs go to benefit the whole community. It is difficult for such arguments to wash since the implementation of SRA and definition of who constitutes community are fraught with nibbling problems.

For instance due to the scattered nature of the off-reserve timber resources, a concession allocated for logging may span several farms and communities. So the question is which community in a specific forest area should be the negotiator and the recipient of SRA. Again, it is needless to say that the implementation of SRA itself leaves much to be desired. Mayers & Vermeulen (2002)⁵⁰ found that local groups saw little positive impact from timber operation. It is common knowledge that any profits from timber operations in forest areas through adhoc agreements with timber companies mostly go to stool chiefs or elders rather than the ordinary citizens. Ayine (2008)⁵¹ after studying nine SRAs confirms the afore-mentioned point about the potential of representative authorities blocking community benefits. In seven out of the nine cases, SRAs were concluded by traditional authorities (contrary to what the law stipulates) and in five cases no mechanism for the representation of community's interests other than the traditional authority's in the contract was involved. He further observes that sometimes provisions for marginal side-payments to chiefs and other community leaders were in the agreement, citing an example of USD 600 to be paid every month to one paramount chief. Ayine (2008) concludes after following 173 licensed timber operations in Ghana that while the legal framework provides an enabling environment for negotiating SRAs the actual practice of negotiating and implementing these agreements leaves much to be desired.

TBI (2009) contends that looking at the value of the resources the benefits of SRAs is insignificant for the entire community value and for farmers labour.

⁴⁹ See Ayine (2008)

⁵⁰ Mayers, J. and Vermeulen, S. 2002. *Company-community forestry partnerships: From raw deals to mutual gains?* Instruments for sustainable private sector forestry series. International Institute for Environment and Development, London. 77-82 pp.

⁵¹ Ayine, A. D., 2008. *Development Social Responsibility Agreement Ghana's Forest Sector*. Legal Tools for Citizen Empowerment Series, IIED, London.

Compensation for crop damage, another form of benefit that supposedly provides direct benefits to farmers has its own problems bedeviling it that it is hard to even call this benefit. In most cases, these may be labeled as short chaining. Various sources mention that compensations are not paid or even if paid at all the amount is like a slap in the face of these hardworking farmers. Time and again, legitimate claim for compensation often end up in long protracted court battles that farmers simply abandon or avoid legal process for claiming what is rightfully theirs. Various authors such as: Treue (2001)⁵², Inkoom (1999), Amanor (1996), Mayers et al (1996) mention this situation in their studies or findings.

In relation to all the information discussed under this section the most obvious question is, the present benefit sharing arrangement and its appendages a good enough incentive to sustain farmer engagement in timber tree maintenance on farm and fallow lands? Can it be described as being equitable?

2.9 Equitable Benefit Sharing

The issue of equity in benefits sharing and incentive for farmers toward tree maintenance has been widely discussed with varying agreements and disagreements. This notwithstanding, the sharing of economic benefits from timber trees in areas outside forest reserve cannot be described as equitable and also a good positive incentive to sustain farmers' interest in timber tree maintenance (TBI, 2005)⁵³ and this is a major concern for all stakeholders.

In an attempt to answer the question of equity and enabling incentive for farmer engagement, it is fair to examine the effects of the existing arrangement on sustainable timber resource management in off-reserve areas. The continuous dwindling of the resource base is one telling effect on the performance of the arrangement so far. Though other factors contribute to the decline, it is obvious that forestry laws and policies have failed hence requiring reforms and the need for firmer implementation of policy requirements.

⁵² Treue, T. 2001. *Politics and economics of tropical high forest management: A case study of Ghana*. 1-366. Klüver Academic Publishers, Dordrecht, the Netherlands, 366 pp.

⁵³ Tropenbos International, 2005. Workshop proceedings 3 'Equity in Forest Benefit Sharing: Stakeholders' Views', 29th October 2004 (K.S. Nketiah, J.A.S. Ameyaw & B. Owusu Jnr.), Tropenbos International, Wageningen, and the Netherlands

Amanor (2005)⁵⁴ emphatically states that the existing forestry laws and policies in Ghana do not provide a framework for equitable sharing of forest resources and the benefits they provide nor do they provide a framework for rational or sustainable management of the resources. He further continues saying that these laws and policies rather enable and justify the appropriation of the benefits of forestry by a narrow sector of society which is the rich, powerful and politically well-connected.

It is interesting to note that the universal declaration of rights adopted and proclaimed by the General Assembly Resolution states that ‘everyone without any discrimination has the right to equal pay for equal work’. The farmer in this case works to tend, nurture, protect and preserve timber trees on farms and fallow lands yet he is denied just and favourable reward for his hardwork. Can such policies denying farmers’ right to economic benefits be deemed as equitable? It is justifiably acknowledged that not all stakeholders can be rewarded for their roles (inputs), rights and responsibilities in off-reserve timber resources management, it is regrettable that such obvious and quintessential stakeholder (farmer) is ignored given credence to the saying in the local Ghanaian parlance ‘monkey works baboon eats’. The continuation of such situation would not auger well for the sustainability of timber resources in off-reserve areas.

Small wonder then that most stakeholders and authors have favoured the revision of policies, laws and benefit sharing arrangement pertaining to these resources. A good basis for an equitable benefit sharing would be the capturing of farmers into the fold of the existing beneficiary stakeholders and also base any benefit sharing on roles (inputs), rights and responsibilities of the stakeholders.

One African proverb says ‘he who wants to plant corns must make peace with the monkeys’. The farmers being brought into the benefit arrangement are not only a fine way to go but also the roles, rights and responsibilities being the basis would be acceptable to both farmers and other stakeholders. TBI, 2009; TBI, 2005; Owubah, (2001)⁵⁵ considered this to be a step in the right direction for achieving sustainable off-reserve timber resources management.

⁵⁴ Amanor, K.S., 2005. *Equity in forest benefit sharing and poverty alleviation*. In: Tropenbos International 2005. Workshop proceedings 3 ‘Equity in Forest Benefit Sharing: Stakeholders’ Views’, 29th October 2004 (K.S. Nketiah, J.A.S. Ameyaw & B. Owusu Jnr.), Tropenbos International, Wageningen, and the Netherlands.

⁵⁵ Owubah E. C., Le Master D.C., Bowker J.M., & Lee J.G., 2001. *Forest Tenure Systems and Sustainable forest management: the case of Ghana*. Forest Ecology and Management 149. 253-264 pp

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Materials

The study was carried out in Goaso in Asunafo North Municipal of Brong Ahafo region, Ghana. The selection follows the factors that, the municipality has and still experiences timber operation both in reserve forests and areas outside reserves. It has previously participated in studies relating to off-reserve timber resources management hence paving way for a comparative analysis and also coming into contact with persons who have a good understanding of the issues involved. Figure 3.1 below shows the study area (eight communities in the municipality) selected for the study:

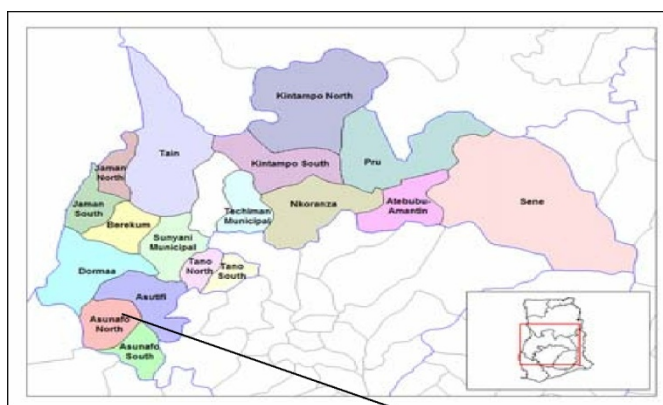


Figure 3.1: Map showing the study Area (coloured: brick)

3.2 Methods

3.2.1 Research Design

The research is a comparative case study. Data collection process consisted of two parts. In the first phase an extensive literature review and expert consultation took place. Following consultation with TBI-Ghana, field study locations were selected for the interviews and administration of both unstructured and semi-structured questionnaires. This constituted the second phase. Key stakeholders such as Traditional authorities (traditional councils and stools), Administrator of Stool lands, representative of the Municipal Assembly and the District Forest Manager were interviewed to capture their views on roles, rights and responsibilities of stakeholders and as well as their opinion on what will constitute a good basis for equitable benefit sharing arrangement. Farmers were selected to respond to a set of questionnaires soliciting their views on their roles, rights and responsibilities in timber tree resources management as well as those of the above mentioned stakeholders.

Additionally they responded to questions bothering on what constitutes on-farm timber resources management, cost of maintenance of timber trees on farms and fallows and what will constitute a good basis for equitable benefit sharing arrangement.

In all, seven (7) categories of primary stakeholders were interviewed. The stakeholders include: farmers, traditional council and stools, office of administration of stool lands (OASL), forest service division (FSD) and forestry commission (FC), district assembly (DA).

3.2.2 Data collection/Sampling design

Stratified random sampling technique was employed in the selection of farmers in the communities that the study took place. The entire study was stratified into four (4) zones (NE, NW, SE, and SW). Proximity to forest cover was considered an important factor since this will be useful in eliciting timber recourses' related responses. In each zones, two (2) communities were randomly selected resulting in a total of 8 communities in consultation with the District Forest Service Division officer. The communities are: Nsuta, Dominase, Kwahu, Asumura, Mfama, Pesewokrom, Gambia No.2 and Akrodie. In each community, ten (10) farmers were randomly selected and interviewed making a total of 80 farmers in the entire study area. As much as possible an equal proportion of native and migrant farmer was sought so that diversity or variability in responses could be compared taking cognizant of the fact that the two categories of farmers have different opportunities and circumstances in relation to rights and tenure. Five farmers from the study areas were selected for a pilot study and this was included in the data for analysis.

3.2.3 Data Analysis

Preliminary data analysis took place simultaneously to data collection. All interviews were recorded and notes were taken down. Next, the interviews were reviewed and relevant information was extracted. This information was briefly summarized in written form and coded for input into a statistical package. Similar procedure was used in regards to literature study. The notes were taken down for each document and later they were condensed into a written summary.

The data collected were subjected to appropriate qualitative and quantitative analyses, using Statistical Package for Social Scientists (SPSS, version 16, IBM) and relevant deduction were made in relation to the objectives of the study. The data and results from the study are synthesized and presented in the next chapter.

CHAPTER FOUR

4.0 RESULTS

This chapter draws on the findings from the field survey conducted in eight (8) communities of the Asunafo North Municipal. The chapter begins by discussing the socio-demographic characteristics of the participating households and explores the statistical association between some demographic variables. Next farmers' reasons for tree maintenance, on-farm tree management strategies and its associated costs are discussed. Results obtained on stakeholders' perception of each other's role, rights and responsibilities in timber resources management in areas outside reserves are presented. Stakeholders' view on the appropriate basis for policy reforms and economic benefit sharing in relation to on-farm timber trees is assessed and described.

4.1 Socio-Demographic Characteristics of Respondents (Farmers)

The results under this section have been presented under two main subsections. These are:

1. Demographic characteristics of respondents
2. Relationship between selected socio-demographic variables (gender and status of farmers) and selected socio-demographic characteristics

4.1.1 General Demographic Characteristics of Respondents (Farmers)

From table 4.1 more males (69%) participated in the study than females (31%). In the Ghanaian context male members of the family are traditionally seen as the voices of the family hence represent their households with women performing subordinate roles, though the pattern is gradually becoming less assertive. Therefore it is expected that in a random selection of respondents from farming communities more males may be selected than females unless the community is female dominated. In some communities, some female respondents declined to take part in the study preferring or nominating male members of the household to do so. Anyomi (2008), who made a similar study in nearly half of the selected communities reported similar figures of male (62%) and females (38%).

Furthermore, 74% of the respondents fall under the age category of 31-60 with most of the respondents (66%) having obtained basic school education. An outstanding characteristic of the respondents is the exceedingly high percentage of migrant farmers (85%) as opposed to native farmers (15%). The dominant modes of land acquisition out of the six (6) that were identified are 'family allocation' (32%) and 'purchased' (26%).

Table 4.1: Socio-Demographic Characteristics of Respondents (Farmers)

Parameters	Categories	Percentage
Gender	Male	69
	Female	31
Age	21 – 30	11
	31 – 40	31
	41 – 50	20
	51 – 60	22
	61 – 70	9
	71 – 80	6
	81- 90	1
Education	No formal education	18
	Basic	66
	Secondary	6
	Tertiary	11
Nativity	Migrant	85
	Native	15
Mode of Land Acquisition	Family allocation	32
	Purchased	26
	Inheritance	18
	Share cropping	13
	Gift	4

4.1.2 Statistical Association between Selected Socio-Demographic characteristics and Mode of Land Acquisition: Gender and Farmer status

This section presents statistical association between gender and farmer status (native or migrant); and mode of land acquisition. Mode of land acquisition was selected since it determines rights to certain resources on the land as well as influence actions or activities carried out to ensure the management of such resources. The variables gender and farmer status have some form of relationship with land acquisition methods.

Table 4.2 presents the statistical associations and the strength of the association between the selected variables. An association is observed between farmers' status (native or migrant) and mode of land acquisition with $P(0.029) < 0.05$ and Pearson's Chi-square (χ^2) of 12.49. However, there was no association between gender and mode of land acquisition having scored $P(0.74) > 0.05$.

Table 4.2: Statistical Association between Gender, Farmer status; and Mode of Land Acquisition

Socio-Demographic Characteristics		Mode of Land Acquisition (%)						Pearson's Chi-square (χ^2)	Sig. (95%)
		Family Allocation	Gift	Purchased	Rented	Inheritance	Share-Cropping		
Gender	Male	28.8	3.4	32.2	5.1	15.3	15.3	10.065 (df)	0.74 Not significant
	Female	40	16	12	0	24	8		
Farmer Status	Native	69.2	0	7.7	0	23.1	0	12.495 (df)	0.029 Significant
	Migrant	25.4	8.5	29.5	4.2	16.9	15.5		
Gender: P > 0.05 (not significant)			Farmer status (Native/migrant): P < 0.05, significant						

A further look at the association between farmers' status and mode of land acquisition in table 4.3 reveals strong relation between these variables. For instance it is expected that the dominant mode of land acquisition among natives would be family allocation and inheritance. The observed and expected values under the family allocation and inheritance columns support this assumption. The two categories have expected counts less than their observed counts indicating that any association observed is not due to chance. Similar pattern is observed in the case of migrants whose dominant forms of land acquisition are purchase, rent and share-cropping since they are not community members hence can only access land by these means. These modes of land acquisition have the expected counts less than observed counts thence the indication that the observed association is not due to chance.

Table 4.3: Statistical Association between Farmer status; and Mode of Land Acquisition

			Mode of Land Acquisition					Total
			Family Allocation	Gift	Purchased	Rented	Share-Cropping	
Farmers	Native	Count	9	0	1	0	3	13
		Expected						
		Count	4.2	0.9	3.4	0.5	2.3	13.0
	Migrant	Count	18	6	21	3	12	71
		Expected						
		Count	22.8	5.1	18.6	2.5	12.7	71.0
Total	Count		27	6	22	3	15	84
	Expected							
	Count		27.0	6.0	22.0	3.0	15.0	84.0

4.2 Areas outside Forest Reserves: Resources and Management

This section presents the results obtained regarding factors informing farmers' decision to maintain timber trees on their farms as well as farmers' tree management practices. It also reports on tree resources available in various land use systems.

4.2.1 Off-reserve Timber Resources: Timber species Distribution and Agricultural Land use Systems

As many as 29 different timber species were reported to be found in various agricultural land use systems considered in this study (cocoa, food crop and oil palm farming system; and fallow). However, the greatest number of species was reported under cocoa farming system (69%) with food crop farming system hosting the least number of species (8%). This is shown below in fig 4.1:

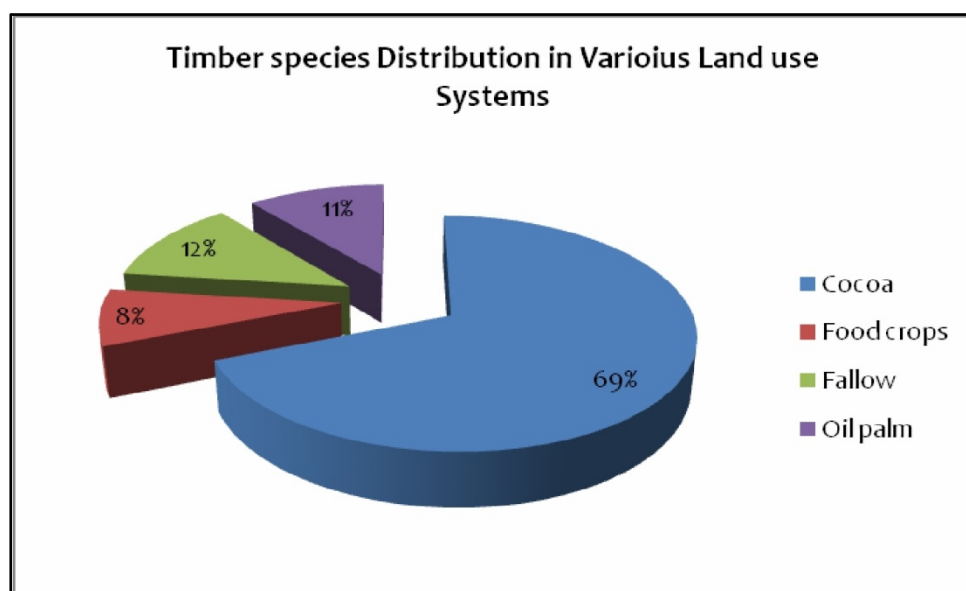


Fig. 4.1: Timber species Distribution in Various Land use Systems

Fig. 4.2 shows the overall timber species distribution and abundance in all land use systems. In all, four (4) of the species had relatively high distribution and abundance. The species include: *Terminalia superba* (23%), *Triplochiton scleroxylon* (22%), *Ceiba pentandra* (20%) and *Milicia excelsa* (10%).

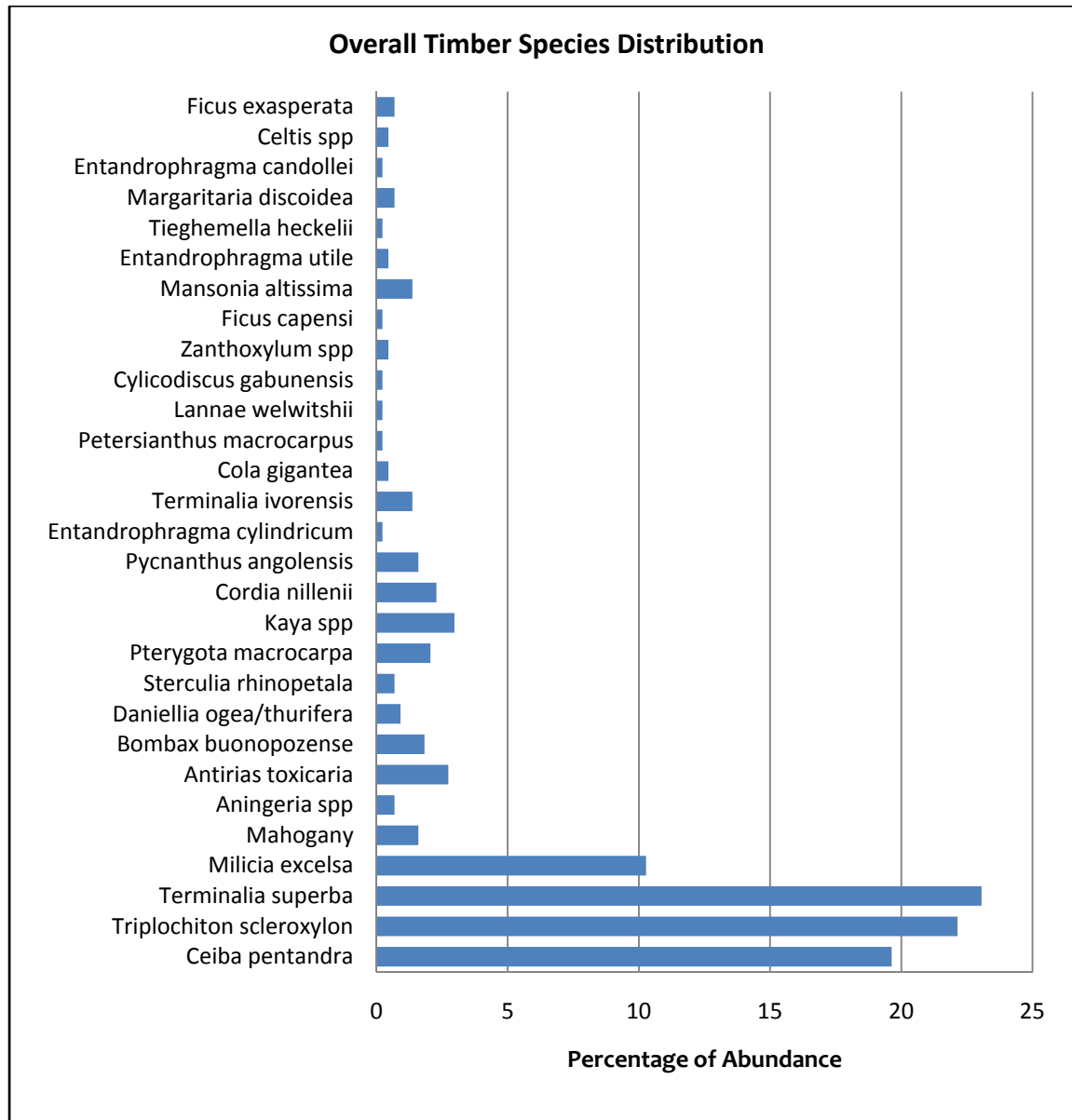


Fig. 4.2: Overall Timber Species Distribution and Abundance

4.2.2 Off-reserve Timber Resources: Timber tree Maintenance

From fig 4.3 it is observed that a great number of farmers (85%) perform various management activities to nurture, tend and maintain timber trees on their farms. Migrant farmers (83%) dominate the proportion of farmers that maintain timber trees. A small percentage of farmers (15%) does not maintain timber trees in their farm lands.

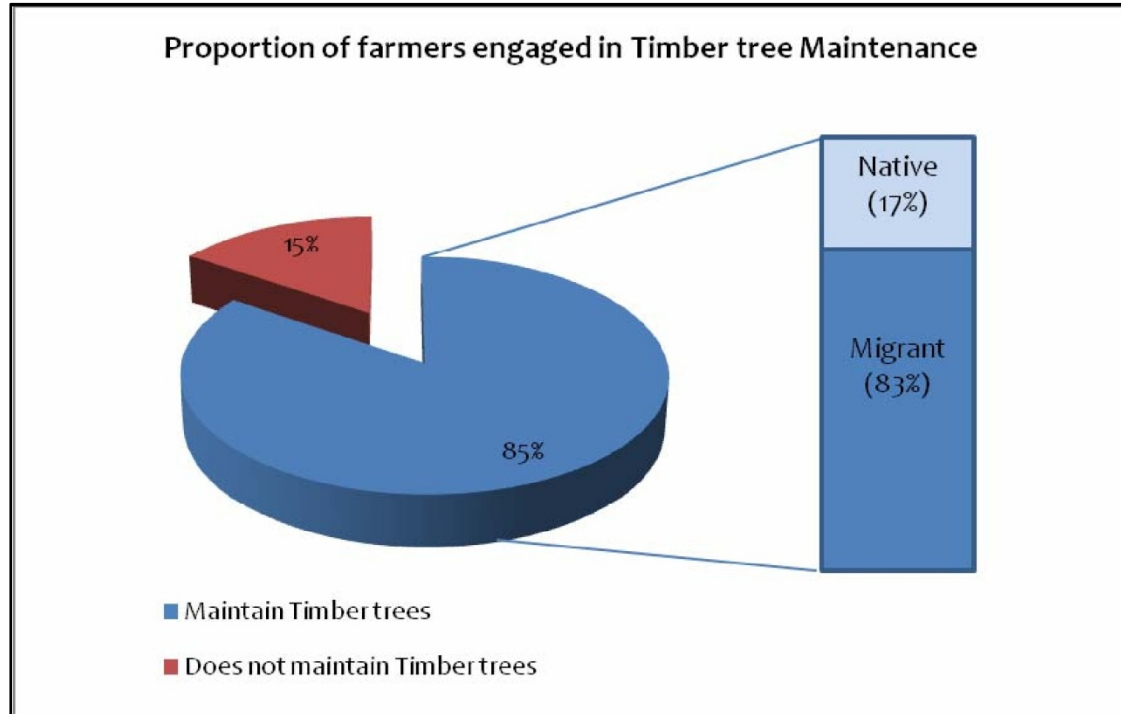


Fig. 4.3: Proportion of farmers engaged in Timber tree Maintenance

Farmers' motivation for maintenance of trees were diverse, however the oft-mentioned reasons are: trees providing shade to nurture growing crops particularly cocoa (34%); source of wood production to meet domestic needs (24%) and soil protection or conservation (14%) as shown in fig 4.4:

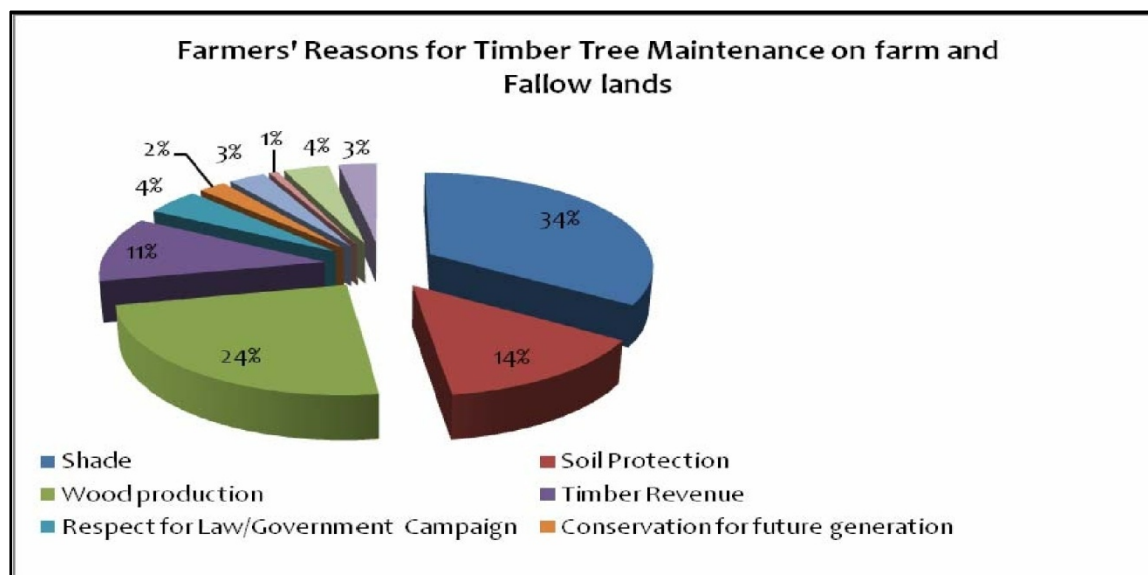


Fig 4.4: Farmers' Reasons for Timber Tree Maintenance on Farm and Fallow lands

Regard farmers who do not engage in timber tree maintenance, prominent reasons informing their decision were: risk of crop damage during logging (54%), lack of economic benefits for maintenance of timber trees (23%) and trees serving as alternative hosts for pest and disease attack on their crops (15%). This is illustrated in fig. 4.5:

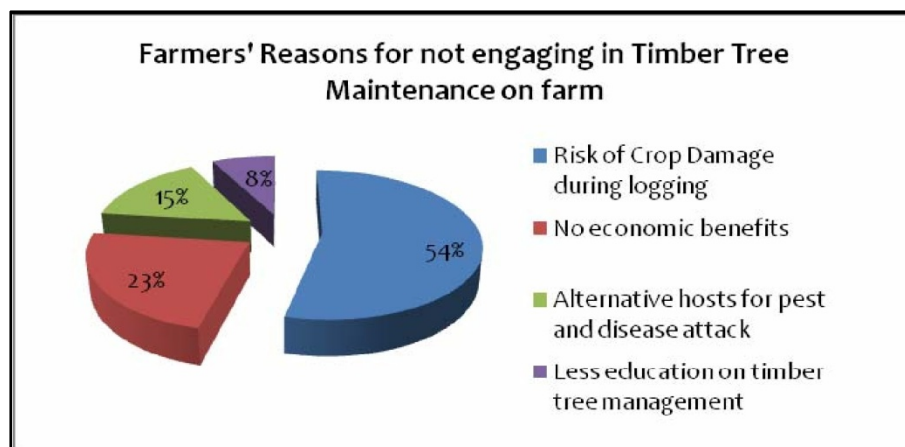


Fig. 4.5: Farmers' Reasons for not engaging in Timber Tree Maintenance on farm

4.2.3 Off-reserve Timber Resources: Management Practices, Cost and Influence of farming Systems

Seven different on-farm tree management practices are performed by farmers in order to nurture, tend and retain timber trees in their farms. Most of the activities performed are fairly distributed, except protection against illegal logging which is the least performed activity (2%) as shown in fig. 4.6 below:

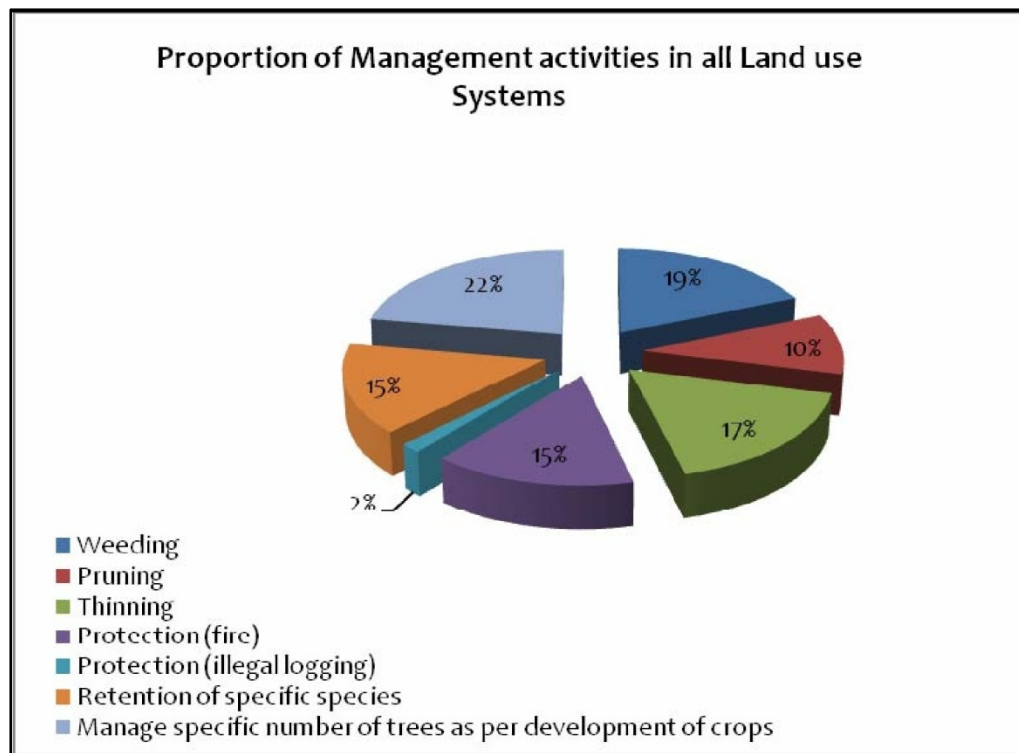


Fig. 4.6: Proportion of Management activities in all Land use Systems

Nonetheless, capturing these activities under the various land use systems as shown in fig. 4.7 points to cocoa farming system as a land use system receiving most management activities having scored above 60% in all cases. Interestingly only one kind of management activity is performed on fallow lands (i.e. protection against illegal logging). This is not surprising since fallows in general are left to regenerate trees and also recuperate soil nutrients in the most natural way without human intervention. Fallows saw least investment in terms of energy, time and resources.

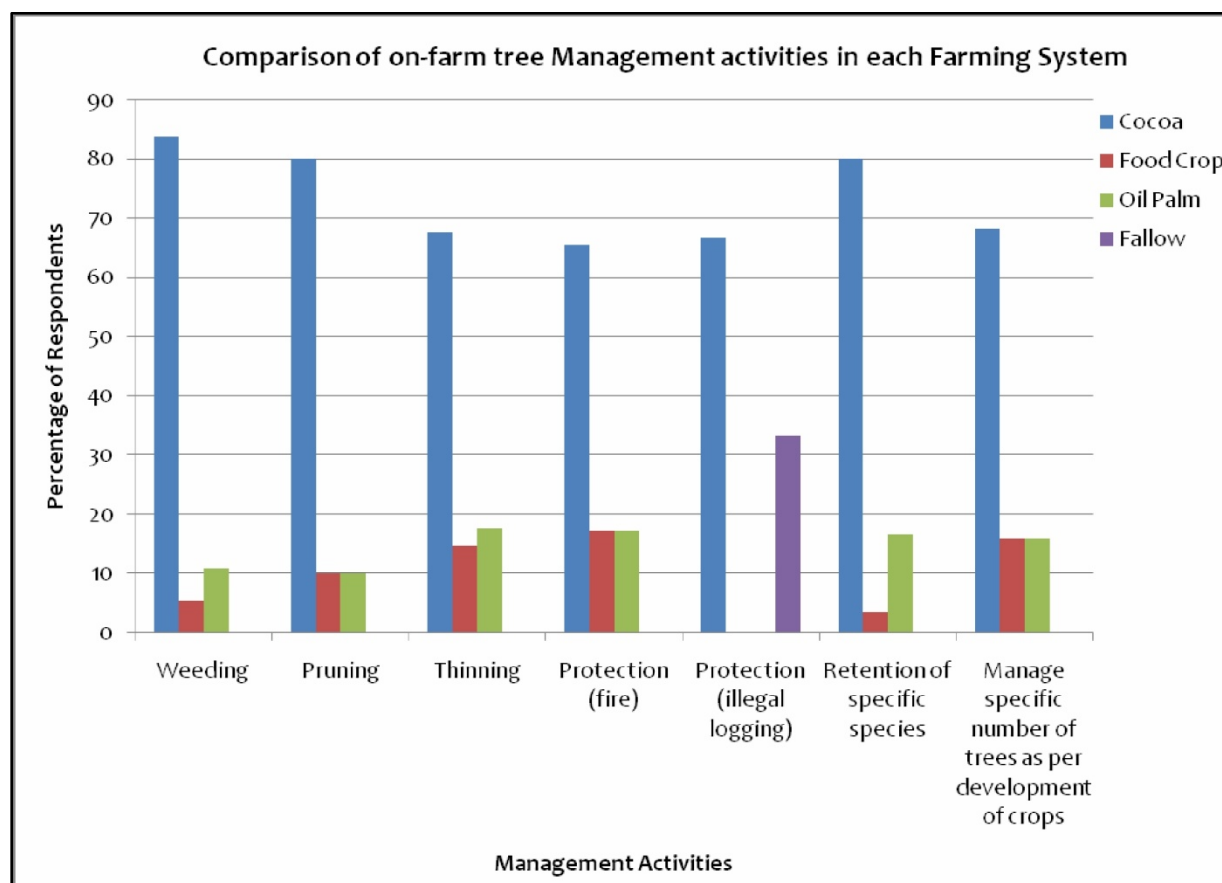


Fig. 4.7: Comparison of on-farm tree Management activities in each Farming System

Farmers who maintained timber trees on their farms listed at least four (4) forms of cost associated with the decision to retain and manage trees. Cost of engaging labour for clearing or spraying of undergrowth featured most (45%) and this corresponds with most performed activity (see fig. 4.6). The remaining costs such as trees acting as alternative host for pest and disease infestation of crops, taking up of farming space by trees and risks of injury to life and crop damage resulting from the fall of whole or parts of trees had a somewhat fair distribution. This is depicted in fig. 4.8 below:

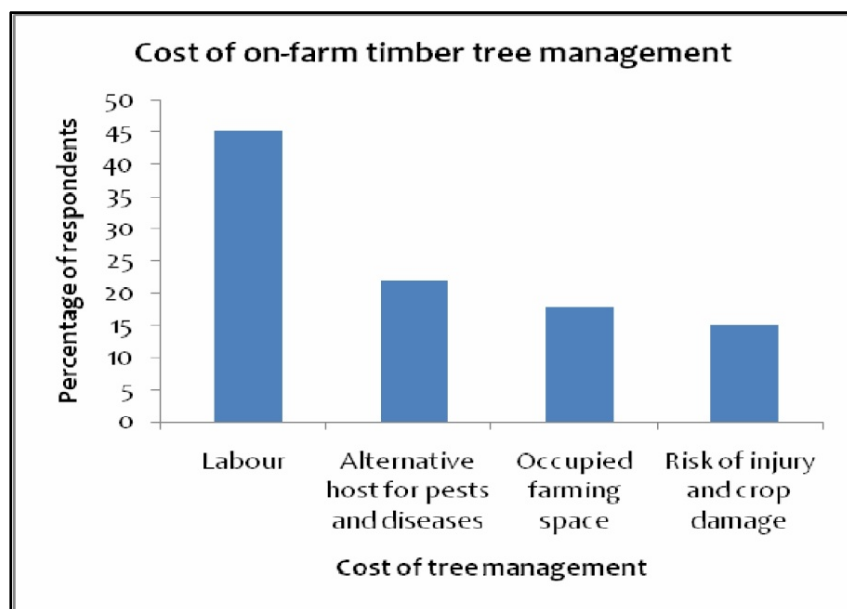


Fig. 4.8: Cost of on-farm timber tree management

The study further explored whether the kind of land use system practiced influences the choice and intensity of management activities performed to maintain timber trees. From table 4.4, a good number of the respondents (77%) who already maintain timber trees in their farms admitted that the kind of land use system practiced influenced choice, intensity, frequency of management activities and tree density. However, 23% said there is no difference in normal farm management and management of farms integrating timber trees and that no special effort is required.

Table 4.4: Farmers' view on Influence of Land use system on tree management practices

Responses	Frequency	Percent
Yes	55	77%
No	16	23%
Total	71	100

4.3 Off-reserve timber resource management: Stakeholders' Perception of Present Benefit Sharing Arrangement

The section that follows illustrates results obtained on stakeholders' view of the present benefit arrangement and this includes issues of SRAs and compensations. Views of stakeholders other than farmers are captured in narratives.

4.3.1 Stakeholders' Perception of Present Benefit Sharing Arrangement: Farmers

From fig. 4.9, it is clear that a great majority of farmers interviewed believed that the current benefit sharing arrangement as stipulated in the 1992 constitution is not equitable with 96% of the respondents saying so. Various reasons cited for their view centered on incommensurate reward for roles or inputs of stakeholders involved in off-reserve tree resources management. Fig 5.1 depicts the reasons below. However the most high-flying ones are exclusion of farmers from economic benefits sharing (73%) and role/input incommensurate to economic reward.

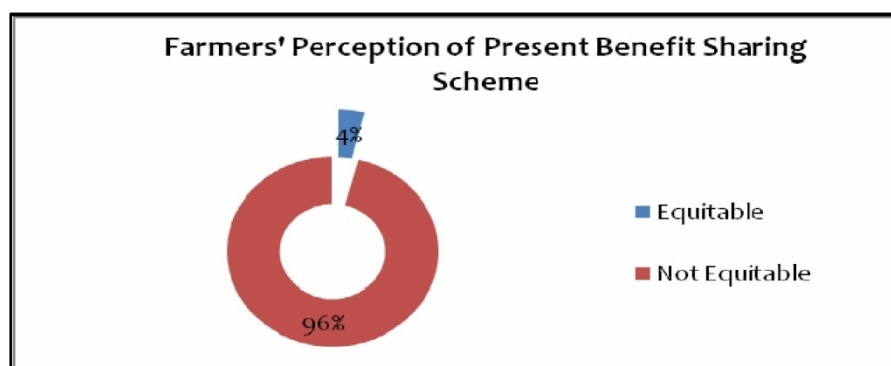


Fig. 4.9: Farmers' Perception of Present Benefit Sharing Scheme

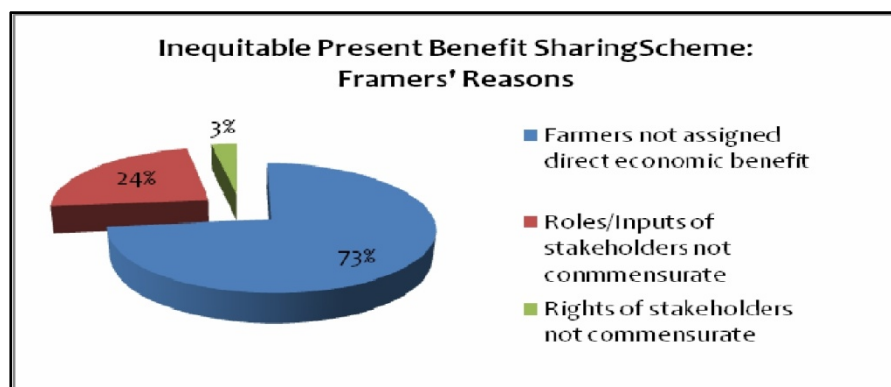


Fig 5.1: Inequitable Present Benefit Sharing Scheme: Farmers' Reasons

4.3.2 Stakeholders' Perception of Present Benefit Sharing Arrangement: Traditional Council and Stool land Owners

Traditional Authorities (Traditional council and Stool land owners) who are leaders and represent the interest of the communities express somewhat different opinion contrary to that of the farming communities. The Traditional council and Stool land owners interviewed acknowledged that farmers do not receive any direct economic benefits for their role in maintenance of timber resources outside forest reserves. However in their opinion farmers have no need for any direct economic benefits and that they are adequately covered in the present benefit sharing system by means of SRA and compensation in cases of crop damage.

Regarding the equitability of the benefit sharing arrangement as stipulated by 1992 constitution, they unanimously agreed that it is not equitable. In their estimation, the arrangement is not equitable because they have somewhat low or small percentage of the share considering the fact they are forest land owners hence deserved an appreciable level of the shares. Almost all the traditional authorities interviewed pushed for increase of their share through the reduction of the share of other stakeholders. They assert that bringing farmers into the present benefit sharing arrangement would only complicate matters.

4.3.3 Stakeholders' Perception of Present Benefit Sharing Arrangement: District Assembly (DA)

District Assembly as a stakeholder was satisfied with their share of the benefit but expressed concern for the exclusion of farmers in the present benefit sharing scheme. The plight of farmers was of particular concern to them because in their view, farmers were essential stakeholders who ensure the preservation of the resource base. Their decisions and actions affect for good or bad the resources hence should be given the recognition they deserve. Bemoaning the situation of the farmer, DA felt that the present benefit arrangement could hardly qualify to be described as equitable. To salvage the situation, they felt the share of the traditional authorities (TA) should be reduced and channeled to the farmer who nurtures the trees since TA is largely unaccountable to the communities in the use of royalties they receive from timber operations.

4.3.4 Stakeholders' Perception of Present Benefit Sharing Arrangement: Forestry Commission (FC)

Forestry Commission represented by the Forest Service Division (FSD) acknowledged the immense role of farmers in maintenance of timber trees in areas outside reserves. They emphatically admitted that the farmer who plays a critical role in nurturing, protection and maintenance of timber trees are not catered for in the present benefit sharing arrangement hence deeming the arrangement to be short of equity toward farmers. In their opinion a direct assignment of economic benefit to the farmer would be a major leap toward achieving sustainable management of timber resources outside the reserves. They held the view that some of the percentage shares of the traditional authorities and FC itself should be reduced and given to the farmers directly.

4.4. Stakeholders' Perception of SRA and Compensation for Crop damage

Under this section perceptions of various stakeholders on other forms of benefits (Social Responsibilities Agreement and Compensation for crop damage) are presented. Stakeholders express their views on whether SRA and compensation payment in case of crop damage is adequate to motivate farmers to keep maintaining timber trees on their farms and fallows.

4.4.1 Stakeholders' Perception of SRA and Compensation for Crop damage: Farmers

It is obvious from fig. 5.2 that a great majority of the farmers interviewed could not think of the provision of SRA and compensation payment in the event of crop damage as motivating package for them to engage in timber tree maintenance on their farms. Although a few thought the provision is adequate for farmer engagement, 87% thought otherwise.

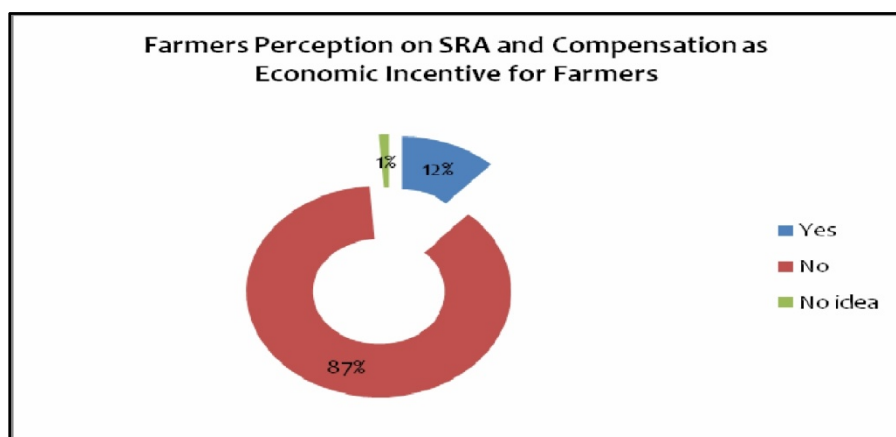
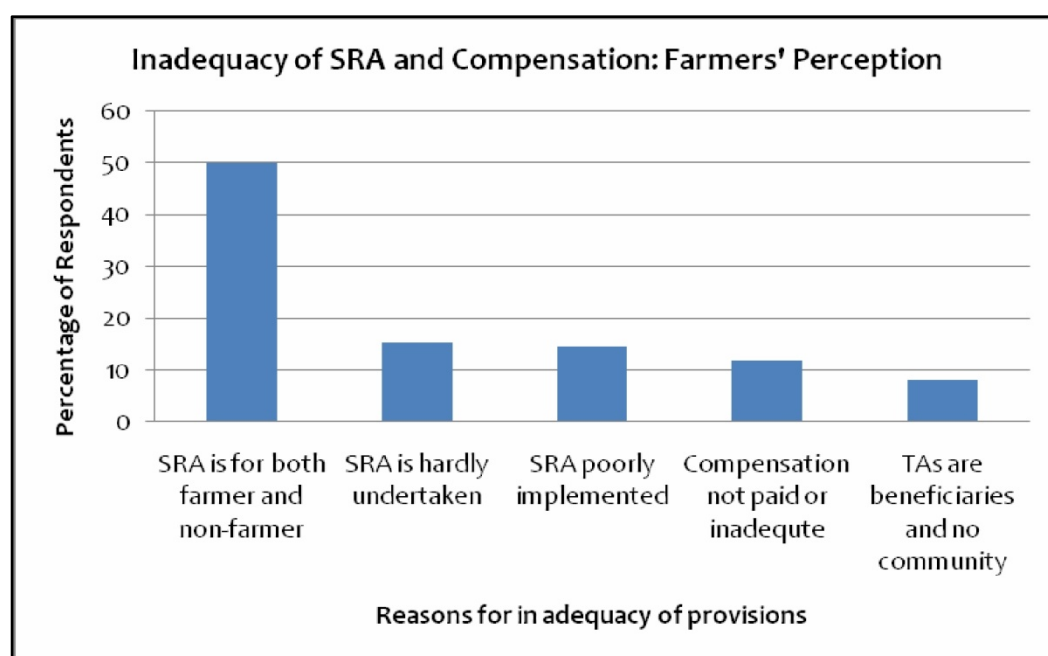


Fig. 5.2: Farmers Perception on SRA and Compensation as Economic Incentive for Farmers

Reasons cited for the assumption of such perception are categorized into two (2) subject areas: issues relating to implementation and the other relating to beneficiaries. The oft-mentioned reason is that SRA benefit both farmer and non-farmer (50%) hence that could not constitute direct economic incentive or benefit. They argue that a community member with different profession receives direct economic benefit for his or her roles performed, so should the farmer. Other reasons such as poor implementation, lack of implementation were fairly mentioned. The main issue with compensation was lack of payment and inadequate value compare to value of crops damaged. Fig. 5.3 presents the findings below:



Note: SRA (Social Responsibility Agreements); TAs (Traditional Authorities)

Fig. 5.3: Inadequacy of SRA and Compensation: Farmers' Perception

4.4.2 Stakeholders' Perception of SRA and Compensation for Crop damage: Traditional Council and Stool

Traditional Authorities were of the view that SRA and Compensations are fine arrangement meant to cater for the economic needs of farmers who maintain timber trees on their lands and also the community at large. To them, such arrangement constitutes direct economic incentive for farmers to continue maintaining timber trees on their farms and fallows. However they appreciated the fact that SRAs are poorly implemented and that compensations are saddled with non-payment and if paid the package is meager in comparison of the value of crops damaged. The situation mostly leaves the farmer despondent thereby resulting in their conniving with illegal timber operators to extract timber trees and also engage in deliberate killing of trees. They called for the stay of SRA and the compensation arrangement but emphasized the need for firmer and strict implementation and enforcement.

4.4.3 Stakeholders' Perception of SRA and Compensation for Crop damage: District Assembly

DA expressed the view that SRA and compensation payment to farmers for crop damage is a very good arrangement intended to provide forest fringe communities and farmers with some form of economic benefits in order to encourage these ones to maintain timber resources in areas outside reserves. They were also quick to admit that the implementation of these packages has not been enviable as SRAs have been poorly executed with it getting into wrong hands (traditional leaders) or projects poorly chosen and with compensations having gone unpaid. In the face of these problems they called for a strict enforcement of the provision and also supported the view that the farmer who particularly nurtures trees on his farmlands should be directly included in the benefit sharing scheme. In this way timber resources will be preserved for the benefit of all.

4.4.4 Stakeholders' Perception of SRA and Compensation for Crop damage: Forestry Commission (represented by FSD officials)

FSD as stakeholder was of the view that SRAs and compensation payment may be part of the benefit sharing system. However some form of direct economic benefit should be given to the farmer who nurtures trees on his farm and fallow.

According to FSD, SRA is a community project meant to benefit both farmers and non-farmers hence what reaches the farmers directly may be insignificant. Besides the projects may be located in just one community or two but farmers who are affected by logging operations may be scattered and

come from near and far of the beneficiary community. Therefore the trickling down of such benefits becomes highly difficult to distribute if at all not reaching all farmers.

Regarding the payment of compensation in the event of crop damage FSD bemoans the fact that the arrangement is not strictly enforced and ill-implemented, though the arrangement seems to be the only one that provides direct economic benefit to the farmer. They acknowledged that most compensation is not paid with most cases of non-payment ending up in their offices to resolve.

In cases where farmers receive compensation it is appalling that they do not match the value of the crops damaged. Timber companies take advantage of the lack of knowledge and negotiation skills of the poor farmer as well as the general lack of power and economic means to pursue adequate compensation packages. Their situation is like that of a man fighting a multitude of elephants as timber operators are all too powerful and huge to grapple with.

4.5 Basis of Equitable Benefit Sharing Arrangement: Perception of Stakeholders

The section that follows presents findings of stakeholders' view of basis for reconstituting economic benefit sharing scheme acceptable to all.

4.5.1 Basis of Equitable Benefit Sharing Arrangement: Farmers

As shown by fig. 5.4, it was in the opinion of all stakeholders that the assigning of economic benefits should be based on the roles (inputs) of stakeholders involved in timber resource management in areas outside reserve. Majority of the stakeholders (56%) contacted supported the afore-mentioned view. The other basis such as recognition of stakeholders' rights and the inclusion of farmers in the present scheme were fairly mentioned. They pointed out that if benefit sharing schemes are based on these factors then the arm of the arrangement will be long enough to capture farmers who may be part of the arrangement by reason of their role in tree nurturing. Traditional authorities would be captured for the rights they exercise as land owners. Forestry Commission would receive share for their technical and monitoring role while the District Assembly would claim a share because of their responsibilities as local government agency responsible for local governance of district resources, and implementers of development projects.

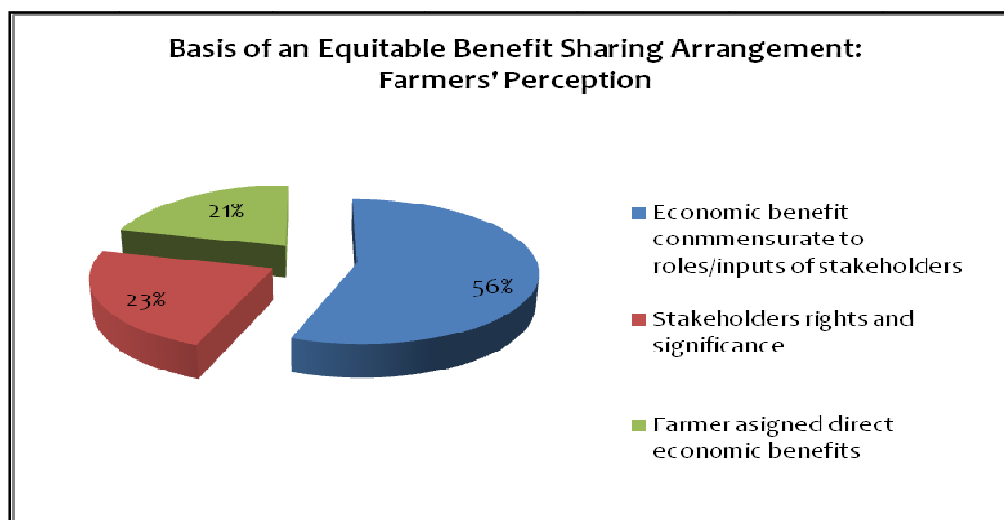


Fig. 5.4: Basis of an Equitable Benefit Sharing Arrangement: Farmers' Perception

4.6 Roles, rights and Responsibilities of stakeholders

Both farmers and FC were found to play direct roles in timber tree management. Farmers engage in tending, nurturing, protection against fire, while FC is concerned with timber resources inventory, monitoring of logging operation and protection against illegal logging.

Other stakeholders such as OASL, TC and Stool landowners and DA play indirect roles in the area of disbursement of timber revenue, education on the importance of keeping trees on farms and fallow, wildfire prevention, conflict resolution and use of revenue for community development projects.

Most roles of stakeholders are overlapping and some are not clearly defined. For instance TA, DA, and FC all claimed to educate communities on the importance to nurture and protect trees on farms. In many instances roles, rights and responsibilities were incorrectly or inappropriately assigned. An example is farmers' perception that TC or Stool landowners and DA allocate TUC to timber firms. Additionally TC and Stool land owners were said to be engaged in timber revenue collection. The aforementioned roles are performed by Forestry Commission.

In many instances, there was assignment of 'no roles' and incorrect designation of roles, rights and responsibilities. This is an indication of lack of awareness or knowledge of stakeholders' role in off-reserve timber resources management. It could also suggest that roles and responsibilities of stakeholders have not been performed as expected hence their obscurity. It is also an indication of the government's failure to formulate policy and define roles to ensure sustainable forest resource use and management. Additionally the few relevant policies in relation to stakeholders' roles, rights and responsibilities are ambiguous (Akyeampong & Boakye, 2006)⁵⁶. The results are presented in Table 4.5

⁵⁶ Akyeampong Boakye, K. & Affum, Baffoe K., 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Case study from Ghana. FAO Regional workshop on Trends in forest ownership, forest resources tenure and institutional arrangements in Africa. Nakuru, Kenya. 19-21 October, 2006.

Table 4.5: Roles, Rights and Responsibilities of Stakeholders in Off-reserve Timber Resources Management

Stakeholders	Perception of own role	Perception of others on their roles, rights, responsibilities
Farmer	Nurturing, Tending, Weeding	Nurturing, Protection against fire, Report illegal logging
Traditional Council	Developmental projects, land owners Education	Education, Negotiation of SRA related, Settling of conflicts, land owners, no role Sign SRA with timber operators Granting of timber concessions Control land boundaries
Stool land Owner	Monitoring of illegal logging Protection of timber trees	Education, conflict negotiation (SRA related) Land owners/Provision of land Monitor illegal timber operations No roles, control land boundaries
OASL	Disbursement of timber revenue	No role , land property tax collection Control land boundaries
District Assembly	Developmental projects Development of district forest management plans	Enforcement environmental by-laws; initiate tree planting Monitoring illegal timber operations; regulate chainsaw operators.
Forestry Commission	Management, Regulation of timber operations Assist DA develop district forest management plans	Education, Grant timber concessions resources and logging Monitoring of illegal logging Assist communities in negotiating SRA

CHAPTER FIVE

5.0 DISCUSSION

5.1 Demographic Characteristics

A greater number of men were contacted in the study more than women (Table 4.1). Though this was not purposeful but it is an indication of how men have dominated farming and how women in general have been constrained by certain factors hindering their participation compare to their male counterparts. Concerning the study area, Ardayfio-Schardorf et al (2007) reported that the social-cultural system places lots of obstacles to women. One of such factors is access to land which restricts women's participation in farming.

Regard the dominance of migrant farmers as against relatively few native farmers encountered in the study area, the reason could be that, the communities are cocoa production areas. Anyomi (2008)⁵⁷ made similar observation in the study area reporting about how migrant farmers from southern Ghana dominate cocoa production areas and it is noteworthy that the study area is a cocoa production area.

On the issue of education, an overwhelming two thirds of farmers have obtained only basic school education, a level that is quite low. Some authors believe that obtaining high levels of secular education influences positively a person's disposition toward sustainability. Owubah et al (2001) made the assertion that the level of education of a farmer affected his willingness to engage in sustainable forest management. Ardayfio-Schardorf et al (2007) also argued that education generate consciousness toward the conservation of natural resources. The assertions by the authors to some extent may be noticeable, nevertheless the role of secular education does not entirely determine people's engagement in sustainable management of timber resources and that it is the interplay of several factors. For instance indigenous knowledge has long guided the sustainable practices of indigenous people before the introduction of secular education and interestingly issue of sustainability is still talked about in educated societies benefiting from the age of information and knowledge. The results of this study shows that though there was generally low levels of secular education, a high percentage of farmers were conserving trees on farms and fallows (see Fig 4.3).

⁵⁷ Anyomi, K. A., 2008. *Managing on-farm trees for timber production in south western Ghana*. (Msc Thesis)University of Freiburg.

The study shows that the dominant mode of land acquisition in the study area is ‘purchased, inheritance and family allocation’ indicating personal ownerships (Table 4.1). Therefore there is a strong attachment to the land and whatever resources found on it. This may suggest the high percentage of farmers engaged in timber resources management.

5.2 Timber tree Maintenance in areas outside reserves

This section discusses the factors influencing farmers’ participation in timber tree resources management as well as their tree management practices and how these affect the composition, diversity and density of trees. Also discussed is the effect of various agricultural land use systems (farming systems) on timber tree management activities and species dynamics.

5.2 .1 Timber tree Maintenance: Farmers’ Participation

Farmers in the study area are active managers of trees indicative of 83% of the farmers engaged in timber tree management. The figure is similar to what Anyomi (2008) reported in a similar study carried out in the study area. Although he reported 91%, the figure is still high to indicate generally high interest in tree maintenance.

It is noteworthy that there is an important difference in the perspective of foresters and farmers. Foresters are concerned with primary forest species that have economic value while farmers’ main focus is on pioneer forest species often with much less economic (timber) value (CFMU, 1995)²⁵.

Several factors influence farmers’ decision to maintain trees on farms and fallows. The most significant one is their knowledge of the usefulness of the trees to the agricultural crops under cultivation. Amongst the perceived importance of trees is shade necessary for raising agricultural crops (cocoa), source to fill domestic wood needs, soil protection and conservation. Anyomi (2008) reported trees for shade to be the most important use to farmers. Ardayfio-Schandorf et al (2007) mentioned shade, prevention of soil erosion, wood for the furniture, building and construction, fuelwood as useful attributes of trees that farmers seek. Over the past years farmers have built considerable knowledge on variety of tree species providing different kinds of benefits. Such tree species are identified, preserved, tended, managed, maintained and protected so as to benefit from their useful attributes. This kind of management style based on knowledge of tree species usefulness has influenced timber tree species dynamics in terms of species diversity, age class and density.

Knowledge of species specific attributes and tree species-crop interactions do not only determine selection of tree species for maintenance but determines whether they are allowed in a particular agricultural land use system (farming system). For instance farmers pointed out that certain species were not favourable for integration with cocoa but may pose little or no problem for integration in food crop farming system (See Box 1).

Other factors that influence farmers' decision to leave trees on farms are labour and level of negative effects of trees. Some farmers stated that sometimes the amount of work required to remove some trees is huge such that it is better to leave them standing.

Box 1: Farmers' opinion of Tree species Attributes

Trees favourable for cocoa integration

Bombax buonopozense, Ceiba pentandra, Terminalia superba, , Milicia excelsa

Soil conservation (soil moisture)

Ficus exasperata, Ceiba pentandra

Nutrient cycling

Ficus exasperate, Margaritaria discoidea

Trees unfavourable with crop integration

Cola gigantea, Celtis mildbraedii

Box 2: Farmers' Disinterest in On-farm Timber tree Maintenance

'I do not keep timber trees on farms simply because of the arrogance of the timber contractors and their refusal to pay compensation for the damage caused on the farms'. – Lydia Owusu, Farmer (Akrodie)

'Frankly I have a few trees on my farm. I have planned to kill them. I do not want the painful experience of crop damage without compensation anymore.' – Akosua Serwaa, Farmer (Asumura)

I avoid keeping trees on my farms because I cannot risk infesting my cocoa with disease'. – Darko Samuel, Farmer (Domenase)

Additionally, though some trees may have some negative interaction with crops yet they may not be so detrimental hence are left standing since crops with favourable interaction may be cultivated in seasons to come. Mayers & Kotey (1996) mentioned the above observation when broadly listed three types of trees left on farms.

However in spite of farmers' huge interest in timber tree maintenance, a few of them had no interest in timber trees (See Box 2). Fig. 4.5 presents four main reasons for their lack of interest. Prominent amongst these are risks of crop damage during logging, lack of incentives to encourage timber tending and risks of pest and disease infection resulting from timber trees serving as hosts. Ardayio-Schandorf et al (2007) noted that these factors such as crop damage, non-payment of compensation and unfair compensation for crop damage influenced tree depletion in the Goaso forest district (study area).

Another factor intrinsically influencing farmers' unwillingness to maintain timber trees is the apparent lack of incentive visited on farmers by policies/laws governing timber tree ownership and use in areas outside reserves. The prevailing policies and laws alienate farmers from owning trees, appropriating wood for domestic (building and construction) and economic use. To them timber trees have become like white elephants who are cared for but their owners or caretakers do not profit from. Farmers who are not strong-willed and have wavering interest in trees will certainly not budge even with their little fingers in its management knowing that they will not benefit from their labour (see Box2). To protect the future of the tree resources, policies and laws regulating off-reserve timber resources should be looked at.

Summary

- Generally there is high interest in timber tree maintenance in farms and fallows due to a high percentage of farmers engaged in timber tree maintenance. Their interest in timber is largely due to their knowledge of the useful attributes of trees.
- A relatively small number of farmers disinterested in timber tree maintenance on farms and fallows are deterred by issues of crop damage during logging operations, non-payment of/meager compensation packages in case of crop damage, lack of economic incentives for timber tree tending and increased risk of pest and disease attack resulting from timber trees serving as hosts.

5.3 Timber tree Maintenance and Agricultural land Use systems (Farming Systems)

One factor that influences the composition, diversity and density of trees is the form of agricultural land use (farming system) practiced. Amanor (1996) observed that some farming systems are friendly to trees while others discourage crops and tree integration. According to figure 4.1 the main agricultural land use system practiced in the study area is: cocoa farming, food crop farming (annuals) and oil palm production. Ardayfio-Schandorf et al (2007) in a socio-economic study conducted in the study area reported cocoa farming system to be the most common agricultural land use systems followed by oil palm and food crop farming (annuals) respectively.

5.3.1 Cocoa Farming System

Out of the four farming systems, cocoa farming system was found to contain the highest number timber species both in terms of diversity and density. The high number of timber species in cocoa farming system is not by chance as generally cocoa cultivation is largely compatible with integration of trees. Trees are retained, promoted and used to raise crops under their shades. The density of trees is varied as cocoa progresses from seedling stage to fruiting and aging stages. Relatively more trees are maintained during seedling stages so that they can be used to raise the young developing seedlings, but it is reduced as they approach fruiting and maturation. However the farm is never devoid of trees since a number of them are retained for soil conservation purposes (maintenance of moisture regime), nutrient cycling and wood production to fill domestic needs. Anyomi (2008) found out that there is high density of trees in cocoa farm within the first ten years (60%) but density is reduced to 30% after ten years. Additionally old cocoa plantations tolerate the integration of more trees than any other traditional farming systems.

Ardayfio et al (2007) found that, cocoa was the most important cash (economic) crop in the study area. The implication is that cocoa cultivation may dominate the landscape in the future. Such a development coupled with the adoption of new cocoa hybrids developed for degraded landscape (Mayers & Kotey 1996) spell a gloomy future for off-reserve timber resources. The hybrid is less tolerant to shades hence less favourable for tree integration. Continual cultivation of the new hybrid by farmers will further erode the already depleted off-reserve timber resources. Therefore the time is now for timber resources managers (FC/FSD) to begin active campaign to encourage farmers to actively engage in timber tree maintenance. Also, collaboration with Cocoa Research Institute of Ghana would be useful in launching research into how to develop new hybrids that is tolerant to shade and would allow tree integration in a bid to secure the future of timber resources.

5.3.2 Food Crop (Annuals) Farming System

This farming system recorded the least number of timber tree species (fig4.1). The traditional cultivation of annuals requires open conditions in order to admit sunlight for growth. The light demanding nature of annuals renders the integration of trees very difficult unless the system is a contemporary agro-forestry system with conscious effort of integration of tree. The result obtained (as in few number of trees preserved) is much expected. One of the means to encourage an appreciable level of tree integration in food crop farming system is the adoption of modern forms of agro-forestry systems such as alley cropping. In spite of this, Amanor (1994) and (Mayers & Kotey 1996) report on how farmers in some parts of the high forest zone have developed innovative means of integrating trees in annuals or food crop farming system. Their innovations spring from their knowledge of the fact that less or no tree cover on farms is detrimental to crop growth and facilitate soil fertility depletion. Hence some of the innovations developed are preservation of rapid growing tree species with favourable effects on soil nutrients, and preservation of specific trees species known for their favourable interaction with crops.

From the foregoing it is very much clear that farmers have already developed and are engaged in some of form of timber tree management on farms and fallows. Such initiatives provides the FC an entry point to engage farmers in a collaborative way as they and other stakeholders seek to promote sustainable off-reserve timber resources management. FC could benefit from the farmers' knowledge and improve on them as well as introduce them to other effective ways of tree management. Exploring such opportunities will be a fine step toward achieving sustainable off-reserve timber resources management.

5.3.3 Oil palm farming system

Ardayfio-Schandorf et al (2007) reported oil palm to be the second most important crop farmers prefer to cultivate in the study area. This kind of agricultural land use system recorded a somewhat low number of timber species compare to cocoa farms (see fig4.1). Farmers mentioned that having high number of trees in oil palm plantation stifles their growth due to excessive amount of shade cast over the palm trees. However only a few trees are retained during seedling stages so that they can be used to raise the developing palm trees. Most farmers preferred to raise seedlings with annuals such as cassava and plantain since these are harvested annually to open up space for light necessary for the growth of the palm trees. Abundant use of trees are avoided since they become difficult to remove as they begin to mature, grow tall and develop heavy branches and cast shade over the palm trees. The practice has resulted in only trees of known benefits been retained.

It is noteworthy that a few big trees are left on the farm while very limited number of regenerating trees is allowed to grow. The greater number are weeded out and prevented from growing. As the palm trees mature the developing pioneer species are out competed. Generally it can be said that unless consciously managed for tree integration oil palm farming systems are less friendly to trees compare to old cocoa farming system.

5.3.4 Fallow

Fallows are lands left unseeded or uncultivated for a season or more in order to allow recuperation of soil nutrients.

Fallow was found to be the next agricultural land use system that had considerable timber trees apart from cocoa farms (see fig4.1). This is no surprise since the main purpose of fallow is to allow the land to regenerate trees and recuperate nutrients for a specified period after which farmer return to cultivate it. Management of trees in fallow is left to nature as it was reported by farmers that no forms of management activities (apart from protection against illegal logging) is undertaken (fig. 4.7). Due to land constraints and increasing population (Mayers & Kottey 1996) fallow periods are becoming shorter hence the negative effect on tree species dynamics. The longer the fallow periods, the higher the diversity in terms of species and age composition. In relation to the above factors, more pioneer species are promoted yet a few non-pioneer species are established in mature fallows (Amanor 1994). With shortened fallow periods, farmers admitted that most of the trees mentioned during the study are in sapling stages. However most of these would be cut down during preparation for farming should the farmer return to cultivate the land.

Therefore it is clear that fallows cannot be relied on to maintain high number timber trees for the future. Although the potential exists for retention of a few perceived beneficial species capable of reaching maturity, there is narrowed window for species diversity and age composition.

Summary

- Of all the agricultural land use systems, cocoa farms were found to host the highest number of timber species followed by fallow, oil palm farming system and the least was found to be food crop (annuals) farming system.

However the trend is highly likely to change as more hybrid cocoa which encourages less tree integration is adopted by farmers. Fallows can no more be relied on for future tree maintenance as fallow periods are shortened by factors such as population growth and growing land scarcity.

- The study revealed that agricultural land use system does not only influence timber tree maintenance but also species diversity, age composition, and density.
- The potential for timber tree dynamics such as species diversity and age class composition and structure are very low since the decision to retain trees on farms and fallow are mostly based on perceived benefits (shade for raising crops, known timber value, medicinal attributes, and soil conservation) and not silvicultural knowledge.
- Farmers' main focus is on pioneer forest species often with much less economic (timber) value than non-pioneer species. Factors such as short crop rotation periods and short fallow periods favour regenerating pioneer species than non-pioneer species.

5.5 Timber tree Maintenance and Farmers' Management Activities

This section discusses the management and conservation practices or patterns of farmers in on-farm tree resources maintenance. Included in the discussion is how agricultural land use systems (farming systems) impact on tree management. Various forms of costs associated with on-farm timber tree management are also analyzed.

Ardayfio-Schandorf et al (2007) emphatically mentioned that the way in which tree resources are managed and conserved in off-reserved localities has not attracted the attention it deserves. This underscores the need for considering the above subject, since knowledge of farmers' management has significant implications for tree species dynamics (species diversity, age composition, and density).

The main management activities performed by farmers include weeding, thinning, pruning, retention of specific species (singling) and prevention of fire (Fig. 4.7). Anyomi (2008) and Ardayfio-Schandorf et al (2007) reported weeding, pruning and singling (preservation of specific species) as specific tree management activities practiced by farmers in the study area (Goaso Forest District). A close examination shows that tree management activities performed by farmers take after the conventional silvicultural practices carried out by foresters.

5.4.1 Weeding (Clearing of weedy undergrowth)

Weeding involves the removal of weedy undergrowth from around crops and trees so as to reduce competition for space, sunlight and nutrients necessary for the growth of crops and trees. Weeding is a regular feature of farming and it may be carried out mechanically through the use of machete or hoes or may be carried out by spraying of weedicides. It is worth mentioning that weeding primarily is directed toward agricultural crops and not tree per se since farmers' main focus is on cultivation of crops.

Nevertheless the trees benefit from the management activities performed periodically and even in the case of spraying of weedicides, chemicals are carefully selected so as not kill potential timber trees. Frequency of weeding depends on the size and condition of the farm. Small farms are weeded mechanically and by farmer rather than sprayed with weedicide. In the case of large farms, labour is mostly engaged and portions of the farm are cleared by use of weedicides and other parts are mechanically weeded. Farms under open conditions such as food crops (annuals) are weeded more often than less open farms as found in mature cocoa farms. Nonetheless weeding takes place 2-3 times in a season.

5.4.2 Thinning

Thinning involves the removal of trees with the aim of reducing competition and providing space for growth of plus trees. Though thinning is practiced in commercial forestry, farmers have developed a practice that is very much like conventional thinning. It was mentioned by several farmers that when they observe that several trees sprout, regenerate or grow very close to each other, they cut a number of them to free one or two stems in order to allow better development of the remaining trees and crops. In cutting or removing trees they consider factors such as distance between trees/and crops, and number of stems and condition of stems growing together. Thinning usually takes place during weeding when crops (particularly cocoa) is maturing and when farmer realizes that trees are becoming detrimental to the growth of crops (i.e. more shade cast, or trees spreading diseases).

5.4.3 Pruning, Pollarding

Pruning as carried out in conventional forestry involves the cutting or lopping off of branches of trees for the purpose of obtaining straight clear boles necessary for valuable timber production, improving or maintaining health and reducing risk from falling branches. Pollarding on the other hand focuses on the lopping-off of upper branches of trees for the purpose of creating space and use as fodder. The cut branches are used as fuelwood, stakes for supporting creeping crops and as mulch for soil conservation. Farmers contacted during study explained that they periodically prune trees that they identify as useful to fill domestic need for wood production. Pollarding is performed to reduce shade cast over crops. The branches and leaves from the pruned and pollarded trees are left on the floor of the farm to decompose and return nutrients to the soil.

5.4.4 Preservation of specific species (Singling)

Amanor (1994) reported the practice of preserving specific tree species known to be beneficial for the growth of crops under cultivation by farmers in the high forest zone of Ghana. The practice involves the deliberate singling of tree species known to be favourable for crop growth, ecological benefits to soil and crops. These trees are usually left on the farm and protected from fire or removal because of its value. Some of such timber species frequently mentioned by farmers for their soil improvement and favourable crop interaction attributes are: *Terminalia ivorensis*, *Terminalia superba*, *Milicia excelsa* and *Daniella olivera*. Others are: *Ceiba pentandra*, *Ficus exasperate* for maintenance of moisture regime (Box 1). Mayers & Kottey (1996) lists two of these species (*Terminalia superba* and *Ceiba pentandra*) as favoured by farmers in the ecological zone of the country.

5.4.5 Fire prevention and protection

Another important tree management practice carried out by farmers is the protection of trees from wild fires. When the dry season approaches, farmers indicated that they create fire belts around their farms to protect them from burning. Interestingly particular attention is paid to some specific timber tree species which are of value to farmers. Dried leaves around these trees are cleared so as to reduce fuel in case of fire spreading to these trees.

By so doing many timber trees have been protected against fire and subsequently preserved. Protection against fire mostly takes place at the onset of and during the dry season when conditions are drier and the likelihood of fire is high. Farmers perform this task by hiring labour or through the assistance of other farmers or through their own labour.

5.5 Costs of Timber tree Management on Farms and Fallows

Farmers' decision to maintain timber trees on farms and fallows come at considerable costs. Among the costs borne by farmers are engagement of labour for spraying and/or clearing of weedy undergrowth, trees acting as alternative hosts for pests and diseases detrimental to cultivated crops, taking up of farming space by trees and risks of injury to life and crop damage resulting from the fall of whole or parts of trees. Several farmers mentioned during the study that their cocoa farms have been infested with diseases known to be associated with some valuable timber species which act as hosts for pests and diseases. This often results in low crop yield and loss of income due to reduced crop value. They lamented the heavy losses incurred and rising operational costs because they have to buy chemicals to treat the infections. Mention was made of *Cola gigantea* as host of the mealybugs causing Cocoa Swollen Shoot diseases, a dreadful disease in the cocoa industry. Cocoa Research Institute of Ghana (CRIG) has included this species on their black lists (Mayers & Kottey 1996).

A social cost identified during the study is the risks of injury or damage to crops and human life. The latter was not reported but the former had several mentioning during the study. Crops such as cocoa suffer considerable damage due to the snapping of parts of trees or falling of whole tree on crops. Damage is rendered to both mature and seedling-stage crops. Regard all the costs associated with tree maintenance on farms, one thing is quite obvious which is that the farmer alone bears the costs. It is ironical and quite unfortunate that the sower does not enjoy the reaping. The government (FC) and TC who are major stakeholders benefit from timber trees maintained by farmers at such considerable costs yet do not provide subsidies or any form of assistance to farmers as a way of sharing costs.

Farmers do not receive share of the ultimate revenue accruing from such trees. Small wonder then that some farmers have lost interest in timber tree maintenance with some deliberately destroying or preventing their development.

Summary

- Specific management activities performed by farmers are: weeding, thinning, pruning/pollarding, preservation of specific tree species (singling) and fire protection/prevention. Tree species managed by farmers are of importance to the timber industry (see Fig 4.2). Though such management strategies are not the last stop of effective management of the off- reserve timber resources, however it constitutes the basis for the sustained timber resources up to now.
- The main factor influencing farmers' management activities is perceived and known beneficial tree attributes to agricultural crops (shade for raising crops, known timber value, and soil conservation, wood production to fill domestic needs) and to a limited extent the timber industry.
- Because management activities are not based on conventional silvicultural knowledge, the potential for timber tree dynamics such as species diversity and age class composition and structure is very low.
- The performance of such management activities and maintenance of timber trees in farms and fallows involve transactional costs. The costs include: labour for clearing weedy undergrowth, trees acting as alternative hosts for pests and disease infestation of crops, taking up of farming space by trees, risks of injury to life and crop damage resulting from the fall of whole or parts of trees. Such costs are borne by the farmers alone without support from the state.

5.6 Management of Timber Resources in Areas outside Reserves: Stakeholders' Roles, Rights and Responsibilities

This section presents the actual and perceived roles, rights and responsibilities performed by stakeholders with some key observations discussed. The description is drawn from the synthesis of the interviews of all stakeholders and information from available literature. These are made explicit in Table 5.2

Box 3: Some Key Observation on Stakeholders' Perceptions of Roles, Rights and Responsibilities

Direct and indirect Roles and Responsibilities

Both farmers and FC play direct roles in timber tree management. Farmers engage in tending, nurturing, and protection against fire, while FC is concerned with timber resources inventory and monitoring of logging operation and protection against illegal logging.

Others stakeholders such as OASL, TC and Stool landowners and DA play indirect roles in the area of education on the importance of keeping trees on farms and fallow, wildfire prevention, conflict resolution and use of revenue for community developmental projects.

Overlapping and Incorrectly assigned Roles and Responsibilities; "No Roles and Responsibilities"

Most of the roles of stakeholders are overlapping and some are not clearly defined. Occasional overlapping of roles and responsibilities may not necessarily be counterproductive if only they are streamlined and performed effectively. However too many of such phenomenon could results in redundancy and neglect of roles and responsibilities because of the assumption that other stakeholders with similar roles would perform them. For instance TA, DA, and FC all claimed to educate communities on the importance to nurture and protect trees on farms. However they had little to show as to well-planned educational programmes for the communities.

In many instances roles, rights and responsibilities were incorrectly or inappropriately assigned. An example is farmers' perception that TC or Stool landowners and DA allocate TUC to timber firms. Additionally TC and Stool land owners were said to be engaged in timber revenue collection. The aforementioned roles are performed by Forestry Commission are not these stakeholders.

The assignment of no roles and incorrect designation of roles, rights and responsibilities is an indication of lack of awareness or knowledge of stakeholders' role in off-reserve timber resources management. It could also suggest that roles and responsibilities of stakeholders have not been performed as expected hence their obscurity. Additionally, it is also an indication of the government's failure to formulate policy and define roles to ensure sustainable forest resources use and management. However, the few relevant policies that assign role, rights and responsibilities are ambiguous (Akyeampong & Boakye, 2006). Surely roles, rights and responsibilities should be defined and streamlined, so that stakeholders would be clear on their roles and responsibilities and subsequently be inclined to perform them and as well as critique and check each other. Such is critical for the achievement of sustainable management of timber resources outside the reserves.

Table 5.2: Roles, Rights and Responsibilities of Stakeholders in Off-reserve Timber Resources Management

Stakeholders	Role	Rights	Responsibility
Farmer/ Land Owner	Nurturing, Tending	Usufruct (portions of (young timber trees) Access/withdrawal of non-timber trees Veto felling of timber tree on farm Withdrawal (TUPs)	Report illegal logging activities Take part in SRA & compensation negotiation Involved in fire prevention
F C	Control, Management Regulation, Monitoring & Supervision of logging operations	Receive royalties Management Alienate/exclude (TUCs) Withdrawal (TUPs)	Educational campaigns Assist communities in negotiating SRA Assist DA develop district forest management plan Settling of conflicts related to compensation Collect timber revenue Monitor illegal timber operations Perform pre/post-felling inspections Advertize & set process for TUC allocation
D A	Supervisory	Receive royalties Withdrawal (TUPs) Supervise timber management activities	Monitoring, control, report illegal logging activities Initiate tree planting & educational campaigns Enforcement bush fire & environmental by-laws
T A	Provision of land (land owners)	Receive royalties Alienates portions of lands Withdrawal (TUPs)	Organize communities in negotiating SRA Settling of conflicts related to compensation Allows timber operations in their communities Assist FSD in locating boundaries of TUCs
OASL	Stool land revenue collection	Withdrawal (TUPs)	Establishment of accounts for all stools Disburse stool land revenue & timber right fees Allocate timber stumpage & mineral revenue to district assemblies

5.6.1 District Assemblies (DA)

DA as the local government agency is a major stakeholder in both reserve and off-reserve tree resources management. Their roles and responsibilities in areas outside reserves are indeed elaborate and enormous particularly with the advent of 1994 Forest and Wildlife Policy which advocates the management of off-reserve forest resources. Generally, DA is to undertake a supervisory role in off-reserve management with technical support from FSD. As part of its responsibilities it is to develop District Strategic Forest Development Plan and District Forest Development Implementation Plan. Subsequently land owners and farmers are to be the real implementers of the plans (Asare, 1997)⁵⁸. Nonetheless, many of such roles and responsibilities are yet to be lifted off the pages of the documents and transferred to the ground after many years of its prescription. Some factors preventing the fulfillment of these roles and responsibilities are lack of commitment, lack of logistics and technical staff and patchy collaboration or coordination with FSD (Crawford, 2004, Mayers and Kotey, 1996). It is hoped that the current state of the resources will jumpstart the process of fulfillment of the roles and responsibilities. In spite of the challenges it is noteworthy that some DAs are active in some roles relevant for off-reserve tree resources management. They have been active in educating communities on wildfire prevention, importance of retention of trees on farm lands, settling of disputes between loggers and farmers on issues relating to compensation payment and monitoring of illegal logging operations. Though such efforts are commendable, it is critical that the yet-to-be fulfilled roles and responsibilities as shown in Table 5.2 be fulfilled to safeguard the future of the timber tree resources outside the reserves.

5.6.2 Traditional Council and Stool land Owners (Traditional Authorities)

According to customary land tenure (portions of which are recognized by Statutory laws), Traditional Authorities are land owners though they do not exercise absolute ownership over land resources under their jurisdictions. In reality they hold the land estates in trust for the communities they preside over. However by virtue of their position as heads of communities and owners of lands they have exercised some rights that have afforded them a share of timber revenue in the present benefit sharing arrangement.

Some of the rights they exercise are rights to allocate lands to individual persons or group of persons, rights to deny access to certain parts of land (sacred groves).

⁵⁸ Asare, A. B., 1997. Collaboration with farmers, landowners, and district assemblies for off-reserve forest management. Workshop Proceedings: Piloting collaborative forest management systems for off-reserve areas in southern Ghana. ITTO/FD Seminar on Sustainable timber production from outside forest reserves. Kumasi, Ghana. 1-2 October, 1997.

Their share of timber revenue is to be used to maintain the status of the ‘stool’ a symbol of their authority. Therefore their input is the provision of land which hosts timber resources allocated as TUCs for logging. It is noteworthy that TAs exercise various forms of rights (control, alienation/exclusion, transfer and use/withdrawal or access), such rights are directed toward land and not the tree resources since control rights over trees are vested in the state. Nonetheless they enjoy use right which allows them to appropriate timber for community project and not for commercial purpose. Legally, such use rights is exercised through the application for TUPs.

5.6.3 Forestry Commission (FC)

FC through its Forest Service Division (FSD) is the managers of both reserve and off-reserve forest resources. They have technical training and knowhow and the legal mandate to manage these vital resources. Their position as managers affords them the following rights: exclusion/alienation, withdrawal/use/access, management and control. Such rights lead to performance of roles and responsibilities necessary for the sustainability of tree resources. Thence they perform such tasks as patrolling of boundaries and monitoring of illegal logging; advertise TUCs and facilitates the granting of TUCs/TUPs; conduct pre/post-felling inspections and timber resources inventory, undertake educational campaigns, assist in the negotiation of SRAs and compensation for crop damage. FCs responsibility in the management of off-reserve areas is constrained by the scattered nature of or the distribution of off-reserve areas ranging from private, communal, public lands and individual farms compare to forest reserves which occur in unit blocks though may stretch over a large area. FC seems to enjoy the most rights yet performs few responsibilities particularly with respect to management of off-reserve areas.

5.6.4 Farmers

Farmers as stakeholders perform real day-to-day management activities of nurturing and tending timber trees on farms and fallows. It can be said that farmers are managers without portfolio and interestingly all stakeholders admit to their quintessential role in off-reserve timber resources management. Yet this group of stakeholders is left with virtually no rights. Timber Resources Management (amendment) Act 617 granted farmers the right to deny or grant rights to concessionaires prior to allocation of TUC when the allocated area includes their farms. However the law seems to be a window dressing as it is evident that, farmers’ rights have been ignored and that the law is yet to gather momentum.

A study by Marfo and Schanz (2009)⁵⁹ shows that right of the farmers to restrict access to timber trees is commonly ignored, with timber contractors often gaining access by force, and also failing to pay crop damage compensations. The few rights left for farmers are the ones captured under usufructuary rights which include use of parts of trees as stakes support creeping crops, bark and foliage for medicine and fodder, etc.

5.6.5 The Office of the Administrator of Stool Lands (OASL)

The Office of the Administrator of Stool Lands (OASL) seems to play very limited role in off- reserve timber resources management. Some of its roles and responsibilities are:

- Establishment of a stool land account for each stool into which shall be paid all rents, dues, royalties from the stool lands;
- Collection of all the above types of revenues and account for them to the beneficiaries;
- Disbursement of revenues according to the provision of the Constitution.

In relation to timber revenues, it appears the OASL has little stake in the collection of revenues, a task carried out by the FC. The main role of the OASL is the disbursement for which it attracts a 10% management fee, as its rights that it enjoys.

Summary

- Various roles, rights and responsibilities of stakeholders were identified. However while some were incorrectly assigned, others were mostly overlapping (see Box 3). Such phenomenon calls for the need to define and streamline roles and responsibilities of stakeholders.
- Farmers, FC and DA to a limited extent have been able to assert their roles and responsibilities in timber resources management in areas outside reserves. TA still has much do in the performance of their roles and responsibilities.
- The inability of stakeholders other than FC to assert their rights and responsibilities is mainly the result of the government's failure to formulate policy and define roles to ensure sustainable forest resource use and management. Relevant policy prescribing stakeholders' roles, rights and responsibilities is ambiguous.

⁵⁹ Marfo, E., Schanz, H., 2009. *Managing logging compensation payment conflicts in Ghana: Understanding actor empowerment and implications for policy intervention.* Land Use Policy, 26, pp. 619-629

5.7 Basis of Equitable Benefit Sharing and Economic Incentives

Several authors have served critique on the equity of the present benefit sharing arrangement with varying agreements and disagreements (Hansen & Treue, 2009⁶⁰; TBI, 2005; Appiah & Taabazuing, 2004⁶¹). What stands out clear in their commentary is the fact that the present benefit sharing arrangement is not equitable. However the problem is not only with benefit sharing but also the policies related to it.

Amanor (2004) was of similar view when he asserted that the existing forestry laws and policies in Ghana do not provide a framework for equitable sharing of forest resources and the benefits they provide nor do they provide a framework for rational or sustainable management of the resources.

Equity in natural resources governance policies is not only essential for securing the active and unreserved participation of stakeholders but also bodes well for the sustainable use and management of the resources. Concerning the benefit sharing arrangement the main issue underscoring its inequitable nature has to do with farmers' exclusion and unclear basis for its establishment. Marfo (2009) clearly mentions that the inclusion of stakeholders on the scheme and negotiation and prescription of the percentage assigned the various stakeholders is based on stakeholder influence, power and proximity to politicians responsible for enacting natural resources governance related policies. Such basis for constituting benefit sharing cannot be seen as equitable to other stakeholders who play critical roles in off-reserve timber resources conservation (e.g. farmers) yet do not receive any economic benefits. Additionally such a basis is not robust or stable enough to stand the test of time since stakeholder influence, power and politicians change, therefore subjecting the arrangement to constant review and change. It would also detract from sustainability of the resources since marginalized stakeholders will derail the process of sustainable management as already seen in the case of farmers deliberately destroying timber trees on their farms (Amanor, 2005). Therefore it is in the opinion of this author that, the basis of benefit sharing pertaining to areas outside reserves be revised.

⁶⁰ Hasen, C.P. & Treue, T., 2009. *Strengthening off-reserve timber management in Ghana*. Proceedings of a national workshop held in Accra, Ghana, on the 27th and 28th of September, 2007. Tropenbos International - Ghana Workshop Proceedings 7. Kumasi, Ghana.

⁶¹ Appiah, N., S., K., Taabazuing, J., 2004. *Preliminary draft report on natural resource conflicts and benefit sharing*. Ghana Land and Forest Policy Support Facility.

An acceptable basis embracing equity would be to proceed on the basis of stakeholders' roles, rights and responsibilities as well as including farmers on the benefit sharing scheme, a position advocated by TBI (2009, 2005) & Owubah et al, (2001). Therefore the section that follows advances the argument for the need for an acceptable basis for equitable benefit sharing.

Why farmer inclusion

Farmers were professed by all stakeholders contacted during the study as performing critical roles essential for off-reserve tree resources management. There was an unflinching acknowledgement by all stakeholders that farmers receive no direct economic incentives for their inputs and farmers contest this by deliberately destroying timber trees or facilitate illegal extraction of timber trees (See Box 2). Direct economic incentives apart from compensation for crop damage should be paid farmers who have timber trees on their farms and fallow and perform management activities to maintain them. Similar view was espoused by Richards & Asare (1999) and Amanor (1996). Receiving such benefits will help defray the high transactional costs they incur during management.

Assigning farmers economic benefits is just a fulfillment of the customary tenure arrangement where benefits rights over naturally occurring timber trees correspond with the usufruct rights to the land. Amanor (1997) mentioned that the distinction made in legislation between the land and tree tenure is based on the "*colonial myths about traditional ownership of the land and trees*". In relation to this Dabrowska (2009) reports of community members' awareness of the customary arrangement thereby noticing the strong feeling among community members that they are entitled to such benefits even though the legal regulations deprive the local communities' right to benefit from timber trees. Appiah and Taabazuing (2004) give examples of conflict situations where community members did not want to give the contractors access to timber trees. They claimed that they and not the timber contractors have the right to benefit from timber trees, referring to the customary law to justify those claims.

Owing to the afore-discussed points there is a need for policy reforms and rearrangement of benefit sharing schemes and roles, rights and responsibilities. Opoku (2005)⁶² noticed how the 1994 policy did not establish an effective legislative programme for benefit sharing and participatory resource management.

Though the policy suggested that a new Forest Act be drawn up by 1996, but the Ministry of Lands, Forestry and Mines shelved plans for this Act to avoid giving politicians too strong an influence on the reform drive. Since 1994, the legislative programme has been very limited and timber-biased, and does not include benefit sharing and participatory management issues. He continues saying that substantive changes in policy, legislation and practice are more likely to occur now, because of the current increase in social activism and assertion of the rights of forest fringe communities, which are supported by both local and international non-governmental organizations. Considering the policy's handicapped position on benefit sharing and the current wind of forest fringe communities' push for the recognition of their rights, the time is only ripe to undertake of any such reforms by including farmers on a revised benefit sharing arrangement.

Why Benefit sharing should hinge on stakeholders roles, rights and responsibilities

An examination of the present benefit sharing arrangement pertaining to areas outside reserves reveals a partial attempt at assigning share of benefits to beneficiaries based on roles, rights and responsibilities. For instance, FC is assigned percentage share of the timber revenue for supposed regulatory and management roles in areas outside reserves. TA (TC and Stool landowners) is part of the arrangement by virtue of their position as traditional land owing authorities, custodians and representatives of the communities.

OASL is the administrator of stool lands on which these timber resources are found hence meriting a share of the benefit. DA currently receives a share of timber revenue by virtue of the fact that it is the local government agency responsible for local governance in all respects in matters relating to the areas under their jurisdiction. Additionally DAs argued that the benefits are used for development projects (actually the intended purpose of the benefits they receive) for the benefits of all the communities.

⁶² Opoku, K., 2005. *Benefits sharing and participatory resource management*. In: Opoku, K., Nketiah, K. S., Arthur, E. (Eds.) *Workshop Proceedings 5. Reconciling policy reforms with forest legislation*. Ghana. 4 and 5 July 2005. Tropenbos International, Wageningen, the Netherlands 2005, 18-26.

Interestingly the fact is that the benefits come to these stakeholders for tasks they do not or hardly perform. For instance FC does not perform the so-called management and regulatory function in the off-reserve areas (tasks for which they receive 40% share of timber revenue generated). The amount received is used as part of internally generated funds for handling administrative costs. DAs admitted that the district is often confronted with socio-economic issues that the timber revenue share received cannot only be used for developmental projects but for other things since the district mostly leave on shoe string budgets.

That said, it is clear that the attempt was not thorough since the farmer is left out for untold reasons. Yet these are the real managers (section 5.2.3) whose decision determines the fate of the trees. All stakeholders have roles, rights and responsibilities to perform for the sustainability of tree resources in areas outside reserves. Streamlining and clearly defining roles, rights and responsibilities are critical to bring every hand possible on board for the sustainable management of these vital resources.

Conceivably, in a revised benefit sharing arrangement, FC will be part of the scheme for its role and responsibilities in technical management and advisory role to farmers and DA, and regulatory and monitoring functions in stock surveying, illegal logging control and TUC allocation.

TA by means of their rights as stool land owners and custodians and representatives of the communities will have their fair share. Their critical role in provision of land capital to farmers for the cultivation and to FC for TUC identification cannot be minimized. Additionally TA roles in conflict mediation and dispute settling between timber operators and farmers in the area of compensation payment should be highly recognized and strengthened. The performance of these roles qualifies them to be part of the benefit sharing arrangement.

Thus far, the way to go is the transfer tree ownership rights to the land owner or farmer (in case he/she is the land owner) or a percentage share be paid to non-land owning farmer who nurture timber trees by the land owner. Additionally percentage share of stakeholders benefiting from present arrangement could have their shares, roles and responsibilities reviewed on the basis of their inputs.

However, proceeding solely on the basis of actual roles and responsibilities, some stakeholders would score few points but their contribution in other areas and some inherent rights associated with their position qualify them for a share of the revenue.

Note that roles and responsibilities can be streamlined so that redundancy, duplication and idleness can be avoided so that all stakeholders will have one input or another to contribute to the sustainability of the resources.

In relation to all that have been considered, it is in the opinion of this author that, going back to the customary arrangement and streamlining it to avoid the ambiguity they sometimes create would hurt less compare to the current policy. Moreover to achieve sustainable management of timber resources in areas outside reserves through the development of new mechanisms of benefit sharing, devolution of power over timber trees to informal landowners, there is the need to proceed cautiously. Stakeholders need to have tools to perform their roles and responsibilities, coordination and collaboration between stakeholders and transparency through information dissemination is central for this course.

Box 4: Stakeholders' Perceptions on Farmer inclusion on Benefit Sharing Arrangement

'Farmers have to be included in the benefit sharing arrangement. They have cried for far too long, yet it is their efforts that sustain and preserve timber resources on farms. May be part of FC share could be given to them'. - District Forest Officer (Goaso Forest District)

'Farmers should be given real cash (money) to motivate them to continue protecting and preserving timber trees on their farms. It is said that the worker shall live by the fruit of his labour. The so-called SRA is poorly implemented and compensations are not paid or too small. So the only way to stop farmers from destroying the trees is to make them part of the benefit sharing scheme'. - Akrodie Traditional Council

SRA is given to whole community. For instance a teacher part of the community benefits from SRA yet he is paid for his professional job. Yes I am part of the community but farming is my profession, so I need to be paid for the work I perform to nurture timber trees for the government just as the teacher is paid for teaching the kids'. - Comfort Odenke, Farmer (Pesewokrom)

CHAPTER SIX

6.0 CONCLUSION

Conclusion

Farmers' Management of Timber trees on Farms and Fallows

Though farmers and foresters have different perspective on the management of trees, it was clear from the results of the study that, farmers are very much interested in trees and they perform some form of management activities to maintain trees on farms and fallows. Foresters have been largely driven by the objectives of timber production and maintenance of environmental services in their quest for sustainable management of trees. Farmers on the other hand have their motivation rooted in other factors. Such factors inform the kind of tree management practices they engage in. The most prominent among the factors is farmers' perception or knowledge of usefulness of trees to agricultural crops under cultivation. Some of the useful attributes of the trees are: soil nutrient cycling, shade to raise agricultural crops and wood production for domestic use. It is worth noting that farmers do not necessarily plant new trees; rather they regenerate through coppicing, nurturing regenerated saplings and preserve mature trees which are of ecological, environmental and economic importance to their cropping systems. Their tree management practices promote more pioneer species in the farm and a few non-pioneer species in mature fallows. Though such management strategies are not the last stop of effective management of the off- reserve timber resources, however it constitutes the basis for the sustained timber resources up to now. Interestingly most of trees preserved by farmers are of interest to the forestry sector since these are mostly sought after timber species. Specific management activities performed by farmers are: weeding, thinning, pruning/pollarding, preservation of specific tree species (singling) and fire protection/prevention.

The performance of management activities and maintenance of timber trees in farms and fallows involve transactional costs. The costs include: labour for clearing weedy undergrowth, trees acting as alternative hosts for pests and disease infestation of crops, taking up of farming space by trees, risks of injury to life and crop damage resulting from the fall of whole or parts of trees. Such costs are borne by the farmers alone without support from the state.

Stakeholders' Roles, Rights and Responsibilities in Off-reserve Timber resources management

Various roles, rights and responsibilities of stakeholders were identified though unequally distributed and mostly overlapping. Farmers, FC and DA to a limited extent have been able to assert their roles and responsibilities in timber resources management in areas outside reserves.

TA still has much to do in the performance of their roles and responsibilities. The inability of stakeholders other than FC to assert their rights and responsibilities is mainly the result of the government's failure to formulate policy and define roles to ensure sustainable forest resources use and management. However there is the need to define and streamline roles, rights and responsibilities of stakeholders.

Basis of Equitable Benefit Sharing and Economic Incentives

Existing forestry laws and policies in Ghana do not provide a framework for equitable sharing of forest resources and the benefits they provide nor do they provide a framework for rational or sustainable management of the resources.

An acceptable basis embracing equity would be to proceed on the basis of stakeholders' roles, rights and responsibilities as well as including farmers on the benefit sharing scheme.

To achieve sustainable management of timber resources in areas outside reserves through the development of new mechanisms of benefit sharing, devolution of power over timber trees to informal landowners there is the need to proceed cautiously. Stakeholders need to have tools to perform their roles and responsibilities, and also there should be coordination and collaboration between stakeholders and transparency through information dissemination.

Zusammenfassung (Abstract-German)

Wälder, neben der durchgehend bewaldeten Landflächen (Staatswälder), spielen eine große Rolle wenn es um die wirtschaftlichen, sozialen und ökologischen Belange Ghanas geht. Eine Schlüsselrolle spielt die Bauholzgewinnung, die durch die rückläufigen Holz Ressourcen unterstützt wird. In den letzten zwanzig Jahren, machte Nutzholz aus privaten Vorkommen/Nutzholzplantagen ein bis zwei drittel des gesamten jährlich verzeichneten Holzertrages Ghanas aus. In den letzten Jahren, ist der der Holzertrag aus solchen Vorkommen allerdings auf ca. 30 % zurückgegangen. Einer der Hauptgründe für diesen entmutigenden Rückgang, ist der fehlende wirtschaftliche Anreiz für die Landwirte, die für die Pflege, die Aufrechterhaltung und den nachhaltigen Anbau der Holzressourcen sorgen. Dieser fehlende wirtschaftliche Anreiz ist die Folge einer ungerechten Regelung der Regierung in Bezug auf den Besitzanspruch auf Wälder und die Aufteilung von natürlichen Vorkommen außerhalb der Waldreservate. Um die Zukunft und die Nachhaltigkeit für Nutzholzplantagen zu sichern, sind politische Änderungen nötig, die den Beitrag der Interessengruppen in Bezug auf das Nutzholz Ressourcen Management ausgewiesener Reservate berücksichtigt. In dieser Studie wurden die Maßnahmen der Landwirte zur Organisation der Nutzholzgewinnung, sowie die Rolle, Rechte und die Verantwortung der Interessengruppen in Verbindung mit dem Nutzholz Ressourcen Management ausgewiesener Reservate untersucht. Die Studie wurde im ‚Asunafo North District‘ von Ghana durchgeführt. Es wurden achtzig (80) Landwirte, die aus verschiedenen Schichten stichprobenartig ausgewählt wurden, befragt, unter ihnen auch einige, die wichtigen Interessengruppen angehören. Die Studie ergab, dass zu den spezifischen Organisationsmaßnahmen durch die Landwirte das Jäten, die Durchforstung, das Aufasten/die Schneitelung, die Bestandserhaltung der Arten (Vereinzelung), sowie der Brandschutz bzw. die Brandvorbeugung gehören. Wichtige Einflussfaktoren bei der Erhaltung der Nutzholzplantagen sind die grarwirtschaftliche Landnutzung, sowie die Artenvielfalt, die Alterszusammensetzung und die Dichte. Der Kakaoanbau beherbergt den größten Anteil an Bauholzarten, gefolgt von Brachland, dem Anbau von Ölpalmen und den kleinsten Anteil hat der Anbau von Nahrungsmitteln. Ein Hauptfaktor der Managementmaßnahmen der Landwirte ist das Wissen über die Eigenschaften der Bäume zu nutzen, um die Bestandserhaltung der Saaten zu sichern. Landwirte und Forstverwaltung spielen eine direkte Rolle, während die Distriktversammlung (District Assembly) und die traditionellen Behörden eine indirekte Rolle einnehmen, wenn es um das Bauholz Ressourcen Management außerhalb der Reservate geht. Die Ergebnisse der Studie zeigten, dass Landwirte, die Forstverwaltung und die Distriktversammlung ihre Rolle und Verantwortung im Bauholz Ressourcen Management außerhalb der Reservate, in einem geringen Ausmaß geltend machen konnten. Die traditionellen Behörden haben dagegen noch viel Arbeit vor sich in der Ausführung ihrer Rolle und Verantwortung. Außerdem zeigte die Studie, dass die Interessengruppen die Nutzung ihrer Rolle, Rechte und ihrer Verantwortung als Basis für eine gerechte, nützliche und allgemein annehmbare Maßnahme für die gemeinsame Benutzung befürworten. Zusammenfassend kann gesagt werden, dass ein beachtliches Potenzial für das Nutzholz Ressourcen Management ausgewiesener Reservate besteht, wenn die Bestimmungen zum Besitzanspruch auf Wälder und die Regelung für die gemeinsame Benutzung mehr zum Vorteil der Landwirte und Grundbesitzer ausgerichtet wird, sowie die Rolle, Rechte und Verantwortung der Interessengruppen anerkannt werden. Die Interessengruppen brauchen Werkzeuge, um ihre Rolle und Verantwortung zu erfüllen. Die Abstimmung und Zusammenarbeit zwischen den Interessengruppen und Transparenz durch die Informationsweitergabe sind äußerst wichtig für ein nachhaltiges Nutzholz Ressourcen Management ausgewiesener Reservate.

References

- Adam K A., Pinard M., Cobbinah J., Damnyag L., Nketiah K.S. Nutakor, E. Kyereh B. & Nyarko C. (2006). *Corruption in the chainsaw milling and lumber trade in Ghana*. Report submitted to the Natural Resource Institute, UK. Forestry Research Institute of Ghana, Tropenbos International Ghana, University of Aberdeen.
- Akyeampong Boakye, K. & Affum, Baffoe K., 2006. Trends in forest ownership, forest resources tenure and institutional arrangements: Case study from Ghana. FAO Regional workshop on Trends in forest ownership, forest resources tenure and institutional arrangements in Africa. Nakuru, Kenya. 19-21 October, 2006.
- Amanor, K.S., 1996. *Managing trees in the farming system. The perspectives of farmers*. Forest Farming Series No. 1. Forest Department, Kumasi, Ghana, 202 pp
- Amanor, K.S., 1997. *The potential for tree certification and labelling in farming systems in Ghana*. Unpublished paper to IIED, London
- Amanor, Kojo (1999). *Global Restructuring and Land Rights in Ghana: Forest food chains, timber and rural livelihoods*. Uppsala: Nordiska Afrikainstitutet.
- Amanor, K.S., 2005. *Equity in forest benefit sharing and poverty alleviation*. In: Tropenbos International 2005. Workshop proceedings 3 'Equity in Forest Benefit Sharing: Stakeholders' Views', 29th October 2004 (K.S. Nketiah, J.A.S. Ameyaw & B. Owusu Jnr.), Tropenbos International, Wageningen, and the Netherlands
- Appiah, N., S., K., Taabazuing, J., 2004. *Preliminary draft report on natural resource conflicts and benefit sharing*. Ghana Land and Forest Policy Support Facility.
- Ardayio-Schandorf, E., Yankson, P.W.K., Asiedu, A.B., Agyei-Mensah, S. & Attua, E.M. 2007. *Socio-economic Perspectives of Off-Reserve Forest Management in the Goaso Forest District of Ghana*. Woeli. 176 pp
- Asante, M.S., 2005. *Deforestation in Ghana. Explaining the cronical failure of forest preservation policies in a developing country*. University Press of America, Lanham, Maryland, USA, 267 pp
- Asare, A. B., 1997. Collaboration with farmers, landowners, and district assemblies for off-reserve forest management. Workshop Proceedings: Piloting collaborative forest management systems for off-reserve areas in southern Ghana. ITTO/FD Seminar on Sustainable timber production from outside forest reserves. Kumasi, Ghana. 1-2 October, 1997.
- Assimeng, J.M., 1996. *Traditional leaders' capability and disposition for democracy: The example of Ghana*. Paper presented at International Conference "Traditional and contemporary forms of local participation and self-government in Africa" held 9-12 October 1996 in Nairobi, Kenya, 145-160. Downloaded from: www.kas.org.za/Publications/SeminarReports/Traditionallocalparticipation/assimeng.pdf on 19 July, 2006

- Ayine, A. D., 2008. *Development Social Responsibility Agreement Ghana's Forest Sector*. Legal Tools for Citizen Empowerment Series, IIED, London.
- Anyomi, K. A., 2008. *Managing on-farm trees for timber production in south western Ghana*. (Msc Thesis)University of Freiburg.
- Bird, N., Fometé, T. & Birikorang, G. (2006). *Country Case Study 1: Ghana's experience in timber verification system design*. VERIFOR.
- Birikorang, G., Hansen, C.P., & Treue, T., 2007. *Review of the current taxation system relevant to the forest sector in Ghana*. VLTP Background Paper No. 1. Validation of Legal Timber Programme, Forestry Commission, Accra, Ghana, 67 pp
- Birikorang, G., Okai, R., Asenso-Okyere, K., Afrane, S., & Robinson, G., 2001. *Ghana Wood Industry and log export ban study*. Forestry Commission report to the Ministry of Lands and Forestry. Forestry Commission, Accra, Ghana, 53 pp
- Boamah, A.S., 1986. *A study of indigenous tenures relating to trees and forests in some parts of Ghana*. IRNR, KNUST.
- Boni, S., 2005. *Clearing the Ghanaian Forest: Theories and practices of acquisition, transfer and utilization of farming titles in the Sefwi-Akan area*. Institute of African Studies, Legon, Accra, Ghana.
- CFMU., 1995. *A framework for collaboration outside reserves*. Unpublished paper presented at the Workshop on Forest Plantation Development in Ghana, Ejisu, Ghana, 27 February 1996. Collaborative Forest Management Unit, Planning Branch, Forest Department, Kumasi.
- Crawford, G., 2004. *Democratic decentralisation in Ghana. Issues and prospects*. POLIS Working Paper No. 9. School of Politics and International Studies, University of Leeds, Leeds, 35 pp.
- Dabrowska, M., 2009. *Access to timber trees for commercial purposes in off-reserve areas in Ghana*. MSc thesis. Unpublished. 56pp
- England, P. 1992. *Environmental protection and conservation of natural resources in Ghana*. Contrasting studies of the law in action. PhD dissertation, University of London, London, United Kingdom, 447 pp.
- FC/OASL, 2005. *Stumpage revenue distribution report 1 January – 31 July 2004*. Forestry Commission and the Office of the Administrator of Stool Lands, Accra, Ghana
- FC 2005. *Annual Report, 2004*. Forestry Commission, Accra, Ghana. 40 pp.
- Fortmann, L. 1985. *The tree tenure factor in agroforestry with particular reference to Africa*. *Agroforestry Systems* 2, pp. 229-251.
- FSD, 2006. *List of extant leases and concessions*. Forest Services Division, Accra, Ghana, unpublished.
- GB Forestry Commission., 1995. *Policy recommendations for sustainable management of the forest resource in Ghana*. Unpublished paper: Overseas Consultancy Service, Forestry Commission of Great Britain, Edinburgh.

General Woods., 1993. *Technical and financial audit of the Ghana timber industry*, Volumes 1-6. Unpublished report: prepared for Ministry of Lands and Forestry, Ghana General Woods and Veneers Consultants International Ltd., Quebec.

Hansen, C.P., & Treue, T. (2008) *Assessing illegal logging in Ghana*. *International Forestry Review* 2008 10 (4), 573-590

Inkoom, D.K.B., 1999. *Management of non-reserve forests in Ghana. A case study of Mpohor Wassa East District*. Spring Research Series 24.

Kasanga, K., & Kotey, N.A., 2001. *Land management in Ghana: Building on tradition and modernity*. International Institute for Environment and Development, London, 34 pp.

Kasanga, K., R., 1988. *Land tenure and the development dialogue: the myth concerning communal landholding in Ghana*. Occasional paper 19. Department of Land Economy, University of Cambridge.

Richards, M. & Asare, A., 1999. *Economic incentives for cocoa farmers to tend timber trees in southern Ghana*. Overseas Development Institute, London. 39 pp

Klutse, A.K.P., 1973. *Ghana 1: Ewe law of property. Restate of African law*. Sweet and Maxwell: London.

Kotey, N.A., Francois, J., Owusu, J.G.K., Yeboah, R., Amanor, K.S., & Antwi, L., 1998. *Falling into place. Policy that works for forests and people series*. No. 4. International Institute for Environment and Development, London, 138 pp

Mayers, J., & Kotey, N.A., 1996. *Local institutions and adaptive forest management in Ghana*. Forestry and Land Use series. No.7. International Institute for Environment and Development, London, 82 pp.

Odoom, F.K., 2004. *A study of chain sawing in the natural forests of Ghana*. Food and Agriculture Organization of the United Nations (FAO), Rome, 76 pp.

Opoku, K., 2005. *Benefits sharing and participatory resource management*. In: Opoku, K., Nketiah, K. S., Arthur, E. (Eds.) *Workshop Proceedings 5. Reconciling policy reforms with forest legislation*. Ghana. 4 and 5 July 2005. Tropenbos International, Wageningen, the Netherlands 2005, 18-26.

Opoku, K. 2006. *Forest governance in Ghana*. An NGO perspective. FERN, Brussels, 32 pp.

Owubah E. C., Le Master D.C., Bowker J.M., & Lee J.G., 2001. *Forest Tenure Systems and Sustainable forest management: the case of Ghana*. *Forest Ecology and Management* 149. 253-264 pp

Planning Branch, Forestry Department, 1994. *Report on piloting collaborative forest management systems for off-reserve areas in southern Ghana project*. Unpublished

- Ribot, J.C., & Peluso, N.L. 2003. *A theory of access*. Rural Sociology 68 (2), 153-181
- Richards, M., Asare, A. 1999. *Economic incentives for cocoa farmers to tend timber trees in Southern Ghana*. Overseas Development Institute (ODI), London, 39 pp.
- Sarpong G. A., 2006. *Improving Tenure Security for the Rural Poor; Ghana Country Case Study*. FAO, Rome.
- Treue, T. 2001. *Politics and economics of tropical high forest management: A case study of Ghana*. 1-366. Klüver Academic Publishers, Dordrecht, the Netherlands, 366 pp.
- Tropenbos International – Ghana, 2009. *Strengthening off-reserve timber management in Ghana*. Proceedings of a national workshop held in Accra, Ghana, on the 27th and 28th of September, 2007. Tropenbos International - Ghana Workshop Proceedings 7. Kumasi, Ghana. 109 pp
- Marfo, E., 2009. *Security of tenure and community benefits under collaborative forest management arrangements in Ghana: A country report*. CIFOR and RRI.
- Mayers, J. and Vermeulen, S. 2002. *Company-community forestry partnerships: From raw deals to mutual gains?* Instruments for sustainable private sector forestry series. International Institute for Environment and Development, London. 77-82 pp.

Laws and Policies

- Concessions Act, 1962. Act 124. The Government Printing Department, Accra, Ghana, 10 pp
- The Constitution of the Republic of Ghana, 1992. Tema Press of Ghana Publishing Corporation, Tema, Ghana, 210 pp.
- MLF, 1994. *National Forest Policy of the Republic of Ghana*. Ministry of Lands and Forestry, Accra.
- Timber Resources Management (Amendment) Act, 2002. Act 617. Printer, Accra, Ghana, 7 pp.
- Timber Resources Management Regulations, 1998. L.I. 1649. Government Printer, Accra, Ghana, 24 pp.
- Timber Resources Management Regulations, 2003. L.I. 1721. Government Printer, Accra, Ghana, 8 pp.
- The Administration of Lands Act, 1962. Act 123. The Government Printing Department, Accra, Ghana, 15 pp. Government