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COMMUNITY-BASED GOVERNANCE ARRANGEMENTS FOR CHARCOAL PRODUCTION IN THE ATEBUBU-AMANTIN DISTRICT

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF PHILOSOPHY IN NATURAL RESOURCE AND ENVIRONMENTAL GOVERNANCE

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DECLARATION

I hereby declare that this submission as Master of Philosophy (MPhil) Degree thesis is the result of my own investigation and that to the best of my knowledge contains no material previously published by another person nor material which has been accepted for the award of any degree except where due acknowledgement has been made.

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ABSTRACT

With its enormous contribution to national development, the charcoal sub-sector in Ghana remains largely informal with community-based governance arrangements (CBGA) regulating key aspects including access to trees for production. Recently however, governments' effort targets formalising the sub-sector for sustainability. As evidence suggests, this imperils CBGAs with implications on locals' access to wood resources, local economy and livelihoods as well as relationship between state and informal governance structures. This study examined the evolution and effectiveness of CBGAs for sustainable charcoal production in Ghana. Together with documents review, fieldwork was undertaken from February to June 2017 in the Atebubu-Amantin District. Information was solicited from 75 charcoal producers using questionnaires, focus group discussions and PRA techniques coupled with information gathering from traditional authorities and sub-sector regulatory institutions. Findings are that, charcoal producers adhere to the community-based governance arrangements in their charcoal related activities though the exact date for its institution remains unknown. Consolidation of traditional authority and the need to benefit from commercial charcoal production were some reasons for initiation of the arrangements. The arrangements are dynamic with changes mainly driven by national directives, emergence of conflict situations, exposure to practices elsewhere among others. High adherence/compliance, less bureaucracy and flexibility are typical strengths of the arrangements. On the contrary, lack of recognition for the arrangements by state institutions, poor accountability and cultural differences constrain the arrangements, leaving stakeholders with some level of uncertainty on its effectiveness towards achieving sustainable charcoal production. To address this, sector institutions should consider and align informal arrangements with national development strategies and management priorities as well as interventions targeting sustainable charcoal value chain.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PLATES

ABBREVIATIONS

CBGA	Community-Based Governance Arrangements
CBNRM	Community-Based Natural Resource Management
CCC	Charcoal Conveyance Certificate
CFA	Community Forest Association
CFUG	Community Forest User Group
CPR	Common Pool Resources
CREMA	Community Resource Management Area
CRMC	Community Resource Management Committee
CSOs	Civil Society Organisations
DA	District Assembly
EC	Energy Commission
EPA	Environmental Protection Agency
FC	Forestry Commission
FGD	Focus Group Discussion
FPDF	Forest Plantation Development Fund
FSD	Forest Services Division
GNFS	Ghana National Fire Service
GSS	Ghana Statistical Service
IEA	International Energy Agency
IIED	International Institute for Environmental and Development
IUCN	International Union for the Conservation of Nature
KCC	Kisakasaka Conservation Committee
MEA	Millennium Ecosystem Assessment
MESTI	Ministry of Environment, Science, Technology and Innovation
MLNR	Ministry of Lands and Natural Resources
MOF	Ministry of Finance
MoFA	Ministry of Food and Agriculture
NAMA	Nationally Appropriate Mitigated Actions
NGO	Non-Governmental Organisation
REDD+	Reducing Emissions from Deforestation and Degradation

S4ALL	Sustainable Energy for All Action Plan
SDG	Sustainable Development Goals
TA	Traditional Authority
TBI	Tropenbos International
UNDP	United Nations Development Programme
WD	Wildlife Division

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Charcoal production constitutes an integral energy source and a major livelihood component in most developing countries especially those with wood resources suitable for its production (Zulu & Richardson, 2013). Wood fuels (firewood and charcoal) serve the domestic energy needs of about half of the world's population and about 81% of sub-Saharan African households (World Bank, 2011). This means, more than two billion people in developing countries rely on biomass energy to meet their cooking and heating needs (MEA, 2005).

In Ghana, more than 66% of households depend on charcoal for their domestic energy needs (Energy Commission, 2014). Besides energy needs, the charcoal sub-sector forms a key livelihood base for several rural households, providing more than 400,000 direct and indirect jobs (Energy Commission, 2006). For such households, charcoal is second most important source of income after crops, and subsequently serves as a gap-filler during seasonal income shortfalls and a major mitigation option for economic shocks (Brobbey *et al.,* 2019). Further, it forms an integral component of local government revenue especially in areas where production and trade occur (Brobbey *et al.,* 2015) and remains an important source of revenue for the Forest Services Division (FSD) (MOF, 2014).

Despite these contributions to national development, the charcoal sub-sector remains poorly regulated (Sawe, 2012). Currently, state institutions (Energy Commission [EC], Forestry Commission [FC]) and local government authorities have become adept bricoleurs, trying to fill the gaps in formal charcoal governance by exerting some sort of control on the actions of actors along the production and transportation nodes of the charcoal commodity chain (Brobbey *et al.,* 2015). However, their actions are principally focused on revenue generation to the neglect of other aspects especially production, which is very important to its sustainability (Zulu, 2010).

Within this scene and originating from the fact that local communities in tropical Africa have a long tradition of managing their lands and associated resources (Roe *et al.,* 2009), community-based governance arrangements (CBGA) exist for managing

charcoal (Schure, *et al.*, 2013). Initially, such governance arrangements were imposed by local chiefs with or without consent of the people subject to it (Owusu *et al*., 2014). In recent years however, the decision-making processes under such arrangements have become more inclusive and participatory, though final authority and enforcement rest with the community head, i.e. chiefs. Under these arrangements, the chief and stakeholders in a defined geographic area institute local rules rooted in customary laws to regulate the activities of charcoal production. There are procedures guiding access to wood resources and regulations for undertaking charcoal production with which sanctions apply for defaulters. Such arrangements are prevalent in charcoal producing communities where customary system vests lands in chiefs/stools or skin, though they differ from one community to the other. It is through these arrangements that local stakeholders have managed charcoal production to secure livelihoods over the past decades (Schure *et al.*, 2015).

Against this, there are speculations that CBGAs for charcoal production do not promote sustainable resource (wood) use in Ghana, therefore a call for rigorous formal state control (Neufeldt *et al.*, 2015; Schure *et al.*, 2015). However, national level regulation of charcoal which mostly functions in the form of national bans or at best complex rules and regulations poses eminent threat to the existence and functioning of community-based charcoal governance arrangements (Espaldon *et al*, 2016). Moreover, experiences of national level regulation for charcoal production from other countries such as Kenya and Gambia (Girard, 2002; Mwampamba *et al*., 2013) and some sectors in Ghana, notably timber and minerals suggest that, national level regulations have not always worked. Lack of logistical and human resources to police resources (Asamoah and Osei-Kojo, 2016) and corruption (Teschner, 2012) are but a few of the reasons why national level regulations continue to fail, leading to increased illegality and less sustainability. Uncertainty therefore surrounds the effects of such displacement as there may be livelihood insecurity and conflicts between customary and state institutions which will exacerbate challenges in governance and management of the sub-sector.

Interestingly, community-based governance of resources has been proven in other contexts to secure resource rights, increase investment in sustainable wood fuel production and guarantee inclusive development (Fabricius, *et al.*, 2013). This then raises questions about the nature of the current approach to community governance for charcoal production in Ghana and what needs to change to make them effective. This

study addresses these questions with insights from Atebubu-Amantin, one of the largest charcoal production areas in Ghana.

1.2 Problem Statement

Considering the need in meeting future demand for charcoal which is projected to increase (Broadhead *et. al.* 2001; IEA, 2006; EC, 2010), current production under local governance arrangements is keenly contested and often tagged as unsustainable (UNDP, 2014). It has been argued that charcoal production practices contribute to deforestation, and therefore provide no assurance of sustainability (MLNR, 2010). This is premised on the believe that charcoal production under existing governance arrangements add more pressure to the already depleted resource base (Haile *et al.*, 2009; Boafo, 2013).

With attempts to rationalise the sub-sector, not many studies exist on the nature of CBGAs on charcoal production in Ghana; leaving actors partly informed on best governance arrangements that ensures sustainable charcoal production. Worth noting is that, community and family resource management examples from Nepal and Canada respectively suggests that, with the right mechanisms, community-based governance arrangements for charcoal production can lead to sustainable resource use and management. Apart from these, successful community governance and management of natural resources in other countries reveal that, stakeholders' participation in community-based governance arrangements for sustainable charcoal production is only possible when they are resilient and adaptive to changes that ensure maximum benefits to all.

1.3 Justification of the Study

Many stakeholders with different interest are involved in community-based governance arrangements for charcoal production within a dynamic environment. These community specific governance arrangements have guided charcoal production for decades with little or no information on their nature, how they regulate charcoal production and how they have been maintained to date. It is therefore imperative to scrutinise existing community-based governance arrangements to see how they have evolved including challenges to their operation and suggestions for making them more effective.

Equally important is the general need to provide empirical information on performance of existing community-based governance arrangements and its effects on charcoal production. This will provide valuable information on the key features and practices of arrangements. Among other things, results of this study will serve as basis for reforming and instituting more attractive charcoal governance models that improve benefits to all stakeholders.

1.4 Aim and Objectives

The study examined the effectiveness of community-based governance arrangements for charcoal production and describes how they have evolved overtime. Specifically, the study sought to:

1. Assess how community-based charcoal governance arrangements in the Atebubu-Amantin District have evolved over time and the factors driving those changes.

2. Assess stakeholders' perceptions on the effectiveness of the existing arrangements in promoting sustainable charcoal production.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Governance and management of wood resources in Ghana

2.1.1 Context

Few things matter as much in Africans' lives than natural resources as majority of their livelihoods are based on them (Nelson, 2010). However, natural resources are not only important to African communities, but also to various government institutions and the private sector - domestic as well as international. More importantly, resource users are often heterogeneous entities characterized by different interests. As such, resource use is affected by these different and often conflicting interests in combination with institutional histories all together shaping how resources are governed and used.

Ghana is one of the African countries with a rich forest resource base. Unlike many other African countries however, the forest is depleting at high rates with the most common culprits being illegal miners, slash and burn farmers, illegal timber loggers and charcoal producers (Appiah *et al.,* 2009). According to the FC, firewood and charcoal production constitute the second largest cause of deforestation (MLNR, 2012). The depleting resource base is not the only important aspect for the consequences it is thought to have on charcoal production, but also regarding the existing governance arrangements including land ownership. Farms and fallow lands from where charcoal is mostly produced is normally under the customary land tenure system as stool lands, with chiefs as custodians given them so sort of ownership rights (Amanor, 2010). As such, chiefs are in many cases the focal regulators in terms of right and access to tree resources for charcoal production acknowledging that the subsector remains poorly regulated formally. Consequently, localised governance arrangements are reported in several communities including bans on use of certain tree species imposed by chiefs under the reasoning of protecting the environment (Amanor & Brown, 2003). There are also cases of adhering to traditional procedures e.g. payment of token to chiefs in accessing tree resources for charcoal production (Brobbey *et.al*, 2015). This exemplifies the heterogeneity of communities as traditional authorities due to their entitlement to land are in a far more powerful position in resource use and management (Amanor, 2009a; Berry, 2013).

In general, community governance is not a new thing within Ghana, but in 2014 a further step was taken when the Wildlife Resources Management Bill was promulgated defining Community Resource Management Areas (CREMA) as legal entities. Within the charcoal sub-sector, informal governance arrangements exist in Ghana but are yet to be instituted. An overview of the identified ones is presented in this review alongside experiences from other countries.

2.1.2 Historical overview of community-based governance arrangements

Governance and management of natural resources by local communities instituted through collective agreements to the benefit of locals broadly describes community based natural resource management (CBNRM) systems (Pailler *et al.*, 2015). Such systems take many forms depending on the uses and benefits that people derive under diverse socio-political and bio-physical contexts.

Manifesting in the form of collective governance, community-based governance arrangements for charcoal production couched under customary practice hints of its long history in Ghana. Such arrangements entrusted chiefs with much powers, making them custodians with final authority over community resources especially before colonial rule. This assertion is typical in Ghana where allodial title being the highest title to land as recognized by law are in many cases vested in stools or skins (Amanor, 2010). In practice, where even family heads control lands, they remain loyal and accountable by paying homage to their chiefs signifying the overall line of authority in resource governance and use (Fisiy, 1995). As custodians of community resources and with authority, chiefs manage resources in a way that inure to the benefit of all subjects (Bwalya, 2002). This culminated in long-established traditional standards guiding the use and management of resources within a locale.

However, during the scramble for Africa in the quest of extending European political control, natural resource management procedures propagated by the colonial powers were integral to instituting their authority in African landscapes (Neumann, 2002). In effect, the 18th and the 19th centuries conservation and management practices were affront to, and disregard for traditional rights (Colchester, 1994). Authority was thus transferred to the state domain to facilitate exploitation of resources by colonial masters (Kumeh, 2017). Not deviating from the colonial legacy however, African countries including Ghana after independence in the 1950s assumed imitative colonial political structures based on centralized control and exploitation (Mamdani, 2018). This waned

the authority of local governance structures or locals right over natural resources as state systems (constitutional rule) replaced local control and authority over resources (Van de Walle, 2001).

In effect, natural resource governance and management adopted command and control, expert driven as well economically motivated approaches to the neglect of local governance initiatives and indigenous knowledge. As evidence suggest, these approaches however have marked failures in most countries especially in Africa, therefore opting for a more decentralised resource governance that embraces local participation. This has paved way for traditional authorities and their communities to maintain some level of control and management right over land and associated resources.

The role of local communities is specifically emphasized, as local participation in resource management is paramount (Pokharel *et al.*, 2007) in respect of the realization that, natural resources (trees) cannot be managed without cooperation of local communities (Shrestha, 1996). Their involvement is premised on the understanding that sustainable management of natural resources is most likely where local users can manage and extract benefits from the resources (Nelson & Agrawal, 2008). Again, it is believed that the people closest to the natural resources have better knowledge on how to manage them and have more incentives to do so sustainably (Nunan, 2006). Notwithstanding these positives, uncertainty surrounds the effectiveness of community-based governance arrangements towards achieving sustainable charcoal production in space and time. Yet, evolution has become a buzzword which without proper definition is easily devoid of meaning. As such, for purposes of clarification, this study defines evolution of community-based governance arrangements focusing on how social interactions, especially among people with collective interest arise, change and are maintained. To further narrow the scope, this study specifically focuses on evolution of the governance arrangements under which charcoal is produced by looking at typical aspects of the arrangements in its earliest simple form to its current multifaceted and highly specialised form.

2.1.3 Charcoal governance in Ghana

Despite the contribution of charcoal to Ghana's development as well as its perceived negative consequences, the sub-sector remains poorly regulated (Sawe, 2012).

Structurally, no sector ministry or its subsidiary bodies takes full responsibility for charcoal i.e. production, transportation and consumption. The EC has the mandate of providing regulations and licensing to person(s) or institution(s) undertaking any commercial activity in the renewable energy industry including charcoal. The FC has the mandate of managing tree resources including extraction for charcoal production. Local government authorities i.e., district assemblies especially in major charcoal producing areas also regulate charcoal production through the enactment of bye-laws.

Aside these institutional mandates, the country under its various development initiatives and policy frameworks have strategic actions targeting sustainable energy supply including charcoal. To ensure that such policy actions are well coordinated in a more recent development, the Environmental Protection Agency (EPA) under the Ministry of Environment, Science, Technology and Innovation (MESTI) through the Nationally Appropriate Mitigation Actions (NAMA) have roadmap actions to develop sustainable charcoal value chain. These actions have been aligned with policy goals in energy, forestry, agriculture, transport and environment. Other strategic documents that were considered in the roadmap actions included the Sustainable Development Goals (SDGs), National Energy Policy, Draft Bioenergy Policy, Ghana Forest and Wildlife Policy, Ghana National Climate Change Policy, National Environment Policy, National Forest Plantation Development Programme, Bamboo and Rattan Development Programme, Bamboo as Sustainable Biomass Energy, Ghana Sustainable Energy for All (SE4ALL) Action Plan, etc.

The absence of clearly defined institutional mandate, coupled with poor inter sectorial coordination has resulted in a scenario, where the source material i.e. tree and the final product i.e. charcoal is respectively regulated by the FC and EC.

From this governance gap, the actual production of charcoal is still untouched with informal regulations and customary rights playing central role. In effect, traditional authorities (chiefs) under the pretext of renting out land to charcoal producers grant them access to extract tree resources for charcoal production (Brobbey, *et al.* 2015). Reasoning from this, it is inevitable to include the land tenure systems in place when examining natural resource governance systems in Ghana as it serves a major means to have control and access to other resources.

2.1.3.1 Customary land tenure system in Ghana

About 61 % of Ghana's land cover is a divided between different tenure systems, a large part under stool lands. This implies that communities have entrusted chiefs with the authority over the land, and chiefs in return promise to represent the community's interests (Biitir & Nara, 2015). Generally, two major distinctions can be made: i) the family tenure system using rotational bush-fallowing system where cleared land is claimed by family; and ii) the communal system where farmers rather move around and cultivate regenerated areas, i.e. farmers can farm land as long as it is not used by others (Amanor, 2009a). On usufruct rights, different systems exist depending on whether you are a native or a migrant and where locals freely can use the land, migrants are forced to pay rents, either monetary or parts of their yield. Furthermore, chiefs respond to the state where a beneficiary partnership has been established with the state acknowledging chief's rights over natural resources (Amanor, 2009a).

Generally, the customary system and its consequences for individual and community land rights are widely debated as it is on one hand seen as system that ensures equal land distribution in the favour of marginalised groups. On the other hand, it is criticised for providing the chiefs with immense control leaving the communities with few decision-making possibilities, and in turn few rights over their land (Amanor, 2009a; Amanor & Brown, 2003; Schoneveld *et al.*, 2014). It is from the latter point of view that community governance arrangements are suggested as a solution; securing the rights of charcoal producers (Owusu *et al.*, 2014).

2.2 Community governance

As acknowledged, the customary tenure system is viewed as an example of community governance. However, before discussing other community governance systems further and providing examples of their presence in Ghana and within charcoal production, a short theoretical outline to the concept is provided.

2.2.1 Theoretical perspectives on community governance

Community governance of natural resources is strongly associated with theoretical concepts of self-organisation and collective action. These concepts contrast with centralised control of common resources emphasising that, communities cannot effectively govern resources they depend on, as humans are driven by self-interest

(Hardin, 1968). This view has been widely debated, including Ostrom (1999; 2009), explaining why resource users are in fact the best to govern their own resources and under which circumstances this can best be obtained. She was of the view that, solutions to policy problems do not have to be centralised. Individuals can organise themselves to generate collective outcomes and that, they do not always need governmental intervention to realise their intent. Ostrom conceptualised the notion of self-organisation and collective action in relation to problems in governance of common-pool resources (CPR) which she defines as "natural or man-made resource system that is sufficiently large as to make costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use".

In resemblance of other governance theorist and researchers, (e.g., Jessop, 1990; Koppenjan & Klijn, 2004; Torfing *et al.* 2012), Ostrom (1990) dwelled on problems typical of the role of government or governmental agencies in resource governance and management. She emphasized that, the premises for contemporary policy recommendations – i.e. resources are so interconnected that they all need to be managed centrally, resource appropriators are not themselves capable of designing rules to sustain resources over time and designing rules to improve outcomes is a relatively simple analytical task that is best done by objective analysts – are baseless. According to her, the interconnectedness of resources does not always necessitate a central management and that people in general, i.e. resource users are in fact capable of designing their own rules for governing themselves. She finally posited that, designing rules to govern resources is not simple analytical task for governments alone.

Other theoretical inputs focused on community participation in natural resource management with the most well known the Ladder of Participation focusing on what participation entails. Thus, are communities included and affecting decisions, or are they rather included as tokens to give the impression that the governance system is participatory. This very well highlights the problem with community governance being that, it rarely defines what it entails. Totikidis *et al.,* (2005) discussed this in their preliminary review of the concept by concluding that: "community governance is about community management and decision making but also implicates the broader aims of addressing community needs and developing community capacity and wellbeing". In their review, it is explained how communities are either based on relational or geographical aspects, and in applying community governance almost always referred

to the latter. It is further elaborated how the concept of community governance, although academically traced back to the 60s seriously gained grounds in the 90s recognizing the importance of including the differences amongst communities in decision-making.

As such, Ostrom, (1999) highlights how many natural resources have been managed by central governments, based on Hardin's (1968) proposition. Yet, as empirical data shows, these systems have substantial failures and alternatives do exist, including community-based governance arrangements instituted through collective action that in several cases have had more positive impacts than central governance systems. Central for both theories (tragedy of the commons and collective action) is that, they investigate how natural resources can best be managed.

It is important to note that, Ostrom (2009) did not claim that community governance will work in all cases, and that, the effectiveness depends on a long list of factors. Further, even though individuals have differing interest, collective action puts them in one group with the main goal of sustaining their own resource base. This however, has been criticised from two points of view: i) resources users cannot be one single group as variations exist in age, gender, class, ethnicity; and ii) protecting resources might not be their main interests as other things might be more pressing, e.g. providing food and shelter (Fabinyi *et al.,* 2014). As such, community governance and its effects on equal resource distribution should not be romanticised as it is affected by underlying power structures within a given community. Such power structures in turn also affect the willingness of people to engage in community governance (ibid). Discourses are also pointed out to be another important factor determining management and access to resource as expounded in Ribot & Peluso's (2003) theory of access. These are altogether important to consider when analysing the nature, effectiveness and impacts of existing community-based governance systems.

2.2.2 Recognised community natural resource governance in Ghana

Though not a new concept, community governance in Ghana was not formalised until the Wildlife Resources Management Bill of 2014 which proposes the legalisation of CREMAs, promoted by the Wildlife Division (WD) of the FC. Efforts towards this started with the Forest and Wildlife Policy (1994) and the Collaborative Wildlife Management Policy (2000).

CREMAs are geographical areas based on one or more communities committed to managing resources sustainably. The specifics are determined through a constitution and bylaws regulating their activities. It is constituted of an Executive Committee and a Community Resource Management Committee (CRMC), the former being the operational arm reporting back to the division and the latter being the local part of the CREMA. Revenues obtained from managed resources are divided within the CREMA based on their own arrangements, but typically not less than 90-95 % of the revenues going to the communities for development purpose, the remaining 5-10% going to the Executive Committee (Asare *et al.*, 2011; Agidee, 2011). The CRMC is most often in the size range of 5-13 men and women elected through a community meeting based on the groups they belong to within the community (ibid). Further, traditional authorities play an important role in identification, establishment and management of CREMAs, especially in ensuring that it follows land tenure systems accordingly to avoid conflicts.

This notwithstanding, it is formally established under the sector Minister with the consent of both local authorities and community members (Asare *et al*., 2011; Wildlife Resources Management Bill, 2014). Before the CREMA regulations can be formalised and adopted as general district by-laws, all the mentioned entities of the CREMAS, including traditional authorities, WD and the District Assembly (DA) will review the established regulations, also focusing on other national laws and bye-laws from the DA. As of 2017, Ghana had over 20 CREMAs with many more under development, yet their resource user rights and permits relate more to wildlife protection.

2.3 Informal/Community-based governance arrangements on charcoal in Ghana

Few studies exist on informal or community-based governance systems for charcoal production in Ghana. As posited, Amanor (2003) explains how discourses around charcoal's role in deforestation have been used to pursue chiefs and landowners own interest. As such, local regulations (sometimes ban) on charcoal production are found in several localities imposed by chiefs under the reasoning of protecting the environment. As explained, the customary land tenure systems mean that chiefs cannot generate income from local citizens, a critique to be in disguise of this is to further claim rents from migrants in order to grant them access to land and its associated resources. Charcoal regulations by chiefs have been a way to increase their income as charcoal production is allowed through extra payments (ibid).

In the Atebubu-Amantin District, a Tropenbos International (TBI) Ghana/ International Institute for Environmental Development (IIED) project worked in three communities (study communities) to organise charcoal producers into associations to enhance their decision-making capacity in charcoal governance (Owusu *et al*., 2014). Existing local governance arrangements on charcoal were reformed to embrace a more inclusive and participatory decision making. Firstly, all producers had to belong to an association. Secondly, land owners had to document clear and fair rules as to how community members can equally access land for woodlots, however taking differences between natives and migrants into account Thirdly, the resource base must be sustained through locally established regulations on how much, and which tree-species may be harvested and monitored by the associations. Hereafter, different benefit-sharing arrangements were set up, e.g. including that if the land is already leased out, land owners cannot take an extra fee from charcoal producers as seems to have also been the case in some other charcoal producing communities in Ghana (Amanor & Brown, 2003). Further, the associations must in collaboration with chiefs deal with unauthorized charcoal producers, i.e. those who are not following the established governance arrangements. Lastly, the pricing of charcoal should be done through cooperative regulations by the associations to ensure fair pricing (for full overview see Owusu *et al*., 2014). Due to the capacity of the communities and a short time-span of the initiative, these establishments are yet to be assessed and the outcome or effectiveness still unknown.

As noted, unclear land ownership arrangements and limited access to decision-making processes by communities are leading to gaps within forest governance in Ghana (Gyimah & Dadebo, 2010). In terms of community involvement, it is mentioned how primary stakeholders such as traditional authorities rarely are a part of forest policy planning, which reflects how the level of actual community members in participatory governance must even be lower.

2.3.1 Community based charcoal governance examples and their development from other countries

Although the charcoal sector is being overlooked by governments in many countries, some community governance arrangements have been detected in Nepal, Kenya (that also is nationally regulated), Zanzibar and Congo DR.

In Nepal, the community governance is based on a series of national legislations starting from 1980 giving more power to communities. e.g. the Forest Act from 1993 giving Community Forest User Groups (CFUG) decision-making power to take important decisions over forest resources i.e. getting certificates through the District Forest Offices. As such, 1.6 million households own a quarter of the forest resources which amongst others have given opportunities for charcoal producers; more specifically ensuring sustainable income at the producer link (IIED, 2014). This has been supported through e.g. the Value Added Tax Act of 1995 supporting sustainably sourced forest products through economic incentives making it more competitive (ibid).

Like the TBI project in Ghana, the government of Kenya mandated the Forest Service to grant permission to Charcoal Producer Associations to legally produce charcoal in 2009. Additionally, Community Forest Associations (CFA) were legally recognised in the 2005 Forest Act (IIED, 2014). Whereas these initiatives provided a solid legislative base, implementation is weak, especially through long licensing processes, continuing illegal trade, corruption and overlapping institutional responsibilities. However, the legislations are considered a step in the right direction, and the challenges Kenya faces are like many other sub-Sahara African countries where informal rules continue to be precedent.

A study undertaken in Zanzibar reaffirms the need for community based natural resource management in the mangroves in Kisakasaka. The Kisakasaka Conservation Committee (KCC) of Tanzania was adopted under the 1996 Forest Management and Conservation Act as a response to the changing views on the importance of including local knowledge in natural resource management (Saunders *et al*., 2008). The Act legalized creation of community-based forest management and the means to establish local bye-laws. Like the CREMAs, a group of community representatives is formed, making agreements with the Commission for Natural Resources-Forestry Department on behalf of the broader community. The KCC sustainably managed tree cutting for charcoal through licensing in identified suitable areas. Whereas the study shows how the KCC in the initial period was effective, it has proven to be quite ineffective in recent years, amongst others explained by community micro-politics with conflicting interests. The increasing market prices and demand also affected the effectiveness of the KCC as it incentivized overharvesting of the resource base.

In the Democratic Republic of Congo, informal institutions have been noted to shape access to commercialized woodlots (Schure *et al*., 2013). Five means of woodlot management exists, one of them being rural community forests. However, like in the case of Kenya, enforcement is weak and fragmented between different institutions. As such, access to resources are rather informally governed and a charcoal producer's access is determined on the capitals he possesses, i.e. social, human and financial (ibid). In effect, informal working relations are at play with charcoal producers generally having poor access to resources and woodlots considering their limited capacity to compete with other resource users.

From the foregoing, it is important not to exaggerate the effectiveness of community in reaching both environmental, social and economic sustainability. Communities are fragmented entities, where many different and sometimes contradicting interests exists (Fabinyi *et al*., 2014). As such, when considering how community governance is applied on charcoal production in Ghana, it is crucial to consider how intra-communal power relations, surrounding legal systems, market conditions and institutional arrangements strongly affects such community governance arrangements.

CHAPTER THREE

3.0 METHODOLOGY

To achieve the overall intent of exploring the evolution of community-based governance arrangements, the study relied on both qualitative and quantitative data. The use of these two data types enabled a more complete understanding of the issues to be studied as they complement each other. Various data collection techniques including questionnaires, personal interviews and focus group discussions were used which allowed for triangulation of responses to check consistency and validity.

3.1 Study Area

The study was conducted in the Atebubu-Amantin District. It is one of the 27 districts in the Bono East Region of Ghana and located between latitudes 7^{o} 23" N and 8^{o} 22" N and longitudes 0^{o} 30'W and 1^{o} 26'W. The District falls within the forest savannah transitional vegetation zone. Though the area is wooded, most of the trees are not as tall and large as those in the Dry Semi Deciduous Forest Zone. It is believed that the transitional zone was once forested and that the savannah conditions currently prevailing have been the result of human activities (GSS, 2014). Agriculture is the main primary economic activity employing more than 70% of the population (ibid). Main food crops cultivated are maize, groundnut, cassava, yam and vegetables. Crops such as cotton, tobacco and cashew thrive well in the district. As a secondary activity, quite a substantial number of the populace are also engaged along the charcoal commodity chain as producers, transporters, merchants and others (Obiri *et al.,* 2014).

As a transition zone, total annual rainfall is between 1,400 mm to 1,800 mm and average temperature ranges between 26.5^{o}C and 27.2^{o}C (GSS, 2014). There is high prevalence of bush fires in the district. The District is a major charcoal producing area with woodlands for charcoal production. (Amanor, 2009b). The communities selected for the study (Kokofu, Fakwasi and Kumfia) (Plate 1) are known to produce charcoal under

community-based governance arrangements (Owusu, *et al.*, 2014; Brobbey *et al.*, 2015).

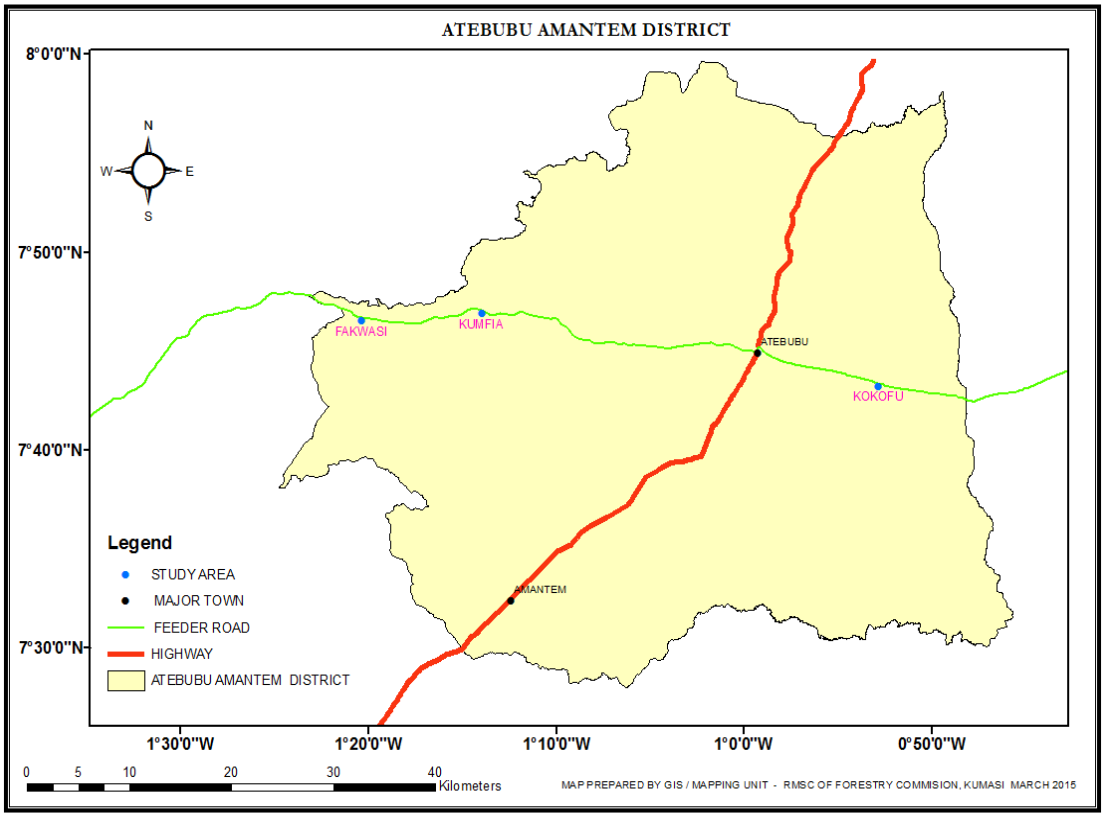


Plate 3.1 Map of Atebubu-Amantin district showing study site

They were identified as having some model charcoal governance arrangements that cover key aspects including production, pricing and transportation. The communities benefited from a TBI Ghana/IIED initiated and co-funded project, titled "Supporting Small and Medium Forest Enterprises for Sustainable Livelihoods; Facilitating Sustainable Charcoal Production in Ghana" which developed the capacity of stakeholders to strengthen their local governance arrangements for improved charcoal production, through a multi-stakeholder process. Though differences exist in the arrangements among these communities, they present a model community-based governance arrangement suitable for the study.

3.2 Sampling

Purposive sampling method with snow-ball was used in selecting respondents and this enabled researcher to focus on peculiar characteristics of the population that are of interest, and to provide requisite information for the study. Within the communities, the

respondents were sampled according to their experience with community-based charcoal governance arrangements, thus people who are directly or indirectly affected by the arrangements and vice versa. Semi-structured questionnaires were administered to a total of 75 respondents mainly due to respondent's availability coupled with saturation of responses. The sampling frame consisted of charcoal producers, executives of charcoal producer associations and Unit Committee members at the community level. Other stakeholders of interest including Traditional Authorities (TA), District Assembly (DA), Forest Service Division (FSD), Non-Governmental Organisations (NGOs) and Energy Commission (EC) were also identified and information solicited from them. Gathering data from these institutions was based on the following criteria: operating/working on charcoal in the district; engagement in and/or participating in informal governance arrangements for charcoal production; engagement in policy/law review and/or implementation at the national, regional and district levels.

3.3 Data and sources

The study relied on both primary and secondary data. Secondary data was gathered from Tropenbos Ghana's project reports on charcoal producer associations in the study area and management reports of Atebubu FSD and the DA while primary data was gathered through administration of questionnaires, focus group discussions and interviews.

Questionnaires/Interview checklist- The data collection instrument was designed to entail both qualitative and quantitative items administered in a form of interview checklist and semi-structured questionnaire respectively. Where necessary, it was administered in the local language (Twi) of the respondents to ensure they fully understand questions they were providing answers to. This ensured effective capturing of detailed information from the respondents. The data collection elicited from 75 individual stakeholders information relating to the nature of existing informal arrangements on charcoal production, changes in the arrangements and factors that drive such changes, successes and constraints, their perceptions on effectiveness of the arrangements in meeting their production targets and promoting sustainable resource use.

Interviews- The study also used one–on-one interview with two (2) key persons each from the FSD and EC, one (1) from the DA, three (3) TA and leadership of charcoal producer associations within the three study communities. An interview guide was prepared which ensured that, the researcher and the interviewee remained focused on the study. Information from the above key institutions provided further information to triangulate the responses from the individual respondents (charcoal producers).

Focus Group Discussions – three focus groups discussions (one per community) of between 7 to 11 participants were carried out after questionnaire administration and the interviews between February and June 2017. This was to provide an opportunity to understand collectively how community-based governance arrangements and their structures are perceived from different perspectives. It again furnished the researcher with information to triangulate responses provided by individual respondents during the questionnaire administration as well as from the interviews. Key attention was given to ascertaining the genesis of the arrangements, reasons for their initiation and processes of decision making as well as drivers of changes in the arrangements while at the same time determining perceptions, performance and challenges on the arrangements. The groups were organised taking into consideration key parameters such as gender, community membership status (indigene or migrant) since different groups are treated differently under the arrangements.

Multi-stakeholder workshop – one multi-stakeholder workshop with 32 participants was organised in July 2017 to analyse stakeholders of interest to the arrangements. Specifically, the analysis identified various stakeholder groups, relations, their responsibilities and level of importance which subsequently defines their power (real or perceived) under the arrangements. During the exercise, participants first listed the different stakeholders and their respective roles and secondly, with five choices each, ranked listed stakeholders in terms of importance. Aside this, the workshop also discussed changes in the arrangements, mapped beneficiaries and losers of such changes and validated some preliminary findings of the study.

Initial engagements for primary data collection including questionnaire administration, interviews and focus group discussions served as scoping exercise for selecting workshop participants. The diversity among participants ensured that, the process

captured wider perspective and that, all stakeholders had the opportunity to contribute to, and reach conclusions by consensus.

3.4 Data analysis

Data was analysed by identifying and quantifying the presence, meaning and relationships of words and concepts from responses gathered. Thereafter, inferences were made about the meaning or reasoning behind such words and concepts. The analyses focused on pattern of responses on themes such as fair or equitable benefit sharing, participatory governance, transparency among others. Where necessary, appropriate statistical analysis including one way Analysis of Variance (ANOVA) in Statistical Package for Social Science software was employed to ascertain whether any statistically significant differences exist among variables. Results were presented in narrative together with graphical formats where applicable to provide overview of the findings at a glance.

CHAPTER FOUR

4.0 RESULTS

4.1 Demographic characteristics of respondents

Table 4.1 provides details on the demographics of respondents within the study communities. About 61% of the respondents were males as against 39% for the opposite sex, and most of them (68%) were, migrants. Eighty-three percent of respondents were primarily charcoal producers, all belonging to one or more charcoal producer associations. The remaining 17% of respondents were mainly engaged in agriculture activities and involved in charcoal related activities sparingly. Quite a substantial number of respondents (37%) had lived in their respective communities between 10-15 years. The minimum and maximum number of years' respondents had lived in their respective communities was 2 and 42 respectively. People between the ages of 25 and 35 years formed 34% of respondents; quite typical of more active working population. About 20% of respondents had never experienced formal education whilst 24% had only been to primary school. Close to 43% of respondents had completed Junior High School but only 10% had completed Senior High School. Just a low number of respondents (3%) had tertiary education.

Table 4.1 Demographic characteristics of respondents

Demographic attribute	**Response**	**Percentage of respondent**			
		Kokofu (n=20)	Kumfia (n=30)	Fakwasi (n=25)	All Communities (N=75)
Sex	Male	55.0	63.3	64.0	61.3
	Female	45.0	36.7	36.0	38.7
Residency status	Indigene	40.0	30.0	28.0	32.0
	Migrant	60.0	70.0	72.0	68.0
Major occupation	Charcoal production	85.0	86.7	76.0	82.7
	Others (Farming)	15.0	13.3	24.0	17.3
	Member	70.0	93.3	80.0	82.7

Charcoal Association	Non-member	30.0	6.7	20.0	17.3
Length of stay in community (years)	Less than 5	10.0	16.6	12.0	13.3
	10 to 15	40.0	36.7	36.0	37.3
	15 to 20	20.0	10.0	16.0	14.7
	20 to 25	20.0	0.0	12.0	9.3
	25 to 30	5.0	10.0	4.0	6.7
	Over 30	5.0	26.7	20.0	18.7
Age class (years)	Less than 18	0.0	3.3	0.0	1.3
	18 to 25	15.0	6.7	20.0	13.3
	26 to 35	20.0	43.3	36.0	34.7
	36 to 45	40.0	23.3	12.0	24
	46 to 55	15.0	6.7	8.0	9.3
	More than 56	10.0	16.7	24.0	17.4
Highest level of education	None	25.0	23. 3	12.0	20
	Primary	15.0	16. 7	40.0	24
	JHS/Middle School	45.0	43. 3	40.0	42.6
	Senior High (SSS/SHS)	10.0	13. 3	8.0	10.7
	Tertiary	5.0	3. 4	0.0	2.7

4.2 Origin and evolution of community-based charcoal governance arrangements

The exact date for the initiation of the arrangements could not be traced in all the communities. From a group discussion, its beginning was linked to chiefs/landowners' decision to exercise their property rights to lease out lands under agreed benefit sharing arrangements. The chiefs recounted that farming used to be the dominant occupation and at that time, the collection of fuel-wood (mostly dead wood) was mainly for domestic use and therefore had no community level arrangements. It was explained that, fuel wood was extracted for free from uncultivated or fallow lands and where the area was cultivated, then, one needed permission from the farmer before accessing such resources. With the influx of commercial charcoal producers who were mostly migrants, it became necessary to request for some form of payment before access to land and tree resources could be granted by chiefs to the migrants as custom demands, therefore the need for the arrangements.

Among respondents, there was a general acknowledgement and awareness on the existence of community specific rules and procedures guiding charcoal production. All respondents indicated that, chiefs initiated and continue to be responsible for superintending over procedures for charcoal production. They however noted the improved involvement of other key stakeholders (unit committee, leaders of charcoal association, etc.) in reforming and enforcing the arrangements in recent years. Specifically, the arrangements have assumed the importance of ensuring that most stakeholders (charcoal producers, merchants) have their voices/concerns heard on key decisions or regulations on charcoal production.

Also, the mode of payment for accessing land and tree resources for charcoal production has evolved from mere payment of tokens before production, through offering a percentage of the total charcoal yield under an agreed benefit sharing arrangement after production to monetary payments either before, during or after production. Presently, payment for land rent or tree resources is mostly demanded for and/or paid in monetary terms due to commodification and monetization of resources for charcoal production. As confirmed by an informant,

> "*At first, you could produce charcoal even if you didn't have money to pay for trees or rent land. All you need is to assure the chief or landowner that you would give him his share. But now, you must pay something (money) before you can produce. That is why some of us rely on merchants to pre-finance our production activities*" - *Key informant 1, February 2017.*

Further, the increasing number of charcoal producers and extension of their operations into new territories under the respective communities have manifested in expansion in geographical scope of the arrangements. In effect, regulations under the arrangements now cover much wider geographical area with the potential for further expansion.

Again, the arrangements in its earliest form had limited or no interface with statutory bodies and state regulations as well. More recently, there is evidence of increased collaboration between the arrangements and statutory regulations. For instance, chiefs in some cases collaborate with state regulatory and law enforcement agencies to arrest and sanction defaulters of the arrangements; thus, people who illegally source wood for charcoal production. As attested to by an informant,

> "*It is difficult to produce charcoal without following the arrangements considering that, chiefs are custodians of the land. To work on the land, you need to respect their decisions, or they can sanction you or report you to police or FSD for your arrest, and charge you especially for illegal sourcing of trees" Key informant 2, February 2017.*

With focus on sanctioning defaulters, strict and harsh punishments including complete ban of people from charcoal production is least applied these days. Recently more human face is attached to the application of sanctions to defaulters. These include the confiscation of charcoal and imposition of fines by chiefs in case of illegal sourcing of trees.

4.2.1 Factors that necessitated the institution of the arrangements

From the perspectives of respondents, six major reasons may account for the institution of the charcoal governance arrangements. Chief among them was the desire of the chiefs to benefit directly from charcoal production by taking rent for leasing out land or selling trees to charcoal producers. Other reasons were consolidation of traditional authority, sustainability of charcoal production, upholding of customary practice, safeguarding natives resource use right and protection of the resource base (Fig. 4.2).

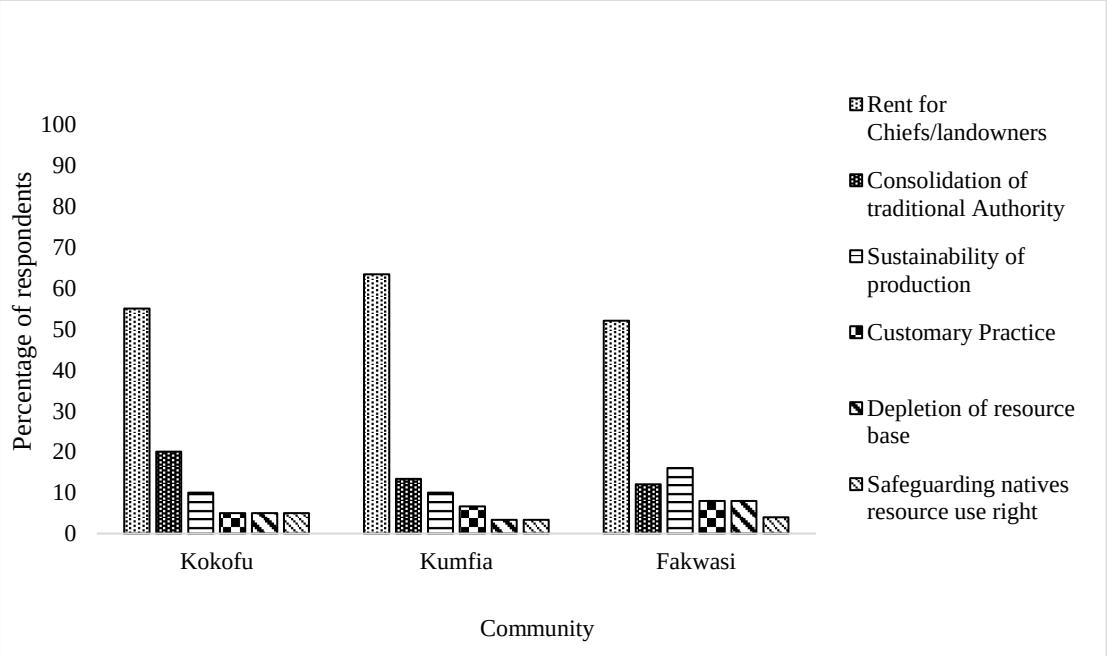


Figure 4.1 Reasons behind the institution of CBGA on charcoal production

Apart from these reasons shared by individual respondents, royalties enjoyed by traditional authorities elsewhere regarding other natural resources (timber, gold, bauxite etc.) was identified as a reason for instituting arrangements on charcoal. This was revealed in a group discussion at Fakwasi.

4.2.2 Stakeholders involved in the community-based charcoal governance arrangements

Ascertaining key stakeholders in any governance model is always an important step to take when identifying, describing and analysing the nature of a given governance kind. From multi-stakeholder workshop, participants listed 12 stakeholders as having interest in the arrangements. These stakeholders were identified by their individual relevance depending on their roles and responsibilities. This eventually defines their strength and influence/power under the arrangements based on which their level of importance was ranked. Participants with 5 voting chances each indicated their choices of stakeholders in terms of importance as presented in Table 4.3. Worth noting is that, the ranking for farmers within this context was limited to those who do not double as charcoal producers as some charcoal producers undertake farming activities.

Table 4.2 Stakeholders, roles and importance ranking

Actors	Roles and Responsibilities	Number of votes	Importance ranking
Charcoal Producers	• Monitor and report charcoal production activities contrary to established norms • Produce and sell charcoal in accordance to laid down procedure	33	1
Chiefs/Landowners	• Embodiment of customary rules that determine right and access to land and its associated resources • Lease out land to charcoal producers/ sell trees for charcoal production • Make provisions and collect royalty on extraction of trees for charcoal production • Settle disputes among actors • Set and or revise provisions or rules on charcoal production • Punish defaulters/enforce sanctions	29	2
Charcoal Producer Associations	• Generally, seek to the welfare of charcoal producers	22	3

	-Provide financial and moral support of its members -Negotiate with other actors on behalf of its members for favourable charcoal production arrangements • Monitor and report illegal charcoal production activities • Provide linkage between charcoal producers and other stakeholders e.g. traditional authority, district assembly, charcoal merchants etc. • Negotiate with charcoal merchants or traders for fair and uniform pricing • Settle disputes among producers		
Merchants	• Pre-finance charcoal production activities • Offer ready market for producers	17	4
Chainsaw Operators	• Fell trees • Cut wood into burnable sizes	13	5
Forest Services Division	• Manage tree resources used for charcoal production • Issue charcoal conveyance certificate (CCC) • Educate producers on best charcoal production practices • Arrest illegal chainsaw millers	12	6
Ministry of Food and Agriculture (District Level)	• Provide technical support on farming and effects of competing activities (charcoal production) to farmers.	9	7
Farmers	• Make land and trees available for charcoal production • Benefit from charcoal proceeds in the form of cash payment or charcoal sharing arrangements	9	7
Police and Judiciary	• Settle dispute among stakeholders	6	8

	• Prosecute and or sanction defaulters		
District Assembly/Unit Committee	• Enact and enforce byelaws on charcoal production • Collect revenue on charcoal • Register charcoal associations	5	9
Ghana National Fire Service	• Educate and serve notice to charcoal producers on fire prevention • Support enforcement of temporal ban on charcoal production especially at the peak of the dry season	3	10
NGOs	• Set the agenda for discussing topical charcoal issues including governance • Tree planting campaigns/ education on environmental issues	2	11
Total		**160**	

Respondents (N=32), multiple response

Charcoal producers emerged as first most important stakeholder group followed by chiefs. The top ranking of charcoal producers was attributed to their core activity (charcoal production) around which all actions of other stakeholders revolve. Chiefs who also double as landowners are embodiment of traditional rules and customs; thus, making them the second most important stakeholder group. Charcoal producer associations (3rd ranking) are key under the arrangements as it presents them as a formidable group especially in pursuing specific agenda such as negotiating for equitable benefit sharing for its members. Charcoal merchants or buyers are concerned with the arrangements and remain the 4th most important due to their business relationship with other stakeholders. Another important stakeholder group mentioned was chainsaw operators whose livelihood depends on felling trees which is key to charcoal production. Other stakeholders of importance were the FSD, MoFA-district office, farmers, Police and Judiciary. The DA, Ghana National Fire Service (GNFS) and NGOs were further ranked less in importance owing to their perceived less relevant roles and responsibilities under the arrangements.

4.2.2.1 Stakeholders' power and influence

To understand the level of stakeholder's involvement and how they shape the arrangements, their perceived or actual influence and power were analysed. Through a multi-stakeholder workshop, participants categorised stakeholders based on their relevance as having direct (D) or indirect (I) involvement in the arrangements which ultimately defines their influence and power. By direct involvement, only stakeholders who make decisions under the arrangements or those that such decisions have direct bearing on their activities and the vice-versa were categorised as such. Indirect involvement on the other hand were stakeholders who have no direct responsibilities in making decisions under the arrangements, however, the arrangements have some indirect influence on their activities and the vice-versa. Where after, their level of power and influence were determined on a scale of 1- 4 with 4 being the highest.

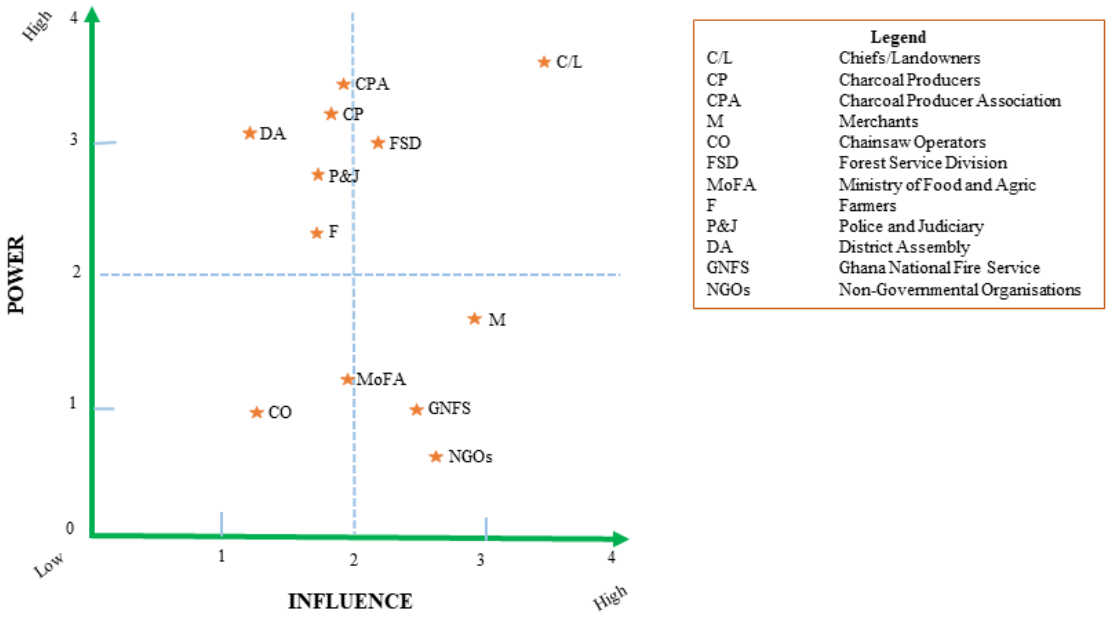


Figure 4.2 Power/Influence matrix of stakeholders in CBGAs on charcoal production

Chiefs/landowners with direct involvement wield much power and influence than any other stakeholder group due to their land entitlement and responsibilities under the arrangements. Charcoal producers though powerful with direct involvement in the arrangements, they become very powerful and influential in the arrangements when represented as an association. Except for farmers who sometimes have direct and indirect involvement in the arrangements owing to their role as land-holders, all the remaining stakeholders are indirectly involved in the arrangements. For such

stakeholders, their power remains generally low but with some appreciable level of influence as in the case of merchants, GNFS and NGOs.

4.2.2.2 Relationships among stakeholders

The relationships among stakeholders were ascertained to understand how stakeholders interact and contribute to the functioning of the arrangements. Through a participatory exercise, stakeholders in a workshop indicated how each relates to the other under the arrangements. As illustrated, figure 4.2 portrays the relationship i.e. cooperation, competition and disagreement among stakeholders. All stakeholders are represented by rectangles. Rectangles with thick outline represent stakeholders with direct involvement and far more powerful. The distance or closeness of a stakeholder to the oval indicates its perceived relevance to the arrangements.

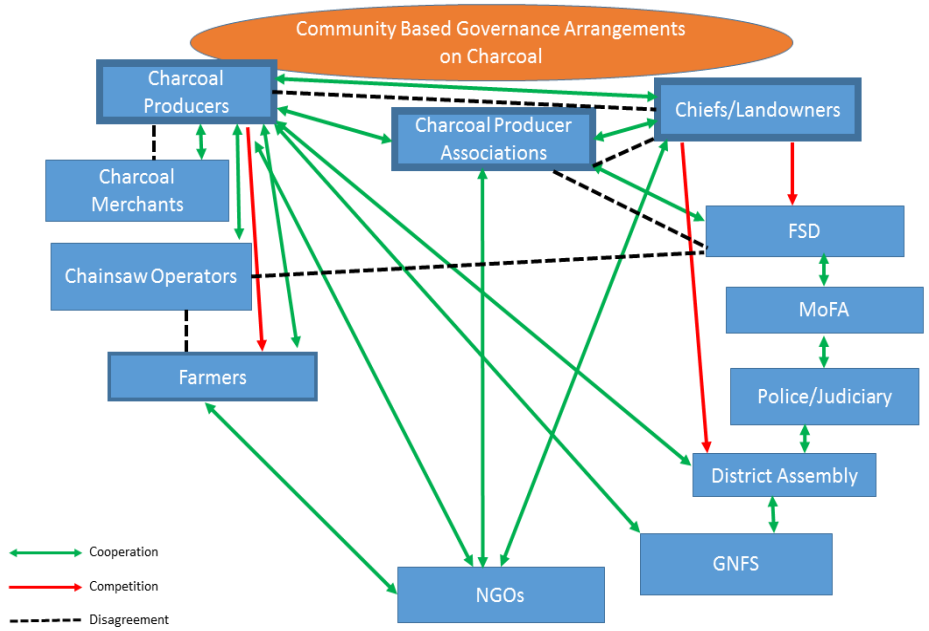


Figure 4.3 Relationships among stakeholders under CBGA

Generally, there is some level of cooperation among most stakeholders. Nonetheless, disagreements occur sometimes especially between charcoal producers and/or their associations on one hand and chiefs or charcoal merchants or the FSD. Underlying reasons for disagreements mentioned were unfavourable benefit sharing arrangements, high levies, limited inclusiveness in decision making among others. Disagreements also exist between chainsaw operators and the FSD mainly due to illegal logging and between chainsaw operators and farmers mainly due to crop damage during tree

extraction. Also, disagreements were noted between charcoal producers and merchants in cases where the former do not meet their obligations of supplying charcoal especially when pre-financed by the latter.

Competition sometimes appears to exist between charcoal producers and farmers over operational space especially where the two activities are being carried out concurrently on the same land. Again, competition also exists between the traditional authorities (chiefs) and the FSD in terms of revenue collection from sale of trees for charcoal production. Chiefs sell trees to charcoal producers while the FSD has that legal mandate.

4.2.3 Decision making under community-based charcoal governance arrangements

It was revealed from group discussions that, decisions under community-based governance arrangements are made and enforced by chiefs, and such decisions ultimately become norms or customary practice. As revealed by an informant;

"Chiefs are responsible for initiating and superintending over arrangements that guide charcoal production"- Key informant 3, February 2017.

It should be noted that, decisions under the arrangements are sometimes taken in consultation with respective community elders who mostly double as family heads together with the unit committee. Irrespective of whoever is consulted, final authority resides with the chief to decide on what best suits the situation. Individuals/subjects are only expected to accept and abide by those rules and can only influence the decision by appealing to the final authority for modifications. The outcome of such appeals remains the prerogative of the final authority (chief).

4.2.4 Aspects of charcoal production covered by local governance arrangements

The arrangements mainly stipulate procedures for acquiring land and wood resources for charcoal production with some community specific practices that address social, environmental and economic concerns. Table 4.5 summarises the three main aspects of the arrangements with community specific practices indicated where applicable.

Table 4.3 Aspects of charcoal production covered by CBGA arrangements

Aspects covered by arrangements	**Community**		
	Kokofu	Kumfia	Fakwasi
Social Aspects			
Social Relations: Encourages the formation of production and trade associations well recognised by both traditional and state institutions.	Applicable	Applicable	Applicable
Right and Access to resources: Rules and procedures for access to land and wood for charcoal production are made fair to all persons residing in a community. However, differences exist depending on one's residential status in the community	Applicable	Applicable	Applicable
Benefit Sharing: With respect to production of charcoal from natural woodlands, different benefit-sharing arrangements play out and are recognised by party's subject to it.	Applicable	Applicable	Applicable
Enforcement: To ensure compliance with the arrangements, the associations and community members collaborate with the chiefs/landowners in dealing with charcoal producers who do not abide by established rules.	Applicable	Applicable	Applicable
Environmental Aspects			
Sustainability of resource base: Local governance arrangements provide for sustainable charcoal production by encouraging sustainable tree harvesting practices to allow natural regeneration	Applicable	Applicable	Applicable
Integrated woodlot: It further encourages woodlot establishment by associations where resources are available.	Applicable	Not Applicable	Applicable
Economic Aspects			
Pricing of charcoal: The arrangements aim at a uniform and efficient pricing of charcoal through formation of cooperative and regulations by the associations	Applicable	Applicable	Applicable
Financial support for members: The arrangements enhance investment in	Applicable	Applicable	Applicable

charcoal production especially by charcoal merchants as it guarantees their investment by setting rules and resolving conflict between parties (charcoal producers and pre-financiers)	

Key reason for the non-applicability of integrated woodlot establishment at Kumfia is the land tenure disagreement between the traditional authority and some community members including charcoal producer associations.

4.2.4.1 Respondents' satisfaction on how the arrangements address social, environmental and economic aspects of charcoal production

Based on results in Table 4.5, respondents expressed their contentment with the social, environmental and economic aspects of the arrangements. Generally, stakeholders are not fully satisfied with how the arrangements address social, environmental and economic issues in all the study communities. As shown in Figure 4.3, though many stakeholders are satisfied with how the arrangements address social issues in Fakwasi and Kumfia, same cannot be said for Kokofu where only 45% of respondents showed satisfaction. On the environmental front, 72% of respondents in Fakwasi expressed satisfaction for the arrangements compared to Kokofu (40%) and Kumfia (26.7%). For the economic aspect, 60% of respondents in Kokofu expressed satisfaction compared to Kumfia and Fakwasi where 46.7% and 40% of respondents respectively said they were satisfied. Comparing how the arrangements address these three key components of charcoal production, stakeholders were highly satisfied with how the arrangements address social aspects relative to how it addresses economic and environmental issues.

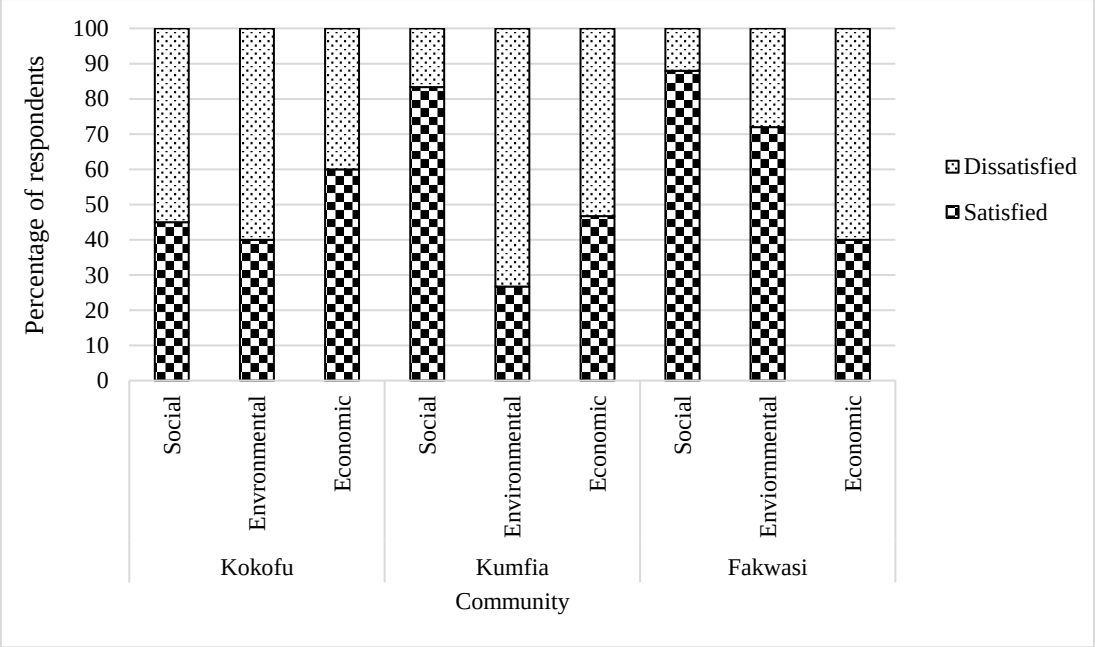


Figure 4.4 Stakeholders satisfaction with how CBGA covers main aspects of charcoal production.

One Way ANOVA was used to ascertain differences in the level of agreement among study communities on their satisfaction with how various aspects of charcoal production are addressed by the arrangements, The results indicated that, there is a significant difference among the three study communities on their level of satisfaction with how the arrangements address social (p=0.001) and environmental issues (p=0.002). However, there was no significant difference in stakeholder satisfaction considering how the arrangements address economic issues in the three communities (p=0.414) (Table 4.6). Post hoc comparison employing the Tukey HSD test shows Kokofu is less satisfied with the social aspects compared to Kumfia and Fakwasi. On the other hand, Kumfia is less satisfied with environmental aspects compared to Kokofu and Fakwasi communities (Annex VII for detail One Way ANOVA test).

Table 4.4 Significant differences on communities' satisfaction with how CBGA address social, environmental and economic aspects of charcoal production

		Sum of Squares	df	Mean Square	F	Sig.
Social	Between Groups	2.43	2	1.215	7.441	0.001
	Within Groups	11.757	72	0.163		
	Total	14.187	74			

Environmental	Between Groups	2.88	2	1.44	6.601	0.002
	Within Groups	15.707	72	0.218		
	Total	18.587	74			
Economic	Between Groups	0.453	2	0.227	0.893	0.414
	Within Groups	18.267	72	0.254		
	Total	**18.72**	**74**			

4.2.5 Reforms in the arrangements

The arrangements are subject to change and therefore, not static. As recounted in a focus group discussion;

> *"Unlike previously, we the natives of this community are now expected to pay for wood for charcoal production or offer two bags out of every 20 bags produced to the chief"- (Focus group discussion 2, Kokofu, February 2017).*

Majority of the respondents indicated there have been some notable changes since their encounter with the arrangements. As summarised in Table 4.7, the changes ranged from procedures of acquiring wood for charcoal to the point of sale.

Table 4.5 Observed changes in CBGA on charcoal production

Reforms in CBGA on charcoal production				
Previous Provision	**Present Provisions**	**Name of Community**		
		Kokofu	**Kumfia**	**Fakwasi**
1. Access to wood for charcoal production				
Agreements on lease or rent of land/ purchase of wood resources for charcoal production was done verbally	Accessing resources (land and tree) for charcoal production activities now involves some documentation.	√	√	√
Various groups/ individuals were treated differently under the arrangements based on their social ties, community status,	There is a high level of uniformity in the arrangements pertaining to how individuals or groups in the community are treated.	√	×	×

negotiation capabilities etc.				
An indigene of a community whose family owns land pays nothing for accessing wood for charcoal in that land	Payment made to chiefs by all charcoal producers (natives and migrants) on each truck load of charcoal transported out of the community	√	√	√
Chief reserved the right to lease out land at any fee or in any agreed form of payment e.g. taking 20% share of the total produce	Preference in payment for rent of land/tree resources now mostly in monetary terms	√	√	√
Farmers could produce charcoal from their cultivated lands and could also sell such trees to others	Farmers can only sell trees on their cultivated lands to charcoal producers with the consent of the chief/landowner	×	√	√
Charcoal production associations were non-existent	Charcoal production associations have been formed and operating	√	√	√
	2. Sustainability of resource base			
No special attempts were made as tree resources were considered abundant and could meet the needs of society	There are clearly stated rules and practices on sustainable production of charcoal, for instance controlled/rotational harvesting to allow natural regeneration.	√	√	√
	3. Plantation establishment			

Establishment of woodlot not considered as an option previously	There is support for integrated woodlot/ plantation establishment by making lands available in most cases e.g. Kokofu and Fakwasi	√	×	√
	4. Benefit sharing			
Payment for trees or use of land for charcoal production in non-monetary form was decided based on negotiation, mostly to the benefit of the landowner.	Payment of trees or land for charcoal production to landowner in non-monetary terms do not exceed 20% of the total yield	√	√	√
	5. Enforcement			
Solely the responsibility of the traditional authority	All stakeholders have a role to play in monitoring and reporting illegal actions of charcoal producers	√	√	√
	6. Pricing of charcoal			
Individually set prices for charcoal was mostly low due to wide spread poverty and the need to generate income	Now more uniformity in pricing as they get access to price information as members of an association	√	√	√

Key: √=reforms observed, ×=reforms not observed

4.2.5.1 Drivers of reforms in the arrangements

To enhance understanding of the dynamics of the charcoal governance arrangements, factors that drive the changes were identified in a group discussion. There were differing but connected views on drivers of change in the arrangements. Participants mentioned the involvement of more people in charcoal production leading to increase in demand for trees which draws the attention of traditional authorities to initiate or modify the arrangements to enhance their benefit from the business. Connected to this, participants pointed to the emergence of conflict as a driver of change in the

arrangements. Some conflict situations required changes to address the concerns of actors especially where existing resolutions were not applicable. A case in point is the introduction of fixed sharing of benefits (80% & 20%) of charcoal yield between charcoal producers and landowners to avoid conflict over non-adherence to already negotiated benefit sharing arrangements in case of low production yield by the former. Participants further recounted that, directives from the national level drive changes in the arrangements. For instance, the local ban on the use of commercial timber and endangered tree species for charcoal production is partly in response to national ban on harvesting and use of such species for charcoal production (FGD at Fakwasi, 2017).

Land grabbing by commercial plantation developers according to participants also drive changes in the arrangements. The huge sums of money realized by chiefs from land grabs tends to influence them to apply similar land commodification to the use of land by smallholder users including charcoal producers.

Also, exposure to practices and experiences from elsewhere was noted to drive changes in the arrangements. As confirmed by an informant, changes in the arrangements become imminent when chiefs are exposed to practices from elsewhere especially those that accrue more benefits to property owners. For instance, the proposition by the chief of Kokofu that natives should pay for the use of trees for charcoal production which previously wasn't the case was largely informed by benefits chiefs in adjoining communities such as Kwame Danso realise from land rent from tree plantation developers.

4.2.5.2 Respondents' perspectives on the likelihood of drivers to trigger reforms in the arrangements

After identifying drivers of change in the arrangements, their likelihood to trigger changes was ascertained based on respondents' perspectives. As shown in table 4.8, directives from national and the emergence of conflict situations related to charcoal production were rated more likely to drive changes in the arrangements compared to the others. It is worth noting that, the possibility of these drivers to cause changes in the arrangements sometimes functions concurrently.

Table 4.6 Drivers of change in the arrangements

Drivers of reforms	% of respondents (N=75)		
	Very Likely	Likely	Not Likely
Increase in demand of trees	41.3	33.3	25.3
Conflict situations/new charcoal issues	68.0	28.0	4.0
National directives	88.0	9.3	2.7
Land grabs	4.0	17.3	78.7
Experiences/practices from elsewhere	11.7	33.3	25.3

4.2.5.3 Respondents perception of impact of reforms in the governance arrangements on charcoal production

Of the six observed reforms in the governance arrangements, three namely; access to trees for charcoal production, benefit sharing, and enforcement were perceived to have very high impact on charcoal production activities. Between 50 to 85% of respondents attested to this. Reforms in arrangements regarding pricing of charcoal, was perceived to have low impact on charcoal production as indicated by half of the respondents. The reason mentioned was that, majority of charcoal producers sell their produce without recourse to prices agreed by their associations mainly due to poverty. With respect to changes relating to plantation establishment, majority (above 53%) deemed it to have neutral impact on their charcoal production activities. Reforms in the arrangements pertaining to sustainability of the resource base was mostly perceived to have low impact on charcoal production though some few deemed it to have no impact at all.

Table 4.7 Perceived impact of reforms in CBGA on charcoal production

Provisions under the arrangements	Percentage (%) of Respondents			
	Kokofu n=20			
	Very High	High	Low	Neutral
Access to trees for charcoal production	80.0	15.0	0.0	5.0
Sustainability of resource base	5.0	10.0	60.0	25.0
Plantation establishment	5.0	10.0	15.0	70.0
Benefit sharing	85.0	10.0	0.0	5.0
Enforcement	70.0	25.0	0.0	5.0
Pricing of charcoal	10.0	15.0	50.0	25.0
	Kumfia n=30			
	Very High	High	Low	Neutral

Access to trees for charcoal production	50.0	26. 7	3.3	20.0
Sustainability of resource base	6.7	10.0	26.7	56. 6
Plantation Establishment	0.0	10.0	36.7	53. 3
Benefit sharing	63.3	23.3	3.4	10.0
Enforcement	53.3	30.0	3.4	13.3
Pricing of charcoal	6. 7	33.3	40.0	20.0
	Fakwasi n=25			
	Very High	High	Low	Neutral
Access to trees for charcoal production	52.0	32.0	4.0	12.0
Sustainability of resource base	8.0	4.0	60.0	28.0
Plantation Establishment	0.0	4.0	56.0	40.0
Benefit sharing	60.0	28.0	0.0	12.0
Enforcement	52.0	32.0	4.0	12.0
Pricing of charcoal	20.0	16.0	40.0	24.0

A Kruskal-Wallis H test was conducted to ascertain the differences that exist in how reforms in various aspects arrangements impact charcoal production in the respective communities. Generally, no statistically significant difference exists among communities on how reforms in the arrangements impact charcoal production (Annex VII). For instance, Kruskal-Wallis H test on how reforms in the arrangements on access impact charcoal production showed no significant difference among the communities; $\chi^2(2) = 5.296$, $p = 0.071$, with a mean rank impact score of 29.63 for Kokofu, 41.90 for Kumfia and 40.02 for Fakwasi. Similarly, on reforms aimed at sustainability aspect of the arrangements and its impact on charcoal production, no statistically significant difference exists among the communities; $\chi^2(2) = 3.552$, $p = 0.169$, with mean rank of 33.58, 43.27 and 35.22 for Kokofu, Kumfia and Fakwasi respectively.

4.2.5.4 Beneficiaries and losers of reforms in the governance arrangements

Through a participatory exercise, beneficiaries and losers of reforms in the arrangements were determined. Participants on a scale of 0-5 with five being highest indicated the extent of cost or benefit stakeholders realised from reforms in the arrangement. It was identified that; no stakeholder group solely benefits or loses out from changes in the arrangements. However, chiefs were noted as the ultimate beneficiaries under the arrangements as they had little or nothing to lose compared to charcoal producers and farmers. Charcoal producers (natives and migrants) were the second on the ladder. As revealed;

"most of the nice houses you see here belong to charcoal producers, if the arrangements are not to their advantage, how would they have been able to put up such structures" (Chief of Fakwasi, February 2017).

Farmers were also noted to benefit from modifications in the arrangements as they enjoy some benefits (money or percentage of total produce) when charcoal is produced from their farms though they make no direct investment towards production activities. It was revealed from the discussions that, reforms in the arrangements do not affect revenue mobilisation by the FSD through the issuance of CCC.

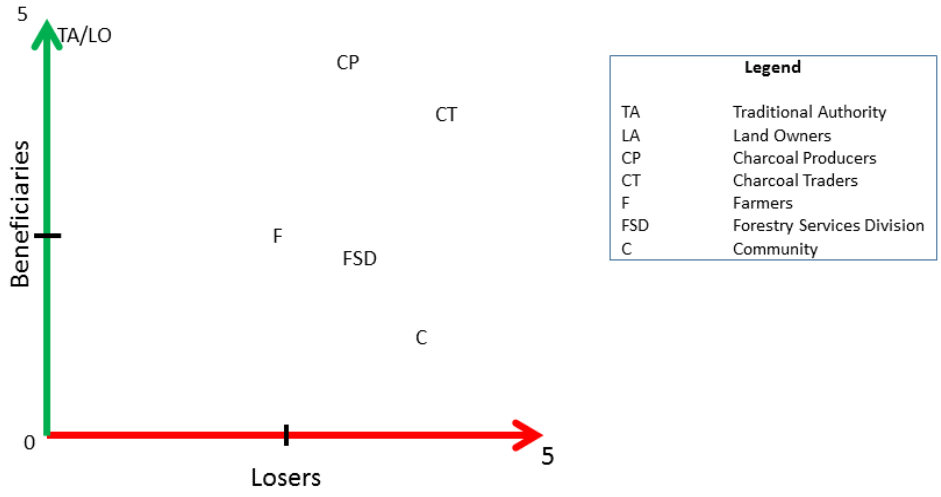


Figure 4.5 Beneficiary-Loser matrix of reforms in CBGA on charcoal production

As shown in the diagram above, the respective communities as an entity (though not an actor under CBGA) benefit in some respect from the arrangements and reforms that have taken place. Such benefits manifest in expansion of the local economy through improvements in individual/household incomes. In the other direction however, communities risk losing huge volumes of trees owing to charcoal production with little practically done on woodlot establishment. It was further mentioned that, revenues accrued by chiefs under the arrangements are not invested in any community development activity but mainly for upkeep of the stool.

4.3 Effectiveness of CBGA on charcoal production

4.3.1 Strengths and constraints of the arrangements

The arrangements as revealed through group discussions are specific on procedures for accessing trees for charcoal production with less bureaucracy. This is noted as a major

positive aspect of the arrangements as it prevents illegal extraction of trees and secures one's resource use right. Another positive aspect of the arrangements is its conflict prevention and resolution mechanism. Where conflicts or misunderstandings ensue, resolutions were noted to be beneficial to or in the interest of conflicting parties. As recounted by a participant in a group discussion at Fakwasi;

> *"I was stopped from producing charcoal due to my inability to pay in full cost of trees offered by a farmer. However, the chief appealed on my behalf and an agreement was reached where I paid the farmer after producing and selling the charcoal" – Sumaila Bukari[1], 9th March 2017.*

This demonstrates how provisions and even sanctions are made flexible and adjustable to prevailing conditions as well as individual needs. Again, the rate of compliance with the arrangements was identified to be higher as averred by chiefs in the respective communities. Over the past one year, four, five and two cases of misconduct contrary to the arrangements were recorded in Kumfia, Kokofu and Fakwasi respectively. Consequently, the arrangements are considered to have some high level of legitimacy among the populace. A factor mentioned as a source of strength is the arrangements' commitment towards sustaining the resource base (trees) to secure livelihoods and energy supply, though little is done to that effect practically. Another, strength of the arrangements is its high level of conformity and support for national regulations especially on forest/tree resources.

This notwithstanding, the absence of effective state legal backing for the arrangements and lack of recognition constrain the arrangements. For the more advanced community resource management systems, the lack of legal backing limits their operations. Such informal arrangements are prone to setbacks when subjected to or tested by formal laws. Other constraints mentioned were cultural differences, land grabs, fading tradition authority and depletion of tree resources.

Interaction with representative of NGOs, DA and experts from research institutions pointed to the fading traditional authority due to education, urbanisation and the advent of orthodox religious beliefs as a constrain to the smooth operation of the arrangements. There is evidence of some few defaulters of the arrangements refusing summons by local chiefs unless threatened with the authority of the paramountcy. This leads to

[1] Adhering to ethics on confidentiality and anonymity, the responded consented to the use of his statement and appearance of his name in this study.

disrespect for traditional authorities and adherence to localised rules from such authorities; affecting the effective operationalisation of the arrangements.

From the various perspectives, lack of accountability on revenues by chiefs and selective justice in applying sanctions under the arrangements were mentioned as the main weakness of the arrangements.

4.3.2 Stakeholders perceptions on the effectiveness of the arrangements towards sustainable charcoal production.

Considering how the arrangements regulate charcoal production, its effectiveness towards sustainability was ascertained based on its impacts on charcoal production activities. On a scale of 1 to 5 with 1 being highly effective and 5 highly ineffective, respondents' rating of the effectiveness of the arrangements in terms of how they impact access to trees, sustain the resource base, support plantation/woodlot establishment, benefit sharing, enforcement, and pricing is presented in Table 4.10. Comparatively, stakeholders view on effectiveness of the arrangements differed on most of the provisions. However, their views to some extent pointed to the same direction considering how the arrangements provides for enforcement, access to tree resources for charcoal production, and benefit sharing in all the three study communities.

Generally, no statistically significant difference exists among communities on effectiveness of the various aspects of the arrangements towards sustainable charcoal production in the study communities except for the aspect on access to trees for charcoal production. A Kruskal-Wallis H test on effectiveness of access to trees for charcoal production showed significant difference among the communities; $\chi 2(2) = 13.230$, $p = 0.001$, with a mean rank impact score of 47.48 for Kokofu, 41.57 for Kumfia and 26.14 for Fakwasi. As indicated earlier, statistically no significant differences are noted among communities on effectiveness of the other aspects of the arrangements (Annex IX).

Table 4.8 Stakeholders perception on effectiveness of CBGA in sustainable charcoal production

Provisions under the arrangements	**% of respondents**				
	Kokofu (n=20)				
	Highly effective	Effective	Uncertain	Ineffctive	Highly ineffective
Access to trees for charcoal production	15.0	30.0	40.0	15.0	0.0
Sustainability of resource base	0.0	30.0	35.0	25.0	10.0
Plantation establishment	0.0	5.0	25.0	55.0	15.0
Benefit sharing	15.0	40.0	40.0	5.0	0.0
Enforcement	15.0	50.0	30.0	5.0	0.0
Pricing of charcoal	0.0	0.0	30.0	35.0	35.0
	Kumfia (n=30)				
	Highly effective	Effective	Uncertain	Ineffctive	Highly ineffective
Access to trees for charcoal production	20.0	40.0	33.3	6.7	0.0
Sustainability of resource base	0.0	10.0	43.3	26.7	20.0
Plantation establishment	0.0	13.3	43.3	20.0	23.3
Benefit sharing	30.0	43.3	23.3	3.3	0.0
Enforcement	30.0	53.3	16.7	0.0	0.0
Pricing of charcoal	0.0	10.0	16.7	26.7	46.6
	Fakwasi (n=25)				
	Highly effective	Effective	Uncertain	Ineffctive	Highly ineffective
Access to trees for charcoal production	52.0	36.0	12.0	0.0	0.0
Sustainability of resource base	0.0	0.0	68.0	12.0	20.0

Plantation establishment	0.0	16.0	32.0	20.0	32.0
Benefit sharing	24.0	48.0	24.0	4.0	0.0
Enforcement	20.0	60.0	20.0	0.0	0.0
Pricing of charcoal	0.0	12.0	20.0	24.0	44.0

4.3.2.1 Rating of effectiveness of key aspects of CBGA

As shown in Table 4.11, stakeholders perceive enforcement aspect of the arrangements to be effective with lowest mean score of 2.01, followed by how it regulates benefit sharing (2.12) and access to trees resources for charcoal production (2.12). Key reasons for the effectiveness rating of enforcement aspect of the arrangements stems from the expediency with which chiefs by custom are able to make rules and apply sanctions to defaulters coupled with respect that subjects have for customary pronouncements. For aspects on benefit sharing and access to trees; both ranked second in effectiveness, main reason was that, chiefs are duty-bound by custom to protect right and access to stool resources and benefit same; as such, much attention is devoted to procedures on access to resources (deny or grant access to others) and benefit sharing (benefit from the granted access) by chiefs. Worth noting is that, though stakeholders view was quite similar on effectiveness of the arrangements on these three aspects, uncertainty was not ruled out in all cases.

Table 4.9 Rating of effectiveness of aspects of CBGA

Aspect of CBGA	**Effectiveness Score**		**Mean**	**Std. Deviation**	**Ranking**
	Mini	**Maxi**			
Enforcement	1	4	2.01	0.71	1
Benefit sharing	1	4	2.12	0.82	2
Access to trees for charcoal production	1	4	2.12	0.91	3
Sustainability of resource base	2	5	3.44	0.92	4
Plantation establishment	2	5	3.65	0.97	5
Pricing of charcoal	2	5	4.05	.98	6

Respondents: (N=75)

Effectiveness rating: (1=highly effective, 2=effective, 3=uncertain, 4=ineffective, 5=highly ineffective)

Specifically, stakeholders were generally uncertain with respect to aspects of the arrangements targeting sustainability of the resource base and plantation/woodlot establishment owing to limited practical effort to that effect. Finally, the arrangements are largely perceived to be ineffective with respect to how they influence pricing of charcoal. Some reasons adduced included the fact that, due to poverty, charcoal producers have limited bargaining power to negotiate for better prices especially when production is financed by merchants. Again, so far as the commodity (charcoal) can be sourced from other parts of the country, its price is mainly determined by market forces rather than stipulations by producer associations.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Demographic characteristics of respondents

The age characteristics of respondents from the present study align with findings from previous studies on charcoal in the three northern regions of Ghana (Agyeman *et al.*, 2012) and the Philippines (Espaldon *et al.,* 2016) indicating that, people between the ages of 25 and 45 are more involved in charcoal production than other age groupings. This age group falls within the age bracket of the more active working population, showing that, the young (below 18 years) and the aged (above 60 years) are less involved in charcoal production. The observation can probably be explained by the drudgery nature of charcoal production; felling of trees, arranging the logs, covering them with fresh grass and sand and perforating holes (Brobbey *et al*., 2015). It further re-affirms the low participation of females compared to males in charcoal production. However, women are dominant in the downstream parts along the charcoal value chain (i.e. distribution, marketing and consumption) (ibid).

The results of this study also point to the high involvement of migrants (68%) in charcoal production within the Atebubu-Amantin District which happens to be the third major charcoal-producing forest district in Ghana (Nketiah & Asante, 2018). This is in line with findings by (Amanor, 2009b) highlighting the degree to which locations with trees suitable for charcoal production become large receivers of migrants. This notwithstanding, the residency status of most charcoal producers in this study fell between the ages of 10-15 years, indicating less influx of new producers and contradicting the findings of Espaldon *et al.,* 2016 in the Philippines for example.

Results of this study further presents charcoal production as an avenue or opportunity where people with low educational attainment and therefore less competitive on the job market can secure meaningful employment and self-sufficiency. Employment prospects for uneducated people in Ghana is quite low and unstable (OECD, 2013). Also, through the charcoal producers' associations, the less privilege in society are able to achieve a voice to self-organise and pursue their interest notwithstanding their low educational attainment, a situation which improves socio-economic inclusiveness (Ostrom, 2009).

5.2 Origin and evolution of community-based charcoal governance arrangements

This study could not trace the beginning of the institution of the arrangements to a specific date as most information on customary or informal practices exists in oral form, therefore lacking specifics. The uncertainty that surrounds the institution of the arrangements affirms the assertion that, origin of informal community resource governance and management practices are mostly not documented and therefore remains generally unknown (Fabricius, *et al.*, 2013). Another important observation is the fact that, these arrangements are not captured by FSD records even though they claim to be aware of them and attested to its beneficial effects on charcoal production. This is another piece of evidence of lack of formal recognition especially among state institutions of community-based governance arrangements for natural resource management contrary to the claim by Agrawal & Gibson (1999). Such a situation results in limited or absence of information exchange and experience sharing between formal and informal institutions within the charcoal subsector which does not augur well for multi-level resource governance. This notwithstanding, the study re-affirms the claim that communities have the capacity and can self-organize in pursuing things of interest to them, and that such a belief is crucial for community resource governance (Ostrom 1999).

Tracing the institution of the arrangements to commercial charcoal production in the area is of significance as it demonstrates the role of markets in shaping natural resource governance. Results from this study also point to the perception that, the arrangements were instituted chiefly to serve as avenue for generating revenue for chiefs/landowners and to consolidate their authority. This means that benefits from charcoal within producing communities are key to sustaining and consolidating traditional authority. This affirms Asamoah's (2012) claim on the significance of economic status of chiefs in determining their power and authority considering that most chiefs have been caught up in the web of global economic deterioration. More especially, most subjects do not normally render the kind of services they used to render to chiefs in the past and therefore, charcoal revenue fills an important economic and political gap for chiefs.

Again, as observed from ranking of reasons behind the arrangements, responsibilities are brought to bear on chiefs and other stakeholders owing to benefits that accrue to them. Chiefs therefore initiate and supervise governance actions aimed at meeting their

own needs and those of their subjects including sustaining charcoal production, maintaining customary practices as well as safeguarding local resource use rights. This largely explains the high ranking of benefits to chiefs and consolidation of traditional authority considering that, they serve as mechanisms for traditional authorities to pursue other general needs and interests. Local resource users (charcoal producers) also benefit from the arrangements through guaranteed access to trees for charcoal production and therefore contribute to efforts towards sustainability. As hinted by Berkes & Folke (1998), benefits, especially economic serve as incentive that drive stakeholders need to conserve and sustainably use their natural resources. This indicates the importance with which the arrangements attach to efficient benefits flow to stakeholders in attempt to sustain charcoal production.

5.2.1 Stakeholder involvement in community-based charcoal governance arrangements

Acknowledging that the success of any governance regime depends on the actions of stakeholders, Grimble, (1998) reminded us of the importance that must be attached to stakeholder analysis especially in resource governance and management. This study identified many individuals, groups and institutions with varying interest and stake in charcoal and its governance arrangements. Like other value chains in Ghana; notably timber and cocoa, the multiplicity of stakeholders coupled with their diverse interest and power describes the complexity that surrounds the charcoal value chain. This notwithstanding, charcoal like other commodity chains (formal or informal) serve quite several needs and interest. This highlights the importance of charcoal, its contribution to individual livelihoods and incomes, group and institutional revenue and sustainability comparable to other products/commodities. This subsequently underscores the governance arrangements under which activities on charcoal are regulated as key to addressing stakeholder needs and as well sustaining interests taking into consideration power and influence at play.

Key determinants of stakeholder power and influence under community-based governance arrangements are existing entitlements, associated responsibilities and level of one's involvement with the arrangements. In effect, chiefs by their chieftaincy entitlement and accompanying property rights as well as their role in resource governance makes them more powerful than the other stakeholder groups either directly or indirectly involved in the arrangements. This contradicts the overly perceived

powerfulness of charcoal merchants in the commodity chain (Agyei *et al.*, 2018; Brobbey *et al.*, 2019; Ribot, 1998). However, it affirms the claim that, irrespective of policies and legislations to raise the stakes and power of private individuals, fuelwood merchants, and even formal state institutions through royalty and other payments, land ownership right remain single most important determinant of stakeholder identity and power (Barrow, 2002). As a consequence, traditional authorities as custodian of lands are resilient, powerful and influential despite the lack of/limited formal institutional support to customary resource use controls particularly in remote areas. Worth noting is that, statutory bodies (FSD, Police, Judiciary, etc.) by their mandate in resource governance and management reserves some influence on the arrangements. However, the increasing influence of formal institutions on customary arrangements has been noted to disrupt community-based processes. This for instance explains the level of competition that exists between traditional authorities (chiefs) and the FSD in terms of revenue mobilisation from charcoal production. Notwithstanding such power struggles, the continual operationalisation of the arrangements hints of compromises to the effect that, each power grouping including the weaker or marginalised feels accommodated under the arrangements.

5.2.2 Decision making under the charcoal governance arrangements

In most parts of Africa, communities are mainly defined by governance structures characterised by geo-political, economic and cultural bonds especially in the rural areas. This makes community participation in decision-making towards sustainable development paramount (Shackleton *et al.,* 2002). However, from results of this study and as also noted by Irvin & Stansbury, (2004), communities have tended to systematically employ a non-participatory approach to decision-making. This mainly stems from the traditional governance system which presents chiefs as the sole authority responsible for decisions and innovations on the use and management of community resources (Asamoah, 2012). Contrary to these practices, Irvin & Stansbury, (2004) have argued that, it is active participation by individuals/locals in decision making that secures more important benefits to them. In their opinion, such involvement in decision making enhances ownership of decisions, resources and processes which ultimately leads to sustainable utilization of resources and enhanced benefits flow. This implies that, there is high possibility that subjects of CBGA and other informal governance

arrangements with limited decision making responsibility stand the risk of not having their concerns and interest addressed.

5.2.3 Aspects of charcoal production covered by local governance arrangements

The issues covered by community-based governance arrangements align with the NAMA approach to the charcoal value chain which focuses on environmental, social and economic sustainability. This implies that, the arrangements to some extent provide for or address critical aspects of charcoal production.

Generally, the level of stakeholder satisfaction with how the arrangements address issues on charcoal production varied with none of them feeling fully satisfied. Having their interest not fully served might be linked to the limited stakeholder's involvement in decision making under the arrangements as hinted earlier. It may also be explained by other factors. For instance, the extent to which the arrangements serve the interest of natives might not be the same for migrants. Similarly, charcoal producers who have strong social ties with chiefs may have their interest served better compared with those with no or weak social relations as well as less vulnerable groups. It is these dynamics which may subsequently inform individuals' satisfaction with how the arrangements cover the broad areas of charcoal production.

5.2.4 Reforms in the arrangements

As the results point out, many factors are responsible for the reforms that have taken place in all aspects of the arrangements since they were first made. Generally, changes in the arrangements are aimed at effectively addressing stakeholder needs such that, they encounter minimal or no challenges in charcoal production within the dynamic environment in which they operate. This confirms the position that, customary resource use and controls have not remained static, but have evolved in response to changing circumstances (Barrow, 2002). Again, considering that the reforms are aimed at effectively meeting stakeholder needs coupled with its adaptability to emerging conditions pre-supposes the responsiveness of the arrangements to stakeholder needs. This highlights the strength and the high potential of the arrangements towards its intent of sustainable charcoal production with maximum benefits flow to all stakeholders especially in the wake of internal and external threats.

Worth mentioning is that, the responsibility to effect changes in the arrangements rest with chiefs. This role of chiefs affirms Adam (2000) position that, chiefs are major driving force behind changes in land use; with other stakeholders including individuals and government authorities relatively being passive with no clear role in promoting sustainable land use. This further confirms the assertion that, chiefs in Ghana are major forces behind innovations and changes in strategies for development especially at the community level (Asamoah, 2012), an indication that their concerns and interest is paramount.

On the contrary and from the traditional authority's perspective however, the charcoal governance arrangements are mainly intended to benefit charcoal producers and further safeguard the environment. As mentioned earlier, the arrangements create conditions under which charcoal producers can freely go about their activities without any hindrance. Regarding this, chiefs as a major force and extremely powerful stakeholder under the arrangements balance their expected benefits with the needs, concerns and benefits of other stakeholders. This shows that, trade-offs exist between protecting the integrity of traditional authorities and meeting general stakeholder needs in local resource governance. As a consequent, benefits are presumed to be equitably distributed between resources owners and users under the arrangements comparable to forms of resource governance including formalized resource controls which are persistently criticized for its benefit sharing flaws.

5.3 Effectiveness of CBGA on charcoal production

5.3.1 Successes of the arrangements

The positive aspects of the arrangements which include guaranteed access to wood resources for charcoal production, conflict prevention, high compliance of established regulations, among others bring important benefits to people and their communities. For instance, resolution of disputes among parties are noted to be fast and mostly result in a win-win situation. This quite resonates with assertion by Boafo-Arthur (2003), Lutz & Linder (2004) whose research attested to the accessibility and local people's understanding of customary dispute resolutions processes. These successes subsequently bring additional benefits ranging from job creation to substantial management rights and income as well as revenue-generation (Malla, 2000).

Typical example is the CAMPFIRE and community-based wildlife management, through which some communities in Zimbabwe and Tanzania appropriated some portion of revenues from community-based enterprises to investments in key infrastructure needs. Unlike the above case however, revenue generated by chiefs under community-based governance arrangements on charcoal production are not invested in any communal development activity but rather for upkeep of their respective stools. The challenge to the use such revenues for community's development is much greater as individual community members are not the powerful actors under the arrangements and within the community in general. This does not present such informal arrangements as models of local empowerment, imbuing communities with greater authority over the use of their revenues.

It is worth mentioning that, successes are not solely attributed to the arrangements as it is not practiced in isolation. It stems from customary practices and inherently forms part of a continuum of land use practices ranging from forestry to agriculture. As such, successes of community-based governance arrangement should also be viewed as an element in the development of the larger landscape.

5.3.2 Stakeholders perception of effectiveness of CBGA towards sustainable charcoal production

This study assessed the effectiveness of the CBGA towards sustainability based on its provisions and how stakeholders perceive its impact on charcoal production. The arrangements are notably effective with its enforcement mechanisms. This is probably so, acknowledging that traditional authorities largely demonstrate their power by pronouncing and enforcing rules within their jurisdiction. In effect, strong enforcement of charcoal governance arrangements couched as customary practices is no exception. Another component of charcoal production where the arrangements are effective is guaranteed (granting or denying) access to trees for charcoal production. This confirms Wynberg & Laird (2007) assertion that, when resource use right is secured, customary laws are strong and therefore provide for effective access and resource management oversight. In the opinion of Mvula *et al.*, (2014), this makes chiefs important access point to livelihood resources, thus re-enforcing their control over access to resources and enhancing their social status among their subjects. Also, benefit sharing aspect of the arrangements is effective considering that more benefits accrue to stakeholders equitably. Worth noting is that, chiefs are key beneficiaries of charcoal production and

therefore attach much importance to provisions on benefits; thus, making such aspect more effective. Other aspects of the arrangements that do not grant direct or immediate reward to chiefs (sustainability of resource base, plantation establishment and pricing) receives less attention. In effect, minimal effort is geared in that direction by chiefs, thus making such aspects less effective compared to other aspects that are of nested in customary practices and of relevance for upkeep of their stools.

Notwithstanding the uneven effectiveness of aspects of the arrangements, a critical look of effectiveness of the arrangements in one community epitomises the other; thus minimal or no difference were noted among communities. This implies that, irrespective of community differences and challenges, they are capable and effective in regulating their resources in some respect; especially those that accrue benefits to them. This aligns with Ordera's, (2009) assertion that, generally accepted community-based governance structures are noted to be effective for the management of tree and forest resources. This further confirms Brobbey *et al*., (2015) position that, stakeholders under informal arrangements have the willingness to contribute to efforts towards sustainable charcoal production including reporting and enforcing sanctions on defaulters. To Wily (2005), it requires that structures and constituents of the arrangements are empowered with responsibility, secured rights and equitable benefit sharing to contribute efficiently towards achieving the ultimate intent of the arrangements.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Two main objectives were set out for this study. It is based on these that the following conclusions are drawn;

6.1.1 Evolution of community-based governance arrangements

The CBGA on charcoal production was necessitated by the desire for chiefs to generate rent or revenue from lands and tree resources from which charcoal is produced but has since evolved to incorporate social, economic and environmental issues related to sustainable charcoal production. Many stakeholders are involved in the arrangements though charcoal producers are the most important stakeholder group. However, chiefs remain the most powerful owing to their role as heirs to customs and custodians of the land as also recognised by law. Decisions under the arrangements are mainly taken by chiefs. One can appeal for modification but the power to effect changes rest with the chief.

Stakeholder satisfaction with how the arrangements addresses social and environmental issues varied among the three communities but not for economic issues. Changes in the arrangements were triggered by local and national initiatives. However, national directives appear to be more influential on the changes.

6.1.2 Stakeholder perception on effectiveness of CBGA towards sustainable charcoal production

Stakeholders perceived the arrangements to be effective with respect to its enforcement mechanism, benefit sharing and procedures on access to tree resources for charcoal production but not with measures on sustaining the resource base, plantation/woodlot establishment and pricing of charcoal. The arrangements therefore need to be strengthened for effectiveness towards sustainable charcoal production.

6.2 Recommendations

Based on findings of the study, the following are recommended:

For charcoal policy and management

1. Considering that charcoal production is key to livelihoods and energy in pursuit of sustainable development agenda, state institutions and CSOs should create awareness among communities on the relevance of established community-based governance arrangements on charcoal, the need to participate, manage, and own their natural resources.
2. The arrangements should be embraced by formal sector institutions and aligned with national development strategies and management priorities as well as interventions targeting sustainable charcoal value chain.

For research and knowledge generation on charcoal

1. Further studies should be formulated to provide options for strengthening community-based governance arrangements and subsequently, its effectives towards sustainable charcoal production.
2. Again, studies should be conducted to investigate whether findings in this study resonates with other charcoal producing areas under similar community-based governance arrangements.

REFERENCES

Adupong, R. & Gormey, B. (2013). Development of Conservation Management Scenarios: The case of Amanzule wetlands. USAID, Coastal Resources Center, University of Rhode Island and Friends of the Nation.

Agidee, Y. (2011). Forest carbon in Ghana: spotlight on community resource management areas (CREMA). Katoomba Group's Legal Initiative Country Study Series. Washington, DC: Forest Trends.

Agrawal, A., & Gibson, C. C. (1999). Enchantment and disenchantment: the role of community in natural resource conservation. World development, 27(4), 629-649.

Agyei, F.K., Hansen, C.P., & Acheampong, E. (2018). Profit and profit distribution along Ghana's charcoal commodity chain. Energy for Sustainable Development, 47, 62-74

Agyeman, K. O., Amponsah, O., Braimah, I., & Lurumuah, S. (2012). Commercial charcoal production and sustainable community development of the upper west region, Ghana. Journal of Sustainable Development, 5(4), 149.

Alcorn, J., Kajuni, A. & Winterbottom, B. (2002). Assessment of CBNRM Best Practices in Tanzania. Final Report Presented to USAID/Tanzania

Amanor, K. & Brown, D. (2003) Making Environmental Management More Responsive to Local Needs: Decentralisation and Evidence-Based Policy in Ghana. ODI Forestry Briefing, Number 3, April 2003

Amanor, K. S. (2009a) Securing Land Rights in Ghana in Ubink, Janine M., Hoekema, André J. & Assies, Willem J. (ed.) Legalising Land Rights: Local Practices, State Response and Tenure Security in Africa, Asia and Latin America, Leiden University Press, chapter 4

Amanor, K. S. (2009b) Tree plantations, agricultural commodification, and land tenure security in Ghana in Ubink, Janine M., Hoekema, André J. & Assies, Willem J. (ed.) Legalising Land Rights: Local Practices, State Response and Tenure Security in Africa, Asia and Latin America, Leiden University Press, chapter 5

Amanor, K. S. (2010). Family values, land sales and agricultural commodification in South-Eastern Ghana. Africa, 80(1 1), 104-125.

Amanor, K., Osei, E. & Gyampoh, K. (2005). Charcoal burning in the Kintampo Districts: policies, environment and livelihood issues. The DEAR project. University of Ghana, Legon, Accra.

Anang, K. O., Amponsah, O., Braimah, I. & Lurumuah, S. (2011). Charcoal production in Gushegu District, Northern Region, Ghana: Lessons for Sustainable Forest Management, International Journal of Environmental Sciences 1(7), pp.1944-1953

Appiah, M., Blay, D., Damnyag, L., Dwomoh, F. K., Pappinen, A., & Luukkanen, O. (2009). Dependence on forest resources and tropical deforestation in Ghana. Environment, Development and Sustainability, 11(3), 471-487.

Asamoah, K. & Osei-Kojo, A. (2016). A Contextual Analysis of Implementation Challenges of Small-Scale Mining Laws in Ghana: A Case Study of Bekwai Municipality. SAGE Open. 6. 10.1177/2158244016665885.

Asamoah, K. (2012). A qualitative study of chieftaincy and local government in Ghana. Journal of African Studies and Development, 4(3), 90-95.

Asare, R.A., Kyei, A. & Mason, J.J. (2011). The community resource management area mechanism: a strategy to manage African forest resources for REDD+. Philosophical Transactions of the Royal Society B, 368 art. 18

Ayittey, G. (2010). Traditional Institutions and the State of Accountability in Africa. Social Research, 77(4), 1183-1210. Retrieved from http://www.jstor.org/stable/23347124

Barrow, E. G. (2002). Analysis of stakeholder power and responsibilities in community involvement in forest management in Eastern and Southern Africa (No. 9). IUCN.

Berkes, F., & Folke, C. (1998). Linking social and ecological systems for resilience and sustainability. Linking social and ecological systems: management practices and social mechanisms for building resilience, 1(4).

Berry, S. (2013). Questions of Ownership: Proprietorship and Control in a Changing Rural Terrain – A Case Study from Ghana. Africa, 83(1), pp. 36–56

Biitir, S. B. & Nara, B. (2015) The Role of Customary Land Secretariats in Promoting Good Local Governance in Ghana. Land Use Policy 50, pp. 528-536

Blomley, T., Pfliegner, K., Isango, J., Zahabu, E., Ahrends, A., & Burgess, N. (2008). Seeing the Wood for the Trees: An Assessment of the Impact of Participatory Forest Management on Forest Condition in Tanzania. Oryx, 42(3), 380–391.

Boafo, J. (2013). The Impact of Deforestation of Forest Livelihoods in Ghana.

Boafo-Arthur K (2003). "Chieftaincy in Ghana: challenges and prospects in the 21st Century." Afr. Asian Stud., 2: 125-153

Broadhead, J., Bahdon J., & Whiteman A. (2001). Wood fuel consumption modeling and results. In Past trends and future prospects for the utilization of wood for energy. Global Forest Products Outlook Stud. Rome: FAO

Brobbey L.K., Hansen C.P., Boateng K., & Pouliot M. (2019). The economic importance of charcoal to rural livelihoods: Evidence from a key charcoal-producing area in Ghana. Forest Policy and Economics, 101, 19-31

Brobbey, L.K., Asante, J., Sampong K., Kumeh, E.M., & Nketiah K.S. (2015). Securing rights to wood resources for charcoal production in Ghana. IIED small and medium forest enterprise.

Bwalya, S. M. (2002). Critical analysis of community-based wildlife resource management in Southern Africa: case study from Zambia. In Commons in an Age of Globalisation," the Ninth Conference of the International Association for the Study of Common Property, Victoria Falls, Zimbabwe.

Colchester, M. (1994). Sustaining the forests: the community-based approach in south and south-east Asia. Development and Change, 25(1), 69-100.

Decentralised Development Action Research (DEAR) (2005). Charcoal Burning in the Kintampo Districts: Policies, Environment and Livelihood Issues. The DEAR Project

Ecosystem Alliance (2013). Community Resource Management Areas (CREMA) - Building sustainable landscapes in Ghana [Available online] http://www.ecosystem-alliance.org/case-study/ea-results-livelihoods-and-ecosystems-ecosystem-landscape-approach-land-resource-use [20.11.2016]

Energy Commission (2006). Strategic National Energy Plan 2006 – 2020. Energy Supply to the Economy – Wood Fuel and Renewable Energy. Energy Commission of Ghana

Energy Commission (2014). Charcoal Price Tracking in Major Urban Centres of Ghana. EC Strategic Planning & Policy Division

Energy Commission, (2010). Draft Bio Energy Policy for Ghana

Espaldon, M. L. O., Sumalde, Z. M., Rebancos, C. M., & Alcantara, A. J. (2016). Who wants to adopt sustainable charcoal production?: Determinants and willingness to adopt sustainable practices among small-scale producers in Quezon Province, Philippines. Journal of Environmental Science and Management, 19(Special Issue 2), 84-92.

Fabinyi, Michael; Evan, Louisa & Foale, Simon J. (2014). Social-ecological systems, social diversity, and power: insights from anthropology and political ecology. Ecology and Society 19(4), art.

Fabricius, C., Koch, E., Turner, S., & Magome, H. (Eds.). (2013). Rights resources and rural development: Community-based natural resource management in Southern Africa.

Falcão, M. P. (2008). Charcoal production and use in Mozambique, Malawi, Tanzania, and Zambia: historical overview, present situation and outlook. Proceedings of the Conference on Charcoal and Communities in Africa

Fisiy, C. F. (1995). Chieftaincy in the modern state: An institution at the crossroads of democratic change. Paideuma, 49-62.

Food and Agriculture Organization (FAO), (nd). Forestry Statistics Today and tomorrow. FAO, Rome, Italy

Forestry Commission of Ghana (2017). Rosewood Harvesting in Ghana and Way Forward (Accessed 20th May,2017). Available at: http://fcghana.org/news.php?news=101

Ghana Forest and Wildlife Policy, (2012). Ministry of Lands and Natural Resources, Accra

Ghana Statistical Service (2014). District analytical report. (Accessed 20th January 2017). Available at: https://new-ndpc-static1.s3.amazonaws.com/CACHES/PUBLICATIONS/2016/06/06/Atebubu+Amantin+2010PHC.pdf

Girard, P. (2002). Charcoal Production and Use in Africa: What Future? Unasylva 211: An international journal of forestry and forest industries, 53, FAO, pp. 30-34

Grimble, R. (1998) Stakeholder methodologies in natural resource management. Socioeconomic Methodologies. Best Practice Guidelines. Chatham, UK: Natural Resources Institute

Gyimah, R. & Dadebo, M. (2010). Mapping of Key Forest Governance Reform in Ghana and the Role of Growing Forest Partnerships. GFC.

Haile, K., Urgessa, K., & Sandewall, M. (2009). Wood fuel demand and sustainability of supply in south-western Ethiopia, case of Jimma Town. Res. J. For, 3, 29-42.

Hardin, G. (1968). The Tragedy of the Commons. Science 162(3859) pp. 1243-1248

IEA, (2006). World Energy Outlook (2006). OECD/IEA, Paris, France, ISBN-13: 9789264109896, Pages: 596.

Integrated Network for Social Sustainability (INSS) (2016). Defining Social Sustainability. [Available online] https://clas-pages.uncc.edu/inss/what-is-social-sustainability/ [20.11.2016]

International Institute for Environmental Development (IIED) (2014). Informality and market governance in wood and charcoal value chains. IIED Briefing: Shaping Sustainable Markets December 2014 Issue.

Irvin, R. A. & Stansbury, J. (2004). Citizen Participation in Decision Making: Is It Worth the Effort? Public Administration Review, 64: 55–65.

IUCN, (2008). Energy, ecosystems and livelihoods: Understanding linkages in the face of climate change impacts. Switzerland

Jessop, B. (1990). State theory: Putting the capitalist state in its place. Penn State Press.

Kallinen, T. (2004). Some Chiefs Are "More Under" Than Others Kinship, ritual, and the concept of political hierarchy among the Asante. PhD Dissertation, Helsinki University Press, Helsinki.

Haile, K., Sandewall, M. & Kaba Urgessa. (2009). Wood Fuel Demand and Sustainability of Supply in South-Western Ethiopia, Case of Jimma Town. Research Journal of Forestry, 3: 29-42.

Koppenjan, J. F. M., & Klijn, E. H. (2004). Managing uncertainties in networks: a network approach to problem solving and decision making (Vol. 40). London: Routledge.

Kumeh, E. M. (2017). Natural resource governance in Africa. TANA High-Level Forum on Security in Africa, Bahir Dir, Ethiopia.

Leonard I. Chirenje, Richard A. G. & Emmanuel B. M. (2013). Local communities' participation in decision-making processes through planning and budgeting in African countries, Chinese Journal of Population Resources and Environment, 11:1, 10-16, DOI: 10.1080/10042857.2013.777198

Lubilo, R., & Child, B. (2010). The rise and fall of community-based natural resource management in Zambia's Luangwa Valley: an illustration of micro-and macro-

governance issues. Community Rights, Conservation and Contested Land: The Politics of Natural Resource Governance in Africa, 202-26.

Lurimuah, S. (2011). The economic and environmental effects of commercial charcoal production in the Upper West Region of Ghana. Master Thesis submitted to the School of Graduate Studies, Kwame Nkrumah University of Science and Technology, Kumasi–Ghana.

Lutz G., & Linder W. (2004). "Traditional Structures in Local Governance for Local Development." Report Commissioned by World Bank Institute's Community Empowerment and Social Inclusion (CESI) Learning Program. Berne: Institute of Political Sci. University of Berne.

Mahmood, M. (1996). Citizen and subject: Contemporary Africa and the legacy of late colonialism. Kampala: Fountain Publishers.

Malla, Y. B. (2000). Impact of community forestry policy on rural livelihoods and food security in Nepal. Unasylva, 51(202), 37-45.

Mamdani, M. (2018). Citizen and subject: Contemporary Africa and the legacy of late colonialism. Princeton University Press.

Marcatney, R. (2012). Gender differences in on-farm tree planting in Ghana's high forest zone. A thesis submitted to the University of Amsterdam

Marfo, E. (2010) Chainsaw Milling in Ghana Context: Drivers and Impacts. CSIR & Tropenbos International Ghana

Mason, J., (2008). Charcoal Production in Ghana. Building a Sustainable Model Based on Community Management and Payment for Ecosystems Services. NCRC, Accra, Ghana

Mgumia, F.H. & Oba, G. (2003). Potential role of sacred groves in biodiversity conservation in Tanzania. Environmental Conservation, 30, 259–265.

Millennium Ecosystem Assessment (MEA), (2005). Timber, Fuel and Fiber. In: Ecosystems and Human Well-Being: Current State and Trends, Hassan, R., R. Scholes and N. Ash (Eds.). Vol. 1, Chapter 9, Island Press, Washington, DC., USA., ISBN-13: 9781559632287, pp: 243-269

Ministry of Finance (MOF), (2014). Ghana Natural Resource Revenue Forecasting Mode. Ministries, Accra

Ministry of Land and Natural Resources (MLNR) (2012). Ghana Investment Plan for the Forest Investment Programme. MLNR & Climate Investment Fund

Ministry of Lands and Natural Resources (MLNR) (2010). REDD+ Readiness Preparatory Proposal, Ghana. Ministries Accra

Mvula, P., Kalindekafe, M., Kishindo, P., Berge, E., & Njaya, F. (Eds.). (2014). Towards defragmenting the management system of Lake Chilwa Basin, Malawi (Vol. 1). LIT Verlag Münster.

Mwampamba, T.H., Ghilardi, A., Sander, K. & Chaix, K.J. (2013). Dispelling Common Misconceptions to Improve Attitudes and Policy Outlook on Charcoal in Developing Countries. Energy for Sustainable Development 17, pp. 75–85.

Mwihomeke, S.T., Msangi, T.H., Mabula, C.K., Ylha ¨ Isi, J. & Mndeme, K.H. (1998). Traditionally protected forests and nature conservation in the North Pare Mountains and Handeni District, Tanzania. Journal of East African Natural History, 87, 1–28.

Nelson, F. (ed.) (2010). Community Rights, Conservation and Contested Land; The Politics of Natural Resource Governance in Africa. Earthscan. London. New York.

Nelson, F. & Agrawal, A. (2008), Patronage or Participation? Community-based Natural Resource Management Reform in Sub-Saharan Africa. Development and Change, 39: 557-585. doi:10.1111/j.1467-7660.2008.00496.x

Neufeldt, H., Fuller, J., Liyama, M. & Dobie, P., 2015. From Transition Fuel to Viable Energy Source: Improving Sustainability in the Sub-Saharan Charcoal Sector. ICRAF Working Paper No. 196. World Agroforestry Centre, Nairobi.

Neumann, R. P. (2002). Imposing wilderness: struggles over livelihood and nature preservation in Africa (Vol. 4). University of California Press.

Nketiah, S.K., & Asante, J. (2018). Estimating national charcoal production level in Ghana. Tropenbos Ghana.

Nunan, F. (2006). Empowerment and institutions: Managing fisheries in Uganda. World Development, 34(7), 1316–1332.

Obiri, B. D., Nunoo, I., Obeng, E., Owusu, F. W & Marfo, E. (2014). The Charcoal industry in Ghana: An alternative livelihood option for displaced illegal Chainsaw lumber producers, Tropenbos International Wageningen, The Netherlands.

OECD, (2013). "Does Upper Secondary Vocational Education and Training Improve the Prospects of Young Adults?" Education Indicators in Focus, No. 17, OECD Publishing, Paris, http://dx.doi.org/10.1787/5jzbb2st885l-en.

Ordera, LA. (2009). The changing forest management paradigm in Africa: a case for community-based forest management system. Disc Innov. 21(1) (SFM Special Edition):27–35

Ostrom, E. (1990). Governing the Commons – The Evolution of Institutions for Collective Action, Political Economy of Institutions and Decisions, Cambridge University Press, Cambridge, UK, p. 280.

Ostrom, E. (1999). Coping with the Tragedy of the Commons. Annual Reviews 2, pp.493-535

Ostrom, E. (1999): Self-Governance and Forest Resources, Occasional Paper no. 20, Centre for International Forestry Research, Bogor, Indonesia, p. 15.

Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. Science 325: 419-422.

Owusu, K.A., Nketiah, K.S & Sampong, E.K. (2014). Supporting SMFEs for sustainable livelihoods: Facilitating sustainable charcoal production in Ghana. IIED & Tropenbos International Ghana

Pailler S., Naidoo R., Burgess N.D., Freeman O.E., & Fisher B. (2015). Impacts of Community-Based Natural Resource Management on Wealth, Food Security and Child Health in Tanzania. PLoS ONE 10(7): e0133252. https://doi.org/10.1371/journal.pone.0133252

Passer, M. W., (2014). Research methods: Concepts and Connections. Worth Publishers, New York. Resource Issues No. 18, International Institute for Environment and Development,

Peluso, N. L., & Lund, C. (2011). New frontiers of land control: Introduction. Journal of Peasant Studies, 38(4), 667-681.

Pokharel, B. K. (1997). Foresters and villagers in contention and compact: the case of community forestry in Nepal. Foresters and villagers in contention and compact: the case of community forestry in Nepal.

Pokharel, B. K., Branney, P., Nurse, M., & Malla, Y. B. (2007). Community forestry: Conserving forests, sustaining livelihoods and strengthening democracy. Journal of Forest and Livelihood, 6(2), 8-19.

Ribot, C.J. & Peluso N.L. (2003). A Theory of Access. Rural Sociology 68(2), pp.153-181

Ribot, C.J. (1998). Theorizing access: Forest profit along Senegal's charcoal commodity chain. Development and Change, 29, 307-341.

Roe, D., Nelson, F., & Sandbrook, C. (Eds.). (2009). Community management of natural resources in Africa: Impacts, experiences and future directions (No. 18). IIED.

Saunders, F. Mohammed, S.M. Jiddawi, N. & Sjöling, S (2008). An Examination of Governance Arrangements at Kisakasaka Mangrove Reserve in Zanzibar. Environmental Management 41, pp. 663-675

Sawe E.N. (2012). Sustainable Charcoal and Firewood Production and Use in Africa. In: Janssen R., Rutz D. (eds) Bioenergy for Sustainable Development in Africa. Springer, Dordrecht

Schoneveld, George C. & German, L. (2014). Translating Legal Rights into Tenure Security: Lessons from the New Commercial Pressures on Land in Ghana. The Journal of Development Studies, 50(2), pp. 187–203

Schure, J., Ingram, V., Arts, B., Levang, P., & Mvula-Mampasi, E. (2015). Institutions and access to woodfuel commerce in the Democratic Republic of Congo. Forest Policy and Economics, 50, 53-61.

Schure, J., Ingram, V., Sakho-Jimbira, M. S., Levang, P., & Wiersum, K. F. (2013). Formalisation of charcoal value chains and livelihood outcomes in Central-and West Africa. Energy for Sustainable Development, 17(2), 95-105.

Schure, J., Ingram, V., Sakho-Jimbira, M. S., Levang, P., & Wiersum, K. F. (2013). Formalisation of charcoal value chains and livelihood outcomes in Central-and West Africa. Energy for Sustainable Development, 17(2), 95-105.

Seidel, A. (2008). Charcoal in Africa: Importance, Problems and Possible Solution Strategies.

Shackleton, S., Campbell, B., Wollenberg, E., & Edmunds, D. (2002). Devolution and community-based natural resource management: Creating space for local people to participate and benefit. Natural resource perspectives, 76(1), 1-6.

Shrestha, K. B. (1996). Nepal Madhyasthata Samuha: Community forestry in Nepal-an overview of conflicts.

Teschner, N. A., McDonald, A., Foxon, T. J., & Paavola, J. (2012). Integrated transitions toward sustainability: The case of water and energy policies in Israel. Technological Forecasting and Social Change, 79(3), 457-468.

Torfing, J., Peters, B. G., Pierre, J., & Sørensen, E. (2012). Interactive governance: Advancing the paradigm. oxford university Press on demand.Adam, M.G. (2000). "Kumasi Natural Resources Management Project". Natural Resources Systems Programme. Final Technical Report. DFID Project No. 6799. Natural Resources Institute, University of Greenwich, U.K.

Totikidis, V., Armstrong, A. F. & Francis, R. D. (2005). The Concept of Community Governance: A Preliminary Review. Centre for International Corporate Governance Research, Faculty of Business and Law, Victoria University, Presented at the GovNet Conference, Monash University, Melbourne, 28-30th November 2005

Tropenbos International Ghana, (2015). Report on Stakeholder Analysis Workshops for the Project: Property, Access and Exclusion along the Charcoal Commodity Chain in Ghana, Tropenbos International

Tropenbos International, (2014). Supporting Small and medium forest enterprisers for sustainable livelihoods: facilitating sustainable charcoal production in Ghana. Tropenbos International Ghana Project Document

UNDP, (2014) NAMA Study for a Sustainable Charcoal Value Chain in Ghana. Regional Environmental Project.

Van de Walle, N. (2001). African economies and the politics of permanent crisis, 1979-1999. Cambridge University Press.

Wildlife Division (2014). Wildlife Resources Management Bill [Available online] http://www.parliament.gh/assets/file/BILLS%20%20FOR%202016/Wild%20life%20Resource%20Mangt_%20Bill,%202014.pdf [20.11.2016]

Wily, L.A. (2005). Introduction: from needs to rights in: Sayer, J. (ed.) 2005. The Earthscan reader in Forestry and Development. Earthscan, London

World Bank, (2011). Wood-Based Biomass Energy Development for Sub-Saharan Africa; Issues and Approaches. World Bank, Washington.

Wynberg, R. P., & Laird, S. A. (2007). Less is often more: governance of a non-timber forest product, marula (Sclerocarya birrea subsp. caffra) in southern Africa. International Forestry Review, 9(1), 475-490.

Zulu, L. C. (2010). The forbidden fuel: charcoal, urban woodfuel demand and supply dynamics, community forest management and woodfuel policy in Malawi. Energy Policy, 38(7), 3717-3730.

Zulu, L. C., & Richardson, R. B. (2013). Charcoal, livelihoods, and poverty reduction: Evidence from sub-Saharan Africa. Energy for Sustainable Development, 17(2), 127-137.

ANNEXES

Annex I: Questionnaire for charcoal producers in the study area

Demographic information of respondents

1. Gender (Sex). Male [ ] Female [ ]
2. Community status. Indigene [ ] Migrant [ ]
3. Major Occupation. Charcoal producer [ ] Non-producer [ ] Other specify…….
4. Membership of charcoal association. Member [ ] Non-member [ ]
5. Name of Charcoal producer association (if applicable) ……..
6. Number of years in community. Less than 5 [ ] 5-10 [ ] 10-15 [ ] 15-20 [ ] More than 20 [ ]
7. Age class. Less than 18 [ ] 18-25 [ ] 25-35 [ ] 35-45 [ ] 45-55 [ ] Above 55 [ ]
8. Level of education attained.

    a. Never being to school [ ]

    b. Primary [ ]

    c. JHS/Middle School [ ]

    d. SSS/SHS [ ]

    e. Tertiary [ ]

    f. Other (specify)……..

Objective 1: Assess how community-based charcoal governance arrangements in the Atebubu-Amantin District have evolved over time and the factors driving those changes.

9. Are you aware of any local arrangements to satisfy to produce charcoal?

    a. Yes [ ]

    b. No [ ]

    If yes, what are some of the key provision(s):

    a.

    b.

    c.

    d.

    e.

10. If no, under what condition(s) do you secure resources (trees and/or land) for charcoal production?

    a.

    b.

    c.

    d.

11. Do you know when the arrangements were instituted

    Yes [ ] indicate the year ……

    No [ ]

12. State reasons that necessitated the institution of charcoal governance arrangements?

    a.

    b.

    c.

    d.

    e.

    f.

    g.

13. Who makes decisions under the arrangements?

    a. Traditional Authority (Chief) [ ]

    b. Priesthood authority [ ]

    c. Unit committee [ ]

    d. Farmers [ ]

    e. District Assembly [ ]

    f. Forestry Service Division [ ]

    g. All Stakeholders

    h. Other specify……

14. How are such decisions made?

    a. Inclusive (entire community) [ ]

    b. Participatory (entire Community) [ ]

c. Collectively (key stakeholders) [ ]

d. Imposed by chiefs [ ]

e. Other specify……

15. How are the arrangements enforced?

a. Awareness creation [ ]

b. Punishments [ ]

c. Fines [ ]

d. Cease from production [ ]

e. Other specify……

16. Indicate which of these aspects below is/are covered by the arrangements?

a. Right and access to wood resources [ ]

b. Formation of Associations

c. Benefit sharing [ ]

d. Enforcement mechanism [ ]

e. Sustainability of the resource base [ ]

f. Pricing of charcoal [ ]

g. Other specify……

17. Do the arrangements apply equally to both male and female?

a. Yes [ ]

b. No [ ]

18. If no, what variations exit in applying the arrangements?

a.

b.

19. Do the arrangements apply equally to indigenes and migrants?

a. Yes [ ]

b. No [ ]

20. If no, what variations exit in applying the rules

a.

b.

21. Indicate your satisfaction with how the arrangements addresses these broad aspects of charcoal production.

Broad aspect	Level of satisfaction	
	Satisfied	Dissatisfied
Social		
Environmental		
Economic		

22. Have you witnessed any changes in the arrangements?
    a. Yes
    b. No

23. List in order the likelihood of factors that drive changes in the arrangements?

Drivers of change	Possibility to cause changes		
	Very Likely	Likely	Not Likely

24. How often do changes occur in the arrangements?

a. Very often
b. Often
c. Not Often
d. Never

25. Describe how aspects of the arrangements identified under Q 16 have changed since your encounter with the arrangements?

Main aspects	Previously	Status	Observed Changes
Right and access to wood resources			

Sustainability of the resource base			
Benefit sharing			
Enforcement mechanism			
Pricing of charcoal			
Formation of Charcoal Producer Associations			
Other			

26. If change occur in these aspects, indicate its level of impact on charcoal production activities.

Changing Aspects		Impact on charcoal Production		
	Very High	High	Low	Neutral
Right and access to wood resources				
Sustainability of the resource base				
Benefit sharing				
Enforcement mechanism				
Pricing of charcoal				
Benefit sharing				
Formation of Charcoal Producer Associations				
Other				

27. When changes occur in the arrangements, are there beneficiaries and losers?

    a. Yes [ ]

    b. No [ ]

28. How do you cope with changes in the arrangements?

Ans: …….

Objective 2: Explore the strengths of community-based governance arrangements for charcoal production and the constraints facing its implementation.

29. In the table below, state the strengths of the arrangements and constraints to the effective implementation of the arrangements

Strengths	Constraints

Objective 3: Assess stakeholders' perceptions on the effectiveness of the existing arrangements in promoting sustainable charcoal production.

30. Indicated which of these measures you have been subjected to in undertaking charcoal production activities.

    a. Ban on harvesting certain tree species [ ]

    b. Observance of taboo days [ ]

    c. Establishment of woodlot [ ]

    d. Fines on illegal harvesting of trees [ ]

    e. Allowing for natural regeneration [ ]

    f. Other……

31. On a scale of 1-5 with 1 being highly effective and 5 being highly ineffective, how will you rate the effectiveness of provisions under the arrangements in sustaining charcoal production? (1-Highly Effective, 2-Effective, 3-Uncertain, 4-Ineffective, 5-Highly Ineffective)

Impact area	**Rating**				
	Highly effective	Effective	Uncertain	Ineffctive	Highly ineffective
Access to trees for charcoal production					

Sustainability of resource base					
Plantation/Woodlot establishment					
Benefit sharing					
Enforcement					
Pricing of charcoal					

32. What informed your rating?.....

……..

33. How can CBGA for charcoal be improved

……
……
……
……

Thanks for your responses

Annex II: Interview Guide for focus group discussions and multi-stakeholder workshop

1. What procedures/arrangements do you have to follow to produce charcoal?
2. When did the arrangements came into effect or initiated?
3. What reason(s) precipitated the arrangements?
4. Who initiated the arrangements and with which other stakeholders?
5. Kindly mention and provide information on stakeholders of the arrangements in terms of their:
    - Roles/Responsibilities
    - Level of involvement
    - Importance (scale:1-5)
    - Relationship
    - Power/Influence (scale: 1-5)
6. How are decisions made under the arrangements and by which stakeholder(s)?
7. Which aspects of charcoal production does the arrangements cover?
8. Has there being any changes in the arrangements?
9. Explain how various aspects of the arrangements have changed?
10. What propel changes in the arrangements and who effects such changes?
11. Who are the beneficiaries and losers when changes occur in the arrangements? (indicate stakeholders loss and benefit on a scale of 0-5 with 5 being the highest level of benefit).
12. What are the key successes and constraints of the arrangements?
13. What's your assessment of the arrangements in promoting sustainable charcoal production?

Annex III: Interview Guide for Traditional Authorities (Chiefs)

1. How is charcoal production regulated within your enclave?
2. What role do you play in terms of governing and managing charcoal production?
3. Which other stakeholders are involved especially in decision making on charcoal production?
4. What are the motives/objectives for your involvement in regulating charcoal production?
5. For how long have such regulations being in existence?
6. Which aspects of charcoal production do local regulations focus on and why?
7. What accounts for reforms in regulations?
8. Do stakeholders complain when reforms are made?
9. How frequent do you modify the regulations and for what purpose?
10. Can you comment on the level of compliance or otherwise of the arrangements by stakeholders (charcoal producers) and underlying reasons for your comment?
11. What in your opinion are the positive sides of the arrangement?
12. What constraints the operationalization of the arrangements
13. What your view of your governance approach in promoting sustainable resource use?

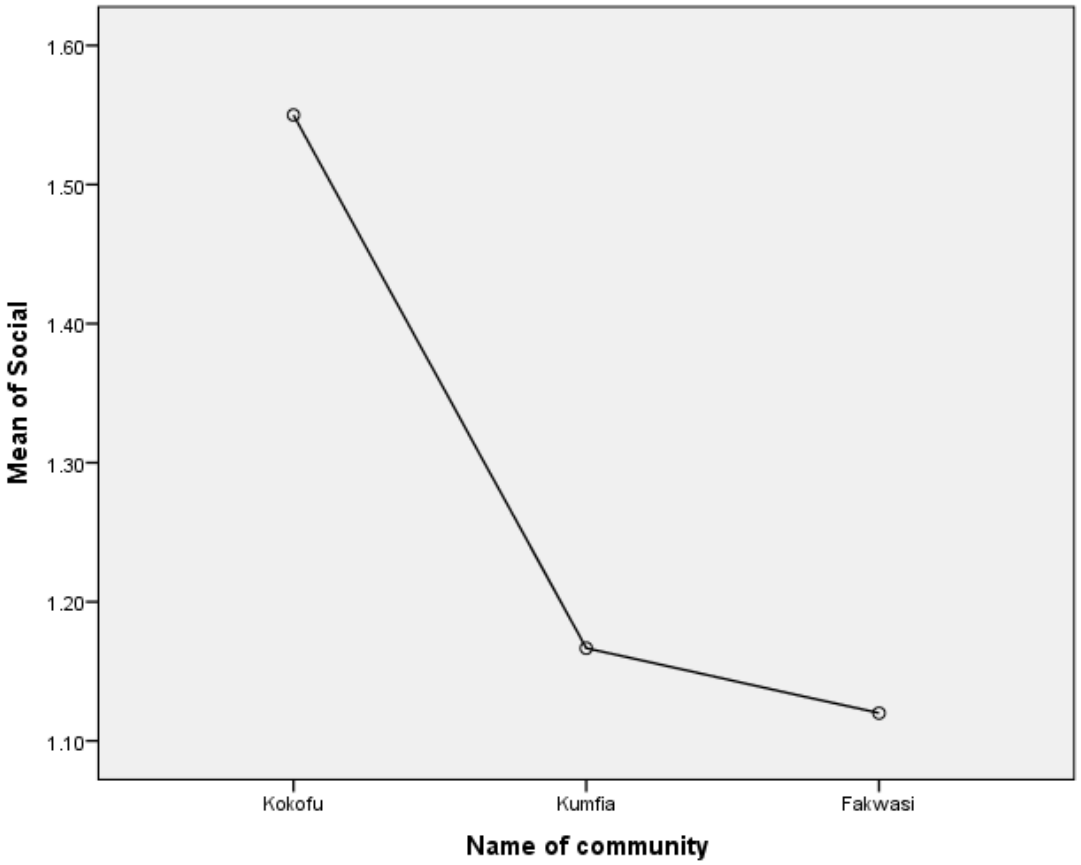
Annex IV: Interview Guide CSOs, FSD, DAs

1. How is your institution concerned with regulation and/or management of charcoal production?
2. To what extent do your outfit collaborate with community-based structures (Traditional authorities) considering their governance arrangements on charcoal production?
3. What are your assessment of the arrangements in terms of:
Decision making
Benefit Sharing
Access to resources
5. What challenges or positives do your actions pose to the arrangements and the vice-versa?
6. What is your overall assessment of the arrangements in promoting sustainable charcoal production and why?

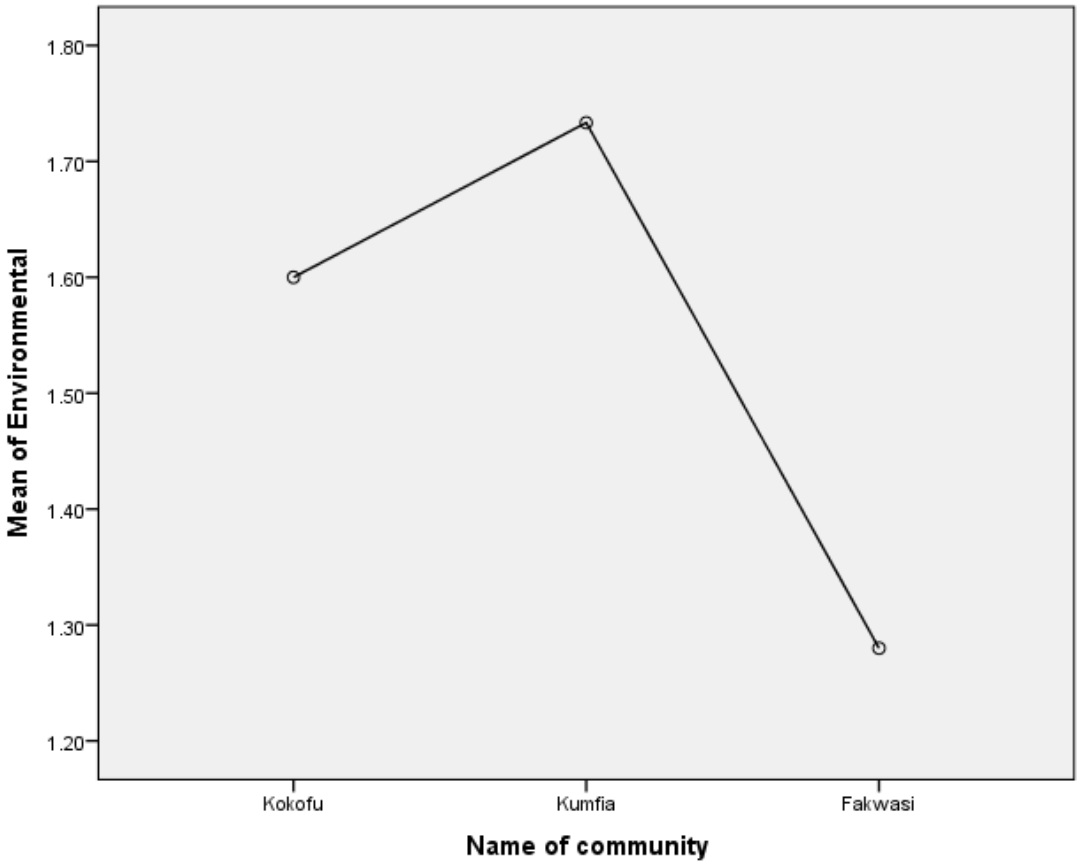
Annex V: Descriptive statistics of One Way Anova between communities and their satisfaction with aspects of CBGAs

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Social	Kokofu	20	1.55	0.51042	0.11413	1.3111	1.7889	1	2
	Kumfia	30	1.1667	0.37905	0.0692	1.0251	1.3082	1	2
	Fakwasi	25	1.12	0.33166	0.06633	0.9831	1.2569	1	2
	Total	75	1.2533	0.43785	0.05056	1.1526	1.3541	1	2
Environmental	Kokofu	20	1.6	0.50262	0.11239	1.3648	1.8352	1	2
	Kumfia	30	1.7333	0.44978	0.08212	1.5654	1.9013	1	2
	Fakwasi	25	1.28	0.45826	0.09165	1.0908	1.4692	1	2
	Total	75	1.5467	0.50117	0.05787	1.4314	1.662	1	2
Economic	Kokofu	20	1.4	0.50262	0.11239	1.1648	1.6352	1	2
	Kumfia	30	1.5333	0.50742	0.09264	1.3439	1.7228	1	2
	Fakwasi	25	1.6	0.5	0.1	1.3936	1.8064	1	2
	Total	75	1.52	0.50296	0.05808	1.4043	1.6357	1	2

Annex VI: The mean plot of social aspect of charcoal production and communities showing their level of satisfaction



Annex VII: The mean plot of environmental aspect of charcoal production and communities showing their level of satisfaction



Annex VIII: Krukal wallis test on impact of reforms in CBGA on charcoal production

Ranks

	Name of community	N	Mean Rank
Access to trees for charcoal production	Kokofu	20	29.63
	Kumfia	30	41.90
	Fakwasi	25	40.02
	Total	75	
Sustainability of resource base	Kokofu	20	33.58
	Kumfia	30	43.27
	Fakwasi	25	35.22
	Total	75	
Plantation establishment	Kokofu	20	42.58
	Kumfia	30	37.93
	Fakwasi	25	34.42
	Total	75	
Benefit sharing	Kokofu	20	31.65
	Kumfia	30	39.82
	Fakwasi	25	40.90
	Total	75	
Enforcement	Kokofu	20	32.60
	Kumfia	30	39.83
	Fakwasi	25	40.12
	Total	75	
Pricing of charcoal	Kokofu	20	41.20
	Kumfia	30	36.73
	Fakwasi	25	36.96
	Total	75	

Test Statistics[a,b]

	Access to trees for charcoal production	Sustainability of resource base	Plantation establishment	Benefit sharing	Enforcement	Pricing of charcoal
Chi-Square	5.296	3.552	1.955	3.479	2.135	.657
df	2	2	2	2	2	2
Asymp. Sig.	.071	.169	.376	.176	.344	.720

a. Kruskal Wallis Test

b. Grouping Variable: Name of community

Annex IX: Kruskal Wallis test of effectiveness of aspects of CBGA among communities

Ranks

	Name of community	N	Mean Rank
Access to trees for charcoal production	Kokofu	20	47.48
	Kumfia	30	41.57
	Fakwasi	25	26.14
	Total	75	
Sustainability of resource base	Kokofu	20	31.83
	Kumfia	30	40.97
	Fakwasi	25	39.38
	Total	75	
Plantation establishment	Kokofu	20	41.43
	Kumfia	30	35.23
	Fakwasi	25	38.58
	Total	75	
Benefit sharing	Kokofu	20	43.90
	Kumfia	30	34.98
	Fakwasi	25	36.90
	Total	75	
Enforcement	Kokofu	20	44.05
	Kumfia	30	34.05
	Fakwasi	25	37.90
	Total	75	
Pricing of charcoal	Kokofu	20	36.73
	Kumfia	30	39.33
	Fakwasi	25	37.42
	Total	75	

Test Statistics[a,b]

	Access to trees for charcoal production	Sustainability of resource base	Plantation establishment	Benefit sharing	Enforcement	Pricing of charcoal
Chi-Square	13.230	2.619	1.084	2.393	3.099	.223
df	2	2	2	2	2	2
Asymp. Sig.	.001	.270	.581	.302	.212	.895

a. Kruskal Wallis Test

b. Grouping Variable: Name of community