

UNIVERSITY OF GHANA

**CO-MANAGING FOREST RESOURCES IN GHANA: THE REALITIES, PROSPECTS
AND CHALLENGES OF THE NKRABIA FOREST RESERVE MANAGEMENT**

BY

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DECLARATION

I do hereby declare that this thesis is the result of my own research undertaken under supervision and has not been submitted in part or in full to this institution or any other institution for academic award. All citations and quotations have all been identified and acknowledged. I bear sole responsibility for any shortcomings.

.....

EMMANUEL LARTEY

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DATE

CERTIFICATION

This is to certify that this thesis was supervised in accordance with the laid down rules and procedures as required by the University of Ghana.

.....

JUSTICE NYIGMAH BAWOLE (PROF)

(SUPERVISOR)

.....

DATE

DEDICATION

This piece of work is dedicated to my Mum, Ruth Mantey; my would be wife, Sweet Akosua Mary; Ps. and Mrs. Berko; Ps. and Mrs. Boachie Yiadom; Eld. Larteys and wives; Eld. Nicholas C. Lartey; all children; Lilly; myself, Sir Lartey, E.; and my entire family.

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LIST OF ABBREVIATIONS

CM:	Co-management
CPR:	Common Pool Resource
DA:	District Assembly
FAO:	Food and Agriculture Organization
FGDs:	Focus Group Discussions
MLNR:	Ministry of Lands & Natural Resources
NGO:	Non-Governmental Organization
SDGs:	Sustainable Development Goals
SRA:	Social Responsibility Agreement
TUC:	Timber Utilization Contract
T/O:	Technical Officer
UN-DESA:	United Nations Department of Economic and Social Affairs

ABSTRACT

The Rio Conference in 1992 highlighted the need for co-management of natural resources. The conference challenged the centralized management of forest resources by the State and encouraged the involvement of other actors in the management of forest resources. Ghana has also been practicing co-management over a decade now. In Ghana however, although there have been forestry policy reforms intended to encourage co-management, it is uncertain whether or not these policy reforms have met the expected results after years of implementation. Meanwhile, some studies on forest co-management earlier concluded that coming decades would see steady increase in the level of local management and NGOs roles in national forests. Using the Nkrabia Forest Reserve as a case study, the key objectives of this study therefore, were to find out the extent to which forest co-management is practiced in Ghana; the entitlements and responsibilities of the co-management actors and the prospects and challenges faced in the co-management arrangement. The study was guided by interpretive research paradigm. It used a framework adapted from the Co-management Theory and the Common Pool Resource Theory which spelt out Ostrom's Design Principles to determine the extent to which co-management is practiced in Ghana. Data were collected through in-depth interviews, Focus Group Discussions (FGDs), direct observation and documentary review. In all, twenty-five (25) in-depth interviews and four (4) FGDs comprising eight (8) participants each were conducted in four forest fringe communities. The co-management actors used in this study include: the Forestry Commission, the local government, the civil society organization, the forest fringe communities and the private sector organization. The study found that the Nkrabia Forest Reserve has clearly defined boundaries; has graduated sanctions by other appropriators; and nested enterprises. It partially satisfies the principle of minimal recognition of rights to organize and fails to meet collective choice arrangements. The study found that the

Forestry Commission and the local government are entitled to royalties; the civil society organizations enjoy indirect benefits such as the possibility of getting funding from donors; the forest fringe communities are entitled to non-timber forest products, entitlements from the Social Responsibility Agreement; the private sector is entitled to proper ways of guarding the concession and community support as watchdog. The responsibilities of actors include overall management and protection of the reserve; making bye-laws, education of fringe communities, serving as watchdogs, among others. The prospects include ecotourism potential, reduction in conflicts, poverty reduction, among others. The forest co-management is challenged with lack of logistics; bribery and delays in court actions against culprits; non-compliance attitudes of some actors. This study concludes that the Nkrabia Forest Reserve partially meets the design principles and this has implications for the compliance level and legitimacy. Also, contrary to the Common Pool Resource Theory's assertion that Graduated Sanctions leads to compliance of forest rules, this study observes that it is not necessarily the sanction of offences based on severity that leads to compliance of forest rules, rather it is the timely trial (sanction) of forestry cases (offences) that ensures compliance of such rules. Among others, the study recommends active involvement of the local communities in making and modifying the operational rules; intensive education for actors; and provision of alternative livelihoods.

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

This study sought to investigate into the realities, challenges and prospects in co-managing forest resources in Ghana using the Nkrabia Forest Reserve as a case study. This chapter presents the background of the study, the research problem, the research objectives and questions, the research significance and the organization of the study.

1.1 Background

There has been a global forest decline between 1990 and 2015, from 31.7 per cent of the world's total land mass to 30.7 per cent (United Nations Department of Economic and Social Affairs, [UN-DESA], 2016). In Africa, total forest area declined from approximately 706 million ha in 1990 to 624 million ha in 2015 (Food and Agriculture Organization [FAO], 2015). This deforestation problem has been a result of slash and burn farming, commercial farming, massive firewood collection, timber logging activities, influx of infrastructure development, among many others (Chakravarty et al., 2012; Lambin & Meyfroidt, 2011). In this respect, the goal 15 of the Sustainable Development Goals (SDGs) aims to protect, reinstate and promote the sustainable use of terrestrial ecosystems, manage forests sustainably, curb desertification, and halt and reverse degrading the land and halt the loss of biodiversity (United Nations-Department of Economic and Social Affairs, 2016).

Having envisioned this menace of forest loss, it was recommended that to prevent forest overexploitation, inter alia, there should be governmental control of the natural resources (McCay & Acheson, 1987). The central government control which was suggested also faced challenges

thereby failing to curb the deforestation challenge (Yeboah-Assiamah et al., 2017a). The central governments encountered conflicts with the local communities over the forest resources and the benefits emanating from the resources (Ullah et. al., 2017). This was foreseen by scholars like Ostrom who earlier hinted that government bearing the responsibility of managing and protecting the natural resources alone would not be effective in managing such resources and that it would be prudent to do so with the local populace (Ostrom, 1990). Countries became convinced with community involvement in forest management (Wily, 2002). It is evident that public involvement in the management of forest resources has increased during the past decades and has become a hallmark of the civics approach to managing the environmental resources and forest management is increasingly becoming the responsibility of different actors other than solely the state (Plummer & Fennell, 2007).

This has led to the concept of co-management (Berkes, 2009) which suggests the new governance arrangement that emphasizes on the interplay between state and non-state actors to cautiously manage forest resources (Yeboah-Assiamah et al., 2017b). Co-management is premised on the stance that local people can actively aid in maintaining the integrity of ecosystems and ensure proper management of the forests if they are involved in the forest management decisions (Chinangwa, 2014; Ferraro et al., 2012). Co-management has its root in the term "the tragedy of the commons" by Garrett Hardin (1968) which symbolizes the degradation of the environment that would result when many persons consume a scarce resource (Ostrom, 1990). Some co-management arrangements in Canada and in Australia, which involve aboriginal communities, have provided official arrangements expanding the room for local involvement in decision making over forest resources, while at the same time respecting indigenous claims over land (Castro & Nielsen, 2001). Some African countries like Mali, Malawi, Senegal, Togo and many others have

also been practicing co-management (Wily, 2002). These countries have consciously integrated co-management practices into their state policies and laws in their quest to ensure proper management of forest resources.

In Ghana, recent deforestation rate has been estimated to be over 135,000 ha annually between 1990 and 2010 (Oduro, 2016). At that rate of deforestation, it is estimated that forests outside forest reserves in Ghana are likely to be completely lost in the next 10 years, and the forest reserves will continue to be under more acute threat of encroachment and other illegal activities if urgent and concerted action to eliminate the threats of deforestation and forest degradation is not taken (PWC, 2015). It is also recorded that there have been low production recovery rate, biodiversity loss, dwindling natural tropical base, and wood wastes (Oduro et al., 2011). This situation was attributed to lack of community involvement, an unequal benefits-sharing system, weak institutions, inefficiency of the timber industry, flouting of laid down regulations and lack of political will and commitment (Boon et al., 2008; Tropenbos International-Ghana, 2007).

To deal with this deforestation menace and to engender effective forest resource governance as occurs elsewhere, the concept of co-management was adopted and practised as it was observed that the non-involvement of the local communities in the management of the forest resources, lack of access and unequal benefit sharing of forest resources in both off-reserve and on-reserve areas of Ghana contributed significantly to the menace (Plummer & Fennell, 2007). As Ghana is concerned with reconciling the conflicting demands of the various stakeholders for the forest resources (Boon et al., 2009), co-management becomes a useful option as it would make the indigenous communities and other key local actors feel a part of the forest resource management responsibilities (McCay & Jentoft, 1998; Wily, 2002).

For the purpose of this study, the operational definition of forest co-management is, “a situation in which state agencies and communities, including indigenous ones, and other parties such as user groups, non-governmental organizations (NGOs), and corporations negotiate, define, and guarantee amongst themselves an equitable sharing of the management entitlements and responsibilities for a given set of forest resources.” Although these stakeholders may stick to diverse interests, the radical postulation is that sharing of decision and authority will improve the process of resource management, making it more responsive to a range of needs (McCay & Jentoft, 1998). Co-management has been identified to provide the following benefits: aids in addressing livelihood concerns of the indigenous communities; wider local-level governance development; sustainable forest use (Chinangwa, 2014; Kinyili, 2014).

Ghana has been practising co-management of forest resources for decades (Wily, 2002), but most of the time, local communities’ views on management of the forest are not methodically solicited, assessed, and integrated into the forest management decisions (Adam, 2010; Fisher et al., 2000). Meanwhile, it has been observed in studies that active involvement of the indigenous communities in environmental management results in sustainable use of natural resources (Kinyili, 2014; Ugolini et al., 2015). Like other countries, the co-management of Ghana’s forest resources is backed by the 2012 Forest and Wildlife Policy and other forest sector laws. The policy states emphatically that, “The focus of forest management in Ghana is shifting from government-led system to a community government collaborative management approach.” Wily (2002) indicated that in decades, national forest resources would involve co-management with indigenous communities and Non-governmental Organizations (NGOs). However, the question is; having appreciated and adopted the practice of co-management, to what extent has this co-management of forest resources been practised in Ghana?

In this research, the case study employed is the Nkrabia Forest Reserve which is a production reserve in the Asante Bekwai Forest District and where forest co-management is practised. The study selected the production reserve because it is the production reserve that has a private sector as a key stakeholder, an arrangement that does not apply to the protection reserves. Selecting a reserve with the private sector as a key stakeholder was relevant to the study because the study considered the private sector as one of the key stakeholders from which data was gathered.

1.2 Research Problem

The Rio Conference in 1992 highlighted the need for co-management of natural resources (Ballet et al., 2009). The conference challenged the centralized management of forest resources by the State and encouraged the involvement of other stakeholders (local government, central government, NGOs, etc) in the management of forest resources (Barnaud et. al., 2008). Many countries were enticed to adopt and practise co-management owing to the benefits that go with it (Amanor, 2004; Kinyili, 2014; Ming'ate et al., 2014; Ugolini et al., 2015). Co-management of forest resources is faced with the problems of forest management officials appearing reluctant to cede power to the indigenous communities, lack of awareness of rights to indigenous communities and lack of appreciable incentives to such communities, low level of participation in forest decision-making, paltry compensation, limited access to forest resources, and paltry benefits from forest management (Akamani et. al., 2015; Boon et. al., 2009).

Considering the prospects of co-management, Ghana's 1994 Forest and Wildlife Policy which initially set a daring agenda for co-management between the officials of government and non-state actors in the management of forest resources (Kotey et al., 1998) was amended and developed into the current 2012 Policy which re-emphasized co-management. However, it is sad to know that this situation of forest loss is being experienced (Shivakoti et al., 2016). This loss applies not only to

off-reserved forest areas but to on-reserved forest areas as well (Muboko et al., 2016: Tropenbos-Ghana, 2010). These records suggest the need to have a second look at the area of forest co-management because it presupposes that some aspects of forest co-management may not have been well attended to.

There have been a number of studies in the field of natural resource co-management. In a recent study on co-management, Yeboah-Assiamah et al. (2017b) examined how crisis or disturbance in natural resource context leads to the rise of collaboration between various actors to promote effective resource governance. On their part, one of the conclusions was that co-management could be initiated by the government or individual actors towards achieving a resilient governance regime. Osei-Tutu et al. (2015) assessed how interactions occur between informal and formal institutions in community, private and state forest contexts. Osei-Tutu et al. (2015) recommended the development of working local institutions considering the failure of formal regulatory frameworks in forest resource management. Also, the work of Adam (2010) on forest management focused on factors that influence primary stakeholder participation in forest management. Adam (2010) concluded that although forest-dependent communities are recognized as key focus of conservation efforts under the co-management approach in Ghana, they are not often actively included in important management processes. Moreover, a study by Ming'ate et al. (2014) assessed whether co-management practice improved upon the livelihoods of participant forest-dependent communities. In their study, the gap for future research which was identified was that studies on forest co-management should further delve deeper into the Ostrom's Design principles to find out how well the forest resources could be well managed.

These studies have indicated the practice of co-management to some extent. However, as indicated by earlier scholars, in-depth studies need to be done to find out the extent to which forest resources

are being co-managed using Ostrom's design principles. Furthermore, with the expectation that forest resources are to see the hands of communities, NGOs and other actors in their management in this era (Wily, 2002), it becomes needful to look at the extent to which forest resources in Ghana are being co-managed having practised co-management over a decade now notably as this field is underexplored (Adam, 2010; Ming'te et al., 2014).

This study therefore sought to investigate into the realities of co-management of forest resources, bringing out the prospects and challenges faced. As the 2012 Forest and Wildlife Policy recognizes the joint roles of the local communities and other actors like the non-governmental organizations (NGOs) and the private sector, the study selected the Nkrabia Forest Reserve, a production reserve in the Asante Bekwai Forest District, for a case study. The study selected the production reserve because it is the production reserve that has a private sector as a key stakeholder, an arrangement that does not apply to the protection reserves. Selecting a reserve with the private sector as a key stakeholder was relevant to the study because the study considered the private sector as one of the key stakeholders from which data was gathered.

1.3 General Objective

The general objective of the study was to investigate the realities, challenges and prospects of co-management of forest resources in Ghana.

1.4 Specific Objectives

The specific objectives of the study were to:

1. Find out the extent to which the Nkrabia Forest Reserve is co-managed.
2. Assess the entitlements and responsibilities of stakeholders involved in co-managing the Nkrabia Forest Reserve.

3. Identify the prospects and challenges in the co-management process of the Nkrabia Reserve.

1.5 Research Questions

1. To what extent is co-management practised at the Nkrabia Forest Reserve?
2. What are the entitlements and responsibilities of actors in co-managing the Nkrabia Forest Reserve?
3. What are the prospects and challenges in the co-management process of Nkrabia Forest Reserve?

1.6 Significance of the Study

The main purpose of this research was to investigate into the realities, prospects and challenges of co-management of forest resources in Ghana. In terms of literature, the study delved deeper into Ostrom's Design Principles of successful forest co-management. Ming'ate et al. (2014) recommend that future research should delve deeper into the Ostrom's Design principles to find out how well the forest resources could be well managed. This study bridges this gap. Apart from that, previous studies in forest co-management focused on collaboration between central government and forest fringe communities. However, this study moved a step further to include non-governmental organizations, local government as well as the private market in understanding how forest co-management works among these groups. In relation to policy, the findings of this study could serve as a basis for well informed decision by the stakeholders of forest resource policies in Ghana and beyond in relation to the co-management processes and the actors to be included. The general public may also consult this piece in their quest to understand certain basic issues touching on extent of co-management and the prospects and challenges.

1.7 Scope of the Study

This study considered the Nkrabia Forest Reserve in the Ashanti Region of Ghana for a case study. The study explored the actors, their entitlements and responsibilities, the extent to which co-management is practised, and the prospects and challenges of the co-management process at the Nkrabia Forest Reserve.

1.8 Limitation of the Study

There are a number of forest reserves that exist in Ghana. Notwithstanding, this study focused on the Nkrabia Forest Reserve in the Asante Bekwai Forest District, Ashanti Region. The study was also limited to four forest fringe communities. In this case, the findings are specific to the Forest Reserve and the fringe communities selected and may not be generalized to be the case for other forest reserves and fringe communities. Furthermore, some in-depth, key-informant interviews were held in the local language. Owing to this, there was a possibility of misinterpretation in the case of interview questions. However, this situation was well handled because the researcher happens to speak the same language with such group of people. The interview questions were translated into the language the fringe communities understood best by the researcher himself.

1.9 Definition of Key Terms

Co-management: A situation in which state agencies and communities, including indigenous ones, and other parties such as user groups, non-governmental organizations (NGOs), and corporations negotiate, define, and guarantee amongst themselves an equitable sharing of the management entitlements and responsibilities for a given set of forest resources.

Production Reserve: A forest reserve exploited mainly for timber.

Protection Reserve: A forest reserve established mainly for the purpose of conservation.

Social Responsibility Agreement (SRA): An arrangement which obliges the timber firm that has been given a concession in a forest reserve to provide for amenities, services or benefits to assist the communities and inhabitants of the traditional paramountcy, at a cost of no less than 5% of the value of the stumpage fee of timber that is harvested.

Protected Area: A protected area is “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.”

Nested Enterprises: An arrangement where the common pool resource is organized in a larger management system so that all forest co-management issues emanating could be handled at a higher level should there be any failure at the lower level.

1.10 Organization of the Study

The study consists of eight chapters. The first chapter which forms the introductory aspect of the study consists of the Background to the Study, Statement of the problem, Objective of the Study, Research Questions, Scope and Limitation of the Study, Significance of the Study and lastly the Organization of the Study.

Chapter two broadly focuses on and reviews both relevant theoretical and empirical literature. It foremost presents the theoretical framework of the study. It then explains the concepts of co-management of forest resources. It further discusses the entitlements and responsibilities of the various co-management actors. It again, reviews literature on the extent to which co-management is practised and presents certain prospects and challenges that accompany co-management of forest resources.

In chapter three, the methodology adopted for this research is provided. This chapter deals with issues such as the sampling techniques and sample size, instrument and data collection tools and data analysis amongst others.

Chapter four contains the presentation and analysis of the findings in relation to the first objective of the study (the co-management of the Nkrabia Forest Reserve). The analysis was based on Ostrom's Design Principles.

The chapter five presents and analyses the study findings in relation to the entitlements and responsibilities of the co-management actors of the Nkrabia Forest Reserve (the second objective).

Chapter six presents and analyses the findings on prospects and challenges of the forest co-management arrangement (the third objective of the study).

In chapter seven, in-depth discussions of the findings of the study have been done. The discussions in chapter seven covered all three objectives of the study. The discussions have been done under the various study objectives. ,

The last chapter (chapter eight) shows the summary of the findings of the research, conclusion and makes recommendations to practitioners, academia and the general public.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter basically focuses on the review of both theoretical and empirical literature. It foremost presents the theoretical literature of the study. It explains the concept of co-management. It further discusses the entitlements and responsibilities of the various co-management actors. It again, reviews literature on the extent to which co-management is practised and presents certain prospects and challenges that accompany co-management of forest resources. It further presents the empirical review of the study.

2.1 Theoretical Literature

2.1.1 The Concept of Co-management

The term co-management has been diversely defined by different scholars. For instance, McCay and Acheson (1987), in their path-breaking edited volume ‘Managing the Commons’, use co-management to connote the political claims of the local population to the right to share the management power and responsibility of resources with the state. Also, Borrini-Feyerabend et al. (2000) state that “Co-management as a situation in which two or more social actors negotiate, define, and guarantee amongst themselves an equitable sharing of the management functions, entitlements, and responsibilities for a given territory or set of natural resources”(p. 1). However, Brown (1999) defines the term as a “working partnership” between local communities and the state, with its principles embodied in participatory forestry, collaborative forest management and joint forest management (p. 1). A look at Brown’s (1999) definition shows that co-management is applicable to a situation where the indigenous population is involved in partnership which is not necessarily sharing of power with the state.

Additionally, scholars like Carlsson and Berkes (2005) used the term co-management synonymously with a lot more of inclusive governance such as: partnerships, participation, collaborative, and community-based management. Conversely, some other scholars advocate a focused definition of the term, limiting the institutional schedules that involve rigorous participation of users in managing a specific resource (Holm, Hersoug & Rånes, 2000). According to Castro and Nielsen (2001), co-management usually involves state agencies wielding resource allocation or management duties with indigenous communities, and other parties like user groups, companies, and civil society organizations.

Most of the definitions of co-management concentrate on sharing of power between central government and local resource users in terms of the responsibilities and rights pertaining to a particular resource, as the central focus (Stöhr, 2013). Stöhr (2013) argues that the typical view of co-management concerns the risk of putting too much focus on the formal side of sharing of power while ignoring the actual function of co-management as a continuing problem-solving process (Stöhr, 2013). With this, I believe that co-management arrangements should, in addition to formal arrangements, take into consideration informal social linkages and other informal arrangements as well.

It could be clearly pointed out that co-management has been variously defined. However, for the purpose of this study, co-management is defined as, “a situation in which state agencies and communities, including indigenous ones, and other parties such as user groups, non-governmental organizations (NGOs), and corporations negotiate, define, and guarantee amongst themselves an equitable sharing of the management entitlements and responsibilities for a given set of forest resources.” Although these stakeholders may stick to diverse interests, the radical postulation is

that distribution of decision and authority will improve the process of management of resources, making it more responsive to a variety of needs (McCay & Jentoft, 1998).

2.1.2 Typologies of Co-management

There are various typologies of co-management (Borrini-Feyerabend et al., 2000; Carlsson & Berkes, 2005). This section discusses some of the typologies.

One of the simple typologies asserts that there could be four different arrangements between public and private actors/local community. The four alternative arrangements include: Co-management acting like an exchange system labels co-management as a form of relation existing between the two domains, including for instance the exchange of information, goods and services, but lacking sharing of power (McCay & Jentoft, 1996); Considering co-management as joint organization where the user groups and the states might form joint management bodies or cooperative units to take part in joint decision making. In this case however, each sector keeps its mandate and its relative independence using co-management as a formally established arena for cooperation; Co-management as a state-nested system characterizes a condition where the state may be the defacto holder of all the legal rights in a certain area or resource, and the private actors may be entrusted with the right to manage or appropriate resources; and Co-management as a community-nested arrangement which has a differing structure. This is where, the resource users could exercise all the legal rights over a resource owned by groups or individuals. In this light, Carlsson and Berkes (2005) assert that the state acts in the domain of a 'non-public' sphere and may put restrictions on the extent of use.

Another typology of co-management is that formulated by Sen and Nielsen (1996). Their typologies of co-management are the first and are key in giving understanding in the study of co-management as literature and research. Here, five unique types of co-management arrangements:

instructive, consultative, cooperative, informative, and advisory are identified on a range from 'government management' to 'user group management.' With instructive management, there is "minimal exchange of information between government and users of resources" (Nielson, 1996 p. 406), with information flowing through one-way from the government to resource users. The consultative management, being the second step in the stage, permits two-way information flows. Concerning the third type of management, cooperative management, Sen and Nielsen (1996) state that it is the management where "government and users cooperate together as equal partners in decision-making" (p. 406). However, under an advisory management arrangement, resource users come out with decisions and government only approves the decisions. In the case of informative management, resource users have full authority for decision-making as the government has devolved responsibility for management to the resource users.

2.1.3 Why Forest Co-Management has Become Important

Nowadays, forest co-management has been accepted to be very important. There are several reasons for the importance of co-management of the forest with local communities and other actors. Brown (1999) point out some of the many reasons to include: **Proximity**-The local people are the direct custodians of the forest resources. They form the actors in nearest touch with the forest resources, and are dependent on it in a wide variety of ways. Hence they are among the best to manage the forest resources; **Equity**-There could be important considerations of equity and social justice in exploiting the forests. Community-based forest management may be expected to increase the resource flows to rural populations, leading to significant effects on alleviation of poverty and distribution of income; **Capacity**-Nowadays, the capacity of management of users of forest resources has been strongly promoted while that of governments has increasingly been queried. The roles of communities in forest management have been recorded over the past and

there is also evidence from experience of community involvement, that this can improve the quality and condition of the forest (Springate-Baginski et al., 2003); **Cost-effectiveness**-In relation to considering efficacy, there may usually be little alternative but to involve communities in forest management. In most cases, in the developing world, there is very limited capacity for effective management of the forest resource by the public sector. Even where public management is plausible, the costs of exclusive direct management by the state may be prohibitively high, and therefore co-management could be a key way of cutting costs; **Governance**-Engaging communities and community institutions in forest management may aid in introducing discipline into the management of the sector and offer key checks and balances on otherwise unregulated public services (Paul, 1991; Kellert et al., 2000).

Also, Carlsson and Berkes (2004) report that co-management serves as a logical strategy for curbing challenges pertinent to management of resources through partnership. They explain that it is difficult for local users alone to handle forest resources in this modern world. It has also been found that managing forest resources at the central level is a difficult task. Also, co-management of forest resources is important because since many resource management systems are cross scale, diverse management problems must be dealt with contemporaneously at different heights (Berkes, 2002). Thus, co-management, as broadly defined, is probably the rule, rather than the exception, and we should expect to find a substantial variety of arrangements. It has been argued by Pinkerton (1989) that a number of tasks can easily be accomplished by forming properly functioning co-management systems: data gathering; allocation decisions; protection of forest from destruction; and enforcement of regulations.

Co-management strategies therefore are believed to possess the potential to curb forest conservation issues without conceding on the ability of the local communities to achieve their current and future fundamental needs from the forest resources (Kellert et al., 2000). Moreover, with the varied ecosystem services that are derived from forests, co-management possesses the potential to balance interests of both the local and higher levels of management of the forests thereby representing the interest of the public at large in the forest field.

It has however been asserted that before suggesting co-management as a general remedy for all problems of common property, one must be sure that management power has not been taken from the local community.

2.1.4.0 Key Actors of Forest Co-management

Forest co-management involves a lot of actors/stakeholders who come together to function for effective management of forest resources. These actors play their respective roles in order to realize the purpose of co-management. The various actors/stakeholders of forest co-management have been identified below.

2.1.4.1 Key Actors of Forest Co-management

In respect of the actors of forest co-management, the World Bank (1999) categorizes the various actors/stakeholders into the central government; the local government; private commercial sector; and civil society/local communities. However, the actors of forest co-management have also been identified and categorized by Carter and Gronow (2005). Carter and Gronow (2005) categorize the actors into users; governments; development agents and other private interests. According to their categorization, no separation has been made for central government and local government. The table below gives a summary of the forest co-management actors.

Table 2.1: Actors in Co-management of Forest Resources

Users	Governments	Development Agents	Other Private Interests
Numerous subgroups based on differing interests, power and location—often linked by highly complex chains, and too diverse to list	Policy makers (and politicians) Senior government officials Field personnel Education and training institutions Other interested governments (other than donors)	International donors Consultants Donor projects (bilateral, multilateral) Non-profit, non-government organizations Research, training and dissemination organizations Private enterprises Other individuals (e.g. entrepreneurs dependent on flows of forest produce)	

Source: Carter and Gronow (2005 p. 3)

2.1.4.2 Entitlements of Key Actors in the Co-management Arrangement

One of the key things that seek to encourage co-management actors is their entitlements. According to Sikor and Baggio (2014 p. 102), entitlements can be broadly defined as “The goods and services derived from endowments under social actors’ effective command.” More specifically, Leach et al. (1999 p. 233) define environmental entitlements as, “Alternative sets of utilities derived from environmental goods and services over which social actors have legitimate effective command and which are instrumental in achieving well-being.” The alternative set of utilities may embrace any or all of these: direct uses in the form of commodities, such as water,

fuel, or food; the market value of such resources, or of rights to the resources; and the utilities derived from environmental services such as properties (Leach et al., 1999).

The central government is entitled to a portion of the total stumpage fee paid by the timber firm (Ministry of Lands and Natural Resources [MLNR], 2016). The central government, represented by the Forestry Commission, is entitled to fifty percent (50%) of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) has been charged by the Administrator of Stool Lands for administrative purposes. The District Assembly is also entitled to 24.74 % of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) administrative charge has been levied by the Administrator of Stool Lands (MLNR, 2016). A key entitlement of NGOs operating in the field of forestry is that co-management helps the NGOs to have access to funding from their donors whose scope is in the forest sector (Cook et. al., 2017). Moreover, the people in the fringe communities derive livelihoods from the forest co-management arrangement both within and outside the reserve, ranging from game hunting, livestock and crop production, to the collection of medicinal plants and other non-timber forest products (Leach et al., 1999).

The forest fringe communities are also entitled to enjoy from the Social Responsibility Agreement (SRA), an arrangement which obliges the timber firm to provide for amenities, services or benefits to assist the communities and inhabitants of the traditional paramountcy, at a cost of no less than 5% of the value of the stumpage fee of timber that is harvested (Ministry of Lands and Natural Resources, 2016). Timber Resources Management (Amendment) Regulation 2003 (L.I. 1721) establishes this Social Responsibility Agreement (SRA). In a study conducted by Mayers and Vermeulen (2002), it was revealed that private timber firms establish the SRA with the local communities in Ghana before operating in forest reserves. Mayers and Vermeulen (2002) indicate that the fringe communities use this percentage of the total stumpage fee in the construction of

boreholes, KVIPs, among others. Moreover, in a study by Lartey (2009), it was observed that timber companies rehabilitate the roads of forest fringe communities for them. The co-management arrangement provides some form of social acceptance to the private firm and security of the firm especially on the part of the relationship with the communities (FAO, 2005). The private sector is also entitled to any acceptable practices that they would undertake to protect the concession (Tropenbos-Ghana, 2005).

The Table 2.2 below shows the existing revenue sharing format from timber for both forest reserves and areas outside forest reserves.

Table 2.2: Forest Reserves and off-reserve Revenue allocation among Stakeholders

STAKEHOLDERS	PERCENTAGE OF REVENUE ALLOCATED	
	Forest Reserves	Off-Reserve
Forestry Commission	50	50
Administrator of Stool Lands	5	5
District Assemblies	24.75	24.75
Stool Chief (Alienation Holder)	11.25	11.25
Traditional Council	9	9
TOTAL	100	100

Source: Adapted from MLNR (2016 p. 34)

2.1.4.3 Roles/Responsibilities of the Key Actors of Forest Co-management

2.1.4.3.1 Central Government

Governments collaborate in order to tap into the strengths of other partners, to share the responsibilities of forest management and to reduce costs (Carter & Gronow, 2005). The central

government has a major role to play in supporting empowerment of the resource users, promoting equity and providing motivations to implement policies. The article 269 (1) of the 1992 Constitution of Ghana, also stipulates, in relation to the Forestry Commission, that the FC is responsible for the regulation and the management of the utilization of natural resources. Furthermore, Section 2 (1) of the Forestry Commission Act - 1999 (Act 571) states, “The Commission shall be responsible for the regulation of the utilization of forest and wildlife resources, the conservation and management of those resources and the co-ordination of policies related to them.” Also, Section 2 (2) (a) states that the Forestry Commission shall regulate the utilization of forest and timber resources; Manage the nation's forest reserves and protected areas; assist the private sector and the other bodies with the implementation of forest and wildlife policies; undertake the development of forest plantations for the restoration of degraded forests areas, the expansion of the country's forest cover and the increase in the production of industrial timber among others. Moreover, Section 8 of the Forestry Commission Act-1999 (Act 571) states that, “ The Commission may for the discharge of its functions appoint committees of the Commission comprising members of the Commission or non-members or both and assign to any such committee such functions of the Commission as the Commission may determine.”

2.1.4.3.2 Local Government

The section 10 (3) (e) of the Local Government Act-1993 (Act 462), states that the local government shall be responsible for the protection of the environment within its jurisdiction. The environment also embraces the part of the Forest Reserve that resides in the jurisdictional area. The local governments therefore, contribute their quota to the forest co-management effort through the establishment of development plans aimed at protecting the reserve. The Section (3) (b) specifies the formulation of development plans as part of the functions of the local government. It

was also observed in a study by Pomeroy and Berkes (1997) that the local government undertakes the following roles: executing forest policies and laws; implementing management plan and measures; issuing local rules, regulations and ordinances; coordinating with other sectors; local project planning.

2.1.4.3.3 Civil Society/Local Communities

2.1.4.3.3.1 Civil Society Organizations

The civil society cannot be left out in discussing the role the actors play in forest co-management. They engage in the following roles: capacity building; advocacy linkages; extension and pilots; and standard-setting (FAO, 2005). In forest co-management, NGOs can also be skilled providers of social science expertise, such as education and training, facilitation and social surveys (Carter and Gronow, 2005). In addition, NGOs play a vital role as advocates for highland communities attempting to protect their landholdings and forest fields from illegal logging undertakings and from local influential interests who sometimes lay claim to their forest resources (Donoghue, 1999). In this regard, they help to protect the forest resources. Other works on roles of Non-Government Organizations (NGOs) in forest co-management show that NGOs can possibly act in three key roles namely: embarking on research and development of livelihood projects; being political and legal advocates for communities; and as assistance providers via the provision of community organizers (Donoghue, 1999; Quesblatin, 1994).

2.1.4.3.3.2 Local Communities

Communities are a set of people (or agents in a more abstract sense) with some shared element. Communities living nearby have intimate knowledge of the forest, are able to monitor and police access, and respond rapidly to threats such as wildfires (Carter & Gronow, 2005). The Control and Prevention of Bushfires Act 1990, P.N.D.C.L. 229 of Ghana states that persons shall not set fire

in a protected area. Section 12 states that if a person conceals a bushfire act and does not report, that person commits an offence and is liable to a fine. Also, in co-management of forest resources, the communities play very key roles. Among such roles are: local planning and implementation; custodian/stewardship over resources; sustainable exploitation of resources; formulation/observance of local rules and regulations; conservation and resource enhancement; participation in objective-setting and planning; facilitate participatory process/partnership; involvement in national/regional processes (Evans et al., 2004). Folke et al. (2005) assert that these rich qualities of the local community: knowledge and experience sharing, and organizational capabilities should be embedded in the forest governance system to help in strengthening the capacity to manage forests sustainably for the well-being of the people. The informal institutions like their taboos and cultural beliefs help to prevent the community members from going into the forest to collect forest resources on some specific days. Scholars earlier discovered this key role of the communities in forest resource management (Attuquayefio & Gyampoh, 2010; Tania et. al., 2006)

2.1.4.3.4 Commercial Private Sector

The private sector brings investment and links to markets (Carter & Gronow, 2005). The private sector encompasses small-scale and larger-scale/industrial entrepreneurs that invest in the forest products and as such seek to help protect and promote the sustainability of the forest resources. By renegotiating responsibilities for forest management, forest services often hope to reduce staffing levels, share the responsibility for protection with communities and concentrate on strategic planning, consensus building, regulation, monitoring and compliance.

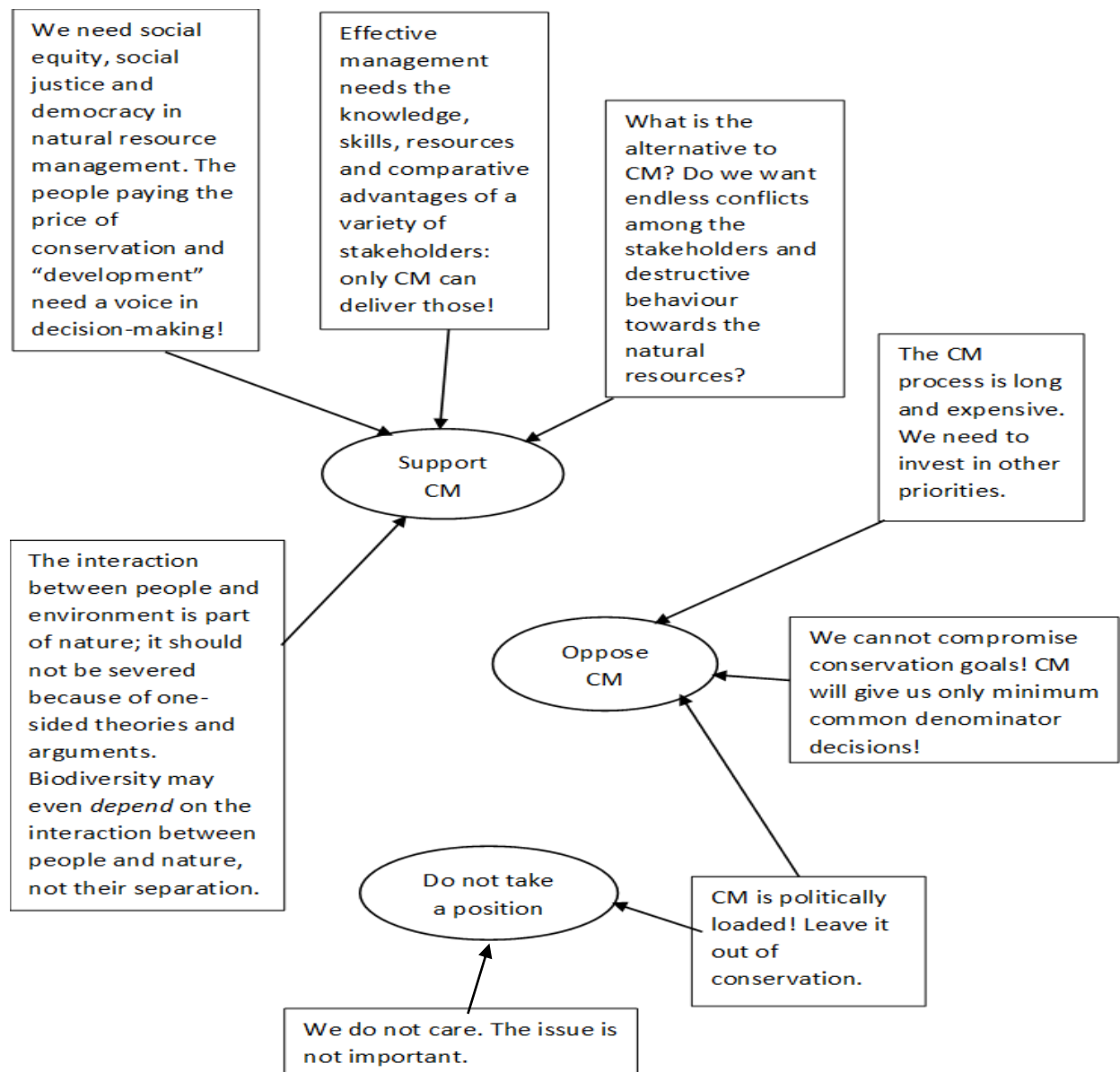
Environmental change, investor pressure, and a new attitude by many companies are changing private sector approaches to the management of natural resources. This is evidenced by two clear trends: more proactive assessment of risks and identification of new business opportunities through the diversification of ecosystem services (Carter & Gronow, 2005; International Finance Corporation, 2006). Where companies used to impact natural resources, they are gradually taking a more rigorous approach to risk assessment, preparing corporate strategies and taking steps to manage impacts responsibly. In so doing, they are protecting their license to operate and enjoying continued access to resources.

For instance Forest Trends' Business and Biodiversity Offset Program, in which leading mining, oil and gas, and construction companies are undertaking voluntary biodiversity, offsets to ensure their new infrastructural projects bring about "no net loss" of biodiversity (International Finance Corporation, 2006). With this, there is a strong relationship with regulators and communities- which are increasingly financial, which helps in accessing capital. Some other roles of the private sector, according to FAO (2005), include: involving in terms of upstream and downstream linkages; financial support; and pilot implementation of projects. Moreover, the private sector is expected to observe all the required rules stated in the Social Responsibility Agreement (SRA). It is reported that the SRA obliges the contractor to provide for amenities, services or benefits to assist the communities and inhabitants of the traditional paramountcy, at a cost of no less than 5% of the value of the stumpage fee of timber that is harvested (MLNR, 2016). It is clearly stated by MLNR (2016), that the Minister in charge of Natural Resources is compelled to quash TUCs if the SRA is not signed by the local communities following the notification of grant.

2.1.5 Arguments for and against Co-management

In the field of co-management, certain arguments have been raised for and against the practice of co-management. These are views that seek to support co-management or that go against it. The views of some people supporting or going against co-management have been summarized in Figure 2.1 below by Borrini-Feyerabend et al. (2007).

Figure 2.1 Summary of Arguments for and against Co-management



Source: Adapted from Borrini-Feyerabend et al. (2007 p. 3)

2.1.6 Prospects of Co-management

The practice of co-management goes with several prospects. It is obviously the effectiveness and the prospects that co-management carries which has enticed many countries to adopt it. Some of the prospects have been presented by some scholars. Co-management is able to harmoniously link the concerns of social scientists, preservationists and implementers policy (Barrett et al., 2001; Borrini-Feyerabend et al., 2000). Also, it serves as a means of achieving social justice and economic equity because the indigenous people who often appear to be side-lined receive some social and economic benefits (Schwartzman & Zimmerman, et al., 2005). Co-managing with communities has been proven to result in very positive social change and has, in some cases, resulted in improved forest resource management (Brown et al., 2005; Pomeroy et al., 1997). Pomeroy et al. (1997) add that forest co-management, which also serves as a poverty reduction strategy, has significant potential and there is an obvious requirement that advocacy be intensified towards this approach. When governments devolve authority, they benefit by achieving better outcomes in terms of economic, ecological, and social results. In forest co-management, forest users have the advantage of involving themselves in management decisions that do affect their welfare and governments could also benefit by being more effective and efficient (Brown et al., 2005). The co-management of forest resources serves as different strategy for effective management of protected areas for tourist activities.

Co-management can also be considered as knowledge conglomerate. Different levels of organization, from local to international, have comparative advantages in the generation and mobilization of knowledge acquired at different scales (Berkes, 2009). Co-management provides a forum for the interaction of different kinds and levels of knowledge, and the coordination of other tasks that enable co-operation: trust building, accessing resources, resolving conflict, and

networking. In co-management, social learning is one of the major tasks relevant both to the co-operation of partners which occurs most efficiently through joint problem solving and reflection within learning network which aid in dealing with problems at larger scales (Armitage, 2010). Another Scholar reiterates the prospects of co-management to include: helping in reaching a common understanding, formation of trust, settling/preventing conflicts, increasing stakeholders' accountability and responsibility, promoting legitimacy and accepting management decisions and policies and increasing the likelihood of compliance (Pita et al., 2010). It was also observed in a study by Ming'ate et al. (2014) in Kenya that co-management of forest resources has the potential of reducing the poverty levels of the local communities.

2.1.7 Challenges of Co-management

It has been observed that one of the major challenges in co-management is significant imbalances in power which exists between industrial and non-industrial users, and civil society tends to be weak and divided; the identities of communities and relationships may be complex in such areas, where the forest figures more as a zone for agricultural expansion than as a resource to be conserved; the heterogeneous nature of human populations in forests makes resource control structures byzantine (Brown, 1999). Brown (1999) reports that local government authorities in high forest areas tend to cover large areas and populations (weakening their capacity to render administrative enticements to the conservation of forests), and where electoral systems bind local government representatives firmly to central politics, there is a very high possibility that decision-making will not represent long-term interest of the local populations, in which case the conservation and sustainability of the forest resources will be at stake.

One other key challenge of co-management of forest resources is non-conformance of local/indigenous populations to forest protection laws which leads to loss of revenues and farm

crops (Beretti, 2009). For instance in a survey conducted in Monterey County (USA), it was reported that most people lost their crops which were estimated to be \$920,000 per year (Beretti, 2009). This happened because of the indigenous people's reluctance to conform to rules pertaining to wildlife and forest protection. Sometimes, the complexities and uncertainties that emerge in forest co-management make the success of co-management practices an onerous task (Plummer & Fennell, 2009; Smith et al., 1999). Also, it has been observed that responsibilities for management of resources are often transferred from the central government to local users without the transfer of the proportionate and access to benefits (White & Martin, 2002). Financial challenges also cause a problem in the forest co-management arrangement as it induces forest fringe communities to encroach on forest resources.

2.1.8 Managing the Challenges of Forest Co-management

In dealing with the co-management challenges, scholars have identified several ways or mechanisms. For instance according to Beretti (2009), open dialogue and collaboration amongst the various actors of the forest industry: private commercial institutions, human health and environmental regulatory agencies, and environmental scientists and organizations. These actors and bodies, when they enter into transparent collaborative exercises and dialogue, will see to it that there is harmony. In this respect, Prahalad and Ramaswamy (2004) earlier hinted on the importance of open dialogue. They argue that it enables actors of co-management to develop appropriate rules concerning the management of resources. With broad-based open dialogue, information about private commercial companies is easily circulated concerning the risks associated with their operations. In response to the complexities and uncertainties that emerge sometimes in co-management which usually result in high incidence of controversy and weak outcomes in the process of management (Plummer & Fennell, 2009; Smith et al., 1999), Smith et

al. (1999) suggest Management strategy evaluation (MSE) which, they argue, can aid in resolving such issues. Management strategy evaluation embraces assessment of the consequences of a range of management options and laying bare the trade-offs in performance across a range of objectives of management.

The major stages in this approach encompass: turning broad objectives into specific and calculable performance indicators, identifying and integrating key uncertainties in the evaluation, and communicating the results effectually to groups and decision-makers (Fulton et al., 2011; Smith et al., 1999). Confirming the usefulness of the adoption of MSE, an assessment by Bunnefeld et al. (2011) also showed that this strategy is a powerful tool for conservation.

2.1.9.0 Theoretical Review

Co-management is a concept that has received global attention owing to its relevance. It has been recognized as a successful means of ensuring sustainable management of forest resources (Plummer & Fennell, 2007; Shivakoti, Pradhan & Helmi, 2016). Attention should therefore be paid to the actors that are involved in co-managing forest resources and how such actors are involved in co-managing the resources. It is against this background that two theories have been identified which seek to render theoretical foundation to this study. Two theories were found relevant because each one could not exhaustively address the purpose of the study singly.

The theories are: Co-management Theory which establishes the argument that managing forest resources should not be the sole responsibility of the central government but the central government and other actors like the indigenous communities (Stöhr, 2013); and Common Pool Resource (CPR) Theory which explains that for a successful co-management of forest resources, certain design principles should be followed (Ostrom, 1990). These two theories have been explained below.

2.1.9.1 Co-Management Theory

The co-management (CM) theory is based on the stance that environmental governance participation is connected with a positive input on the general performance of the governance system in terms of legitimacy, local adaptation, knowledge gathering, compliance and effectiveness (Stöhr, 2013). The theory is premised on the criticisms raised against high level centralized management methods that are stated as follows: Centralized management tends to seek equal regulations for a wide area and number of ecosystems, which causes difficulties should there be significant changes in the local condition; Centralized management tends to despise the local knowledge, which is used in local institutions and depend on practices accepted internationally; Higher level institutions motivate the more influential and larger stakeholders (such as environmental Non-Governmental Organizations) as opposed to local organizations and groups that inhabit the ecosystem they patronize (Berkes, 2002; Young, 2002).

Co-management Theory accepts that the design of centralized form of governance could be useful but asserts that a deliberate attempt should be made to protect and involve local interests and rights. According to Young (2002), the Co-management theory therefore emphasizes the importance of partnerships between the different levels. Co-management gained much attention both by scholars and political actors in the past two decades and can be defined as “the term given to governance systems that combine state control with local, decentralized decision making and accountability and which, ideally, combine the strengths and mitigate the weaknesses of each” (Singleton, 1998 p. 7).

2.1.9.2 Common Pool Resource Theory

The Common Pool Resource (CPR) Theory has the question of voluntariness of collective action as its vital core (Ostrom, 1990). According to Ostrom (1990), theoretically, Garrett Hardin

suggested an alternative panacea to the tragedy dilemma. She asserts that self-organization of the beneficiary population in the form of binding contracts among the people aids in solving the dilemma-whereby the individuals design their own contracts in respect of the information they wield (Stöhr, 2013).

Here, Ostrom (1990) proposes the use of institutional approach for common pool resource issues by looking at the circumstances under which resource users collectively seek to overcome the tragedy of the commons. Through the rigorous empirical scrutiny of numerous case studies of collective action systems, she identified factors that make collective self-organization successful. These factors are design principles that seem to apply in general setting and they embrace: Clearly defined boundaries of the Common Pool Resource and the individuals (or households); Congruence between appropriation and provision rules and the local conditions; Collective choice arrangements; Monitors are accountable or are the appropriators; Graduated sanctions by other appropriators, by officials accountable to these appropriators or both; Conflict resolution mechanisms; Minimal recognition of rights to organize; and Nested enterprises for Common Pool Resources that are part of larger systems.

The Ostrom's Design Principles have been widely accepted to be a guide for a successful co-management of forest resources (Cox et al., 2010). The Design Principles above have been briefly defined in the Table 2.3 below.

Table 2.3 Ostrom's Design Principles

Principle Number	Design Principle	Meaning
1	Clearly defined boundaries	Individual and household users, as well as the Common Pool Resource, must be clearly defined. This means that individual or households with the rights to withdraw resource units from the common pool resources and boundaries of the common pool resources are clearly defined.
2	Congruence between appropriation and provision rules and local conditions	Clear relationship between the rules and the nature of the resource, such that the distribution of benefits from appropriation rules is roughly proportional to the costs imposed by the provision rules. Thus appropriation rules limiting the time place, and quantity of resource units are related to local conditions and provision rules requiring labour, materials and/or money.
3	Collective-choice arrangements	Collective-choice arrangements require that most individuals affected by the operational rules be able to participate in modifying the operational rules.
4	Monitoring	Monitors, auditing the behaviour of the appropriators and the condition of the CPR, are accountable to those appropriating the resource.
5	Graduated sanctions	Graduated sanctions are applicable and are applied to those who violate operational rules depending on the severity of the offence.
6	Conflict-resolution mechanisms	Appropriators must have access to rapid and low-cost mechanisms to resolve conflicts. The principle suggests that conflict resolution mechanisms should be administered effectively and at the least cost.
7	Minimal recognition of rights to organize	The appropriators' right to organize is not challenged by external authorities. This principle stipulates that external government agencies do not challenge the right of local users to create their own institutions.
8	Nested enterprises	Appropriation, provision, monitoring, enforcement, conflict resolution and governance activities are organized in multiple layers of nested enterprises.

Source: Adapted from Ostrom (1990)

A look at the Common Pool Resource Theory shows that for successful co-management effort to be realized, the design principles aforementioned should be given priority. We can identify other scholars who came out with similar design principles even though they are slightly different in terms of focus (e.g. Hanna et al., 1995, Pinkerton & Weinstein, 1995). According to Cox et al. (2010), the design principles formulated by Ostrom have become widely accepted within the discourse of research. These design principles have been used by some other scholars in their studies (Cox et al., 2010; Zhu et al., 2014).

It is important however to stress that this theory has been criticized for being too limited in order to provide enough explanations for failures of collective action in common pool resource scenarios, since it intends to focus on only internal factors that support environmental management processes (Steins & Edwards, 1999). Steins and Edwards (1999) add that though the principles designed by Ostrom give vital guidelines for institutional design on the community level, migrating the principles to higher levels of institutional design could be problematic.

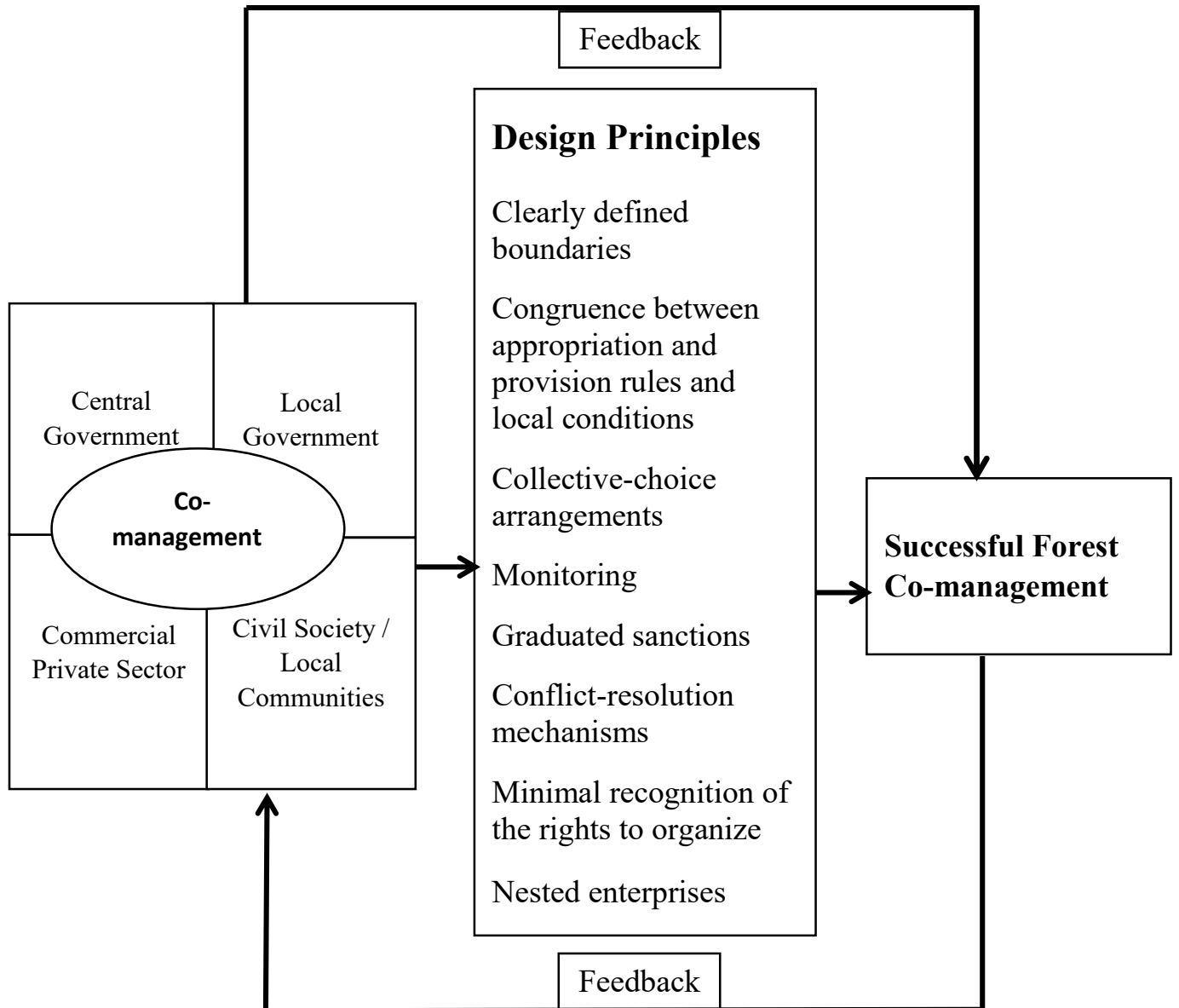
2.1.10 Conceptual Framework

The study formulated a framework that served as the basis of analysis for the study findings. A critical consideration of forest co-management literature shows several frameworks of forest co-management. However, the framework for this study is adapted from co-management theory and common pool resource theory. The co-management theory was able to establish the basis for the varied actors of forest co-management required to ensure sustainable use of forest resources. The theory supports the argument that management of forest resources should not be the business solely of the central government rather the central government and other actors like commercial private sector, civil society/local communities and local government should co-manage forest resources (World Bank, 1999). The co-management theory however, fails to indicate what guidelines or

principles would guide their co-management practices or activities in order to ensure successful co-management in the forest resources.

In this regard, the common pool resource theory becomes relevant as it outlines certain design principles that guide the co-management activities of the actors. These design principles guide the actors in trying to attain a successful co-management practice. The design principles are as follows: clearly defined boundaries; congruence between appropriation and provision rules and local conditions; collective-choice arrangements; monitoring; graduated sanctions; conflict-resolution mechanisms; minimal recognition of the rights to organize; and nested enterprises (Ostrom, 1990). The Figure 2.2 shows the elaboration of the framework.

Figure 2.2: Conceptual Framework for Successful Forest Co-management (adapted from Co-management Theory and Common Pool Resource Theory)



Source: Author's own construct

2.1.11 Operationalization of Framework

In finding out the extent to which forest resources are co-managed, the study employed the co-management theory and the common pool resource theory. The study adapted the World Bank's (1999 p. 11) stakeholder categories in co-management which puts forest co-management actors in four categories: Central Government; Local Government; Commercial Private Sector; and Civil Society/Local Communities. This affirms Sarpong et al.'s (2015) submission which state that the actors in forest co-management include traditional authorities, forest fringe communities, Forestry Commission, civil society organizations, among others.

In forest co-management, these categories of actors interrelate, sharing rights and responsibilities, to manage the forest resources. Some communities help in controlling corruption and mismanagement in the forest co-management arrangement and to establish effectual controls over individual uses of the forest whereas some of the communities help to curb smuggling of timber (Klooster, 2000). Klooster (2000) adds that certain communities receive some shares of profits emanating from the co-management of forest resources.

Ostrom (1990) submits that for co-management to be successful, the design principles should be observed. It implies that the interrelationships among the identified actors should support the design principles spelt out. When the actors adopt these principles in their operations, it will lead to a successful co-management (Ostrom, 1990). Literature reveals that a successful co-management exercise is that which results in compliance; legitimacy; knowledge gathering; and local adaption (Berkes, 2009; Stöhr, 2013).

2.2 Empirical Literature

In a study by Zhu et al. (2014), it was revealed that some communities had divided the collective forest into small pieces for individual or household management. In this case, Zhu et al. (2014)

report that the people hold access, withdrawal, management and exclusion rights of the forest resources within their collective forest. In a study in Nepal on successful co-management, it was revealed that villages partially met the principle of congruence between appropriation and provision rules and the local conditions (Gautam & Shivakoti, 2005). Empirical studies have also observed that where the views of the local communities are not inculcated in the forest management rules, there is less or no legitimacy and high level of non-compliance (Hansen, 2011; Marfo, 2010; Opoku Mensah, 2012). It was found out in a study that the traditional leaders in the local communities aid in formulating and observing local rules and regulations pertaining to the forest (Evans et al., 2004). It was observed in another empirical study that monitors do not perform satisfactorily if they do not directly benefit from improved resource conditions and that it is important that monitors are accountable to those who mostly depend on the resource (Aligica et al., 2014). According to Aligica et al. (2014), a study in two forest systems in the Middle Hills of Nepal revealed that the ability of local users to oversee the monitors' performance had an effect on resource conditions.

In a study by Osei-Tutu et al. (2014), it was revealed that the fringe communities do vote unto the co-management committees, members to participate in monitoring activities. In an earlier study by Ming'ate (2012), it was observed that the village forest guards have no power to arrest violators of the rules of the co-management arrangement. They have to rely on the government forest guards. The KFS and community forest guards conduct forest patrols together. In the study by Zhu et al. (2014), it was revealed that in the communities, the co-management committees do hold conflict-resolution meeting for parties involved in the conflicts. The co-management committees, then report such issues to the management bureau for help in finding a solution should they find it difficult to resolve. Zhu et al. (2014) further revealed that local villagers structure extensive rules

regarding who can use a forest and the type of forest resources that can be used in varied periods. In an empirical study by Agrawal and Chhatre (2007), in Himachal Pradesh maintain, it was observed that the success of local institutions pertaining to forest resources can be tampered with by the strict involvement of higher level government officials in decision-making procedure. Osei-Tutu et al. (2014), in their study, recommended the development of working local institutions considering the failure of formal regulatory frameworks in forest resource management. A study by Zhu et al. (2010) revealed that villagers devise their rules but in conformity to and which are nested in national governmental laws for forest and nature reserve management. They add that the national government directly or indirectly affects the local autonomy through institutional arrangement.

A report by the Ministry of Lands and Natural Resources (2016) declares that Forestry Commission and the District Assembly are entitled to 50% and 24.74% respectively of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) has been charged by the Administrator of Stool Lands for administrative purposes. Mayers and Vermeulen (2002) indicate in their study that the fringe communities use 5% of the total stumpage fee assigned to them in the construction of boreholes, KVIPs, among others. Moreover, in a study by Lartey (2009), it was observed that timber companies rehabilitate the roads of forest fringe communities for them. Earlier study observed that the private actor enjoys social acceptance by the local communities (FAO, 2005).

Studies have identified the roles of central government to include: providing an enabling environment through the specification of policy and legislation; technical support/advice/human resource development; empowerment, incentives, equity; facilitating a participatory process/partnership; ensuring linkages; standard-setting; quality control, trade and market support

(FAO, 2005; Pomeroy & Berkes, 1997). It was also observed in a study by Pomeroy and Berkes (1997) that the local government undertakes the following roles: executing forest policies and laws; implementing management plan and measures; regulations and ordinances; coordinating with other sectors; local project planning. The policies from the central government are implemented at the local level through management plans (Pomeroy & Berkes, 1997). It was also reported in a study by Cook et al. (2017) that NGOs are involved in funding the local government in the field of forestry. It was also found in another study that NGOs are committed to representing and defending the interests of local people (Tropenbos-Ghana, 2005). Moreover, empirical studies have highlighted the key roles of Non-Governmental Organizations (NGOs) as a key actor in forest co-management. In an empirical study by Ballabh et al. (2002) in India, it was observed that community-based groups like watch dog committees, community protection groups, and youth groups monitor and protect the forest. Owing to the important roles played by NGOs in forest co-management, in a study by Folke et al. (2005), it was concluded that the community was very essential actor in forest co-management and advocated against their neglect in major aspects of the management forest resources.

Folke et al. (2005) highlighted the roles of the community to encompass: knowledge and experience sharing, and organizational capabilities. In a similar development, a study conducted by Osei-Tutu et al. (2015) showed that the local communities play a key role in the forest protection through their informal institutions. Informal institutions have been seen to connote: approaches that are adopted and locally enforced by particular communities through their own leaders; and traditional governance arrangements that include chieftaincy and traditional priesthood systems and cultural belief systems (Yeboah-Assiamah et al., 2017b). Studies have confirmed that where traditional leadership is strong and legitimate; their influence has a

corresponding sustainable impact on the environmental resources (Larcom et al., 2016; Shackleton, et al., 2002). Likewise the private sector cannot be left out. It has been observed that the private timber firm is enjoined to make the Social Responsibility Agreement with forest fringe communities (Mayers & Vermeulen, 2002). Among others, the conditions that are specified in the code of conduct of SRA embrace: timing of timber logging with agricultural activities; specific logging techniques to reduce damage to crop; observance of cultural practices like taboo days: assurance of minimal disturbance to sacred sites, existing community; and infrastructure and prime areas for gathering non-timber forest products (Mayers & Vermeulen, 2002). Mayers and Vermeulen (2002) also observed that the private sector is obliged to observe all laid down rules pertaining to the conservation of the reserve as it operates (Mayers & Vermeulen, 2002).

The practice of forest co-management has a lot of prospects which studies have revealed. According to Zachrisson (2009), co-management is a class of management regime that embodies features which help to deal with conflicts among different actors. Beckley (1998) also observed in his study that co-management maximizes the benefits of forest values to a different and wider range of stakeholders while simultaneously serving as mechanisms to reduce conflict between stakeholders. It has also been observed in empirical studies that from the ecological dimension, co-management is employed as a means to reach efficacy in protecting biodiversity and ensuring conservation (Borrini-Feyerabend et al., 2000; Chinangwa, 2014). Also, potential destructive conflicts and forest resource degradation could be curbed or eschewed and it holds some potentials for sustainable tourism (Plummer & Fennell, 2009).

Empirical studies have touched on co-management challenges. For instance in a study by Ullah et al. (2017) on forest co-management, it was observed that the challenges of forest co-management have to do with limited professional foresters within the local forestry. The observation by Ullah

et al. (2017) clearly shows that a key challenge of forest co-management is limited forestry staff who have large areas of the forest in their jurisdiction to oversee. In addition, Ullah et al. (2017) observed in their study that the co-management of the forest was faced heavily with insufficient logistics. Other study by Shivakoti et al. (2017) also observed that some of the challenges in forest co-management have to do economic and financial constraints.

2.3 Overview of Forest Co-management Laws and Policies in Ghana

Considering the rate of deforestation and environmental degradation, certain relevant forest policies and laws were instituted (Wily 2001). These laws were meant to motivate stakeholders more especially indigenous fringe communities to help in protecting the reserve and also to give legal enforcement against illegal and overexploitation of both protected and open forests. Some of such policies and laws are outlined as follows: The 1992 Constitution of Ghana made provision for the establishment of the Forestry Commission. The Forestry Commission Act, (Act 571, 1999) did constitute the Forestry Commission to handle reforms that had to do with institutions within the region or milieu of the government. It was also to regulate the usage of the forest (Adams, 2010). There were other conscious moves aimed at promoting forest collaborative management which encompassed the Forestry Development Master Plan (1996-2000), the 2012 Forest and Wildlife Policy, the National Environmental Action Plan (1990-2000), and the Timber Resource Management Act, (Act 1998, 547). For instance, the 2012 Forest and Wildlife Policy was formed to make necessary provisions to assure forest-fringe communities the fundamental access rights and entitlements from the management of forests and to ensure the sustainable development of Ghana's wildlife and forest resources. This was to ensure good ways of maintaining the quality of the environment and persistent flow of appreciable benefits to all parts of society (Adams, 2010). The 2012 Forest and Wildlife policy strengthens the co-management of forests with indigenous

people, civil society organizations and other non-state actors. Also, the Timber Resource Management Act (1998) sought to regulate linkages between forest fringe communities and timber firms thereby ensuring that some benefits accumulate to indigenous communities, envisioning that in that way, local interests will be promoted to preserve the forest (Agyenim-Boateng et al., 2002).

2.4 Brief Overview of Ghana's Forest and Wildlife Sector

According to the 2012 Forest and Wildlife Policy of Ghana, Ghana has two major ecological zones: the high forest zone mainly in the southwestern part and which comprises of about 35 percent of the country and the savannah zone filling up the remaining part of the country. The forests are categorized into on-reserved and off-reserved and there are 282 Protected Areas covering a sum of 23,729 km² with 216 of them located within the high forest zone. The 2012 Forest and Wildlife Policy further stipulates that forest and wildlife conservation areas form about 16.2 percent of the total land area. Two types of Protected Areas exist – Production reserves exploited mainly for timber (75 per cent) and Protected forests (25 per cent) established for the purpose of conservation. In terms of the biological diversity, the high forest ecological zone is considerable and accounts for most of the biological diversity of the country. For instance, out of 3,725 higher plants known to be in Ghana, about 2,300 are found in the high forest zone, including 730 tree Species (the 2012 Forest and Wildlife Policy). Also, 185 of the 222 mammals of Ghana and about 200 of the 494 resident birds in Ghana are present in the high forest zone. Most diversity groups like fishes, reptiles and amphibians are believed to be hosted by the high forest ecological zone (National Biodiversity Strategy for Ghana, 2002).

2.5 Protected Area

For the sake of conservation and sustainability, most countries have designated some areas as 'Protected'. A protected area is "a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (International Union for Conservation of Nature [IUCN], 2008 p. 8). In such areas, there are sites that embrace meadows, fisheries, forests, etc. These resources are examples of what Ostrom calls 'common-pool resources' or simply 'commons'. In Ghana's forestry sector for instance, two types of Protected Areas exist – Production Reserves exploited mainly for timber (75 per cent) and Protected Forests (25 per cent) established for the purpose of conservation. In this research, the case study employed is the Nkrabia Forest Reserve which is a production reserve in the Asante Bekwai Forest District, Ashanti Region. The study selected the production reserve because it the production reserve that has a private sector as a key stakeholder, an arrangement that does not apply to the protection reserve. Selecting a reserve with the private sector as a key stakeholder was relevant to the study because the study considered the private sector as one of the key stakeholders from which data would be gathered.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discusses the philosophical assumptions that served as a guide to this study and the nature and strategy the study adopted to gather and analyse the data. It presents the research approach, research design, and profile of the study area. It further presents the population of the study, sampling techniques as well as the data management and analysis.

3.1 Research Paradigm

As succinctly pointed out by Kuhn (1970), a paradigm is “a set of beliefs, values and techniques which is shared by members of a scientific community, and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them” (p. 175). A paradigm is considered to be a regime that contours the practice and manner of a qualitative research (Creswell, 2003). Likewise Guba (1990) indicated that a paradigm is “a basic set of beliefs that guide action” (p. 17). There are four models that shape the actions of the researcher: positivism; constructivism/interpretive; advocacy/participatory; and pragmatism (Cresswell, 2013). For the purpose of this study, interpretive assumption was adopted. The interpretive assumption holds that individuals build their own personal interpretations and understanding to the experiences they encounter in the field in which they live and work (Creswell, 2007). Interpretive assumption does allow the researcher to make decisions based on the participant’s views of the phenomena (Creswell, 2003). The scope of this study is such that different categories of actors come into play and that to have a fair representation of findings, each category of actors has to share their view on the co-management practices. From the assertion by

Cresswell (2003), each actor shares their view from their own context. The analysis of findings therefore, had to consider the views of the various actors from their various contexts and the experiences the researcher encountered from the field.

Interpretivism thus focuses on exploring the complexity of social phenomena with a view to gaining understanding (Thomas, 2010). Here, interpretivism fits in this study because the study sought to explore the complexity of views from various forest co-management actors: central government, local government, private firm and civil society organizations concerning how they are involved in the management of forest resources to gain better understanding of how forest co-management works at the Nkrabia Forest Reserve. Also, Gephart (1999) describes interpretivism as “being directed on meaning, and understanding the social interactions between humans” (p. 5). This study which is on forest co-management has to do with the interaction with different stakeholders: how they collaborate to share responsibilities and entitlements to make forest management effective. Exploring these stakeholders’ roles gives deeper understanding of their social interactions.

It has been advanced that the three basic principles of interpretivism include: the social world is constructed and given meaning subjectively by people; the researcher is part of what is observed; and research is driven by interests (Thomas, 2010; Vosloo, 2014). These principles of interpretive assumption fits into the study because the extent and roles of forest co-management are subjective depending on the type of stakeholder involved. In this case, the study considered the broader categories of the actors to amass their views as well. Also, interpretivism enabled the researcher adopt direct observation of co-management exercises at the Nkrabia Forest reserve to support judgment of the views from the varied respondents. Besides, this research was partly motivated by the need to ensure proper forest co-management which would be of benefit to a wide range of

people. Moreover, it has been established that with interpretive assumption, “the researcher engages in active collaboration with the participants to address real-life problems in a specific context; these are directed towards the offering and implementation of feasible solutions to the problem” (Thomas, 2010 p. 308). In this study, in order to know the challenges of forest co-management and recommend measures to help curb the challenges, the researcher was present with the various actors and actively engaged with them while personally observing their contextual situations to experientially understand their specific challenges and propose measures to curb the situation. Therefore, based on these tenets of interpretive assumption and the qualities of the study explained above, the researcher was convinced that this paradigm was suitable for the study.

3.2 Research Approach

It is asserted that interpretivistic views tend to show a preference for methods, which do not only produce facts, but analyse and describe the meaning of the social world (Gephart, 1999 p.5). The adoption of the interpretive assumption for this study therefore necessitated the use of qualitative approach. Gephart (1999) argues that qualitative approach points to the use of qualitative data-gathering methods, which suggest that the data are generated mainly through interactions like conversations and interviews. The qualitative approach helped the researcher to gather data on forest co-management by interacting with the various groups such as the community members, officials of the Forestry Commission, civil society organization and the private timber firm through conversations and in-depth interviews.

Qualitative researchers study things in their natural settings, and attempt to make a sense of what people bring to them (Denzin & Lincoln, 2005). The study on forest co-management required the researcher’s visit to the site for observation and to the various settings of the respondents particularly the communities to understand the views of respondents about their situations and the

state of forest co-management. This enabled the researcher to make a sense of the submissions of the respondents. Cresswell (2013) submits that qualitative research approach serves as a scheme for scrutinizing and comprehending the meaning groups do assign a social problem. Qualitative research is a research method that attempts to gain an in-depth knowledge of a phenomenon or a case by studying it in details (Denzin & Lincoln, 2005). The case could be a group of people, an individual, an occasion, event, an institution or even a policy process (Denzin & Lincoln, 2005). According to Denzin and Lincoln (2005), qualitative researchers study things in their natural settings, “*attempting to make a sense of or interpret a phenomenon in terms of the meaning people bring to them*” (p. 3). The study employed a qualitative research in the sense that it required in-depth understanding of how the various actors of forest co-management are involved in the governance process of the Nkrabia Forest Reserve and how they enjoy certain entitlements emanating from the co-management arrangement as well as the prospects and challenges that go with such arrangement.

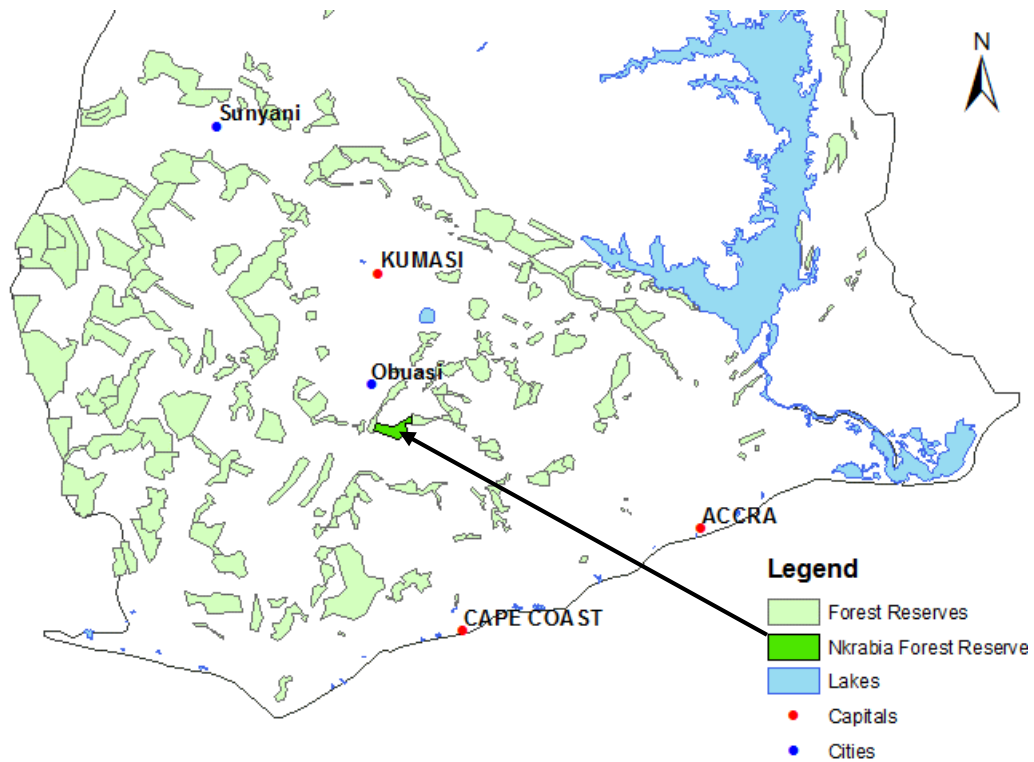
3.3 Research Design

In order to access information to address the research objectives, the researcher used a case study approach. According to Cresswell (2007), a case study permits the researcher to search a case or cases over time via comprehensive, in-depth data collection involving varied information sources such as observations, interviews, audio-visual materials, documents, and reports, and report a case description and case-based themes. However, Yin (2009) defines a case study as “an empirical inquiry that investigates a contemporary phenomenon in depth and within its real life context, especially when the boundaries between phenomenon and context are not clearly evident” (p. 16). The case study was appropriate for the study as it allowed for personal observation of forest co-management activities, interviews with information-rich people, and review of documents for data

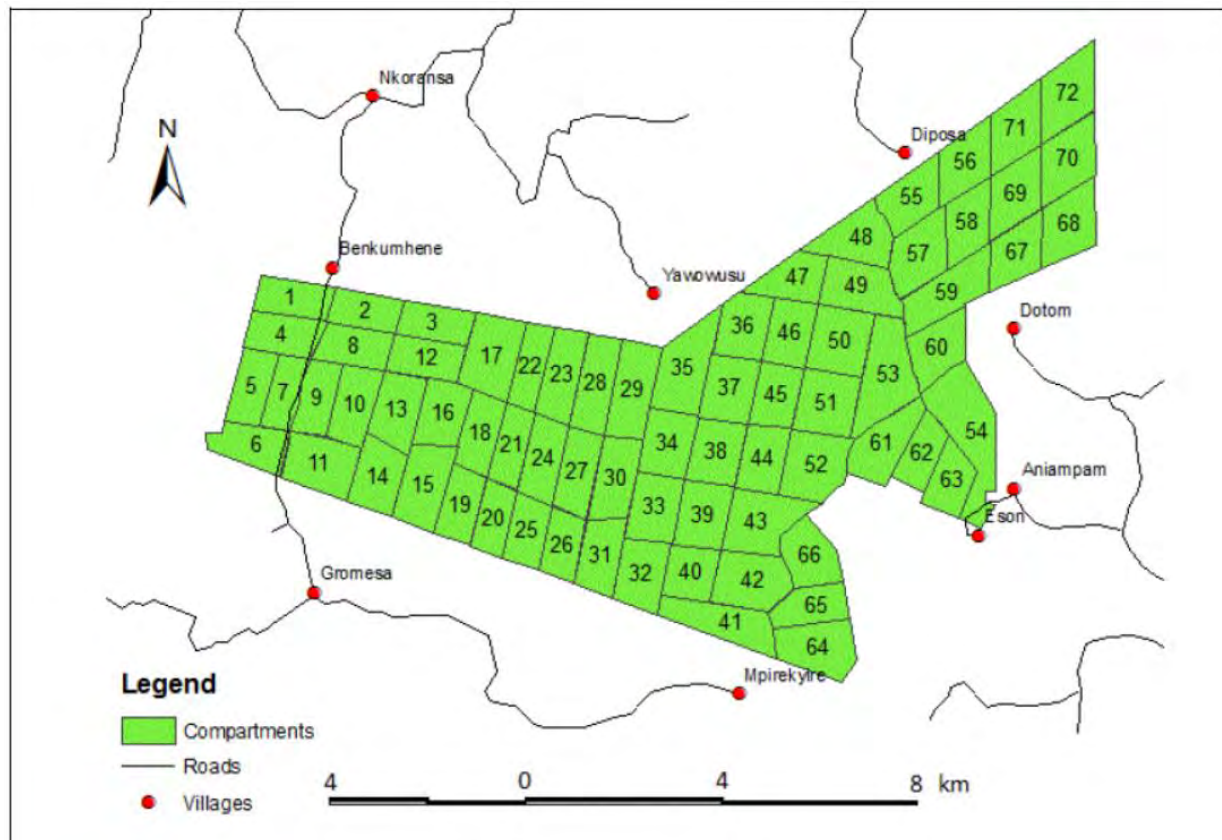
enrichment as pointed out by Cresswell (2007). Also, case studies enable: grounding of observations about social action and social structures in a natural setting studied at close hand, and; provides information from a number of sources permitting a more holistic study of complex social networks and complexities of social action and social meaning (Feagin, Orum & Sjoberg, 1991; Ming'ate et al., 2014). Again, case studies are rich in data (Cassell & Symon, 2004). The case study fits into this study because it created the possibility of observing the forest state and the stakeholders' situations in their natural setting as the study progressed. It created the opportunity to gain information from different sources including: focus group discussions, in-depth oral interviews, personal observation, and documentary review. These sources made the data information-rich and reliable. The use of the case study enabled exhaustive analysis. This helped the researcher to obtain thorough information about the extent to which forest co-management applies at the Nkrabia Forest Reserve and the entitlements and roles as well as prospects and challenges that go with it.

3.4 Profile of the study area

Figure 3.1: Map of Southern Ghana, location of the Nkrabia Forest Reserve [Scale 1:3.500.000]



Source: Herrmann (2011 p. 6)

Figure 3.2: Compartment Map of the Nkrabia Forest Reserve [Scale 1:160.000]

Source: Herrmann (2011 p. 6)

The Nkrabia Forest Reserve is located within the Asante Bekwai Forest District in the Ashanti Region, Ghana, approximately 80 kilometers south of the regional capital Kumasi. The Nkrabia forest reserve is a Production Reserve that is owned by the government and is currently under Timber Utilization Contract [TUC] with “Logs and Lumber Limited” [LLL], a timber processing company, since 1998. The reserve is located on $6^{\circ}05''\text{N}$ - $5^{\circ}55''\text{N}$ and $1^{\circ}40''\text{W}$ - $1^{\circ}35''\text{W}$. It covers a total land area of 100.20km^2 . The perimeter of the reserve is 45.77km . The reserve falls within the moist semi-deciduous ecological zone with two raining seasons. The Reserve has seventy-two (72) compartments and sixty-four (64) boundary pillars. It hosts the following dominant species: *Ceiba*,

Hyedua-white, Edinam, Odum, Wawa, Yaya, Emire, Ofram, Onyina Kobin, Esa, Esakosua, Denya and Bompagya.

Some of the fringe communities around the reserve are Koogyaeme, Bankumhene, Mprakyire, Dotom, Nkoranza, Aduposo, Agyaponkurom, Agada, among others. The main occupation of the citizens living in the forest fringe communities is farming. Cash crops that are produced include cocoa, oil palm, and citrus. There is peace and tranquillity in the communities as people go about their normal duties free of any harassment.

3.5 Target and Study Population

The study gathered relevant information from the actors of the Nkrabia Forest Reserve management: the Forestry Commission, the local government, indigenous communities, the relevant civil society organization and private commercial body operating at the Reserve. The selection of these groups of respondents was informed by the co-management stakeholder analysis and categorization according to World Bank (1999) that was used in the conceptual framework.

3.6 Sampling Technique (s) and Procedure

The research used simple random sampling, a probability sampling method; convenience and purposive sampling methods, non-probability sampling methods, in selecting the Nkrabia Forest Reserve, the fringe communities, and the key informants respectively. According to Gravetter and Forzano (2011), “the logic behind simple random sampling is that it removes bias from the selection procedure and should result in representative samples” (p. 146). In simple random sampling, each member of population is equally likely to be chosen as part of the sample (Saunders, Lewis & Thornhill, 2012). This sampling technique was appropriate for selecting the specific reserve for the study because the Asante Bekwai Forest District, which is noted for

endowment of forest resources and forest reserves, has thirteen (13) forest reserves. Out of this number, six (6) are production reserves and seven (7) are protection reserves.

As mentioned earlier, the World Bank's (1999) stakeholder categorization includes the private as a key actor in forest co-management. Therefore, the reserve to be selected for the study had to be a production reserve because it is the production reserve which has a private timber firm as a co-management actor. To pick one out of the six reserves which had similar characteristics, a simple random sampling method was adopted so as to give each of the six production reserves equal chance for selection, and the Nkrabia Forest Reserve was finally selected for the study. Convenience sampling is a non-probability sampling technique which entails the selection of subjects due to their accessibility and/or closeness to the researcher (Creswell, 2008). Convenience sampling was used to select the four forest fringe communities because they were very close to the Nkrabia Forest Reserve. According to Saunders et al. (1997), "Purposive sampling enables a researcher to use his judgements to select cases which will best answer the research questions and meet the research objectives" (p. 145). The purposive sampling technique was adopted to select key information-rich respondents and those with more experience in terms of co-management activities from the various actor categories who gave out relevant information concerning the co-management practices and the extent to which co-management of forest resources is practised.

3.7.0 Data Gathering Instruments

3.7.1 Interview Guides

This study used semi-structured interviews in its data collection with the aid of interview guides. This involved face-to-face interviews with the selected actors of co-management. The interview guide helped to conduct interviews which are a common method of gathering data in qualitative research. Qualitative interview is defined as "an interview whose purpose is to gather descriptions

of the life-world of the interviewee with respect to interpretation of meaning of the described phenomena” (Kvale, 1983 p. 174). It is needful when an understanding is being sought into the meaning of a concept and has the ability to bring out a true descriptive view of situations (Hanson-Thompson, 2007). Interviews can be face-to-face or through phone or internet. Twenty-five (25) in-depth interviews were conducted for the study.

The study used face-to-face interviews because they portray the true condition on the grounds. They enable the researcher to collect data directly from source and that the information is free from being flawed. Also, face-to-face-interviews are known to allow for opportunities to raise issues that the interviewer may not have thought of (Bailey, 1996). Again, face-to-face interviews offered the researcher some other advantages which alternative sources of data collection lack. Some of these advantages are flexibility, probing and spontaneity.

3.7.2 Focus Group Discussions

This study held Focus Group Discussions (FGDs) in each of the four forest fringe communities: Koogyame; Bankumhene; Dotom; and Mprakyire. In effect, four (4) FGDs comprising eight (8) participants each were held. The participants were citizens of the fringe communities who had personal experience of co-management activities with the forestry commission officials, the civil society organization and the private timber firm. Relevant information pertinent to how the forest co-management activities are embarked upon and their roles and entitlements as well as challenges was voiced. Averagely, the FGDs lasted for one hour, fifteen minutes. The information gathered from the FGDs was recorded and transcribed for in-depth analysis.

3.7.3 Direct Observation

As part of the data gathering, the researcher embarked on transect walk in order to complement the information obtained for qualitative analysis. The walks were taken under the auspices of a technical officer (T/O) who had received a formal introduction to the researcher and was assured of his credibility, to personally observe forest management practices in the forest-fringe communities and also in the Nkrabia Forest Reserve to help broaden the comprehension of issues pertinent to co-management of forest resources, notably aspects of forest resource management that respondents were unwilling to talk about.

3.8 Sample Size

Sample size refers to the number of respondents selected for a particular study. In qualitative research, there have been several debates on what sample size is appropriate. This study used twenty-five (25) respondents who granted key informant interviews and also thirty-two (32) participants for the focus group discussions. According to Dworkin (2012), a total of 25-30 is the minimum sample size required to reach saturation in qualitative study involving in-depth interviews. Based on World Bank's (1999) stakeholder categorization, the following categories of respondents were used for the study: Civil Society Organizations/Local Communities; Central Government; Local Government; and Private Commercial Sector. Concerning the number of respondents for each category, the study sampled the Director of a Civil Society Organization whose area of operation is forest-related and which interacts with the Forestry Commission and the local communities in the area of forest management for in-depth interview. With the local communities, the study interviewed the Local Chief (Odikro), Women's Group Leader, and the Volunteer Task Force member of each of the four fringe communities (i.e. Koogyame; Bankumhene; Dotom; and Mprakyire); the Unit Committee Members of Koogyame and

Mprakyire communities. Also, four FGDs in the four forest fringe communities were held. With the Forestry Commission, the study considered the various capacities of the officials that interact with communities in the area of forest co-management and for that matter the study interviewed the Assistant District Manager of the Forest Service Division, two technical officers and the forest guard for each of the four forest fringe communities. On the part of the local government, the study gathered key informant interviews from two staff. Lastly, an official of the private timber firm was interviewed. Table 3.1 below shows the breakdown of respondents used for the study which was based on World Bank's (1999) stakeholder categorization.

Table 3.1: Summary of Respondents

Category	Status	Male	Female	FDGs	Total
NGO Staff	Top Official	1	-		1
Communities					
Koogyame		3	1	8	12
Bankumhene		3	1	8	12
Mprakyire		2	1	8	11
Dotom		2	1	8	11
Forestry Commission Staff	Assistant District Manager	1	-		1
	Technical Officers	2	-		2
	Forest Guards	4	-		4
District Assembly Respondents	Planning Officer	1	-		1
	Deputy Planning Officer	-	1		1
Private Commercial Sector Staff	Area Manager (Ghana)	1	-		1
TOTALS		20	5	32	57

Source: Author's own construct

3.9 Data Management and Analysis

The analysis of data collected used qualitative techniques. A qualitative technique which involves descriptive analysis was adopted to analyse the information derived and perceptions from the respondents. Qualitative data in the form of interviews was processed by transcription. It was then edited and coded for analysis.

Editing was carried out to detect and eliminate typographical errors in the data. Where necessary, interview transcripts and particularly statements were used as direct quotes in the report in order to enrich the presentation of results and to contextualise the discussions. Also, the qualitative data (i.e. information from various interviews) was analysed by content after transcribing and developing themes.

3.10 Ethical Consideration

To demonstrate ethical responsibility, this research was conducted within the norms of ethical research in both literature and empirical study. Bless and Higson-Smith argue (cited in Walters, 2006 p. 17) that the general aspect of the ethical rights of a participant is the right to privacy, voluntary participation, anonymity, and confidentiality. The researcher ensured that targeted respondents gave out information voluntarily. High degree of confidentiality was observed during and after the interviews. Data collected was used solely for research purposes. Also, literatures used were referenced.

CHAPTER FOUR

CO-MANAGEMENT OF NKRABIA FOREST RESERVE

4.0 Introduction

This chapter presents and analyses the findings of the data gathered through in-depth interviews, direct observation via transect walk and focus group discussions on the extent to which the Nkrabia Forest Reserve is co-managed (the first objective of the study). In meeting this objective, Ostrom's design principles of successful forest co-management were used as the standards and they include: clearly defined boundaries of the Common Pool Resource and the individuals (or households); congruence between appropriation and provision rules and the local conditions; collective choice arrangements; monitors are accountable or are the appropriators; graduated sanctions by other appropriators, by officials accountable to these appropriators or both; conflict resolution mechanisms; minimal recognition of rights to organize; nested enterprises for Common Pool Resources that are part of larger systems. The findings for this objective have been presented in order of these eight design principles. The data gathered in relation to this objective have been presented and analysed as follows:

4.1 Clearly Defined Boundaries of the Common Pool Resource and the Individuals (households)

Ostrom (1990) intimated that to ensure successful co-management, the common pool resource should have clearly defined boundaries. Thus, those who are allowed to use the common pool resource are to be clearly defined. The same applies to the boundaries of the resource-all actors should know the limits of the resource. Data gathered from the respondents indicate that the

Nkrabia Forest Reserve has boundaries which are known to the relevant co-management actors. Persons who are allowed to draw resources from the Reserve are the community members and the community task force. Other persons like the private timber firms that have been permitted by the Forestry Commission are also allowed to use the reserve. For instance, a respondent explained:

Basically, those that are mandated to enter and draw some of the resources are the timber contractors and sometimes the local inhabitants. That is the fringe communities. As for the fringe communities, they go in to collect firewood, non-timber products, rattan, leaves, the snails, the mushrooms, etc. For hunting, they need to get permit from the Forestry Commission (Interview with a Forestry Commission top official, 2017).

Confirming the response by Forestry Commission top official, Focus Group Discussions (FGDs) revealed:

Here, it is the LL Timbers, Community members and the Forestry Commission officials that are permitted to use the reserve (FGDs, 2017).

It appears that the community members and the other co-management actors are well informed of those who are mandated to enter and use the forest reserve. This could be because the various categories have an interaction or are sensitized on who the other authorized persons or bodies are. In terms of people who take part in the reserve's governance, it was found that those who help in governing the reserve include: the traditional leaders and the officials of the Forestry Commission.

For instance a response by one of the respondents was:

The Technical Officer and Forest Guards from the Forestry Commission and the Community members are the ones that are involved in the governance process of the reserve (Interview with a traditional leader, 2017).

This was affirmed when a respondent from the Forestry Commission elaborated that:

The traditional leaders in the communities help in governing the reserve. I know the local people appoint their own leaders (Interview with Forestry Commission top official, 2017).

It was identified that although the community members are involved in governing the reserve, the role they are permitted to play appears minimal. An NGO respondent explained:

Well I know Forestry Commission has the primary responsibility of managing the reserve but they also allow the community to be part in a number of respects. For instance under the collaborative forest management program, they have the collaborative forest management unit and they try to promote participatory forest management. However, that is not always the case. What they let them do is allowing the community members to do boundary clearing and assigning them responsibilities in the form of weeding, of course, for which they are paid (Interview with an NGO staff, 2017).

The response by the NGO respondent suggests that the community is allowed to undertake few or limited roles in the form of clearing of boundaries and weeding around and within the reserve area. However, the study also revealed that the inhabitants of the communities and the other actors were knowledgeable about the boundaries of the Nkrabia Forest Reserve. They had a good idea about the size of the reserve and its boundary limits. It was opined:

This reserve, mmm. Yes, the technical officer told us it is about 100 square kilometers. We are aware of where the reserve ends. You see, most of us are farmers and we go to farm. We know which part of the reserve is not for our farming activities. Apart from that, we sometimes help the forestry officials to clear the boundaries of the reserve for clear demarcation. This even helps us to know more about the boundary (FGDs, 2017).

Another response was captured as:

Oh Yes, I have been shown the limits of the Nkrabia Reserve. We help in patrolling the reserve at times. So I am aware of the boundary (Interview with a task force member, 2017)

These responses were corroborated by another respondent in the remarks below:

The Nkrabia Forest Reserve is specifically 100.20 square kilometres. The forest guards are aware and most of the community members also know. We sometimes ask them to help in clearing the reserve boundaries. If anyone weeds into the

reserve or does anything illegal in there, then the person does so intentionally. It is not like he is ignorant (Interview with a Forestry Commission staff, 2017).

These responses clearly show that the boundaries of the Reserve are clearly defined. In an earlier response, an NGO respondent indicated that some of the community members even engage in boundary clearing which additionally acquaints them with the boundaries. They are aware of which parts of the forest in their communities they can farm in and which parts they cannot farm in.

However, it was revealed that some of the community members help in managing the reserve by secretly revealing information about illegal practices in the reserve. Such people are never revealed to anyone apart from the relevant forestry officials to whom the hints are given. This is evident in the response below:

Okay. Within the community, there are some people who are committed. You will meet some people and they would tell you that T/O, kindly give me your number. Such people would secretly call you and give you information on illegal activity in the forest reserve. I don't mention their names to others for the sake of security (Interview with a Forestry Commission staff, 2017).

Concerning legislative instruments' recognition of informal institutions in the local communities concerning the reserve management, it was found that there is some regard for the traditional authorities in the various local communities in the sense that before any timber firm is permitted to go into the reserve, the chiefs in the communities would have to accept that firm. Informal institutions in this context refer to the traditional governance arrangements encompassing chieftaincy and traditional priesthood systems and cultural belief systems (Yeboah-Assiamah et al., 2017b). A response by an informant evidences this:

The laws actually recognize traditional institutions. The rules of the forestry are such that if any person or organization wants to embark on any project in the reserve, they have to seek the consent of the traditional authority before they would

be permitted to operate. ... The forestry people cannot give you permits without the consent of the chiefs. It was not long ago that the laws factored in the roles of the traditional authorities. For instance the 2012 Forest and Wildlife Policy provides for the involvement of traditional authorities in forest resource management (Interview with Forestry Commission top official, 2017).

Corroborating the response by the Forestry Commission respondent is the following expression:

Yes. What happens is that the Forestry Commission has given us the mandate to assess every timber firm that intends to use the reserve and allow that particular firm before they can issue a permit to the firm. So it is like we must confirm that timber firm or whoever wants to use the reserve before the commission will also allow it to operate (Interview with a traditional leader, 2017).

It was revealed that the regulatory framework that seeks to enjoin forestry commission to involve the fringe communities in the forest governance was not clear or unknown to some of the respondents. However, some respondents also made mention that the laws require the establishment of Community Forestry Committees (CFCs) by which some selected members of the community actively participate in governing the forest reserve. An explanation by a Forestry Commission official goes like this:

The forestry laws state that the forestry commission needs to form the Community Forestry Committees (CFCs) to help manage the forest resources. What I know is that there are CFCs which are appointed from the youth groups, the opinion leaders, women groups, etc. (Interview with Forestry Commission top official, 2017).

Also, another respondent added that:

I am not aware of any regulatory framework that seeks to commit the commission to appoint community members to help in the governance process. I think it is the commission itself that has thought it necessary to involve the community members (Interview with a Forest Guard, 2017).

These were corroborated by the response below:

As for us, we are not sure about which laws state what. The Forestry Officials do inform us about what we are expected to do to help them protect the reserve (FGDs, 2017).

The responses above suggest that the respondents are not either aware of the regulatory framework or that the regulatory framework is not clear on the nature of community involvement in the forest governance. Meanwhile, the Section 8 of the Forestry Commission Act-1999 (Act 571) states that, “ The Commission may for the discharge of its functions appoint committees of the Commission comprising members of the Commission or non-members or both and assign to any such committee such functions of the Commission as the Commission may determine.”

The power relation among the co-management actors is such that more power is wielded by the Forestry Commission. However, the local community or the indigenous people have been mandated by the Forestry Commission to arrest the culprits and later hand them to the forestry commission officials. An NGO respondent hinted:

The landowners in that case the chiefs may have a say and the forestry commission will have a major say. But ultimately the major power rests with the Forestry Commission (Interview with an NGO staff, 2017).

A Forestry Commission official also indicated that:

The community members have been mandated to by the Forestry Commission to prevent unauthorized entrants. They even have the power to arrest them and subsequently notify the forestry commission. If somebody is going to work in the reserve, the community has the power to check their permit. We have given them the power to do all that (Interview with Forestry Commission top official, 2017).

To corroborate the response by the Forestry Commission official, a respondent unequivocally voiced:

We are here and we can easily see what is going on around the reserve. So we have been permitted by the Forestry Commission to check the permit of every person who wants to use the reserve. If anyone wants to use the reserve, we check the persons permit to be sure that they have been legally permitted to use the reserve (Interview with a Women's Group member, 2017).

The private market also has the power to protect their concession by hiring guards to patrol the concession. A Forestry Commission official voiced:

The private sector like the LL Ltd. has also been given the power to protect their concession. So they normally have concession guards who help to guard the reserve against encroachers (Interview with a Forestry Commission staff, 2017).

In an interview with a private firm, it was observed that although the private organizations can hire their own guards to protect the concession, the Forestry Commission just makes the contract laws available to the firms and only expects them to follow the rules, in which case their powers are limited. A private firm respondent explained:

For me, I know that the Forestry Commission has spelt out how we should operate in the reserve. We are expected to follow those rules. But when we signed agreement with them and we were assigned this concession, it was up to us to determine what time to start operation (Interview with a timber firm official, 2017).

Meanwhile, from a direct observation by the researcher, the private timber firm had hired guards who were watching over a concession to avoid encroachers or illegal entrants from making use of the concession area. This observation affirms the claim that the private timber firm has the power to hire their own guards to protect the concession. However, it appears from the responses that such timber firms are not given much power to do things on their own.

On the aspect of NGOs, it appears they are not given much power or are not enjoined to perform certain roles. However, they willingly support the communities in a number of ways: joining in

consultations in the process of preparing forest management plan and educating the community on the usefulness of SRAs. A Forestry Commission official affirmed this by saying:

For the NGOs, we do not delegate powers to them, but they move from community to community to educate them on the SRA, how it works and how useful it is to the populace and the need to protect the forest. The community has therefore understood it and makes sure that every timber firm comes there to arrange the SRA before they will allow it to operate there (Interview with a Forestry Commission staff, 2017).

Corroborating is a response by an NGO respondent which goes like this:

Some civil society organizations like us arrogate to ourselves the right to join in negotiations especially when they do the consultations in the process of preparing forest management plan. In this case, NGOs operating in the Nkrabia Forest Reserve and the environs will take the opportunity to sit in and coach or support the communities in negotiating for things that will be of benefit to such communities (Interview with an NGO staff, 2017).

4.2 Congruence between Appropriation and Provision Rules and the Local Conditions

The study sought to find out the extent to which appropriation and provision rules are congruent with the conditions of the forest fringe communities. This principle states that there should be clear relationship between the rules and the nature of the resource, such that the distribution of benefits from appropriation rules is roughly proportional to the costs imposed by the provision rules. Here, conditions of appropriation (time, place, quantity) reflect the level of access to the resource. The principle states that the appropriation rules do restrict place, the time, and/or quantity of resource units and are related to the local conditions and provision rules that require material, labour, and/or money (Zhu et al., 2014).

Concerning the appropriation rules, the study found the following: prohibition of persons without permit; prohibition of mining activities in the forest reserve; prohibition of illegal chain sawing;

prohibition of hunting during close seasons; prevention from burning of charcoal; and avoiding felling around the reserve area. These are rules established the by Timber Resource Management Act and the Logging Manual and which have been communicated to all actors by the Forestry Commission. These among others are rules that are expected to be observed by all actors.

In a response by a Forestry Commission respondent it was explained that:

....Some of the rules are that persons without the permit are not allowed to enter the forest. Also, mining activities are prohibited in the forest reserve. We also prohibit illegal chain sawing. Hunting is allowed only when permit has been granted. And during close seasons, hunters are prohibited from hunting in the reserve to avoid catching of young animals. That is from the period of first August to first December (Interview with a Forestry Commission staff, 2017).

A citizen of a fringe community corroborated by saying:

Chain saw operators are disallowed. It is a contractor with permit who is allowed to enter the reserve. People are prevented from farming in the reserve. The people are also prevented from burning charcoal. Again, if you don't have permit, you cannot hunt and when it is close season, the hunters cannot catch animals (Interview with a Volunteer Task Force member, 2017).

In respect of the private sector, the rules that are specified in the logging manual are to be strictly followed. Some of the provisions in the logging manual are not felling around the forest reserve and avoiding leaving rubbish in and around the reserve. A private timber firm respondent indicated:

The Forestry Commission gave what we call 'logging manual.' So we are supposed to follow whatever directives are in it. Some of the provisions are that we shouldn't fell around the reserve; we shouldn't leave rubbish in the bush or around the reserve (Interview with a timber firm official, 2017).

A respondent from an NGO remarked:

I think that people can walk into the reserve except that they cannot do any harvesting. The people especially the community members can go in for rattan

and other things although ideally they should have taken permission (Interview with an NGO staff, 2017).

Another respondent hinted:

The local people who would also want to harvest wood in larger quantities would also need to put in an application for permit (Interview with Forestry Commission top official, 2017).

However, a local government respondent hinted that the forestry commission officials can go into the reserve any time to check on the activities of those who have been given permission to work in the reserve. This is evidenced in the following response:

The forestry officials have the power to enter the reserve to check those who have been permitted by law to go there (Interview with a District Assembly staff, 2017).

On the part of provision rules the study found that the community members are to help in managing the reserve with their labour, time and other relevant resources. In a response by a Forestry Commission respondent, it was explained that:

The community members are to help in the management of the reserve through the supply of labour, time and any other relevant resources. They are to avail themselves for instance in the time of weeding and clearing of boundaries. They are also to watch the reserve and protect it from illegal operators (Interview a Forestry Commission staff, 2017).

A citizen of a fringe community corroborated by saying:

Here, we are expected to offer our service in the areas of helping to clear the bush and also clear the boundaries. We also form groups to sometimes patrol the reserve to see if everything is fine. We have to sacrifice some time in doing these. You see, we are close to the reserve so we are expected to do these things (Interview with a Volunteer Task Force member, 2017).

The study probed into how the formal rules governing the reserve are effectively enforced. The study found that enforcement is done by the frequent patrols by the technical officers, the forest

guards and sometimes soldiers whose services are sought by the Forestry Commission. The community task force also helps in enforcing the rules by arresting culprits and reporting illegal activities to the forestry commission for legal action. When such people are caught, they are subject to the law. By these strategies, the rules are enforced. A respondent hinted that:

We have the range supervisors who patrol the forest reserve very often. We also have the task force who patrol the reserve. What happens is that when these people find encroachers, they will arrest the encroachers for the laws to deal with them. This serves as a deterrent to others (Interview with a District Assembly staff, 2017)

Another respondent added:

There have been instances where culprits have been arrested, prosecuted and jailed. At times, the forestry commission employs the services of soldiers and the police. There are some of the communities that help to protect the reserve. Such communities have gotten the essence of protecting the reserve so they willingly help to protect and enforce the rules (Interview with a Forestry Commission staff, 2017).

Additionally, emphasizing the role of unit committees, a respondent voiced:

The formal rules on the Nkrabia Forest Reserve are usually enforced by the community members. These include the unit committees and the Assemblymen. These people help very much in enforcing the rules (Interview with a unit Committee Member, 2017).

Also, the private timber firm sees frequent visits by the technical officer to be sure that it is doing things right. A respondent from a private sector firm explained:

Well, the technical officer of the Forestry Commission comes here very often to inspect this place and to confirm that the trees are in the yield as stated. After the technical officer has come to do the inspection, another inspection done by the forestry commission which we call 'post felling check' also follows. Later another team comes over for inspection to make sure that we are not breaking the rules.

The enforcement process appears to be very strict on the side of private sector. The Forestry Commission has put all these in place to help enforce these formal rules. NGOs are not active in

rule enforcement. They only educate the people on the woes in engaging in illegal activities.

This is evidenced in the response below:

... Usually NGOs may not take arms against illegal operators, but will educate them on the ills of what they are doing about the deforestation, implications of destroying our forest, and help them to as it were adopt the right attitude. In some cases we have supported them to know exactly what the law says and what is required of them as forest fringe communities and what is due to them. For instance when the forest area is logged, the companies doing the logging are supposed to pay some money to the communities toward community development. But we hardly go preventing people from doing wrong things (Interview with an NGO staff, 2017).

The study further considered the extent to which the rules governing the reserve conform to or deviate from local conditions. The findings were ambivalent, conforming to some extent and deviating to some extent. A respondent for instance explained:

I think that sometimes, the rules do deviate from the current local conditions. At other times, they conform to the local conditions. I am saying so because at times, the people complain that they are close to the reserve but they are not allowed to enjoy the timber resources. At other times, they appear to be okay because they are able to get some products like firewood, snails, etc. from the reserve. The commission sometimes asks the community about their needs. For example when the community wanted to have some wood to roof their classroom, they consulted us for permit to fell some of the trees for roofing and we permitted that. So it is a mixed thing (Interview with a Forest Guard, 2017).

This is corroborated by a chief who said:

Ultimately, when the forest is well protected, it inures to the benefit of many. However, in terms of direct benefit, definitely where the community members are prevented from harvesting forest products or other forest items, they would deem that the rules do not benefit them. But ultimately they benefit the wider community (Interview with a traditional leader, 2017).

However, FGDs showed that:

We believe the formal rules do conform to local our conditions here to some extent because they help to protect the forest reserve we have here and we also benefit from it. As we have said, we get snails, mushrooms and other things we need except

that for the timber wood, we don't enjoy. If we had access to that one too, it would have improved our condition better. So to some extent, the rules do not conform to our current condition. We deserve better.

In an interview with an informant, it came up that the prohibition of the citizens from harvesting the timber in the reserve was not desirable. The response is captured as:

I think that the rules are fine. In everything there are rules. That I know. But as we here protecting the reserve are not allowed to take timber for our domestic use, I think I am not satisfied (Interview with Women's Group member, 2017).

Another respondent, registering his dissatisfaction, intimated that:

You see, we know the need to protect the reserve and we help to protect it. However, it will be better if some of us are allowed to take some of the timber to build our domestic structures. You can see the timber you are protecting but you cannot take some (Interview with a Task Force Member, 2017).

As mentioned earlier, this study revealed that some of the appropriation rules concerning the reserve are: prohibition of hunting during close seasons; prevention from burning of charcoal; and avoiding felling around the reserve area, among others. In respect of the private sector, the rules that are specified in the logging manual are to be strictly followed. The fringe communities have to go for permit if for instance they want to fetch firewood in large quantities. Some of the provisions in the logging manual are not felling around the forest reserve and avoiding leaving rubbish in and around the reserve. Also, it was revealed that for the Forestry Commission officials, they can enter the reserve any time to check on the activities of those who have been given permission to work in the reserve. On the part of provision rules, the study found that the community members are to help in managing the reserve with their labor, time and other relevant resources. This is where the community task force is formed and also other community members help to check illegal entrants. In return for their efforts, they receive benefits like the non-timber forest products for free, get employed sometimes by the private timber firm and also benefit from

the Social Responsibility Agreement (SRA) as mandated by the Timber Resource Management Act and reported by the Ministry of Lands and Forest Resources (2016). On the part of formal rules enforcement, the study found that enforcement is done by the frequent patrols by the technical officers, the forest guards and sometimes soldiers whose services are sought by the Forestry Commission. The community task force also helps in enforcing the rules by arresting culprits and reporting illegal activities to the forestry commission for legal action.

4.3 Collective Choice Arrangements

This principle requires that most individuals affected by the operational rules be able to participate in modifying the operational rules. This means that when individuals are affected by certain operational rules in the co-management setting, such individuals should be actively involved should there arise the need to make amends to such rules.

In finding out to what extent the communities are involved in decision making and setting of rules pertinent to the reserve and in managing the reserve, the data collected showed that the communities are more involved in the monitoring and prevention exercises than in rules setting exercises. There is usually, collaboration with the forestry commission and other co-management actors. However, such platforms usually have to do with how best they can help to protect the forest reserve. Here is a feedback in a Focus Group Discussion:

What we are often invited for is education. Often, the commission officials do invite us to attend a meeting which seeks to educate us on how we can help to protect the reserve for example in situations of the dry season where bushfire can easily occur (FGDs, 2017).

Another informant hinted:

Usually, what the communities are involved in is decisions about bushfire prevention. We also take active part in preventing chain saw operation (Interview with Volunteer Task Force Member, 2017).

A Forestry Commission interviewee confirmed by saying:

The community people often volunteer to give us information. Also, sometimes, if illegal activities are detected and the culprits leave the stolen products, machines and other stuff and we need people to convey them to our quarters, some of them help us to do that work.

It was however found that NGOs are consulted in the situation of policy development and legislation and the private sector is also involved in workshops. However, it was realized that the views of the private sector are not usually taken. An NGO official explained:

Well it depends. In policy development, and in development of legislation and things like that, NGOs are usually consulted in terms of stakeholder consultation. But in respect of day-to-day decisions in managing the forest, I don't think that Civil Society Organizations are consulted. However, where there is development of say policy documents, Civil Society Organizations get the opportunity to give their input.

Concerning the private timber firm, the study found that they are invited for workshop sometimes. However, it only becomes paperwork and that nothing significant comes out of that. An official remarked:

Sometimes, they invite us for workshops but that is just pen and paper. At times, they ask us about our challenges, but they don't do anything (Interview with a timber firm official, 2017).

The study found that in respect of making of rules, the local communities are not well involved except that when the forestry commission wants to educate the local communities on bushfire prevention, the local communities are invited. The private sector is sometimes invited for workshop. However, their views are not usually taken by the commission. The collective choice arrangement stipulates that when individuals are affected by certain operational rules in the co-management setting, such individuals should be actively involved should there arise the need to

make amends to such rules. This will even add to their acceptance of the rules and practise or observe them. However, it appears that the local communities are not well represented in the making of forest rules. They appear to only receive instructions from the commission. This could affect the Design Principle 2-Congruence between appropriation and provision rules and the local conditions because it is when the local communities are actively involved in the forest rules that the commission can consider the local conditions. The local communities' involvement is mainly in the area of education. The weak connection in respect of involvement in decision making processes has an effect on the comparative advantage in devising effective rules and strategies for the communities, particularly when local conditions change.

When asked about what effect the non-involvement of the communities in operational decisions has on the reserve management, the study revealed that the non-involvement of the community members in operational decision making concerning the forest reserve has implications for the level of compliance and legitimacy of the rules from the Forestry Commission: it is partly responsible for the non-compliance of the rules by some of the citizens. This is evident in the response below:

As for us we are here. We only receive information and instructions from the Forestry Commission about what to do and what not to do. When we get the information, then we know that that is what we are to do. Some of the community members do not respect the rules much because we are not usually involved in decisions. We don't feel a part of the rules, so we have issues with that. So you see, there is a lot of effort to avoid illegal operations in the reserve but these illegalities still happen (FGDs, 2017).

Another respondent, corroborating this, voiced:

The extent of compliance is not like before. I can see that there is low compliance and legitimacy despite the efforts. It is like as we are here, the forest guard and the technical officer just tell us what rules govern the reserve. They bring us the instructions to obey. Some of us do our best to observe but still there are others that

go against the laws. We try to even warn our people but sometimes some still slink into the reserve (Interview with a traditional leader, 2017).

Confirming the extent of non-compliance, a respondent further added:

Illegal chainsaw activities still go on in the reserve. The perpetrators do so both during the day time and at nights. The Forestry Commission has been monitoring to try to curb the situation (Interview with a Forestry Commission staff, 2017).

The responses above do show that there are absence of acceptance, legitimacy and compliance among the local populations mainly because of their non-involvement in forest decision making.

4.4 Monitors are Accountable or are the Appropriators

What Ostrom means by this principle is that monitors auditing the behaviour of the appropriators and the condition of the common pool resource (CPR) are accountable to those appropriating the resource. The study further looked at the monitors of the rules of the Nkrabia Forest Reserve and those to whom the monitors report. It was revealed that the monitors are the traditional leaders, the forest guards, the technical officer and the District Forest Manager. The community members and at times the community task force report to the traditional heads usually on issues that have to do with their taboos and cultural practices. For instance if a community member is found in the reserve on a taboo day, the community reports culprits to the traditional authorities. However, when illegalities like illegal chain saw operation or mining or illegal felling of trees occur, the community can also arrest the culprit but would hand him to the forestry officials (the forest guard or the T/O) who then reports to the District Manager or Assistant District Manager for action. A respondent hinted:

For monitoring, I would say the community, the chiefs and myself. The community members and the chiefs are very key in the monitoring process. They are very close to the reserve and they easily detect illegalities. The community would usually report to the traditional authorities on taboos and cultural practices. For the case of other strict illegalities like illegal felling of trees and others in the reserve, they

report to me and I send report to the District Manager. They are also allowed to arrest the culprit and hand him to me to take the case on. Whatever be the case, the community members usually see it first and give the report (Interview with a Forestry Commission staff, 2017).

Adding to this, a citizen of a community stressed:

The community members here and the community task force help in the monitoring exercise. We keep an eye on whatever is happening in and around the reserve to detect and to avoid illegal acts. The forestry commission task force also comes around to patrol the forest sometimes. We the community task force report to the traditional leaders but often we report to the forest guard and the technical officer. We can arrest a perpetrator if we have the capacity so that we send him to the Forestry officials (Interview with a Community Task Force Member, 2017).

In another interview with a community member, it was clear that farmers who go to their farms are also key members in the community who act as monitors. This is captured in the response below:

I think it is the forest guards and the farmers whose farms are close to the reserve. If it is the forest guard, he reports to the technical officer who in turn reports to the District Manager. On the other hand, if it happens to be the farmer or another person, they report to the forest guard who then reports to the technical officer for further reporting to the District Manager (Interview with Women's Group member, 2017).

Another respondent also emphasized the role of the technical officer in the monitoring exercise.

In his submission, he voiced:

For monitoring it is the technical officer that plays a major stake. He usually comes around when he has been hinted that an illegal activity is happening. He at times comes with about two soldiers so that in case of any danger, they can help to fight or arrest the bad situation (Interview with a Forest Guard, 2017).

The view of some respondents were that these categories of monitors were working assiduously to protect the reserve. The works of these groups were seen to be commendable. This is evidenced in the response below:

Apart from the forest guards, they have the community members, the technical officers. They also have the district manager. Then they have the assistant district managers. I think that they are working hard. They are doing their best (Interview with an NGO staff, 2017).

The study reveals that the monitors of the forest reserve include traditional leaders, the forest guards, the technical officer and the District Forest Manager. When illegalities like illegal chain saw operation, or mining or illegal felling of trees occur, the community reports to the forest guard who in turn reports to the technical officer and to the District Manager or Assistant District Manager. This design principles states that where monitors do not benefit directly from the improved condition of the reserve, they are not likely to perform satisfactorily. It becomes advisable therefore, that monitors are accountable to people that depend on the resource. In this study, it has been found that most of the monitors of the Nkrabia Forest Reserve are those that have direct stake in the reserve. This could partly explain why some of the respondents indicated satisfaction with the general performance of the monitors.

4.5 Graduated sanctions by other Appropriators, by Officials Accountable to these Appropriators or Both

This principle requires that graduated sanctions are applicable and are applied to those who violate operational rules. The severity of this sanction is contingent on the seriousness and the context of the offense. The findings of the study concerning graduated sanctions were that offenders of the forest rules/laws faced: confiscation of equipment and stolen forest products, fines, imprisonment

and sending off culprits from the community. These sanctions are meted out to culprits depending upon the severity of the offence. One of the respondents intimated:

When you are found and arrested, you will be sent to court for prosecution. Also, sometimes, we confiscate or seize their equipment. At times, when they go there to produce charcoal, we seize the charcoal (Interview with Forestry Commission top official, 2017).

To corroborate the response by the top official from the Forestry Commission, it was remarked that:

We have received information about the kinds of punishment that are meted out to offenders. Some of them are fines, imprisonment, confiscation of tools used in the illegal acts and others. When these culprits are caught, we seize their tools and sometimes the traditional authorities order that such people are expelled from the community. When it happens like that we send such people away to avoid any further future attempt (FGDs, 2017).

Another respondent hinted:

Here we keep watch of the reserve very well. When somebody is caught felling trees in the reserve, we arrest the person and report him to the technical officer who then takes the person to the District Manager for prosecution. The Forestry Commission will then arrange court actions against the person. The court has fined some offenders before. Some people are even put into prison for such offences (Interview with a Community Task Force Member, 2017).

It can be realized that some of the sanctions are meted out by the traditional authorities. For instance in a situations where a potential culprit comes into the community, the traditional leaders ask them to leave the community to avoid future illegal practice or encroachment. If somebody is seen entering the reserve with chain saw without a permit, the community, directed by the traditional leaders can arrest the person, seize their chain saw and send him off the community. However, in a situation where the culprit is caught in the act of logging, he is arrested by the community and is handed over to the technical officer who sends him to the District Manager for

trial by the law court. The court metes to the culprits appropriate sanctions based on the severity of the offence.

The local communities virtually hand every illegal case over to the forestry commission for onward submission to the law court to try such cases. The court sanctions are in the forms of confiscation of equipment and stolen forest products, fines, imprisonment, among others depending on the severity of the offence. The purpose of the sanctions is to serve as a deterrent to such culprits and others. If the local communities had their own instituted mechanism for trial, it would have been more useful because culprits would have been dealt with at the witness of those who reported the cases. In this situation where the cases are tried by the law courts, there are delays in the trial processes and some of those who report the cases may not know the end of their good deeds which discourage them for future whistleblowing. In the fullness of time, it would affect the extent of the compliance of forest rules and laws. This partly explains why the study found the high level of non-compliance by some actors (see Sections 4.3 and 6.2.2 for findings on non-compliance).

4.6 Conflict Resolution Mechanisms

With the principle of conflict resolution mechanisms, Ostrom suggests that conflict resolution mechanism should be administered effectively and at the least cost. Conflict resolution is a key aspect of co-management as there is usually a high probability of conflicts occurring (Cox et al., 2010). The study found out the ways in which conflicts are handled. The traditional leaders are instrumental in handling conflicts. When there are misunderstandings among community members, the traditional leaders meet with the persons involved in the conflicts and settle the issues amicably. In this case, the conflicts are resolved just among the citizens in the community. Where the traditional leaders are not in the capacity to resolve such conflicts, the technical officer or the forest guard comes in to help handle the situation. To substantiate this, a respondent hinted:

Yes, in case of conflicts, the community members themselves, with the help of the traditional leaders, solve them. Sometimes, we the forest guards meet with the community leaders to solve such situations (Interview with a Forest Guard, 2017).

Affirming the above response is another which goes like this:

When there are conflicts, the traditional leaders come in to help handle and settle them. In case the conflicts are beyond them, they would inform the technical officer who would refer to the District Forest Manager (FGDs, 2017).

It appears that NGOs play some role in conflict resolution notably in support of the communities which are seen as the weaker side. The local government also is not left out in conflict resolution mechanisms. The data collected found out that the local government intervenes in conflict resolution sometimes especially when some of the parties to conflicts consult its officials concerning such conflicts. A key informant declared:

When the forestry officials receive complaints from the people, they (that is the officials) meet with the groups involved and settle the conflicts amicably. Well, sometimes civil society organizations go in to support the weaker side which is invariably the farmer or the community people. But generally conflicts are supposed to be reported to the Forest Manager. If the Manager himself is also a part of the conflict, then it should be sent to the chiefs or the traditional heads. Hardly will somebody take the Forestry Commission to court. But that will be a last resort (Interview with an NGO staff, 2017).

Also, substantiating the role of the local government is the response below:

For some of the conflicts, the traditional heads handle them themselves if they can. Sometimes, they people report to the District Assembly. For instance there was a time a contractor cut down somebody's cocoa trees for illegal mining and when there was a misunderstanding between the contractor and the owner of the cocoa, the cocoa owner reported the case to us (Interview with a District Assembly staff, 2017).

In the situation of conflicts, where the local chief is a party to the conflict, then the Forestry or the local government comes in to help resolve the issue. This study has found out that traditional

leaders are instrumental in handling conflicts. When there are conflicts, the traditional leaders meet with the persons involved in the conflicts and settle the issues amicably. In this case, the conflicts are resolved just among the citizens in the community. Where the traditional leaders are not in the capacity to resolve such conflicts, the technical officer or the forest guard comes in to help handle the situation. It appears that NGOs play some role in conflict resolution notably in support of the communities which are seen as the weaker side. The data collected found out that the local government also intervenes in conflict resolution sometimes especially when some of the parties to conflicts consult its officials concerning such conflicts. In this study it was found that in the conflict resolution, conflicts are dealt with easily at the least possible cost and convenience. This has potential for peace and progress of co-management exercise.

4.7 Minimal Recognition of Rights to Organize

Ostrom (1990) posits that for successful forest co-management to be realized, the ability or right to organize should not be challenged by external authorities. It means that local institutions should be allowed to work to help protect the forest. The study probed into the extent to which the local institutions or rules and beliefs are allowed to work in the communities in relation to managing the reserve. It was revealed that the local communities are in most cases not allowed to enforce their own institutions in the management of the reserve. Where they use their institutions, it should be clear that the intention is to protect the reserve. However, in every case the Forestry Commission has to endorse first. A respondent explained:

Mmm. To some extent, they are permitted. Sometimes the traditional heads make strict rules to deter the farmers close to the reserves from venturing the reserve. They also create a buffer where they don't have to weed some meters to the reserve to enjoin the farmers and the local people to stay away from the reserve. Yes, they have their own ways of managing the reserve. But whatever be the case, they need

to seek approval from the Forestry Commission (Interview with a District Assembly staff, 2017).

To confirm the above response, another respondent indicated:

Okay for activities that are clearly meant to protect the forest, the commission does not prevent the people from embarking on such activities. But if it is a key management decision, they cannot. They are also to consult the commission for approval on any act they wish to embark on to help manage the reserve. Of course not a key decision (Interview with Forestry Commission staff, 2017).

It appears that although the local communities are sometimes allowed to apply their own institutions, it either does not happen often or it is not a well-established arrangement between the communities and the Forestry Commission. This is evidenced in a contrary view in the response below:

The central government does not often allow the local communities to establish and enforce their own institutions. Mostly, what the communities can do is to serve as watchdogs. For the usual traditional practices like the taboos, everyone including the Forestry Commission observes (Interview with a Unit Committee Member, 2017).

In support of the above response, another respondent intimated:

...Mainly in the areas of taboo systems, the local communities are allowed to observe their taboo systems relative to the forest. However, for forest reserve, I don't think the local communities have that mandate in its management (Interview an NGO staff, 2017).

Concerning how well respondents envisioned a tighter collaboration between the communities in the short to medium term, the findings revealed more of tighter future alliance although few responses showed a bit loose collaboration. In the focus Group Discussions, this was said:

We think that they conform to each other. These institutions have a cordial relationship and that in the short to medium term, they are likely to maintain this nature of relationship (FGDs, 2017).

Another respondent intimated:

I think there would be tighter collaboration from the look of things (Interview with Women's Group member, 2017).

In addition, an official from the Forestry Commission confirmed:

In fact, in my view, in I can envision a good and tight relation between the two (Interview with Forestry Commission top official, 2017).

However, some respondents registered somewhat weak future collaboration between the government agencies and the fringe communities.

A local government official, basing an excuse on geographical location for instance, opined:

Okay. You see, when you look at the location of the landowners and where we are now, we are not too close geographically. Because of that we do not often have very close relationship with them (Interview with a District Assembly staff, 2017).

The finding shows that the forestry commission allows the local communities to maintain mainly the traditional rules that have been in existence for time immemorial such as the taboo system. However, with key decisions about the management of the forest reserve, the local institutions are not permitted to work. This shows a weak degree of power or independence on the part of the local communities.

4.8 Nested Enterprises for Common Pool Resources that are part of Larger Systems

As asserted by Ostrom (1990), to realize successful forest co-management, monitoring, enforcement, conflict resolution, among others have to be structured in nested enterprises in order to provide room for externalities to be handled. The study therefore enquired into what larger institution/institutions the Nkrabia Forest Reserve forms part of and collaborates with. It was realized that the forest reserve finds itself in multiple layers of nested enterprises. The reserve management is under the auspices of the Forestry Commission which is also within the jurisdiction of Ministry of Lands and Natural Resources.

An informant opined:

The reserve is under the auspices of the Forest Services Division of the Forestry Commission. The Forestry Commission is also under the Ministry of Lands and Natural Resources (Interview with Forestry Commission top official, 2017).

Corroborating this is the response below:

The forest reserve is under the forestry commission which is also under the Ministry of Lands and Natural Resources (Interview with Forestry Commission staff, 2017).

The multiple layered nested enterprises show that when issues arise and are not successfully dealt with at the lower level, the high institutions can intervene and solve the issues. In this study, it was found that issues that are not successfully dealt with at the level of the immediate actors to forest reserve would be referred to the top officials of the Forest Services Division of the Forestry Commission. Should that fail, the Forestry Commission then handles them. In a situation of further unsuccessful handling of the cases, the cases will then be referred to the Ministry of Lands and Natural Resources which would be the last relevant institution to resolve the issues. This applies to all appropriation and provision rules, monitoring and enforcement in the forest reserve management. This hierarchical arrangement makes the co-management of forest resources effective. This serves as a good potential for quicker clarification and settlements of issues arising from the various aspects of the forest reserve management. The Table 4.1 summarizes the findings on the extent of forest-co-management of the Nkrabia Forest Reserve based on Ostrom's Design Principles for successful forest co-management.

Table 4.1 Extent of Co-Management of Nkrabia Forest Reserve

Design Principle	Meaning	Finding
Clearly defined boundaries	Individual and household users, as well as the Common Pool Resource, must be clearly defined. This means that individual or households with the rights to withdraw resource units from the common pool resources and boundaries of the common pool resources are clearly defined.	Yes
Congruence between appropriation and provision rules and local conditions	Clear relationship between the rules and the nature of the resource, such that the distribution of benefits from appropriation rules is roughly proportional to the costs imposed by the provision rules. Thus appropriation rules limiting the time place, and quantity of resource units are related to local conditions and provision rules requiring labour, materials and/or money.	Partially, Yes
Collective-choice arrangements	Collective-choice arrangements require that most individuals affected by the operational rules be able to participate in modifying the operational rules.	No
Monitoring	Monitors, auditing the behaviour of the appropriators and the condition of the CPR, are accountable to those appropriating the resource.	Partially, Yes
Graduated sanctions	Graduated sanctions are applicable and are applied to those who violate operational rules depending on the severity of the offence.	Yes
Conflict-resolution mechanisms	Appropriators must have access to rapid and low-cost mechanisms to resolve conflicts. The principle suggests that conflict resolution mechanism should be administered effectively and at the least cost.	Yes
Minimal recognition of rights to organize	The appropriators' right to organize is not challenged by external authorities. This principle stipulates that external government agencies do not challenge the right of local users to create their own institutions.	Partially, Yes
Nested enterprises	Appropriation, provision, monitoring, enforcement, conflict resolution and governance activities are organized in multiple layers of nested enterprises.	Yes

Source: Field Data, 2017

4.9 Chapter Summary

This chapter presented the findings of the study pertaining to the extent to which the Nkrabia Forest Reserve is co-managed. It was found that the Nkrabia Forest Reserve has clearly defined boundaries. The co-management actors are well informed of the users of the reserve which include: the community members and the private market that have been given a permit to operate. The users are also aware of what they are allowed to pick from the forest and when to pick. The study observed that sanctions are meted to offenders of forest rules on the basis of the severity. For instance in a situation where a potential culprit comes into the community, the traditional leaders ask them to leave the community to avoid future illegal practice or encroachment in the reserve. If somebody is seen entering the reserve with chain saw without a permit, the community, directed by the traditional leaders, can arrest the person, seize their chain saw and send him off the community or hand him over to the forestry officials.

However, in a situation where the culprit is caught in the act of logging, he is arrested by the community and is handed over to the technical officer who sends him to the District Manager for trial by the law court. The court then metes to the culprits appropriate sanctions (confiscation of equipment and stolen forest products, fines, imprisonment, among others) based on the severity of the offence. However, delays in the trial processes sometimes result in dismissal of cases which partly discourages people from further whistleblowing on illegal acts and the net effect of this is that, it affects the extent of the compliance of forest rules and laws.

It was also observed that the Reserve is organized in a nested enterprise where issues on the forest reserve are furthered upward as and when the need arises. However, the study observed that the Central Government does not generally permit the communities to establish their own institutions

concerning the management of the reserve. It was also observed that the local communities are not often involved in changing operational rules governing the reserve. The people only receive the instruction from the Forestry Commission, a situation that has implications for the compliance levels by the local populace.

CHAPTER FIVE

STAKEHOLDER PARTICIPATION, ENTITLEMENTS AND RESPONSIBILITIES IN THE NKRABIA FOREST RESERVE

5.0 Introduction

This chapter presents and discusses the findings of the second objective of the study (assess the entitlements and responsibilities of the co-management actors of the Nkrabia Forest Reserve). With this objective, the chapter foremost looked at the entitlements of the various actors: the Forestry Commission; local government; civil society organizations; local communities and the private sector. It afterwards, looked at the responsibilities of such actors. The findings of the study in relation to this chapter have been presented below.

5.1.0 Entitlements

5.1.1 The Forestry Commission

The study found out that the entitlements/benefits that the Forestry Commission enjoys are that the commission receives royalties when the timber firms are given concession in the forest reserve.

The response of a Forestry Commission official goes like this:

The central government is entitled to receive money from the timber firms when they are permitted to operate in the reserve. This money is in the form of Royalties (Interview with a Forest Guard, 2017).

Another respondent intimated:

The Forestry Commission receives royalties from the private concessionaire. So, the commission enjoys some substantial benefits (Interview with Unit Committee member, 2017).

The responses above confirm that the Forestry Commission enjoys some amount of royalties from the co-management arrangement when a private firm is given a concession in the forest reserve.

In a report by the Ministry of Lands and Natural Resources (2016), it was clearly revealed that the Forestry Commission is entitled to royalties which is specifically fifty percent (50%) of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) has been charged by the administrator of Stool Lands for administrative purposes. In this case, the Forestry Commission receives the highest portion of the stumpage fees.

5.1.2 Local Government

The local government is also entitled to royalties when the timber firms get the concession in the forest reserve. The royalties do serve as a source of funding that enables them to perform their functions well. A respondent hinted:

The local government also receives royalties (fees) which is about 24 % of the stumpage fees after the charge by the Administrator of Stool Lands from the private firm in this co-management arrangement (Interview with a Forest Guard, 2017).

A local government official corroborated by saying:

Yes, we too enjoy some benefits from the co-management arrangement. When for instance the timber firms get a concession in the forest, we are also entitled to royalties. We enjoy from the royalties that are paid by the private timber firm.

This finding is in conformity to a report released by MLNR (2016) which indicates that the District Assembly is also entitled to 24.74 % of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) has been deducted by the Administrator of Stool Lands. The finding of this study revealed that the main entitlement of the local government is the royalties that they enjoy from the stumpage fees paid by the timber firms.

5.1.3 Civil Society Organizations

On the entitlements/benefits enjoyed by civil society organizations concerning forest co-management, the study revealed that the civil society organizations have loose or few entitlements or benefits. Their entitlements/benefits have to do with the possibility of getting funding from donors by virtue of their involvement in forest management practices. An NGO respondent bluntly declared concerning the entitlement:

...In terms of benefits, I would say no. We don't have. Except that because we are working on the forest, we also receive donor funding to support the work of forest management in one way or the other or for capacity building or research or advocacy. But for direct benefit of co-management, we don't have any. ..., maybe sometimes we get some 'bush allowance'. And what I mean by 'bush allowances' is that occasionally we can get some kontomire or maybe bush meat or plantain at a good price. If for nothing at all, they are cheaper in the forest areas (Interview with an NGO staff, 2017).

To confirm this, an interview with a forestry commission official indicated:

Oh for NGOs I don't think they have any significant benefits. Their roles are mainly voluntary. They help a lot but they don't have access to any of the financial benefits from the forest reserve. Maybe what they get is donor funding to keep up their good works in forestry. If they go to the communities for sensitization too and the people have anything like foodstuff for them, fine.

It was found in this study that NGOs generally receive funding for the forest related activities they engage in.

5.1.4 Local Communities

About the benefits that the communities are entitled to, it was revealed that the fringe communities enjoy numerous benefits. They have access to non-timber products like mushrooms, firewood, and rattan, among others. They are also entitled to five percent (5%) of the total stumpage fees paid by the timber firm operating in the reserve for development projects in the communities. The

communities are entitled to this share through the institution of the Social Responsibility Agreement (SRA). By this SRA, the communities have built schools, bore holes, among other amenities. Through this co-management arrangement, at times, the private firms level their roads which are sometimes in bad shape for free, aside the percentage from the stumpage fees. There are situations where the private sector hires some of the fringe community members to serve as tree hunters in their concession for pay. A key informant for instance intimated:

The community also gets financial benefit through the institution of the Social Responsibility Agreement (SRA). Apart from the SRA, when the private firm is conveying its grader to work in the reserve, the community members can say, "Please our roads are not in good shape. Could you kindly level the roads for us?" When they say this, the firm has mercy on them and does so for them. Even bridge, the timber contractor renovates for some of the communities. Additionally, in a situation in which somebody in the fringe community falls ill, the timber firm gives help by offering their car for conveyance of the victim to a health center in case there happens to be no vehicle available at that particular moment. Also, the local people get some form employment when the private firm hires some of them as tree hunters and security people in the areas of concession (Interview with a Forestry Commission staff, 2017).

With the road construction for the fringe communities, a personal observation by the researcher in all the fringe communities he gathered his data from clearly showed that the roads had been levelled. However, it is unclear whether the timber company does so because it uses the roads to convey the timber logs. This finding was however compared with focus group discussions which corroborated by indicating that:

The main benefit that we gain from co-management is the commission we receive when a private firm comes to the reserve to operate. What happens is that if a private firm wants to operate in the reserve, it has to meet with the community elders and agree on what the community needs. The firm will then have to take five percent (5%) of what it has to pay to the government and use it to do the project for the community. This commission is given in the form of projects for the community. For instance through that, a contractor provided blocks and building materials for the community school building. Also, a bore hole has been drilled

for the community. Apart from that we can also go to the reserve to collect non-timber products like snails, leaves, small trees for pestle, among others. They help to make our living here enjoyable and more economical.

Also, a community member intimated:

We get some good benefits from the co-management arrangement. We receive some commission from the contractors and also we can go into the forest for snails, mushrooms and the like (Interview with Women's Group member, 2017).

The main entitlements of the local communities appear to be the Social Responsibility Agreement and the non-timber products. The communities depend heavily on these entitlements. It was indicated that effective co-management which leads to proper management of the forest can facilitate good and favourable rainfall pattern which is very important to farmers in the fringe communities: The response by an informant has been captured as:

You see, if the trees are well protected, it helps in quick rates of rainfall. The rain falls for them to also benefit especially the farmers among them. And of course, majority of the inhabitants are farmers (Interview with a Forestry Commission top official, 2017).

The co-management benefits are quite numerous for the fringe communities. The responses by the Forestry Commission appear to confirm what community members gave. Such entitlements and benefits do cover economic and social benefits. It can be realized that the Social Responsibility Agreement (SRA) is a key entitlement that fetches the fringe communities a lot besides other benefits the communities get from this co-management arrangement.

5.1.5 Private Sector

On the part of the private sector, the findings were that the timber firms are entitled to the management and control of their concession. It was brought to bear that the communities could

help to protect the concession of the timber firm because of the benefits they enjoy. In an interview with a key informant, it was revealed that:

Owing to the benefits the community people enjoy, they prevent people from going into the reserve to steal the products harvested by the private firm. Sometimes, the local people secure rooms for the workers that the private firm come with so that they can lodge there and do their work. In this case, they pay very little amount to the local people. Also, I think that in this co-management exercise, the private firm has some assurance of getting enough timber to fell because of the joint protection of the trees (Interview with a Forestry Commission staff, 2017).

In an interview with a unit committee member, it was made clear that the community helps to avoid intruders into the timber firm's concession because they serve as watchdog for the firm as well. The respondent hinted:

We those in the community observe what goes on in and around the reserve. We make sure that encroachers are not allowed in the reserve. Our work also helps to protect the concession of the private firm in the reserve (Interview with a Unit Committee Member, 2017).

The above finding presupposes that by virtue of the co-management arrangement, the private sector enjoys some social acceptance from the fringe communities. This is evident in the fact that the local communities avoid intruders from coming into the forest. Another fact that substantiates the fact that the private firm enjoys social assistance is that the communities accommodate the private firm's staff for highly subsidized charge.

However, it is quite interesting to note that in an interview with a private firm, it appeared no benefits are enjoyed at all. A contrary response was provided. The respondent indicated bluntly:

I don't think I have benefits. My company does not have benefits. If there are benefits, it is for the community (Interview with a timber firm official, 2017).

From a personal observation by the researcher, the private firm interviewee did not appear to be satisfied with the relations with the local communities. It could be deduced that granting that the benefits expressed by the other respondents were real, he personally was not satisfied with the contract or co-management arrangements with the communities. This could be substantiated by what was manifest in his subsequent response captured below:

At times they ask for assistance about rehabilitating their roads meanwhile it is not our duty, it is supposed to be Feeder Roads duty. Also, when the local people see a foreign company, they want to demand everything from them (Interview with a timber firm official, 2017).

The interviewee's response presupposes that the fringe communities overburden the private timber firm with demands even outside what the SRA stipulates. It has already been espoused in this study by a technical officer that at times the communities request the private firms to rehabilitate their roads for them. This attitude appears to irritate the private timber firm.

5.2.0 Roles/Responsibilities

The study further touched on the roles/responsibilities of the various forest co-management actors. The findings have been discussed below.

5.2.1 Forestry Commission

The forestry commission has a key role to play in the forest co-management arrangement. The commission ensures that there are material and financial resources to properly manage the reserve. It is responsible for the protection of the reserve from destruction. The Forestry Commission also urges the people to comply with the forest laws. A key informant indicated:

The government, through the Forestry Commission, provides material and finances resources for the management of the reserve. We are responsible for the protection and sustainability of the forest reserve (Interview with a Forestry Commission top official, 2017).

Adding to this, another respondent intimated:

We the officials of the Forestry Commission are to ensure that the forest policies are implemented. We encourage the citizens and educate them to comply with the rules pertinent to the management of the reserve (Interview with a Forestry Commission staff, 2017).

The article 269 (1) of the 1992 Constitution of Ghana, also stipulates, in relation to the Forestry Commission, that the FC is responsible for the regulation and the management of the utilization of natural resources.

5.2.2 Local Government

The roles/responsibilities of the local government were found to include the making of bye-laws aimed at governing the forest reserve; constituting task force for guarding the reserve, holding of sensitization programs. In an interview with a local government official, it was explained that:

We sometimes organize sensitization programs for the local community members. We also make bye-laws that pertain to the proper management of the forest reserve. Even in our budget, we make provision to protect the forest, to plant more trees where necessary and anything that can help protect the forest (Interview with a District Assembly staff, 2017).

An official of the Forestry Commission also hinted:

The local government also forms task force sometimes to patrol the reserve. If they also don't help to protect the reserve, they will not also have their royalties.

Notwithstanding the responses of these informants, a key informant indicated the lackadaisical attitude of the local government in respect of the governance of the reserve. It appears that often the local government does not come to the aid of the forestry commission in times of need. To him, the local government is only interested in their share of the stumpage fees. The respondent said bluntly:

For the local government, I don't think they play any serious role in the forest co-management. Only that when the timber firms are moving out with their logs, they give them some tickets. They don't do anything. However, when they see that a timber firm is operating in the forest, they confront the Forestry Commission and complain that they have seen a timber firm working in the forest but they have not heard anything about their share. As for their share, they will quickly follow up on it (Interview with a Forestry Commission staff, 2017).

The response above presupposes that the performance of the local government concerning the management of the reserve does not appear to be encouraging. This is partly substantiated by a comment from a staff of the District Assembly that the District is faced with logistical challenges and that at times when the Forestry Commission calls on the District for a vehicle for monitoring at the reserve, they are not able to help out (See Section 6.2.1).

5.2.3 Civil Society Organizations

Although the civil society organizations have not been given any defined roles in forest co-management, they play a key role in educating the citizens of the fringe communities on the protection of the forest such as in dry seasons when bushfires are highly possible. They also conduct research in the area of forestry to help with proper forest management. The civil society organizations also take part in the preparation of forest management plans to fight for the interest of the local communities. These roles of the civil society organizations have been captured in the following responses:

We don't have any defined roles we perform in the co-management practice except what we arrogate to ourselves to perform. For instance, we do research in the field of forestry. We also arrogate to ourselves the right to join in negotiations especially when they do the consultations in the process of preparing forest management plan. In this case, we take the opportunity to sit in and coach or support the fringe communities in negotiating for things that will be of benefit to such communities (Interview with NGO staff, 2017).

The response of a Forestry Commission official corroborates:

The Civil Society educates the local populace on the need to protect the forest and also educates them on how to prevent bushfires especially during the dry season. They also conduct research into how best to handle the forest resources so they are well protected. After the research, they then make recommendation to the forestry commission for consideration (Interview with a Forestry Commission top official, 2017).

The roles of the civil society organizations are quite commendable. It is quite obvious from the interviews that the civil society organizations play key roles in managing the forest. The 2012 Forest and wildlife Policy of Ghana has ‘encouraging collaborative resource management among communities, government and other stakeholders’ as one of its principles. In this manner, it appears that other stakeholders like the civil society organizations are playing their good part in the co-management of forest resources in Ghana. It was identified in the study that NGOs do provide education to the local communities on how best to protect the forest reserve against bushfires.

5.2.4 Local Communities

The study revealed that fringe communities play key roles in the co-management of the forest reserve. The local communities play numerous roles through serving as watchdog to prevent illegal chainsaw operation. They also educate their citizens on the effects of bushfires and how to prevent bushfires. The traditional leaders residing in the communities help a lot in the education process. The traditional leaders also help to avoid the rate at which the community members enter the forest reserve by enforcing their belief systems like taboos where the people are prohibited from going to the forest on some specific days like Akwasidae, Awukudae, etc. At times, the community task force also voluntarily patrols the reserve to be sure that no illegality is happening within and around the reserve. In the Focus Group Discussions, it was identified that:

... We keep watch over the forest and ensure that people who do not have permit are not allowed to fell trees. Also when people come to the community, the community elders would meet them and ask about the kind of work they do. If it is about chain sawing, the elders would explain to them that they cannot operate there. ... They would sometimes ensure that such persons vacate the community to avoid future illegal logging... We educate the citizens on the effects of bushfires and how they can help to avoid it. In all these, our community leaders organize.

A traditional leader, elaborating the strict role of the traditional authority in helping to avoid bushfires re-affirmed:

We do engage in education of the community members about the right ways of avoiding bush fires. You see, we have heard about how bush fires are able to destroy lives and property at other places in Ghana. Here, during the dry season, we strictly advise the community members not to take fire to the bush or make fire there. We also keep watch to ensure that people do not flout this advice/order.

A key informant confirmed this by saying:

The traditional institution mainly encourages the people to avoid bushfires. The community members help in avoiding the bushfires aspect. They do well to observe all people they see going to the forest to ensure that they are not carrying fire to the bush during the dry season (Interview with a Forest Guard, 2017).

The researcher observed that the interviewees and FGD participants in the local communities were very passionate about the case of bushfire prevention notably in the dry season. This may be because of the fire devastation that had happened in other places in the country claiming lives and property. It was observed by the researcher that the inhabitants in the communities were very close to the Nkrabia Forest Reserve and the off-reserve areas. Some houses were only few steps away from the reserve area. This could partly explain why most of the respondents were very much particular about the bushfires. An outbreak of fire could easily claim the lives and property of the inhabitants of the fringe communities. Meanwhile, concerning bushfires, the Control and Prevention of Bushfires Act 1990, P.N.D.C.L. 229 stipulates that persons shall not set fire in a

protected area. Section 12 states that if a person conceals a bushfire act and does not report, that person commits an offence and is liable to a fine. This Law already mentions the prevention of bushfires especially in a protected area.

It was also found that the local people are knowledgeable about the forest. Their knowledge, concerned when the plants bear their seeds, the best time for the formation of seedlings, among other relevant indigenous knowledge. Substantiating this is a response by civil society official who has frequent interaction with the fringe communities and goes like this:

The people have a lot of knowledge about the forest. For instance they know the best time to have the seedlings or the seeds of some species, etc. They know where the species are...People are beginning to acknowledge and appreciate indigenous knowledge a lot now. But earlier, people thought book knowledge superseded what the indigenous people knew about the forest and more attention was paid to that. But now.... people are realizing the importance of indigenous knowledge.

The response shows that previously, indigenous knowledge about the forest was overlooked. However, in recent times, agencies have recognized the need to adopt indigenous knowledge in realizing sustainable forest management. In the light of this, the 2012 Forest and Wildlife Policy states that the policy is principled on integrating traditional and scientific knowledge to promote sustainable forest management.

5.2.5 Private Sector

The roles/responsibilities of the private sector were also found out in the study. The private sector in this case the timber firm guards their concession by hiring people to serve as security people. The firm is also obliged to observe all the rules stipulated in the logging manual. The response of a Forestry Commission official concerning the role of the private sector is captured as:

The private timber firms, for instance LL Ltd has constituted a security force that seeks to guard the concession. The force patrols the reserve to ensure that people

do not engage in any theft cases within the reserve. They do this to also deter chain saw operators. They also mount barriers to help check people who could smuggle some of the timber products out of the forest (Interview with a Forestry Commission top official, 2017).

Another official hinted:

The private sector is enjoined to observe all the laws and rules governing operation in the reserve. The rules regarding the number of trees to be cut, the observance of the community cultural system, and all other directions provided in the contract agreement (Interview with a Forest Guard, 2017).

To substantiate this, an interview conducted with a private firm respondent showed this response:

The main role/responsibility of my firm is to observe the rules in the logging manual. The logging manual states many things. Some of the provisions are that we shouldn't fell around the Reserve Area, we shouldn't leave rubbish in the bush or around the reserve. Also, we should respect the cultural rules of the local people.

The private firm is enjoined by Forestry Commission rules to meet with the community leaders to agree on a project to be funded by five percent (5%) of the total stumpage fees that it pays to the government for operating in the forest reserve. This is the Social Responsibility Agreement (SRA).

An interviewee indicated:

The timber concessionaire also protects the forest by taking security people to guard their concession. Also, through the Social Responsibility Agreement, they are to fund development projects in the fringe communities (Interview with an NGO staff, 2017).

The private sector is expected to observe all the required rules stated in the Social Responsibility Agreement (SRA). The SRA obliges the contractor to provide for amenities, services or benefits to assist the communities and inhabitants of the traditional paramountcy, at a cost of no less than 5% of the value of the stumpage fee of timber that is harvested. The study observed that the private timber firm is obliged to fulfil the Social Responsibility Agreement (see Table 5.1).

Table 5.1: Summary of Entitlements and Responsibilities of Co-management Actors of Nkrabia Forest Reserve

Actor	Entitlements	Roles/Responsibilities
Forestry Commission	Royalties	Responsible for the overall regulation and the management of the utilization of forest reserve; encourages the citizens and educates them to comply with the rules pertinent to the management of the reserve.
District Assemblies	Royalties	Makes bye-laws aimed at governing the forest reserve; hold sensitization program.
Non-Governmental Organizations	Donor support	Educate the citizens of the fringe communities on the protection of the forest such as in dry seasons; fight for the interest of fringe communities; engage in forest-related research.
Forest Fringe Communities	5% Stumpage fees through Social Responsibility Agreement (SRA) for development projects; non-timber forest products; seasonal employment	Monitor the reserve through volunteer task force; Provide vital information leading to the arrest of culprits; enforce cultural practices that help protect the reserve; educate their citizens on forest protection
Private Timber Firms	Social acceptance, subsidized accommodation charges for workers in the fringe communities, personal acceptable way of protecting the reserve	Protect the reserve with private security; obliged to comply with the logging manual; payment of royalties

5.3 Chapter Summary

This chapter has delved into the various entitlements and responsibilities of the actors of forest co-management. The study found that the Forestry Commission and the District Assembly are entitled to royalties equivalent to 50% and 24.74% respectively of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) administrative charge has been levied by the Administrator of Stool Lands. The fringe communities are also entitled to five percent (5%) of the total stumpage fees paid by the timber firm operating in the reserve for development projects in the communities. The communities also enjoy from the non-timber forest products like mushrooms, snails, rattan, among others which serve as source of livelihoods. They also get employed seasonally. Civil society organizations do not enjoy from any direct entitlements. They stand a chance of getting funding from their donors for researching and educating people on forest-related activities. The private sector is entitled to any proper and acceptable way of guarding the concession and also benefits from the fringe communities effort of protecting the reserve. They also receive subsidized charge for accommodation for their workers in the fringe communities.

The commission is responsible for the regulation and the management of the utilization of forest resources. It also encourages the citizens and educates them to comply with the rules pertinent to the management of the reserve. The local government makes bye-laws aimed at governing the forest reserve. It was also found that through the preparation of forest management plans, the local government makes provision for the management of the reserve in terms of resources to support the forestry commission. The civil society organizations play a key role in educating the citizens of the fringe communities on the protection of the forest such as in dry seasons, fighting for the interest of fringe communities, among others. The fringe communities help in monitoring the Forest reserve through the task force. They also protect the reserve with their traditions and also

by revealing information on illegalities to the forestry commission. The roles/responsibilities of the local government were found to include the making of bye-laws aimed at governing the forest reserve. It was also found that through the preparation of forest management plans, the local government makes provision for the management of the reserve in terms of resources to support the forestry commission and the other actors. The local government sometimes constitutes task force to patrol the forest reserve as well as holds sensitization programs occasionally. These functions however, were not satisfactorily performed which may be a result of *inter alia* lack of logistics. The private market also protects the reserve with their security personnel and also complies with the logging manual.

CHAPTER SIX

PROSPECTS AND CHALLENGES OF CO-MANAGEMENT OF THE NKRABIA FOREST RESERVE

6.0 Introduction

This chapter presents and discusses the findings of the study in respect of the prospects and challenges of co-management of the Nkrabia Forest Reserve. In this chapter, the prospects are presented first, followed by the challenges. The findings have been presented below.

6.1.0 Prospects

On the part of the prospects, it was revealed in the study that with the practice of forest co-management, the forest would be well protected in the future; issues of conflict would be minimized; there is reduction in rural poverty; there would be future employment creation; there would be tourism opportunities; and protection of water bodies would be realized.

6.1.1 Ecological Conservation

One of the prospects for forest co-management identified in this study was that forest co-management helps to ensure the conservation of the environment. For instance a respondent hinted:

Co-management will help to ensure that the forest is properly protected, and this will lead to having more resources in the forest. You know that if there is no forest, the water bodies will all dry up. The forest will serve as canopy to the water bodies (Interview with a District Assembly staff, 2017).

Another response, confirming ecological conservation was that:

We believe that when we all help to protect the forest, it is for our own good because the forest cover will be well protected (FGDs, 2017).

In the responses of the interviewees above, it was realized that forest co-management can help to ensure ecological conservation. It was explained that as more hands get into protecting the forest, it would lead to proper management of the forest which would extend to protecting even the water bodies found within the forest.

6.1.2 Tourism Potential

Also, the study found that proper forest co-management can make the forest a tourist attraction site. The people outside the reserve area could visit the reserve for education and adventure for a fee. A respondent hinted:

...the Assembly is planning to develop some of the reserves to form ecotourism sites. If the Assembly does that in the co-management arrangement, other actors can help in this project and more money/income can be generated (Interview with a District Assembly staff, 2017).

Also, in an interview with an NGO official, it was revealed:

Yes. Co-management is really helpful. If we take the forest co-management seriously and maintain the forest reserve very well, it can serve as a tourist attraction site where people can visit for a fee (Interview with an NGO staff, 2017).

Similarly another response which confirms the earlier ones was that:

We know some forest reserves that are noted for tourist attraction. The Nkrabia Forest Reserve also has the potential. We have trees of different kinds, there are animals here as well. The forest reserve is nice. If we all keep protecting it, this place can also attract people (Interview with a traditional leader, 2017).

The responses above do show that there is great potential for ecotourism in the forest co-management arrangement.

6.1.3 Reduction in Conflicts

This study, moreover, observed that forest co-management has the potential of reducing conflicts among the various actors. The study found that forest co-management arrangement will help in reducing the extent of conflicts concerning the forest. This has been captured as:

With the co-management arrangement, it can be realized that, the forest reserve would be well protected and there would be enough forest resources for use by the children. Also, there would be less conflict about the use of the forest because the private firm and the forestry commission and we the communities, we all get our benefits (FGDs, 2017).

Another respondent indicated:

Of course, co-management helps to reduce conflicts among parties. You see the conflicts come because of the pursuit of interests among actors. However in co-management, the various actors are brought together to fight for a common course. In this case, the conflict level is reduced (Interview with a Forestry Commission top official, 2017).

Forest co-management has been marked for reduction in and resolution of cases of conflicts. This is ostensibly because with co-management, many actors are involved and each actor gets to enjoy share of benefits. In this case, conflicts about forest management and resource sharing are reduced.

6.1.4 Poverty Reduction

Also, it was found in the study that forest co-management could help to ensure poverty reduction within the fringe communities. The response of an interviewee was captured as:

If done well, then with the communities being close to the forest reserve with more power devolved to them, and with greater say in the management process, we hope that the forest will be better managed and conservation will be better practiced. Communities will benefit more and rural poverty will go down (Interview with an NGO staff, 2017).

To corroborate the above response, FGDs indicated:

We don't mean to say we are rich people. But with this co-management exercise, we are able to get some mushrooms, snails, leaves, etc. from the forest reserve. These things are things that we need to live well. We get these and we are able to check our how far. So Yes, it helps to reduce poverty to some extent (FGDs, 2017).

These show that forest co-management has the tendency to reduce poverty among local inhabitants. A respondent further added that:

Yes. The local people here get some small jobs through the sale of the mushrooms and snails. Also, when the timber firm picks some of the people as tree hunters, they get some money. These are ways to reduce poverty (Interview with a traditional leader, 2017).

From these responses, the study clearly found that the prospects of forest co-management could extend to reducing poverty in the fringe communities if done well.

6.1.5 Employment Opportunities

It was also revealed that a successful co-management exercise will lead to future employment because the herbalists will be able to get herbs and leaves from the forest to keep them in employment and to keep on providing health services. Also, the community members who pick up snails and mushrooms from the forest will be employed seasonally. There will therefore be a sustained source of employment for the local inhabitants. To support this, a respondent explained:

The leaves and herbs in the forest help to provide herbalists with raw materials for their medicine. They serve as a source of employment for them. By so doing, it helps to provide good health to the local community people. As well, during the rainy season, there is abundance of mushrooms and snails in the forest. The people pick some of these and even sell to make good amounts of money to boost their standard of living (Interview with a Forest Guard, 2017).

To confirm the above response, an interview with the communities revealed that:

Here, we are permitted to go to the reserve to pick items like snail and mushrooms. We eat some and sell some. So during the rainy seasons, our job comes. So at least we know that in the rainy seasons, we have some job to complement our farming (Interview with Women's Group member, 2017).

FGDs further corroborate these findings in this response:

Yes. We get employment from the forest. When it rains, we are happy because it means more mushrooms, more snails, more everything. We get some for our food and some for sale for small money (FGDs, 2017).

It was however explained by an informant that considering the extent of disobedience by the people, the sustainability of the forest is at stake. This is captured as:

I think that as it stands now, because of the extent of disobedience, the sustainability of the forest is at stake. If things go this same way, then I doubt the future sustainability (Interview with a Forestry Commission staff, 2017).

The above response represents some level of optimism about the prospects of forest co-management. It also shows that people do not normally comply with forest laws that could help in ensuring proper forest co-management.

6.2.0 Challenges

The challenges of co-management were sought in the study. It was revealed in the study that the challenges that go with forest co-management include: logistical problems, attitudinal challenges, delay in court actions and bribery, government's unwillingness to cede power, the Forestry Commission's independence of the Local Government, weak level of dialogue among actors, conflicts among some actors, and length of time in the discussion of SRA with fringe communities.

6.2.1 Logistical Problems

The study revealed a challenge that has to do with logistics to help in monitoring. It was revealed that the Forestry Commission does not have enough logistics in the areas of motorbikes and pickups. It was found in the study that at times when the fringe communities give tips on illegal felling of trees to the technical officer for instance, because of the problem of logistics, the commission is not able to act quickly to go to the forest reserve and arrest the culprits. It has

become a big challenge to the co-management exercise because such culprits are able to flee. The case of not having guns is another issue. The personnel find it difficult to scare a culprit away in the absence of a gun. The lack of these logistics is a big challenge to proper forest co-management.

For instance a respondent hinted:

I think that we need more cars like pickups. If we also get at least 2 soldiers it will help because sometimes, somebody can call at night to inform you that some illegal logging is going on in the forest. But what at all can you do at that time if you don't have soldiers with you and a pickup around? The lack of guns is also a problem. At least if you have a gun you can scare the criminal back if he decides to scare you (Interview with a Forestry Commission staff, 2017).

Adding to this, an informant opined:

The lack of logistics like vehicles at our end is indeed a problem. At times, the Forestry Commission contacts us for our vehicle to go on monitoring around the reserve. But we are not able to help them because we too have a challenge with vehicles. At the time they contact us, the vehicle we use would be on official duty somewhere else (Interview with a District Assembly staff, 2017).

The community members who formed the voluntary task force also decried their woeful situation of not having arms or even protection gear like wellington boots, raincoats, among others. A community task force member for instance declared:

We have a challenge with non-availability of things like raincoats, boots, uniforms, and other things that can help us to protect ourselves. If the forestry commission can help us, we will be very happy (Interview with a community task force member, 2017).

Throughout the period of study in the Nkrabia Forest Reserve, the researcher observed that the technical officer and the forest guards were not holding any arms that they could use to scare away intruders. This partly confirms the claim that was made by the technical officer that they lacked logistics.

However, it appears that the complaints about arms had already been made to the top officials of the Forestry Commission and the feedback was that should the forest guards and the community task force be given the guns, they could be easily tempted to open fire at culprits at the least provocation instead of arresting them. Because of this, the Forestry Commission is discouraged from pressing for guns for them. This is evidenced in this response:

We have been complaining about our lack of arms to the management of the Forestry Commission for long time. What management keeps saying is that there is a fear that when you attempt arresting a culprit and he proves a bit difficult, you guys could shoot the person. So manage as it is now. In case of anything, call the management for police or soldiers to come to your aid (Interview with a Forestry Commission staff, 2017).

Meanwhile it has already been realized that in a situation where the culprit operates in the night, there is less tendency of getting immediate help from the armed security personnel. The lack of arms and other logistics do create a big problem.

6.2.2 Attitudinal Problems

Another challenge that was identified in the study was the attitudes of some of the local community members and the private timber firm. It was revealed that some of the community members did not comply much with the rules pertaining to the reserve. Some of the members would go into the reserve on taboo days. Also, at times, the private firm would go contrary to the logging schedule provided for them to follow. A respondent voiced:

At times the timber contractors also go beyond their limit. They would sometimes fell more trees than what they have been assigned to them within a specific period of time (Interview with a Forestry Commission top official, 2017).

Another respondent also hinted on the attitudes of the local communities:

As for us the company, we observe the taboo system well. We even avoid coming into the forest to repair our machines. Apart from that, in the month, they have

some special days like Akwasidae, Awukudae. We don't come to the forest on all of these days. But for the community, the creator of these rules, they don't respect it (Interview with a timber firm official, 2017).

It was also found in one of the communities that the traditional leaders wanted to compel the government to take some part of the land reserved for conservation for them to use for farming and building. This is captured in the response below:

For instance in one of the communities, the traditional leaders rose up on the District Assembly saying that they should leave some part of the land reserved for forest conservation for them to use for building plots and for farming as well. You see, this makes forest co-management bit of a challenge (Interview with a District Assembly staff, 2017).

These attitudes of non-compliance have effect on the proper functioning of co-management and on the long-term sustainability of the forest reserve. Although the literature reviewed does not show the attitudinal problems of the private firms, this study identifies attitudinal problem as one of the forest co-management challenges.

6.2.3 Delays in Court Actions and Corruption

It was revealed that delay in court actions and bribery pose a challenge to the co-management arrangement. In some situations where culprits are arrested, it happens that some people get into the scene and twist the cases with bribes so that at the end of the day, such cases are halted. Delay in court actions does not help the work of co-management. When this happens, it does not encourage people to keep up with watching out for offenders because in the end they would feel that even if they help to get such culprits arrested they (such culprits) would not be dealt with: they would find their ways out.

A respondent indicated:

Sometimes, issues of bribery make some of the cases “get lost along the way.” All these pose big challenge to our efforts. Also, there are many cases in court that have not been tried yet. You see, when it happens like that, some people may think that we take things for granted. They may think that we don’t deal with culprits as it should be. It in a way discourages those who blow the whistle about illegal activities in the reserve (Interview with a Forestry Commission staff, 2017).

Adding to this, a respondent remarked:

You see, as for us when we catch a culprit, we hand the person over to the forestry officials who take him to the police. On some occasions, we hear about what happens to the culprits like fines by court in imprisonment but it takes long before. There are some cases that we don’t hear about again. We don’t know what has happened about such cases. When it happens so, some of the task force members and the other community members become discouraged about their whole effort (Interview with a traditional leader, 2017).

The responses do show that court delays and bribery are a key challenge to the forest co-management exercise.

6.2.4 Central Government’s Refusal to Cede Power

The study also found that the central government’s refusal to cede more power to the local communities creates difficulty in the co-management exercise. This leaves the local communities with no option than to wait on the government for certain decisions and actions concerning the co-management of the reserve. It was opined that:

The fear of the government to let go is a key challenge. That is to cede more power to the community members. The government still holds more power but still expects the community to cooperate fully (Interview with a Forestry Commission staff, 2017).

To substantiate this, a respondent indicated:

As the Forestry Commission has set the rules, we here, are not permitted to change them or do anything without their permission. So, we are here obeying. We indeed do our best to monitor the reserve, though (Interview with Women’s Group member, 2017).

When the central government does not accept to transfer power to local people to act, it creates a challenge for proper co-management. This study found out that the central government is reluctant to cede more power to the local people regarding the management of the forest reserve.

6.2.5 Weak Dialogue among Actors

This study found that another key challenge was weak level of dialogue. The local government for instance indicated that sometimes they meet with some NGOs and decide on going to educate the communities on forest protection. However, after the meeting, they do not hear from them again. Also, there is a challenge of good relationship between the Forest Commission and the Local Government. This is evident in the response below:

I remember that there was a time the District Assembly had a meeting with an NGO on this collaboration thing. However, since the meeting, they have not bothered to come to our office. Even though they often pass this place and go to the communities. So with NGOs, I think the dialogue and collaboration has not been that tight (Interview with a District Assembly staff, 2017).

A respondent further indicated that:

You see, we are talking about decentralization. As at now, the law has not clearly put the Forestry Commission under the District Assembly. So the Commission acts as a separate entity from the District Assembly. In this case, it becomes difficult for the Assembly to exercise control over the Commission. Because of this, sometimes if you invite the forestry officials for a meeting, they can choose not to come (Interview with a District Assembly staff, 2017).

The weak dialogue between the District Assembly and the Forestry Commission was attributed to the fact that the Forestry Commission is independent of the local government. In this case, the commission does certain things without the consent of the local government.

It was also revealed that the Forestry Commission at times permits the private timber firm to erect barriers in the roads to check smugglers of the timber without seeking the approval of the local government. This creates a big challenge for collaboration. It was voiced that:

This Forestry Commission, at times permits the private timber firm to set up a barrier on the roads without our permission. You see, this is not right (Interview with a District Assembly staff, 2017).

The response by another respondent confirms this. It was remarked that:

The Private timber firm helps to protect their concessions by setting up barriers along the road to check vehicles to see if they have not taken any of their timber logs (Interview with a top official of the Forestry Commission, 2017).

It was also revealed in an interview with a Forestry Official that the Local Government is not helpful in the reserve management. This appears to be responsible for their weak dialogue. It was voiced that:

For the local government, they don't do help us much. They see a firm in the reserve and come to Forestry Commission to ask about royalties (Interview with a Forestry Commission staff, 2017).

These responses show that there is weak dialogue among actors. Meanwhile, respondents had earlier indicated that there is likely strong future link/collaboration among co-management actors. However, it appears that with NGOs and the Forestry Commission, there is good level of dialogue and interaction as the interviewees from the Forestry Commission lauded them on their key roles as discussed earlier.

6.2.6 Limited Personnel

Last but not least, it was manifest in the study that lack of personnel was a key challenge. The nature of this forest co-management is such that it needs more staff or personnel. In the Forestry

Commission, the staff were found to be few. For instance in each community, there was only one forest guard. This person was responsible for the protection of the reserve in his jurisdiction and had to ensure that everything is well. His portion of the reserve is very big. It makes the work stressful for them. The range that the technical officer also supervises is also large for one person. Monitoring is bit of a difficulty. It is the co-operation of the fringe communities that helps them to do their work better. A response goes like this:

You see, here, the staff are limited. You can see how far the place we went is. I am supposed to supervise this entire range. It is far. A tedious work. If we were many, we would have decided the place up for the supervision. The forest guards are also not many. It is difficult in this task (Interview with a Forestry Commission staff, 2017).

A personal observation by the researcher revealed that the communities were far from each other and the residence of the technical officer was very distant from the Nkrabia Forest Reserve.

Table 6.1: Shows the summary of findings on the prospects and challenges of co-management of the Nkrabia Forest Reserve.

Table 6.1: Summary of Prospects and Challenges of Co-management of Nkrabia Forest Reserve

Prospects	Challenges
Ecological Conservation	Logistical Problems
Tourism Potential	Attitudinal Problems
Reduction in Conflicts	Delays in Court Actions and Corruption
Poverty Reduction	Central Government's Refusal to Cede Power
Employment Opportunities	Weak Dialogue among Actors
	Limited Personnel

6.3 Chapter Summary

The chapter probed into the prospects and challenges of co-management of the Nkrabia Forest Reserve. The study observed that forest co-management can help to ensure ecological conservation. Also, when the forest is in good shape, it could have tourism potential. It was also observed that forest co-management has been marked for reduction in and resolution of cases of conflicts. The study further found that forest co-management could help to ensure poverty reduction within the fringe communities in a situation where more power is given to the communities. However, it was revealed that owing to the extent of disobedience of the laws some level of pessimism was expressed.

The study also identified logistical problems as a key challenge. It also identified the following challenges: attitudinal problems on the part of the local community members; delays in court actions and bribery which have implications on future compliance; the central government's refusal to cede more power to the local communities which creates difficulty in the co-management exercise; and weak dialogue among co-management actors.

CHAPTER SEVEN

DISCUSSIONS

7.0 Introduction

This chapter discusses the findings of the study which were presented and analysed in the chapters four (4), five (5) and six (6). These chapters were organized in line with the three research objectives: to find out the extent to which the Nkrabia Forest Reserve is co-managed; to assess the entitlements and responsibilities of stakeholders involved in co-managing the Nkrabia Forest Reserve; and to identify the prospects and challenges in the co-management process of the Nkrabia Forest Reserve. The discussion has been presented in this order: Co-management of Nkrabia Forest Reserve; Stakeholder Participation, Entitlements and Responsibilities in the Nkrabia Forest Reserve; and Prospects and Challenges of Co-management of the Nkrabia Forest Reserve.

7.1 Co-management of Nkrabia Forest Reserve

The first objective was to find out the extent of co-management of the Nkrabia Forest Reserve. This objective was guided by Ostrom (1990) Design Principles of forest co-management. The findings are therefore discussed in line with the principles. It was found that the forest reserve's geographical boundaries were clearly marked. The communities helped the Forestry Commission officials to clear the boundaries. Also, in terms of users, it was found that people with permit are allowed to use the reserve. The community members are allowed to enter the reserve to collect non-timber forest products like mushrooms, snails, rattan, among others. The Forestry Commission officials are also allowed to go into the reserve to do monitoring. The forestry commission officials, the private sector and the communities take part in governing the reserve. These findings do suggest that the boundaries of the Nkrabia Forest Reserve are clearly defined and that all actors are well informed of the boundaries. Therefore, it is expected that the negative

and positive externalities caused by participants will be internalized, so they bear the costs of appropriation and also receive some of the benefits of resource provision (Cox et al, 2010). This finding meets the assertion espoused by Agrawal (2002) that there should be stipulated well-defined boundaries around a community of users and boundaries around the resource system this community uses. However, unlike the finding of Zhu et al. (2014), the Nkrabia Forest Reserve was not divided among the various fringe communities for their utilization and management. This appears to be a result of the fact that the government has a key stake in the Nkrabia Forest Reserve.

The study findings do show that the appropriation and provision rules do conform to local conditions to some extent. A section of the respondents were not satisfied for the fact that they were prevented from harvesting timber from the reserve. However, respondents were happy about the fact that they could fetch the non-timber products from the reserve. Meanwhile, an official from the Forestry Commission indicated that on some occasions, when the community members request some timber for community projects or some buildings, the commission does permit them to take some timber from the reserve. This shows that ideally, some of the people wanted to have been permitted to enter the reserve individually and freely for some of the timber. This study therefore brings to bear that the reserve meets the appropriation and provision rules. As advanced earlier, appropriation rules do restrict place, the time, and/or quantity of resource units and are related to the local conditions and provision rules that require material, labour, and/or money (Zhu et al., 2014). This study reports a finding that confirms earlier study that in Nepal, villages partially met this principle (Gautam & Shivakoti, 2005).

The local communities are not well represented in the making of forest rules. The local communities' involvement is mainly in the area of education. The weak connection in respect of involvement in decision making processes has an effect on the comparative advantage in devising

effective rules and strategies for that location, particularly when local conditions change (Berkes et al., 2000). Berkes (2000) hints the principle of collective choice arrangement is rooted in the stance that local users have first-hand and low-cost access to information about their situation and that they have comparative advantage in devising rules and strategies that best suit their condition. The non-involvement of the local citizens creates inconvenient situation for local populations especially when local conditions change. Earlier research indicated that absence of this principle could have a significant implication on acceptance, legitimacy and compliance (Berkes, 2009; Stöhr, 2013). Other studies also observed that where the views and institutions of the local communities are not inculcated in the forest management rules, there is less or no legitimacy and high level of non-compliance (Hansen, 2011; Marfo, 2010).

The study found that most of the monitors of the Nkrabia Forest Reserve are those that have direct stake in the reserve. This could partly explain why some of the respondents indicated satisfaction with the general performance of the monitors. This is an indication of appreciable performance to identify illegal activities in the reserve. Earlier study revealed that where monitors are not accountable to those who depend on the reserve or are not direct beneficiaries of the forest resource, they are not often motivated to work effectively (Aligica et al., 2014). This study has revealed that the monitors of the Nkrabia Forest Reserve are mostly direct beneficiaries of the reserve. This seeks to confirm the assertion by Aligica et al. (2014) because the responses from the respondents suggest that the monitors are indeed industrious.

Where the court has to try cases, it delays in the trials and this demotivates the whistle blowers. This partly explains why the study found that the level of non-compliance by some actors was high. However, on the part of the fact that there are graduated sanctions, this study confirms earlier study finding that villagers in co-management arrangements who violated protection rules were

given a graduated sanction (Zhu et al., 2014). This is so because with the Nkrabia Forest Reserve, offenders are sanctioned with dismissal from the community, court fines, or imprisonment based on the severity of the offence in question. It is important to also stress an observation here: contrary to the finding of this study, in an earlier study by Ming'ate (2012), it was observed that the local forest guards did not have any power to arrest offenders of the rules of the co-management arrangement. They often had to depend on the government forest guards for situations of arrest. In this study however, the local community members had the power to arrest the culprits and later hand them to the forestry commission officials for trial.

Owing to the obvious tendency of conflicts occurring in forest co-management, Cox et al. (2010) emphasized the need to have conflict resolution mechanisms in place. Unlike the finding by Zhu et al. (2014) that forest fringe communities have co-management committee holding conflict resolution meetings, in this study, it was revealed that the traditional authorities attempt to solve the issue. When they are unable to solve the issue, they would refer the case to the technical officer at the Forestry Commission.

The principle of minimal recognition of rights to organize requires that external government agencies do not challenge the right of local users to create their own institutions (Cox et al., 2010). However, in this study, it was revealed that the external government (Forestry Commission) does not generally allow the local communities to establish their own institutions concerning the management of the reserve. This has the tendency of affecting the freedom to apply their own relevant and creative ideas concerning the forest reserve management. This has the tendency of affecting the proper management of the reserve. In an empirical study by Agrawal and Chhatre (2007) in Himachal Pradesh maintain, it was observed that the success of local institutions pertaining to forest resources can be tampered with by the strict involvement of higher level

government officials in decision-making procedure. The high degree of involvement of the central government found in this study therefore, thwarts the proper functioning of local community institutions. Meanwhile, having observed the risk in this situation, Osei-Tutu et al. (2014), in their study, recommended the development of working local institutions considering the failure of formal regulatory frameworks in forest resource management. In an earlier study by Zhu et al. (2014), it was revealed study that local villagers structure extensive rules regarding who can use a forest and the type of forest resources that can be used in varied periods. Contrary to this earlier finding, the study found that the local communities are not permitted to take active part in key decisions about the Nkrabia Forest Reserve. This finding explains why there is deficiency in the compliance and legitimacy of the Nkrabia Forest Reserve rules as hinted by the respondents.

The existence of nested enterprises in the Nkrabia Forest Reserve serves as a good potential for quicker clarification and settlements of issues arising from the various aspects of the forest reserve management. Earlier study revealed that forest co-management is organized in national governmental laws for forest and nature reserve management (Zhu et al., 2014). This study does confirm the earlier finding espoused above.

7.2.0 Stakeholder Participation, Entitlements and Responsibilities in the Nkrabia Forest Reserve

7.2.1 Entitlements

In a report by the Ministry of Lands and Natural Resources (2016), it was clearly revealed that the Forestry Commission and the local government are entitled to royalties which is specifically 50% and 24.74% respectively of the total revenue from the Timber Utilization Contract (TUC) after ten percent (10%) has been charged by the administrator of Stool Lands for administrative purposes. The finding of this study confirms this report by the Ministry of Lands and Natural Resources.

It was found in this study that NGOs generally receive funding for the forest related activities they engage in. This affirms the finding in earlier study by Cook et al. (2017) that one of the entitlements of NGOs operating in the field of forestry has to do with funding opportunities from their donors whose scope is in the forest sector.

The main entitlements of the local communities appear to be the Social Responsibility Agreement and the non-timber products. The communities depend heavily on these entitlements. In an earlier study elsewhere by Leach et al (1999), it was revealed that the people in the fringe communities derive livelihoods from forest co-management arrangement, ranging from game hunting to non-timber forest products. Also, it was found earlier that forest fringe communities are also entitled to enjoy from the Social Responsibility Arrangement (SRA), an arrangement which obliges the timber firm to provide for amenities, services or benefits to assist the communities and inhabitants of the traditional paramountcy, at a cost of no less than 5% of the value of the stumpage fee of timber that is harvested (Ministry of Lands and Natural Resources, 2016). The finding of this study confirms the earlier report by the Ministry of Lands and Natural Resources. This SRA, according to the findings of this study, is used for establishing bore holes, school buildings, among others in the fringe communities. This conforms to Mayers and Vermeulen's (2002) report that private timber firms establish the SRA with the local communities in Ghana before operating in forest reserves. Mayers and Vermeulen (2002) indicate that the fringe communities use this percentage of the total stumpage fee in the construction of boreholes, KVIPs, among others. The timber company also rehabilitates the roads of the fringe communities for them. This seeks to confirm the response by a forestry commission official that the communities make the timber firm rehabilitate the roads for them. It was earlier observed in a study conducted by Lartey (2009) that timber

companies rehabilitate the roads of forest fringe communities for them. This is affirmed by the finding of this study.

By virtue of the co-management arrangement, the private sector enjoys some social acceptance from the fringe communities. The communities accommodate the private firm's staff for highly subsidized charge. This affirms FAO's finding that co-management arrangement provides some form of social acceptance to the private firm and security of the firm especially in connection with the relationship with the communities (FAO, 2005).

7.2.2 Roles/Responsibilities

The Forestry Commission ensures that there are material and financial resources to properly manage the reserve and urges the people to comply with the forest laws. It is also responsible for the protection of the reserve from destruction. The article 269 (1) of the 1992 Constitution of Ghana also stipulates that the Forestry Commission is responsible for the regulation and the management of the utilization of natural resources. The study finding is in line the 1992 Constitution's provision on the Forestry Commission's role. Also, FAO (2005) reports that one of the roles of the Forestry Commission is supporting empowerment of the resource users and providing motivations to implement policies. The study confirms this role by revealing that the Forestry Commission encourages the citizens and educates them to comply with the rules pertinent to the management of the reserve.

The local government's role of making bye-laws for the proper management of the reserve found in this study conforms to the findings by Pomeroy and Berkes (1997) that part of the roles of the local governments is the issue of making rules, regulations and ordinances concerning the management of the reserve. Pomeroy and Berkes (1997) add that the policies from the central government are implemented at the local level through management plans.

The finding of this study that NGOs conduct research on how best to handle and protect the forest resources confirms previous findings that state that NGOs embark on research pertaining to proper management of forest resources (Donoghue, 1999; FAO, 2005). Also, this study found that NGOs aid forest fringe communities by defending their interests especially on the occasion of the preparation of forest management plans. In a similar development, it was found in earlier studies that NGOs are active in protecting the interests of the local communities in relation to forest and other natural resources (Donoghue, 1999; Tropenbos-Ghana, 2005). These earlier findings therefore affirm the role of NGOs as protecting the fringe communities' interest. Moreover, a study by Carter and Gronow (2005) revealed that NGOs engage in provision of education and training to people. NGOs, again, do provide education to the local communities on how best to protect the forest reserve against bushfires.

Earlier empirical studies identified the role of the local communities in forest co-management to include fighting against bushfires and conserving the forest resources (Carter & Gronow, 2005; Evans et al., 2004). The study finding confirms this earlier finding as it reveals that the communities do educate their citizens on the effects of bushfires and how to prevent bushfires. In this study, it was identified that the community task force sometimes patrols the reserve voluntarily to be sure that no illegality is happening within and around the reserve. This finding is in line with earlier finding which shows that the communities do monitor and police access to the forest reserve (Carter & Gronow, 2005). Also, in an empirical study by Ballabh et al. (2002), it was observed that community-based groups like watch dog committees, community protection groups, and youth groups do help in monitoring and protecting the forest. The study findings confirm this as it has been observed that the communities serve as a watchdog over the Nkrabia Forest Reserve.

Moreover, the role of the local communities in conserving the forest through the operation of the informal institutions has been well elaborated on. For instance, in a study by Osei-Tutu et al. (2015), it was revealed that the local communities' informal institutions like their taboos and cultural beliefs help to prevent the community members from going into the forest to collect forest resources on some specific days. This study, confirming the finding by Osei-Tutu et al. (2015), reveals that the traditional leaders also help to avoid the rate at which the community members enter the forest reserve by enforcing their belief systems like taboos where the people are prohibited from going to the forest on some specific days like Akwasidae, Awukudae, among others. Other scholars also earlier identified this key role of the local communities' informal institutions (Attuquayefio & Gyampoh, 2010; Tania et al., 2006).

The government has recognized the relevance of traditional knowledge in ensuring successful forest co-management. This confirms a provision in the 2012 Forest and Wildlife Policy that the policy is principled on integrating traditional and scientific knowledge to promote sustainable forest management. Moreover, Folke et al. (2005) intimated the roles of the community to encompass: knowledge and experience sharing. Corroborating this earlier finding is the finding in this study which indicates that the local people are knowledgeable about the forest as they know when the plants bear their seeds, the best time for the formation of seedlings, among other relevant indigenous knowledge. Folke et al. (2005), appreciating the rich indigenous knowledge of the local communities, recommend that indigenous knowledge be embedded in the forest governance system to help in strengthening the capacity to manage forests sustainably for the well-being of the people.

This study revealed that the private firm is obliged to observe all the rules in the logging manual. It was revealed in earlier research that the private sector is obliged to observe all laid down rules

pertaining to the conservation of the reserve as it operates in the reserve (Mayers & Vermeulen, 2002). When the private sector observes all the rules, it helps private firm to keep in operation without withdrawal of licence (Carter & Gronow, 2005; International Finance Corporation, 2006). The study finding above shows that as part of the responsibilities of the private sector, it is to observe all the rules in the contract agreement. This affirms the earlier finding espoused by Mayers and Vermeulen (2002). One other key responsibility or role of the private firm is that it must satisfy the Social Responsibility Agreement (SRA) with the fringe communities and this substantiates a report by MLNR (2016).

7.3.0 Prospects and Challenges of Co-management of the Nkrabia Forest Reserve

7.3.1 Prospects

Forest co-management has been observed to help in ensuring the conservation of the environment. This finding is in line with earlier studies which confirmed that one of the prospects of forest co-management is that it serves as a means of reaching efficacy in protecting biodiversity and ensuring conservation (Borrini-Feyerabend et al., 2000; Chinangwa, 2014). In another study by Ming'ate (2012) in Kenya, it was clearly observed that co-management of forest resources has the potential of reducing the poverty levels of the local communities.

In relation to the finding that forest co-management can make the forest a tourist attraction site, earlier studies indicated that forest co-management has a prospect of holding some benefits for sustainable tourism (Plummer & Fennell, 2009). Plummer and Fennell (2009) add that co-management of forest resources serves as alternative strategy for effective management of protected areas for tourist activities. This finding is affirmed by the finding of this study that forest co-management could result in tourism potentials for the community and the other actors.

Forest co-management has been marked for reduction in and resolution of cases of conflicts. In this case, conflicts about forest management and resource sharing are reduced. Earlier literature asserted that co-management leads to conflict reduction among actors. For instance, according to Zachrisson (2009), co-management is a class of management regime that embodies features which help to deal with conflicts among different actors. Beckley (1998) also reports that co-management serves as mechanisms to reduce conflict between stakeholders.

Another interesting finding of this study is that forest co-management could extend to reducing poverty in the fringe communities if it is done well. A similar finding was observed when Ullah et al. (2017) did a study on forest co-management. They observed that co-management of forest resources helps to boost up the income levels of forest fringe communities.

Moreover, the study revealed that forest co-management helps to create employment for the local populace. This finding is in line with the finding observed by Schwartzman and Zimmerman et al. (2005) that forest co-management could result in economic benefits for the local or fringe communities.

7.3.2 Challenges

One key challenge of forest co-management has to do with lack of logistics to help in monitoring. The Forestry Commission does not have enough logistics in the areas of motorbikes and pickups. This situation is so tormenting that at times when the fringe communities give tips on illegal felling of trees to the technical officer for instance, because of the problem of logistical constraint, the commission is not able to act quickly to go to the forest reserve and arrest the culprits. This study finding was earlier discovered by Ullah et al. (2017) who observed in their study that the co-

management of the forest was faced heavily with insufficient logistics. The insufficient logistics pose a great challenge to the smooth practice of the forest co-management exercise.

An attitudinal problem was one of the key challenges identified in the study. Some the members of the community, the private sector and even the chiefs act or attempt to act in a way contrary to the laws pertaining to the management of the reserve. This affirms earlier study which found that a problem arises where the co-management actors see the forest more as a zone for agricultural expansion than as a resource to be conserved (Brown, 1999). Similarly, it was found in earlier research by Beretti (2009) that a key challenge of co-management of forest resources is non-conformance of local/indigenous populations to forest protection laws. These attitudes of non-compliance have effect on the proper functioning of co-management and on the long-term sustainability of the forest reserve.

This study found out that the central government is reluctant to cede more power to the local people regarding the management of the forest reserve. This confirms earlier study which observed that responsibilities for management of resources are often transferred from the central government to local users without the transfer of the proportionate power and access to benefits (White & Martin, 2002).

Lack of personnel was also identified to be one of the major challenges of forest co-management. In an earlier study by Ullah et al. (2017) on forest co-management, it was observed that a key challenge of forest co-management is limited professional foresters within the local forestry. Their observation clearly shows that a key challenge of forest co-management is limited forestry staff that have large areas of the forest in their jurisdiction to oversee. This study finding succinctly confirms the observation made by Ullah et al. (2017) because the finding of the study shows that

the technical officers and the forest guards in charge of the various fringe communities are indeed limited and that makes their work very difficult. Osei Tutu et al. (2015) also observed in their study that the lack of enough forestry personnel was a contributory factor to the attitude of non-compliance concerning formal forest management rules.

7.4 Chapter Summary

This study aimed to find out the extent to which forest co-management is practised at the Nkrabia Forest Reserve and also to assess the entitlements and responsibilities of actors as well as the prospects and challenges of the co-management arrangement. The discussion of the study findings show that users of the reserve have been clearly defined and the geographical borders are defined in which case both the negative and positive externalities caused by users are internalized as observed by Cox et al. (2010). The sanctions that are meted to offenders of forest rules are based on the level of the severity to deter other offenders. The challenge with this however is that where the court delays the trial of cases it demoralizes people from whistle blowing and this has a net implication on compliance. Central Government does not generally permit the communities to establish their own institutions concerning the management of the reserve. The study concludes that the local communities are not often involved in setting up and changing operational rules governing the reserve, a situation that affects compliance and legitimacy of rules (Berkes, 2009; Stöhr, 2013). The study partially satisfies congruence between appropriation and provision rules and local conditions which has implication on the compliance level.

The Forestry Commission and the District Assembly are entitled to royalties equivalent to 50% and 24.74% respectively of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) administrative charge has been levied by the Administrator of Stool Lands. The fringe communities are also entitled to five percent (5%) of the total stumpage fees paid by the

timber firm operating in the reserve for development projects in the communities making the Forestry Commission the highest earner of the royalties. The communities also enjoy from the non-timber forest products. The Civil Society Organizations do receive donor support. The private market employs acceptable ways of protecting their own concession and enjoys protection from the community effort. The Forestry Commission is responsible for the regulation and the management of the utilization of forest resources. The local government makes bye-laws aimed at governing the forest reserve. The civil society organizations educate the citizens of the fringe communities on the protection of the forest such as in dry seasons, and fight for the interest of fringe communities whereas fringe communities help in monitoring the Forest reserve through the task force. Forest co-management can help to ensure ecological conservation; ensure that the reserve has ecotourism potential; results in conflict resolution, among others. The co-management of Nkrabia Forest Reserve has challenges that, among others, encompass: the lack of logistics; and attitudinal problems.

CHAPTER EIGHT

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

8.0 Introduction

This chapter presents the summary of the key findings of this study, conclusions and recommendations based on the data collected from the field. In this case, the summary is presented followed by the conclusion and recommendations.

8.1.0 Summary

This study probed into the realities, prospects and challenges of co-management of forest resources in Ghana using the Nkrabia Forest Reserve as a case study. The key objectives of this study were to find out the extent to which forest co-management is practised in Ghana; the entitlements and responsibilities of the co-management actors and the prospects and challenges faced in the co-management arrangement. The study was conducted through the interpretive research paradigm. It used a framework adapted from the Co-management Theory and the Common Pool Resource Theory which spelt out Ostrom's Design Principles to determine the extent to which co-management is practised in Ghana. Data were collected through in-depth interviews, Focus Group Discussions, direct observation and documentary review. In all, twenty-five (25) in-depth interviews and four (4) FGDs comprising eight (8) participants each were conducted in four forest fringe communities. Based on the World Bank (1999) stakeholder categorization, the co-management actors used in this study include: the Forestry Commission, the Local Government, the Civil Society Organization, the Forest Fringe Communities and the private sector organization. The summary of the findings gathered through interviews, focus group discussions and personal observation of the researcher has been provided thematically in this section.

8.1.1 The Extent to which the Nkrabia Forest Reserve is Co-managed

The study found that the Nkrabia Forest Reserve has clearly defined boundaries. Users particularly the local communities are aware of the area of the Reserve to be 100.20 square kilometres. The community members help the Forestry Commission officials in clearing the boundaries of the reserve. The co-management actors are well informed of the users of the reserve which include: the community members and the private market that have been given a permit to operate. The users are also aware of what they are allowed to pick from the forest and when to pick. The study observed that sanctions are meted to offenders of the forest rules but based on the severity of the offence. For instance in a situation where a potential culprit comes into the community, the traditional leaders ask them to leave the community to avoid future illegal practice or encroachment in the reserve. If somebody is seen entering the reserve with chain saw without a permit, the community, on the authority of the traditional leaders, can arrest the person, seize their chain saw and send him off the community or hand him over to the forestry officials.

However, in a situation where the culprit is caught in the act of logging, he is arrested by the community and is handed over to the technical officer who sends him to the District Manager (of the Forest District) for trial by the law court. The court then metes to the culprits appropriate sanctions based on the severity of the offence. The court sanctions are in the forms of confiscation of equipment and stolen forest products, fines, imprisonment, among others depending on the severity of the offence. However, delays in the trial processes sometimes result in dismissal of cases which partly discourages people from further blowing the whistle on illegal acts. This delay in legal process to a large extent undermines compliance of the forest rules and laws. It was also observed that the Reserve is organized in a nested enterprise where issues on the forest reserve are furthered upward as and when the need arises. However, the study observed that the Central

Government does not generally permit the communities to establish their own institutions concerning the management of the reserve. It was also observed that the local communities are not often involved in changing operational rules governing the reserve. The people only receive the instruction from the Forestry Commission, a situation that has implications on the compliance levels of the local forest users.

8.1.2 Entitlements and Responsibilities of Stakeholders

The study assessed the entitlements and the responsibilities enjoyed by the various stakeholders in the forest co-management arrangement. On the part of entitlements, it was observed that the Forestry Commission and the District Assembly are entitled to 50% and 24.74% respectively of the revenue from the Timber Utilization Contract (TUC) after ten percent (10%) administrative charge has been levied by the Administrator of Stool Lands. The fringe communities are also entitled to five percent (5%) of the total stumpage fees paid by the timber firm operating in the reserve for development projects in the communities. This makes the Forestry Commission enjoy the highest portion of the royalties. The communities also enjoy from the non-timber forest products like mushrooms, snails, rattan, among others which serve as a source of livelihoods. They also get employment seasonally. Civil society organizations do not enjoy from any direct entitlements. They only stand the chance of getting funding from their donors for researching and educating people on forest-related activities. This study further observed that the private sector is entitled to any proper and acceptable way of guarding the concession. The private sector also benefits from the fringe communities' effort of protecting the reserve. They also receive subsidized accommodation charges for their workers in the fringe communities.

On the aspect of responsibilities, the Forestry Commission is responsible for maintaining the ecological integrity of the reserve. The commission is responsible for the regulation and the

management of the utilization of forest resources. It also encourages the citizens and educates them to comply with the rules pertinent to the management of the reserve. The local government makes bye-laws aimed at governing the forest reserve. The local government plays some roles in the forest co-management arrangement. The roles/responsibilities of the local government were found to include the making of bye-laws aimed at governing the forest reserve. It was also found that through the preparation of the forest management plans, the local government makes provision for the management of the reserve in terms of resources to support the forestry commission and the other actors' effort. The local government sometimes constitutes task force to patrol the forest reserve and as well organize sensitization programs occasionally. It was however revealed that these functions were not satisfactorily performed. This was partly a result of *inter alia* lack of logistics.

Although the civil society organizations have not been given any defined roles in forest co-management, they play a key role in educating the citizens of the fringe communities on the protection of the forest such as in the dry seasons, fighting for the interest of fringe communities, among others. The fringe communities help in monitoring the Forest reserve through the community task force. They also protect the reserve with their traditions and also reveal information on illegalities to the Forestry Commission.

The private market also protects the reserve with their security personnel and also complies with the logging manual.

8.1.3 Prospects and Challenges in the Co-management Process

With the prospects, the study observed that forest co-management can help to ensure ecological conservation. In this case, it serves as a means of ensuring the protection and conservation of the

biodiversity. Proper forest co-management can make the forest a tourist attraction site. When the forest is well conserved, it could have tourism potential. In this case, people could visit the reserve for education and adventure for a fee. It was also observed that forest co-management has been marked for the reduction and resolution of conflict cases. This is because with co-management, many actors are involved and they enjoy the benefits as well. In this case, conflicts about forest management and resource sharing are reduced. The study further found that forest co-management could help to ensure poverty reduction within the fringe communities in a situation where more power is given to the communities. However, it was revealed that owing to the extent of disobedience of the laws, some level of pessimism was expressed. It came up that some people do not normally comply with the forest laws to ensure proper forest co-management.

In terms of challenges, the study identified logistical constraint as a key challenge. The lack of logistics on the part of the Forestry Commission and the community task force coupled with limited forestry staff make monitoring a key problem. It was also observed that the non-compliant attitudes of some of the local community members were a challenging factor. Delay in court actions and bribery are challenges to the co-management arrangement and this has implications for future compliance. The central government's refusal to cede more power to the local communities creates difficulty in the co-management exercise. This study found that weak dialogue among co-management actors continue to pose a challenge.

8.2 Conclusion

This study probed into the realities, prospects and challenges of co-management of forest resources in Ghana using the Nkrabia Forest Reserve as a case study. From the key findings and discussions, the following conclusions have been drawn:

With the first objective of finding out the extent of co-management, the Nkrabia Forest Reserve has clearly defined boundaries. Users of the reserve have been clearly defined and the geographical borders have also been well defined and are known to the reserve users. This has the implication of internalizing both the negative and positive externalities caused by users (Cox et al., 2010). Sanctions to offenders of forest rules are based on the severity of the offence to deter others. However, where the court delays the trial of cases, it discourages further whistle blowing and this has a net implication on compliance. The Nkrabia Forest Reserve is organized in a nested enterprise where issues on the forest reserve are furthered to the next level of the hierarchy as and when the need arises. Local communities are not often involved in the formulation and amendment of operational rules governing the reserve, a situation that affects compliance and legitimacy of rules. The study partially satisfies congruence between appropriation and provision rules and local conditions which has implication for the compliance level. This study therefore concludes that the Nkrabia Forest Reserve partially meets Ostrom (1990) Design Principles and that is responsible for the low level of compliance of rules and legitimacy problem.

Also, it is key to note that the Common Pool Resource Theory advances that Graduated Sanctions leads to Compliance of forest rules. However this study has revealed that it is the timely trial (sanction) of forestry cases (offences) that can ensure compliance of forest rules and not necessarily the sanction of offences. This is established in the situation where the principle of graduated sanctions was met in the study yet owing to delays in court trials, there was non-compliance of forest rules as delays in such trials discouraged further whistle blowing, causing illegal practices to persist.

Concerning entitlement, the study found that the Forestry Commission and the District Assembly are entitled to royalties. The fringe communities are also entitled to five percent (5%) of the total stumpage fees paid by the timber firm operating in the reserve for development projects in the communities. The communities also enjoy from the non-timber forest products which serve as source of basic livelihoods. It is concluded that Civil Society Organizations do not enjoy from any direct entitlements, rather they benefit from donor support. The private market employs acceptable ways of protecting their own concession and enjoys protection from the community effort.

Touching on responsibilities, the study concludes that the Forestry Commission is responsible for the regulation and the management of the utilization of forest resources. The local government makes bye-laws aimed at governing the forest reserve. The civil society organizations educate the citizens of the fringe communities on the protection of the forest especially in the dry season, and fight for their interests as well while the fringe communities help to monitor the forest reserve through the task force. The private timber firm is obliged to observe the regulations in the logging manual and also to honour the Social Responsibility Agreement.

With the prospects, the study found that forest co-management can help to ensure ecological conservation; has an ecotourism potential for the reserve where people can go for education and adventure for a fee; is an effective means for conflict resolution; and has the potential of reducing poverty among local populations.

The co-management of Nkrabia Forest Reserve has challenges: the lack of logistics for the Forestry Commission and the community task force coupled with limited forestry staff make monitoring a key problem; attitudinal problems of some actors; delay in court trials; central government's refusal to cede power and weak dialogue among actors.

8.3 Implications of the Study

This study aimed to probe into the extent to which forest co-management is practised by the Nkrabia Forest Reserve and also to assess the entitlements and responsibilities of actors and to find out the prospects and challenges in the forest co-management arrangement. Ostrom's (1990) Design Principles served as the standard for assessing the extent of co-management. Scholars like Wily (2002) indicated that the coming decades would witness more engagement of communities, NGOs and other actors in their management. This study found the involvement of actors like the private sector, the non-governmental organization and the local communities but their roles in the co-management arrangement were somewhat limited, not manifesting the assertion. The Nkrabia Forest Reserve is yet to see deeper engagement of such actors. The local communities that appeared to be most involved were not permitted to act in certain key forest management decisions. The finding of this study to some extent affirms that by Ming'ate et al. (2014) which is that some cases of forest co-management do not fully meet Ostrom's Design Principles for proper co-management notably because of central government control. This study found out that Wily's (2002) argument of seeing more engagement of other actors in forest co-management is yet to fully be realized. The study has also pointed out the various entitlements and responsibilities of actors as well as prospects and the challenges that go with forest co-management. This study informs stakeholders of forest co-management of how far co-management has been practised in Ghana and what could be done next. It has also proposed a framework that could help assess proper forest co-management arrangement.

8.4 Recommendations

From a close look at the findings of this study, the following recommendations are suggested for effective forest co-management:

There should be intensive education of the co-management actors on the importance of the forest and the need to collectively work to manage it. This will make them appreciate why each of them needs to go by the rules pertaining to its management and to eschew any act of jeopardy.

Local communities should be trained on alternative livelihoods and supported with soft loans to start up small businesses. In this case, they can survive on such alternatives and depend less on the forest resources to avoid encroachment.

The government should consider making monitoring more effective by deploying more forestry commission officials and security personnel like soldiers and policemen to patrol the forest reserve.

The local government or the district assembly can negotiate with the magistrate court to dedicate special sessions to expedite forestry cases. With effective and efficient justice delivery, citizens can have confidence in the legal system, which will motivate them to report more of such cases to the court. Punishment should be deterrent enough to discourage others from contravening the forestry laws. In like manner, officials who accept bribes should be dealt with when caught. These will serve as deterrent to others.

To deal with the timber firm's attitude of non-compliance, the Forestry Commission should be strict and firm enough to prosecute it when it goes contrary to the logging manual just as has been suggested for defaulters like illegal loggers and miners in the reserve.

The government should consider giving items like wellington boots, rain coats and other protective items to the members of the community who voluntarily watch over the reserve. This will give them the morale and courage to do a better job.

On the part of inadequate personnel, the Forestry Commission should train and recruit more forestry staff particularly technical officers and forest guards to lessen the burden on the current personnel and to ensure effective monitoring of the reserve.

There should be more devolution of power from the forestry commission to the communities so that the local communities can feel the ownership of the forest reserve and be more committed to its management. Bottom-up approach to decision making should be encouraged over top-down approach as that deepens ownership and active participation of the local people.

The Forestry Commission should actively involve the local communities in amending the operational rules governing the Nkrabia Forest Reserve. This will make them fully accept the rules and willingly comply with them as well.

8.4 Recommendation for Future Studies

Future studies could employ quantitative methods in finding out the extent of forest co-management using Ostrom's (1990) Design Principles and also by same quantitative methods probe into the key challenges involved in forest co-management.

Future studies could consider the extent of forest co-management with the application of Ostrom's Design Principles using a community-owned forest resource as a case study.

Further studies could also consider how forest co-management impacts on the employment opportunities of the fringe communities.

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APPENDICES

APPENDIX A: INTERVIEW GUIDE FOR FORESTRY COMMISSION OFFICIALS

UNIVERSITY OF GHANA Interview Guide

*This Interview Guide is from a student pursuing an MPhil in Public Administration at the University of Ghana Business School. It is meant to collect data to complete a study on the topic: **Co-managing Forest Resources in Ghana: The Realities, Prospects and Challenges**. Kindly assist by responding to these questions. All information provided will strictly be used for research purposes. Thank you.*

Section A: Biodata

- i. Please, what is your position at the Commission?
- ii. How long have you served in this capacity?

Section B: The Extent to which the Asante Bekwai Forest Reserve is Co-managed

Clearly defined boundaries of the Common Pool Resource and the individuals (or households)

1. Please which people are officially entitled to use the Forest Reserve?
2. Who are the members of the community that are involved in the governance process of this environmental resource?
3. To what extent do legislative instruments recognize the traditional institutions or informal institutions here?
4. What is the regulatory framework or provision that sets up this arrangement and to what extent are these individuals recognized in the governance process?
5. How are power and responsibility shared among these actors and how often is this power relation revised?

Congruence between appropriation and provision rules and the local conditions

6. Please, what are the appropriation and provision rules available for adherence by the forest reserve users?
7. How are the formal appropriation and provision rules effectively enforced? Who are the actors in the enforcement process?

8. Explain how such rules deviate from or conform to the current conditions of the local communities.

Collective choice arrangements

9. What type of the management decisions do you involve the other actors in?

Monitors are accountable or are the appropriators

10. Which category of people serve as the monitors and who do the monitors account to?

Graduated sanctions by other appropriators, by officials accountable to these appropriators or both

11. What forms of sanctions are given to offenders of the rules?

Conflict resolution mechanisms

12. Kindly spell out the conflict resolution mechanisms that have been put in place.

Minimal recognition of rights to organize

13. To what extent does the central government permit local communities to establish your own institutions?
14. How well do you envisage further tighter collaboration between the government agencies, the traditional institutions and community in the short to medium term?

Nested enterprises for Common Pool Resources that are part of larger systems

15. What larger institution does the forest reserve form part of and collaborate with?

Section C: Entitlements and responsibilities of stakeholders involved in co-managing the Asante Bekwai Forest Reserve.

16. What are some of the benefits the central government enjoys and those that it extends to the other actors of the co-management of the forest reserve?
17. Kindly explain some of the responsibilities/roles of the central government and of the other actors involved in co-managing the reserve.

SECTION D: Prospects and Challenges in the Co-management Process of Asante Bekwai Forest Reserve

18. In your view, what are the prospects that could be reaped from the co-management arrangements?

19. With your experience, what challenges do you encounter with the co-management of the reserve?

APPENDIX B: INTERVIEW GUIDE FOR LOCAL GOVERNMENT RESPONDENTS

UNIVERSITY OF GHANA

Interview Guide

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Section A: Biodata

- iii. Please what is your current position in this District?
- iv. How long have you served in this capacity?

Section B: *The Extent to which the Asante Bekwai Forest Reserve is Co-managed*

Clearly defined boundaries of the Common Pool Resource and the individuals (or households)

1. Please which people in the community are officially entitled to use the Forest Reserve?
2. Who are the members of the community that are involved in the governance process of this environmental resource?
3. How is power and responsibility shared among these actors?

Congruence between appropriation and provision rules and the local conditions

4. What are the appropriation and provision rules available for adherence by the forest reserve users?
5. How the appropriation and provision rules on restrictions and access are effectively enforced? Who are the actors in the enforcement process?
6. Please explain how such rules deviate from or conform to the current conditions of the local communities.

Collective choice arrangements

7. What type of management decisions are you involved in?

Monitors are accountable or are the appropriators

8. Which categories of people serve as the monitors and who do the monitors account to?

Graduated sanctions by other appropriators, by officials accountable to these appropriators or both

9. What forms of sanctions are given to offenders of the rules?

Conflict resolution mechanisms

10. Kindly spell out the conflict resolution mechanisms that are in place.

Minimal recognition of rights to organize

11. To what extent does the central government permit local communities to establish their own institutions?
12. How well do you envisage further tighter collaboration between the government agencies, the traditional institutions and community in the short to medium term?

Nested enterprises for Common Pool Resources that are part of larger systems

13. What larger institutions does the forest reserve form part of and collaborate with?
14. To what extent would you say this resource is managed by both the state agencies and the community?

Section C: Entitlements and responsibilities of stakeholders involved in co-managing the Asante Bekwai Forest Reserve.

15. What are some of the benefits that the local government enjoys as an actor of the co-management of the forest reserve?
16. Kindly explain some of your responsibilities/roles in co-managing the reserve.

Section D: Prospects and Challenges in the Co-management Process of Asante Bekwai Forest Reserve

17. In your view, what are the prospects that could be reaped from the co-management arrangements?

18. With your experience, what challenges do you encounter with the co-management of the reserve?

APPENDIX C: INTERVIEW GUIDE FOR CIVIL SOCIETY ORGANIZATIONS

UNIVERSITY OF GHANA

Interview Guide

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Section A: Biodata

- v. Please what is your current position in this organization?
- vi. How long have you served in this capacity?

Section B: *The Extent to which the Asante Bekwai Forest Reserve is Co-managed*

Clearly defined boundaries of the Common Pool Resource and the individuals (or households)

1. Please which people in the community are officially entitled to use the Forest Reserve?
2. Who are the stakeholders that are involved in the governance process of this environmental resource?
3. How is power and responsibility shared among these actors?

Congruence between appropriation and provision rules and the local conditions

4. What are the appropriation and provision rules available for adherence by the forest reserve users?
5. How are the formal appropriation and provision rules effectively enforced? Who are the actors in the enforcement process?
6. Explain how such rules deviate from or conform to the current conditions of the local communities.

Collective choice arrangements

7. What type of the management decisions are you involved?

Monitors are accountable or are the appropriators

8. Which categories of people serve as the monitors? Who do the monitors account to?

Graduated sanctions by other appropriators, by officials accountable to these appropriators or both

9. What forms of sanctions are given to offenders of the rules?

Conflict resolution mechanisms

10. Kindly spell out the conflict resolution mechanisms that are in place.

Minimal recognition of rights to organize

11. To what extent does the central government permit local communities to establish their own institutions?
12. How well do you envisage further tighter collaboration between the government agencies, the traditional institutions and community in the short to medium term?

Nested enterprises for Common Pool Resources that are part of larger systems

13. To what extent would you say this resource is managed by both the state agencies, the community, the private sector and non-governmental organizations?

Section C: Entitlements and responsibilities of stakeholders involved in co-managing the Asante Bekwai Forest Reserve.

14. What are some of the entitlements and benefits your organization enjoys as an actor of the co-management of the forest reserve?
15. Kindly explain some of your responsibilities/roles of your organization in co-managing the reserve.

Section D: Prospects and Challenges in the Co-management Process of Asante Bekwai Forest Reserve

16. In your view, what are the prospects that could be reaped from the co-management arrangements?

17. With your experience, what challenges do you encounter with the co-management of the reserve?

APPENDIX D: INTERVIEW GUIDE FOR FRINGE COMMUNITIES

UNIVERSITY OF GHANA

Interview Guide

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Section A: Biodata

- vii. Please, what is your status in relation to co-managing the forest reserve?
- viii. How long have you served in that capacity?

Section B: The Extent to which the Asante Bekwai Forest Reserve is Co-managed

Clearly defined boundaries of the Common Pool Resource and the individuals (or households)

1. Please which people in the community are officially entitled to use the Forest Reserve?
2. Who are the members of the community that are involved in the governance process of this environmental resource?
3. To what extent do legislative instruments recognize the traditional institutions or informal institutions here?
4. What is the regulatory framework or provision that sets up this arrangement and to what extent are these individuals recognized in the governance process?
5. How is power and responsibility shared among these actors?

Congruence between appropriation and provision rules and the local conditions

6. Please, what are the appropriation and provision rules available for adherence by the forest reserve users?
7. How are the formal appropriation and provision rules effectively enforced? Who are the actors in the enforcement process?

8. Explain how such rules deviate from or conform to the current conditions of the local communities.

Collective choice arrangements

9. What type of the management decisions are you involved in?

Monitors are accountable or are the appropriators

10. Which categories of people serve as the monitors and who do the monitors account to?

Graduated sanctions by other appropriators, by officials accountable to these appropriators or both

11. What forms of sanctions are given to offenders of the rules?

Conflict resolution mechanisms

12. Kindly spell out the conflict resolution mechanisms that are in place.

Minimal recognition of rights to organize

13. To what extent does the central government permit local communities to establish your own institutions?
14. How well do you envisage further tighter collaboration between the government agencies, the traditional institutions and community in the short to medium term?

Nested enterprises for Common Pool Resources that are part of larger systems

15. What larger institutions does the forest reserve form part of and collaborate with?

Section C: Entitlements and responsibilities of stakeholders involved in co-managing the Asante Bekwai Forest Reserve.

16. What are some of the benefits the community enjoys as an actor of the co-management of the forest reserve?
17. Kindly explain some of your responsibilities/roles in co-managing the reserve.

Section D: Prospects and Challenges in the Co-management Process of Asante Bekwai Forest Reserve

18. In your view, what are the prospects that could be reaped from the co-management arrangements?
19. With your experience, what challenges do you encounter with the co-management of the reserve?

APPENDIX E: INTERVIEW GUIDE FOR THE PRIVATE COMMERCIAL SECTOR

UNIVERSITY OF GHANA

Interview Guide

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Section A: Biodata

- ix. Please what is your current position in this firm?
- x. How long have you served in this capacity?

Section B: The Extent to which the Asante Bekwai Forest Reserve is Co-managed

Clearly defined boundaries of the Common Pool Resource and the individuals (or households)

1. Please which people in the community are officially entitled to use the Forest Reserve?
2. Who are the stakeholders that are involved in the governance process of this environmental resource?
3. How is power and responsibility shared among these actors?

Congruence between appropriation and provision rules and the local conditions

4. Please, what are the appropriation and provision rules available for adherence by the forest reserve users?
5. How are these appropriation and provision rules effectively enforced? Who are the actors in the enforcement process?
6. Please explain how such rules deviate from or conform to the current conditions of the local communities.

Collective choice arrangements

7. What type of the management decisions are you involved in?

Monitors are accountable or are the appropriators

8. Which categories of people serve as the monitors and who do the monitors account to?

Graduated sanctions by other appropriators, by officials accountable to these appropriators or both

9. What forms of sanctions are given to offenders of the rules?

Nested enterprises for Common Pool Resources that are part of larger systems

10. What larger institution does the forest reserve form part of and collaborate with?

Section C: Entitlements and responsibilities of stakeholders involved in co-managing the Asante Bekwai Forest Reserve.

11. What are some of the entitlements and benefits your organization enjoys as an actor of the co-management of the forest reserve?
12. Kindly explain some of the responsibilities/roles of your organization in co-managing the reserve.

Section D: Prospects and Challenges in the Co-management Process of Asante Bekwai Forest Reserve

13. In your view, what are the prospects that could be reaped from the co-management arrangements?
14. With your experience, what challenges do you encounter with the co-management of the reserve?