KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI
COLLEGE OF AGRICULTURE AND NATURAL RESOURCES,
FACULTY OF RENEWABLE NATURAL RESOURCES
DEPARTMENT OF SILVICULTURE AND FOREST MANAGEMENT

PROFITS, ACCESS AND AUTHORITY ALONG GHANA'S CHARCOAL COMMODITY CHAIN

FRANK KWAKU AGYEI

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Frank Kwaku Agyei

(BSc Natural Resource Management; MSc Forest Ecosystems, Nature and Society; MSc Conservation and Land Management)

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Declaration

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgment is made in the thesis.

Frank Kwaku Agyei (PG3491615)	…….	……...
Name of Student and ID	Signature	Date

Certified by:

Dr. Emmanuel Acheampong	…….	……...
Name of Supervisor	Signature	Date

Certified by:

Dr. Emmanuel Acheampong	……..	……
Name of Head of Department	Signature	Date

Dedication

This work is dedicated to God my creator, my wife, Elizabeth and my sons, Emmanuel, David and Ebenezer.

Abstract

In Africa, charcoal is the main source of energy for cooking and heating in urban households. Charcoal supply produces great wealth and engages remarkable number of people. In spite of its economic significance, the extent to which charcoal income reduces poverty is debatable. This study addresses the questions: (1) What profits are reaped by the different actors in the charcoal production and trade, and what are the characteristics of actors?; (2) By what mechanisms do actors gain, maintain and control access to benefits?; and (3) How are institutions mediating access to opportunities, and how do that affect the legitimacy and authority of institutions? The questions are addressed in the case of the charcoal chain originating in the Kintampo Forest District (the main charcoal production area in Ghana) and going to the three largest end markets in Ghana. The study employed commodity chain analysis to quantify and explain profits, and access mapping to trace the socio-political and economic relations in which charcoal benefits are located. The study estimates that Ghana's charcoal market generates US$ 66 million income annually. Yet, income distribution is highly skewed among and within actor groups. Merchants make up only 3% of the actors in the market, yet reap 22% of the profit. Producers and retailers, the largest groups in the sector, generate incomes below the national minimum wage. The study illuminates how the mechanisms used by various groups of actors to gain, maintain and control access are dynamic in time and space. It shows how significant incomes are derived by those in control of the market while those in control of the production process generate much lower levels of profits. The study documents force, moral economy, social movement and innovation as structural and relational access mechanisms that allow actors to benefit. The study further demonstrates that chiefs, having no legal mandate in trees, are gaining overall authority in Ghana's charcoal production. Chiefs' authority is drawn from long-established customs and social structures in land/tree management, as well as validating of claims. The Ghana Forestry Commission *de facto* have very limited authority over trees for charcoal production despite their *de jure* mandate in this regard. The study suggests that improving equity and wellbeing along charcoal chains requires more attention on access mechanisms operating on charcoal markets, especially access to capital, information and buyers. The legitimacy of institutions stems from the coercive and social ability to control access to resources and opportunities.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AX	Access and Exclusion
CCA	Commodity Chain Analysis
CC	Charcoal Commodity
CCC	Charcoal Commodity Chain
CCC	Charcoal Conveyance Certificate
DA	District Assembly
EC	Energy Commission
EPA	Environmental Protection Agency
FC	Forestry Commission
FSD	Forest Services Division
KNUST	Kwame Nkrumah University of Science and Technology
LPG	Liquid Petroleum Gas
NAMA	Nationally Appropriate Mitigation Action
ToA	Theory of Access

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CHAPTER ONE
INTRODUCTION

1.1 Background: wealth in charcoal production and trade

In Ghana and the Sub-Saharan Africa region at large, woodfuel is the main source of energy for cooking and heating, and is likely to remain the major energy source in the foreseeable future (Arnold *et al.*, 2006; Girard, 2002; Hiemstra-van der Horst and Hovorka, 2009). Woodfuel comprises of all types of biofuels obtained from woody biomass and includes firewood (the original composition of the wood is preserved) and charcoal (the solid residue derived from carbonization of wood) (FAO, 2004). Charcoal is the preferred woodfuel - over 90% of urban households across Africa use it - because it has higher energy content, less smoke, and easily transported and stored than firewood (Arnold and Persson, 2003; Shively *et al.*, 2010; Zulu, 2010). Arnold *et al.* (2006) estimate that by 2030 charcoal demand will double from its base of 23 million tons in the year 2000. This rising demand for charcoal across Africa is due to the high preference coupled with rising urban populations (Arnold *et al.*, 2006; Girard, 2002). This suggests that the importance of the charcoal sector in Africa will continue to grow in the future. However, this growing demand for charcoal will affect wood resources and change the structure of charcoal markets (Arnold *et al.*, 2006; Zulu and Richardson, 2013).

Supplying this fuel - charcoal production and trade - has acquired considerable economic importance across Africa because of the great wealth it produces and the remarkable number of people it engages (Kambewa *et al.*, 2007; Khundi *et al.*, 2011; Shively *et al.*, 2010; Smith *et al.*, 2015). In Kenya, the sector generates an estimated US$ 1.6 billion annually (Kenya Forest Service, 2013) while in Tanzania the annual supply to Dar es Salaam alone is estimated at US$ 350 million, a figure higher than that from coffee (US$ 60 million) and tea (US$ 45 million) which are classified as drivers of economic development (World Bank, 2009). Mwampamba *et al.* (2013) estimate that across Africa 7 million people, projected to increase to 12 million by 2030, derive part of their income from this lucrative market. In Mozambique alone, about 3 million urban and rural dwellers

(15% of Mozambique population) participate in the production and trade of charcoal (Cuvilas *et al.,* 2010), and in Kenya, close to 1 million people work across the charcoal commodity chain[1] (Kenya Forest Service, 2013). Africa's charcoal sector, therefore, has the potential to contribute to pro-poor development and serves as an arena for poverty reduction.

The charcoal sector contributes to government revenues, and also serves as important revenue source for traditional leaders (chiefs) (Kenya Forest Service, 2013; Ribot, 1998; Smith *et al.,* 2015). Chiefs and government institutions - forestry departments and local government leaders - are involved in the charcoal market as mediators of production and marketing (Kambewa *et al.,* 2007; Kenya Forest Service, 2013; Mwampamba *et al.,* 2013; Ribot, 1998). The forestry departments have *de jure* recognized mandate to manage forest resources, and in some countries such as in Senegal, chiefs control direct access to forest (Baumert *et al.,* 2016; Kenya Forest Service, 2013; Ribot, 1998). The chiefs and state institutions engage in roles including charcoal policy formulation, and provision of technical support and licenses such as tree cutting and movement permits (Baumert *et al.,* 2016; Kenya Forest Service, 2013; Smith *et al.,* 2015). While chiefs and state institutions benefit from the charcoal trade through taxes, payoffs and fines, their policies and multiple roles shape profit distribution along charcoal commodity chains (Kambewa *et al.,* 2007; Mwampamba *et al.,* 2013; Ribot 1998; Shively *et al.,* 2010; Smith *et al.,* 2015).

1.2 Problem statement

In Africa, several studies have been dedicated to charcoal commodity chains and environmental impacts (Chidumayo and Gumbo, 2013; Kutsch *et al.,* 2011; Leach and

[1]Following Ribot (1998, p.307) a commodity chain is 'a series of interlinked exchanges through which a commodity and its constituents pass from extraction or harvesting through production to end use' (Ribot, 1998, p.307). I use the word 'chain' illustratively because in reality the 'chain' is rather a network with a vertical and horizontal dimension. The vertical dimension indicates the movement of the commodity from producers to consumers whiles the horizontal dimension denotes the relationship between actors at the same level in the chain such as merchants. In essence, what is referred as commodity chain is in reality a network that holds multiple channels (Lazzarini *et al.,* 2001).

Mearns, 2013; Mwampamba *et al.,* 2013; Nautiyal and Kaechele, 2008; van der Plas and Abdel-Hamid, 2005; Ribot, 1999; Zulu, 2010; Zulu and Richardson, 2013). However, few studies have investigated profit distribution among different groups along the charcoal commodity chain (Baumert *et al.,* 2016; Kambewa *et al.,* 2007; Ribot, 1998; Shively *et al.,* 2010). Limited empirical studies exist on intra-group stratification, that is, how much income is controlled by individual actors within the groups (nodes) along the charcoal chain. Most studies focus on a single commodity chain - typically originating in a major production site and ending in the capital city (Baumert *et al.,* 2016; Jones *et al.,* 2016; Ribot, 1998). Few studies examine multiple commodity chains or multiple strands of a single chain (Shively *et al.,* 2010). Many studies do not examine the entire charcoal chain but focus on the production node (Smith *et al.,* 2015). However, it is the totality of processes along the entire charcoal commodity chain - from production site to end user - that determines where and to whom benefits accrue. Knowledge about the distribution of income within and among different groups along charcoal commodity chains will provide information to policy makers about potential opportunities for improving gains, and highlight the extent charcoal related activities contribute to the income of individual actors in the production and trade of charcoal in Ghana and other African countries.

Studies on charcoal in Africa suggest that, although lucrative, the charcoal production and trade is not alleviating poverty for most producers and traders (Baumert *et al.,* 2016; Kambewa *et al.,* 2007; Ribot, 1998; Shively *et al.,* 2010). Generally, charcoal merchants, wholesalers, and transporters - being few of the actors in the market - control a larger share of profits in the market (Baumert *et al.,* 2016; Ribot, 1998). Few studies explain how (the means) the wealth in the charcoal sector is being concentrated among a few actors. They suggest that powerful actors harness multiple means (both legal and extra-legal) to control and maintain access to opportunities along charcoal commodity chains (Baumert *et al.,* 2016; Faye and Ribot, 2017; Ribot, 1998). Access refers to the ability to derive benefits from things and is about all possible means by which a person is able to benefit (Ribot and Peluso, 2003). Yet, no known empirical evidence exists on how the means of access have played out currently and in the past, and how the means of access vary across geographic

space along charcoal commodity chains (Baumert *et al.,* 2016; Ribot, 1998). Knowledge of constellations of means and processes that enable various actors to derive benefits from charcoal markets will enable policy makers to redress inequalities of access to woodfuel resource and market in Ghana and other African countries.

Governance issues of charcoal commodity chains have received limited attention in the literature (Ingram *et al.,* 2015; Schure *et al.,* 2013). Along charcoal commodity chains, both state and customary institutions mediate the access of producers and traders (Baumert *et al.,* 2016; Kenya Forest Service, 2013; Ribot, 1998), yet the role of legitimate institutions for the charcoal production and trade have not received much scholarly attention. Sikor and Lund (2009) explain the purpose of multiple institutions mediating access to land resources by describing a 'contract' between property and authority. Property is '…a right in the sense of an enforceable claim to some use or benefit of something' (MacPherson, 1978, P.3). Authority refers to a minimum voluntary compliance to power such that a command with a specific content is likely to be obeyed by a given group of people (Weber, 1976). Sikor and Lund (2009) argue that in legal pluralist contexts, people secure their rights to natural resources by sourcing out politico-legal institutions to sanction and validate their access claims as legitimate property and in return the institutions build and solidify their legitimacy and authority in relation to competitors. Yet, few scholars have studied this relationship between property and authority empirically (Byrne *et al.,* 2016; Kronenburg, 2015; Milgroom, 2012). Knowledge of the processes by which politico-legal institutions grant property - and the effects of providing property on authority of institutions - along charcoal commodity chains is relevant for governance and state formation processes. The knowledge will help improve the performance of charcoal commodity chains in Ghana and other African countries and sustain their competitive advantage.

The identified problems above concerning the charcoal commodity chain in Africa also exist in Ghana. In Ghana, few charcoal studies have been dedicated to profit distribution along the charcoal commodity chain; these studies do not examine intra-group income stratification (Agyeman *et al.,* 2012; Anang *et al.,* 2011; Obiri *et al.,* 2014). Most of the

studies do not examine multiple commodity chains or study the entire chain but focus on the production node (Agyeman *et al.*, 2012; Anang *et al.*, 2011). Existing empirical studies do not investigate in detail the means of access, and how the processes and structures shaping profit have played out currently and in the past along Ghana's charcoal commodity chain. Moreover, charcoal studies have not investigated the means by which institutions mediate the production and trade and the effect on the authority of institutions.

1.3 Research objectives and questions

The overall objective of the study is to provide guidance on the structures of access gaining, maintenance and control, and legitimizing processes in order to improve equity, wellbeing and authority of institutions.

The specific objectives of this study were to:

1) Examine profit distribution and characteristics of actors in the charcoal production and trade in Ghana.

2) Investigate the constellations of means shaping actors income in the charcoal production and trade in Ghana.

3) Explain how the ability of institutions to mediate access to charcoal opportunities effects the authority of institutions.

These objectives were further operationalized into three main research questions:

1) What profits are controlled between and within the various categories of actors in the charcoal commodity chain, and what are their characteristics (gender, ethnicity and age)?

2) How are different actors gaining, maintaining and controlling access to benefits along the charcoal commodity chain?

3) How are different institutions mediating access to opportunities along the charcoal commodity chain and how do these affect the authority of institutions?

1.4 Hypotheses

I suggest a highly skewed income distribution among and within actor groups in the charcoal production and trade in Ghana. This reflects variation in quantities of charcoal handled, and differences in expenses and margins made by different actors in the market (Agyeman *et al.*, 2012; Anang *et al.*, 2011; Obiri *et al.*, 2014). I suggest that merchants and wholesalers control the charcoal market to reap higher income than those who control the production process. Merchants and wholesalers are urban based, socially connected and have access to markets, financial capital and loans, and hence could invest more and reap more in the charcoal market (Asiama and Osei, 2007; Osei-Assibey, 2010). I stipulate that women control access at the marketing nodes of the charcoal chain – as merchants, wholesalers, and retailers. The historical strength of women in commerce, and prevailing gender norms in Ghana that associate trade to women reinforce women's ability to benefit at the marketing levels of the charcoal commodity chain (Doss, 2002; Wrigley-Asante, 2012).

I stipulate that chiefs and state institutions control the charcoal production and trade to consolidate their authority as governing bodies and draw from the control to generate revenue from the trade. The Ghana Forestry Commission has the legal mandate to manage forest resources in the country (Hansen and Treue, 2008; Hilson and Nyame, 2006). The Forestry Commission capitalise on their *de jury* role in forest management to claim legitimacy and generate revenue from the charcoal trade. Likewise, District Assemblies draw from their mandate to charge fees for any service provided or license issued to claim legitimacy and derive revenue from the charcoal trade (Act 462 section 34 of the Local Government). Chiefs have been involved in land management and draw from their

customary role in land management to dominate the production process and reap charcoal income (Amanor, 1996; Obiri *et al.*, 2014).

In summary, I hypothesize that:

1. Charcoal traders can access more income in the market because they wield more social and financial capital that they gained through histories and norms of gender and identity relations.

2. Charcoal traders draw from different access mechanisms to control profits in the market because they are differently positioned than producers in relation to capital, market, social ties, and information.

3. Charcoal producers and traders seek validation of their claims from institutions while these institutions use access control as a means to enhance their recognition and authority.

The above hypotheses are investigated empirically through a number of specific (sub) research questions (Table 1.1).

Table 1.1: The key research questions and hypotheses that the data collection attempt to answer

Research questions	Hypotheses	Sub-questions
1) What profits are controlled between and within the various categories of actors in the charcoal commodity chain, and what are their characteristics (gender, ethnicity and age)?	Charcoal traders can access more income in the market because they wield more social and financial capital that they gained through histories and norms of gender and identity relations.	• Which actors operate along the charcoal commodity chain? • At what price does each actor purchase the charcoal? • At what price does each actor sell the charcoal? • What are the expenses? • What is the profit (calculated from the above information) at each level of the charcoal commodity chain?
2) How are different actors gaining, maintaining and controlling access to benefits along the charcoal commodity chain?	Charcoal traders draw from different access mechanisms to control profits in the market because they are differently positioned than producers in relation to capital, market, social ties, and information.	• How are the mechanisms employed by traders different from that of producers? • What are the roles of capital, social relations, social identities, regulatory policies, resistances (like sabotage, protest, threatening), etc.? • In what way have actors and patterns of access changed over time? • What gender roles exist along the chain? • Which social groups are excluded along the charcoal chain? • What means do actors/institutions use to exclude others? • How do actors/institutions use exclusions?
3) How are different institutions mediating access to opportunities along the charcoal commodity chain and how do these affect the authority of institutions?	Charcoal producers and traders seek validation of their claims from institutions while these institutions use access control as a	• Which institutions have claimed authority along the production and trade of charcoal over time? • How are different institutions mediating access to opportunities along the charcoal chain? • How has authority of institutions

	means to enhance their recognition and authority.	changed?

1.5 Significance of the study

This study contributes to the analytical advances in woodfuel studies and a better understanding of the socio-economic characteristics and governance of woodfuel production and trade in Sub-Saharan Africa. Analytically, this study focuses on charcoal as a livelihood resource in a commodity chain approach. Combining commodity chain analysis and access mapping brings out the various actors involved, nodes where profits are concentrated, the multiple market mechanisms that benefits are embedded in, and the structures and mechanisms of social order governing the production, trade and sale of charcoal.

It helps in addressing three analytical issues. First, this is a comprehensive study of the charcoal commodity chain in Ghana investigating inter and intra-group income. By focusing on the charcoal commodity – a forest product – the study contributes to the scientific debates on how forest based livelihoods can improve rural wellbeing and reduce poverty (Angelsen and Wunder, 2003; Ingram *et al.,* 2015; Levang *et al.,* 2005; Mitchell and Coles, 2011; Yemiru *et al.,* 2010). The literature describes how benefit retention remains low among most resource-dependent populations (Agyei and Adjei, 2017; Dasgupta, 1993), this study adds to scientific efforts to improve the livelihoods and benefits of resource-dependent population. By aiming to enhance income of all actors along the entire charcoal commodity chain, the study adds to discourses that promote pro-poor value chain development (Smith *et al.,* 2015; Zulu and Richardson, 2013). Information on how income of different actor groups and individuals vary along the charcoal chain will enable governments to know which particular actor groups or individuals to help, such as taxing or not taxing, in order to address their income.

Second, this study investigates – in time and space – the dynamics of access and exclusion along Ghana's charcoal commodity chain. This brings attention to a wide range of legal

and extra-legal mechanisms that enable a select few people to control the wealth in charcoal markets, and thus contributes to scientific work on the repertoire of mechanisms shaping access to resources and markets (Baumert *et al.,* 2016; Faye and Ribot, 2017; Ribot, 1998; Xu *et al.,* 2010). By adding access/exclusion dimension to commodity chain literature, this study shows that markets are structured by legal and non-legal processes. Thus, it contributes to discussions that explore the gap between policy prescriptions and actual practices/outcomes and open up the space beyond the prescriptions of law (Agyei, 2017; Ribot, 1998; Xu *et al.,* 2010). Knowledge of the structures and processes shaping the distribution of benefits provides a basis for governments, actor groups and individuals to design equitable natural resource policy and practice by providing guidance on structures of wealth control to marginalised actors and the poor (Sommerville *et al.,* 2010; Thomas and Twyman, 2005).

Third, this study provides further exploration of the property-authority relation including empirical backing (Sikor and Lund, 2009). This provides information on the processes that enable institutions to consolidate their authority by way of mediating resources and markets. The processes whereby property over resources are settled and contested are fundamental to how politico-legal institutions establish and compete for authority, and that facilitates insights into state formation (Berry, 2009; Ribot, 2009; Sikor and Lund, 2009). Hence, the study contributes theoretically to state formation and the production of authority via the production of rights (Ingram *et al.,* 2015; John, 2013; Kaplinsky and Morris, 2000; Neilson and Pritchard, 2011; Schure *et al.,* 2013). By focussing on state and customary institutions mediating the charcoal production and trade, this study contributes to discussions on institutional pluralism, post-colonial society and institutional competition (Lund, 2006; Sikor and Lund, 2009). Information on processes that successfully legitimize institutions and their actions will provide guidance to governments to embark on policies that draw from successful legitimizing processes to expand the authority of state institutions.

1.6 Outline of the thesis

The next chapter (Chapter 2) reviews literature relating to the problem and questions posed in this introductory chapter. Chapter three describes the methods of data collection and analysis and provides a description of Ghana's charcoal commodity chain. Chapters 4, 5 and 6 present the empirical findings of the study and are related to the research questions 1, 2, and 3, respectively.

Chapter 4 - Profit and profit distribution along Ghana's charcoal commodity chain - estimates the size of Ghana's charcoal sector, profits controlled between and within the various categories of actors, the taxation in the charcoal sector, the characteristics (gender, ethnicity and age) of actors involved in the charcoal market, and make policy recommendation to enhance the contribution of charcoal production and trade to livelihoods and poverty reduction.

Chapter 5 - Access along Ghana's charcoal commodity chain - uses the Theory of Access (Ribot and Peluso, 2003) as analytic lens to examine the multiple market mechanisms shaping income distribution of the charcoal commodity chain in Ghana. It engages in a discussion of the Theory of Access and expands the structural and relational mechanisms that the theory puts forward.

Chapter 6 - 'Forestry officials don't have any land or rights here' Authority of politico-legal institutions along Ghana's charcoal commodity chain' - investigates the relationship between property and authority. It discusses how chiefs, Ghana Forestry Commission and District Assemblies grant property rights at different nodes along Ghana's charcoal commodity chain to enhance their legitimacy and authority in the charcoal production and trade.

Chapter 7 provides a synthesis of discussion of the major findings of the research. It highlights how the hypotheses of the study have been achieved. Chapter 8 offers a general conclusion and implication for further research and practice.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter first presents the theoretical framework for the study. This is followed by a review of empirical cases by focusing on literature of direct relevance to the charcoal commodity chain in Africa, but literature from other natural resource sectors is included where considered relevant. A second sub-section reviews studies that have addressed the research problem in the specific context of Ghana.

2.2 Theoretical framework

2.2.1 A Theory of Access

The Theory of Access defines Access as 'the ability to benefit from things - including material objects, persons, institutions, and symbols' (Ribot and Peluso, 2003, p.153). Access is closely related to the term property which is having the right to benefit from things (MacPherson, 1978). The key element in the notion of property is 'right', whereas access is defined by one's 'ability' and is premised on being able to enact in practice (Ribot, 1998). A Theory of Access notes that people and institutions employ both right-based (property relations) and extra-legal structures/relations to shape their flow of benefits from resources and markets (Table 2.1). Thus, property relations are part of a wider range of social and market relationships that constrain or enable benefits from resources and markets (Ribot and Peluso, 2003). In framing the concept of 'access', Ribot and Peluso (2003) considered relations of production building on Marx ([1939] 1973) and Polanyi (1945) in attempt to respond to common property scholarship of Schlager and Ostrom (1992) and Berkes (1989). Common property literature (new institutional economics) was criticised as ahistorical and apolitical with no focus on power dimension in its

methodological approaches (Berg, 2008; Weigelt, 2014). The Theory of Access integrated power element into classical property literature by building on the work of Berry (1994, 1989) in shaping the notion of 'access'. Weber's (1978) work on domination informed their notion of power in the context of property relations. The Theory of Access also built on Lund's (1994) and Berry's (1994) contributions on access control.

The Theory of Access distinguishes between gaining access, access control and access maintenance. Gaining access is the general process by which access is established. Controlling access is about mediating the access of others, whilst maintaining access involves the use of resources to open up access for oneself or others via those who control access. Some institutions and people control resource access while others maintain their access through those who have control. Those who control access are in a relation of dominance over those who must maintain access through them. Subordinate actors provide those who control access with benefits in order to either cultivate relations or obtain benefits for themselves (Ribot and Peluso, 2003).

The Theory of Access categorises right-based access as when people benefit from things on the basis of the right they possess and this right is sanctioned by law, custom or convention. This includes people having access through law-based property rights including the holding of licences. Customary access occurs via social acceptance of a given practice through which people can benefit. Benefits enjoyed in ways that do not conform to state and society rules constitute extra-legal access. That includes illegal access, which are gained mainly through the use of coercion or stealth (Ribot and Peluso, 2003).

Ribot and Peluso (2003) distinguish structural and relational access mechanisms from right based access. They include access to technology, capital, markets, labour and labour opportunities, knowledge, authority, identities, and social relations. Those who have access to road (technology) could partake in remote areas or market localities and benefit than those who lack such access (Peluso, 1992). People with access to capital or wealth can engage in production and trading processes associated with obtaining benefits from things

and people. Access to market can enable people to benefit at commercial levels than those who only have rights to resources (Ribot, 1998).

Access to labour opportunities includes the ability to labour for oneself and to maintain access to employment with others. Access to knowledge can be in the form of beliefs and ideological controls. Access to knowledge shapes who can benefit from resources (Peters, 1994; Shipton and Goheen, 1992). People who have relations with people or institutions can advance their ability to benefit from resources through those relations (Thongchai, 1994). Often, social identity mediates access to resources and markets. Groupings of social identity include ethnicity, religion, status, age, gender, and place of birth. Access through social relations (of friendship, trust, reciprocity, patronage) is an important strand in access webs. Berry has observed that: ". . . since access to resources depended, in part, on the ability to negotiate successfully, people tended to invest in the means of negotiation as well as the means of production per se" (1993, p.15).

Statuses and relations social actors have with institutions and people change over time. Changes in relations demand new forms of relations to shape the flow of benefits from resources and markets (Berry, 2009; Moore, 1986; Ribot and Peluso, 2003; Sikor and Lund, 2009). For instance, when there is a shift in the level of resource management from local to national, social actors have to cultivate relations at the national level to continue to benefit from resources. Similarly, new forms of relations are necessarily when resources or markets emerge in a different geographic area other than where actors have operated initially.

Table 2.1: Mechanisms of Access

Type	Mechanism	Definition	Example
Rights- based	Legal	Rights attributed by law	Rights to property through a title or deed
	Illegal	Benefiting from things not sanctioned by law or society	Theft, violence
Structural and relational mechanisms	Technology	Use of a technology makes it possible to extract resources otherwise not possible	Roads, cars
	Capital	Capital can be used to purchase technology, labour, and rights to resources	Pay for travel
	Market	Market allows the resource owner to commercially benefit from it	Price of commodity
	Labour	Those who have labour available to them can benefit from a resource that otherwise would remain unexploited	Ability to work
	Knowledge	Knowledge and information can bring direct benefits from resources	Information about prices
	Authority	Individuals given authority influence who benefits from which resources	Laws, permits
	Identity	Identity can determine who can benefit from which resources	Age, ethnicity
	Social relations	Social relations are key to all mechanisms of access	Friendship, trust

Source: adapted from Ribot and Peluso 2003

2.2.2 Access mapping

Access mapping is a method used to trace out the socio-political and economic relations that benefits are embedded in (Ribot, 1998; Ribot and Peluso, 2003). Hence, the objective for conducting access mapping is to trace the means, processes, structures and relations people use to shape their access to benefits (Ribot and Peluso, 2003). Access mapping explores the bundles of powers that shape the exchanges and transfers through which commodities flow. Access mapping following commodity chain involves: (1) identifying the actors involved in the production and trade of the commodity in question, (2) evaluating income and profits among and within groups of actors along the commodity chain, (3) tracing out the means used to maintain and control benefits. This method provides a map of structures and processes shaping the gaining, maintenance and control of benefits.

Ribot (1998) notes that the value of concern must be specified by the researcher when conducting access mapping. The value of concern could be in the form of "things, currencies, other persons, concepts, symbols and utterances - any object of appropriation or use" (Ribot, 1998, p.313). In this thesis, the value of concern is profit (net income). I use profit or net income to represent the benefit charcoal actors derive from the production and trade of charcoal. The thesis examines economic accumulation in commercial charcoal production and exchange. It examines the income along the charcoal commodity chain in Ghana, and how the actors derive income from the charcoal market. Income accrue in the form of rents to those who gain, maintain and control the production process and forest, and also those who control access to markets, tools and so forth (Baumert *et al.,* 2016; Ribot, 1998).

2.2.3 Access and exclusion -- Powers of Exclusion

Hall *et al*. (2011) have suggested four 'powers of exclusion': regulation, market, force, and legitimation. Each shapes how different actors are prevented from benefiting from things.

Regulation involves setting the terms of use and boundaries for specified purposes by specified users. Regulations are important means for exclusion, but rights are not only about prohibitions but also incentives. Markets exert their influence over the price of resources making it harder for some actors to enter the market. The use of forces as exclusionary practices includes state actors expelling villagers from land citing conservation reasons, for example. Legitimation concerns both the justifications used by leaders to grant or deny property claims, and those used by actors to maintain access/exclusion. Hall *et al*. (2011) discuss legitimation as the rationale used by state actors to exclude other actors. The four powers are heuristic devices that interweave and rely on one other to take effect (Hall *et al.,* 2011).

Hall *et al*. (2011)'s analysis places the concept of exclusion beyond normative rights-based approaches. They define exclusion as the 'ways in which people are prevented from benefiting from things' (Hall *et al.,* 2011, p.7). In this way, the opposite of exclusion is not inclusion but access. This conceptualization embraces both legal and extra-legal mechanisms of exclusions and is 'elevated from an issue of rights alone, as is the case in much of the land grab literature in which the antidote to exclusion is inclusion through land titling and therefore issuing the legal right to access land' (Myers, 2012, p.1). Like Ribot and Peluso (2003)'s concept of access, 'exclusion is broader than the concept of property, even when understood broadly as involving "some kind of socially acknowledged and supported claims or rights": it refers not just to the presence or absence of rights but to the broader array of powers that prevent people from benefiting from land' (Hall *et al.,* 2011, p.8). By focussing on the excluded and the powers that excluded them, issues of contention, conflict, and power relations among actors are highlighted (Hall *et al.,* 2011).

Access is bundles of powers (Ribot and Peluso, 2003), and exclusion too involves bundles of powers. How then do these two 'bundles of powers' connect? Berry has observed that an individual's ability to generate a livelihood is dependent on the 'ability to control and use resources effectively' (1989, p.41). Sikor echoes that 'possession…always involves an element of control, as rights and entitlements situate a social actor in relation to the

authorizing powers of politico-legal institutions' (2012, p.1089). This reflection emphasizes the importance of access control in people's ability to gain or maintain benefits. Both the Theory of Access (Ribot and Peluso, 2003) and Powers of Exclusion (Hall *et al.,* 2011) perform the same analytical task since they both highlight power relations embedded in the struggles for access to resources and markets.

2.2.4 Critique of the Theory of Access: power, agency and illegal access

The concept of access is built on the notion of power. In their conception of access as 'the *ability* to derive benefits from things,' Ribot and Peluso (2003, p.156) note that:

> "Ability is akin to power, which we define in two senses—first, as the capacity of some actors to affect the practices and ideas of others (Weber 1978:53; Lukes 1986:3) and second, we see power as emergent from, though not always attached to, people. Power is inherent in certain kinds of relationships and can emerge from or flow through the intended and unintended consequences or effects of social relationships. Disciplining institutions and practices can cause people to act in certain ways without any apparent coercion" (Foucault 1978a, 1979).

From the above, Ribot and Peluso (2003) identify the term 'ability' to be constituted of 'power', and describe a range of powers which they identify as means, processes, and relations to affect a person's 'ability' (Ribot and Peluso 203, p.154). The means, processes, and relations - bundles of powers - are categorised under the term 'mechanisms' (Ribot and Peluso, 2003, p.160). On the description of the method of access analysis, Ribot and Peluso (2003, p.161) introduce another level of power when explaining the third level as they note that it '...involves 1) identifying and mapping the flow of the particular benefit of interest, 2) identifying the mechanisms by which different actors involved gain, control, and maintain the benefit flow and its distribution; and 3) an analysis of the power relations underlying the mechanisms of access involved in instances where benefits are derived'. The second level identifies the 'mechanisms', which are the bundles of power constituting

one's ability and the third level identifies another level or strands of power relations underlying the mechanisms. So, we see at least two levels of power – the mechanisms, and the power relations underlying the mechanisms. Westermann notes that one weakness or ambiguity of A Theory of Access is not discussing '...specifically or in detail their definition of power nor do they position themselves in an in depth theoretical discussion of power' (2007, p.71).

While the Theory of Access does not go into deep theoretical reflection of the concept of power, Ribot and Peluso (2003) draw from a neo-Weberian focus on power in recognizing individual agency. For instance, they define power as, 'the capacity of some actors to affect the practices and ideas of others' (agency) (Ribot and Peluso, 2003, p.156). Max Weber defines power as the ability of individuals to realize their will despite resistance from others (Weber, 1964, p.152). In this way, Ribot and Peluso (2003) identify power as attribution of a person—an actor oriented power perspective where power is exercised by actors (Svarstad *et al.*, 2018). At the same time Ribot and Peluso (2003) integrate Marxist and Foucauldian structure-influenced power perspectives. They note that 'power … [is] emergent from, though not always attached to, people. … Disciplining institutions and practices can cause people to act in certain ways without any apparent coercion' (Ribot and Peluso 2003, p.156). Therefore, the Theory of Access employs a notion of power that embraces both agency and structure as it notes that 'access is not always a matter of agency' (Ribot and Peluso, 2003, p.160). Ribot and Peluso (2003)'s analysis seems to suggest that certain forms of access are as a result of agency while others fall beyond human agency. Agency is the 'capability' or 'power' of people to act independently or a freedom of action (Bandura, 2000). Yet, identifying the 'bundles of powers', Ribot and Peluso classify eight of them as structural and relational, and even note that 'all of the mechanisms of access we have discussed above are forms of social relations' (2003, p.172). While the Theory of Access acknowledges agency in its usage of the concept of access, it fails to detail the role of agency vis-à-vis structures and relations in shaping the access of people.

I argue that the ‘bundles of powers’ make agency possible, which means that 'benefitting from things' is an act of will or agency when the means are present. Svarstad *et al.* (2018) assert how power is connected to agency and that the agency of individuals are shaped, restricted and enabled by socio-political structures in which people are embedded. In this sense, agency is only possible when there is that freedom and the powers that one has are what enable this freedom. What people do with their agency is another question. Human agency plays a critical role in shaping how people draw from the “webs” of powers at their disposal. Different actors may be exposed to similar structural and relational mechanism, but not all of them will effectively draw from them.

Further, the Theory of Access discusses force under ‘illegal access’ which is a sub-category of rights-based access. I find this somewhat confusing, because force is not only being applied to secure illegal access, it can also be employed to control access through property (legal access). For instance, politico-legal institutions can use force and threats of violence as a means to make actors comply with rules and regulations (Gibson *et al.*, 2005). Hall *et al.* (2011) note that various actors apply force to gain, maintain and control their access (in this case to land). Based on this assertion they suggest force as one of their proposed “powers of exclusion” and that force/violence, or the threat of it, is under-emphasised in the Theory of Access. I support this claim, and suggest that force should rather be considered as a separate access mechanism under structural and relational mechanisms of access.

2.2.5 Property, authority, choice and recognition

In their classical piece entitled ‘Access and Property: A Question of Power and Authority’, Sikor and Lund (2009) describe a ‘contractual’ relationship between property and authority. In normative and legal pluralist societies where access to natural resources are keenly contested, people secure their access claims by sourcing politico-legal institutions to sanction their resources as legitimate property (Sikor and Lund, 2009). Sikor and Lund (2009) further argue that the process of legitimizing an actor’s access claims by way of granting property simultaneously legitimizes the sanctioning institution by granting it the

recognition of its authority to do. Typically, in normative societies, several of these institutions seeking to provide property compete in an attempt to sanction actors' resource claims, some become successful and others less successful. Successful institutions are those whose interpretation of access claims is accepted by the actors (Lund, 2002).

Sikor and Lund (2009) describe a grey zone between access and property. They describe that property forms part of a large picture of access claims. While property is a legitimate claim, access is a claim pending legitimization. Sikor and Lund (2009) further argue that people first seek for access claims and then attempt to convert their claims to land and other resources into legitimized property. So there is a movement from having access to having property. That is people first use any means to get access claims which may or may not be legitimate and then convert their claims (extralegal) to legitimate property. Not all forms of claims are legitimized and there are constant negotiation between access claims and property.

I have no doubts that a 'contractual' relation might exist between property and authority as Sikor and Lund (2009) put it, but I am persuaded that limiting the 'contract' between property and authority does not tell the full story. In principle, politico-legal institutions might have the legal or customary responsibility to provide property (permits and licenses), but in practice these institutions grant access with or without property. In the absence of property, institutions grant access through the social relations, networks, and social identities they have with actors, for example. For instance, if a charcoal merchant has a social relation with the director of the District Assembly, she can be granted access to transport charcoal from production sites to urban centers without necessarily obtaining the license or permit. That is, the merchant in question can transport charcoal to cities without going for license. Equally, a local chief can secure transporters safe passage from loading sites to consumption sites without the need to obtain a conveyance certificate from the District Forestry office. In each of these scenarios, the institution in question grants access through other access mechanisms in the absence of property. Examples have been reported on cases where institutions turn 'blind eye' on irregularities such as overloaded or

unlicensed trucks, and unlicensed trading along the charcoal commodity chain (Smith *et al.,* 2015). Arguably, these 'blind eyes' of institutions could be a mere means to grant access to people. In Senegal, the Forest Service has the legal mandate to allocate commercial rights over forests to wood merchants. However, village chiefs control direct forest access and decide who should be given the privilege to operate. The chiefs' decision to grant access is dependent upon their relations with the villagers and extra-village social and political-economic relations (Ribot, 1998). My argument is that, since actors in the market do not control or maintain access through only property but also through other access mechanisms, it is important to extend the focus of the 'contract' from property-authority to rather investigate access and authority relation. This is because the practices and processes of providing actors' access (not necessarily through property alone) might affect the authority of institutions.

A shift from property-authority contract to a focus on access and authority relation is particularly important to extend the list of institutions mediating access to include those that do not have the mandate[2] to provide property, but could grant access to actors. This is because not all competing institutions might have the legal or customary mandate to grant or validate property. A local chief cannot give wholesaler license in Ghana because he has no legal mandate to do so, for example.

Another way that institutions or people gain authority is through the choices and recognitions made by higher level leaders. The choice and recognition framework explains that central governments and higher-level agencies often choose to work with certain local institutions and they do so by transferring decision making powers such as the right to make decisions on licensing (Ribot *et al.,* 2008). Through the choices made by higher bodies, the receiving bodies get meaningful resources including funds to enable them perform better for the constituents. The selected local bodies get strengthened since their legitimacy towards subjects/citizens and towards competing institutions get improved, while those local bodies who are not selected to receive resources lose legitimacy

[2] By mandate I mean having state or customary support.

(Lankina, 2008). Therefore, the authority of institutions is not solely dependent on what they are able to deliver - services or adjudication. It also depends on how they are recognized: via elections, via being named, via being given contracts by donors or central government, via being given resources by donors and government, etc. In brief, the ability to deliver services can depend on how higher-level institutions empower and recognize them.

Legitimacy is not a fixed absolute quality (Lentz, 1998; Moore, 1988), it refers to a normative belief that an institution must be obeyed. Hurd (1999) argues that the legitimacy of institutions is defined by the perception people have for those institutions, which in turn is derived from the procedure, source or substance by which the institutions is constituted of. According to Weber (1958), three sources of legitimacy exist; rational-legal, traditional, and charismatic. Rational-legal legitimacy is typical of government leaders and they are provided by rules and laws and often coded in constitution. Traditional legitimacy includes the right of monarchs to rule. They are produced through long established social structures and customs. Legitimacy derived from a person's own inspiration constitutes Charismatic legitimacy (Graham, 1991; Hoffmann, 2009).

People and institutions can also strengthen their authority through the procedures applied in making decisions and based on the outcome of decisions made (Nielsen, 2003; Tyler, 1990). Process legitimacy entails constituents becoming satisfied with decisions when the decision making process promotes participation, openness and accountability. Outcome legitimacy entails satisfaction with institutions when the content of the decisions made by the institution in question is accepted by the people. Related to Tyler's outcome and procedural legitimacy is Raz's service conception that holds that the ability to deliver services or to adjudicate claims is part and parcel of the legitimation of society (Raz, 1986). The outcome legitimacy reflects Sikor and Lund's (2009) "contract" between property and authority since they connote the idea that 'superiors' provide 'services' to subordinates.

2.2.6 Conceptual framework for studying access and authority

The conceptual framework and the literature review were developed in parallel with each informing the other. The literature selections that were chosen for the study were those that could contribute to the conceptual framework in that they already structured, to some extent, the domain they covered and provided definitions or further elaborations of categories already within the framework. The framework was then developed and further expanded from these selections. It aims to touch upon every aspect related to access to economic resources and markets, and authority of institutions, and to be as comprehensive as possible. The conceptual framework comprises of eight categories, which are:

1. Rights-based and structural/relational categories (Access)
2. Profit of actors along commodity chains (Opportunities)
3. Legitimacy of institutions (Authority)
4. Higher level authorities/Central government (Institutional recognition)
5. Property rights (Property)
6. Rational-legal, traditional, and charismatic
7. Process and outcome legitimacy
8. Service legitimacy

The interconnection between these elements is shown in figure 2.1. Each of these aspects has been explored above. This choice of categories and the interconnection between access mechanisms and profit distribution is largely based on the works of Ribot and Peluso (2003) and Ribot (1998). The Theory of Access describes ‘bundles of powers’ that constitute heuristic set of mechanisms amongst which people gain, control, and maintain resource access. The Theory of Access has been used extensively to understand the mechanisms of access to natural resources, and to the income derived from their use (Lescuyer *et al.*, 2013; Ribot, 1998; Xiuli *et al.*, 2010). In a study by Ribot (1998), the Theory of Access is used to examine the distribution of benefits from Senegal's charcoal trade and the multiple market mechanisms underpinning that distribution. Ribot (1998, p.

307) asserts that the theory of access 'sheds light on the limited role of property, the embedded nature of markets, and the role of extra-legal structures and mechanisms in shaping equity and efficiency in resource use.' Xiuli *et al.* (2010) apply the Theory of Access to understand for whom the Chinese Fir Market operates. They used the Theory of Access instead of property theory in their investigation due to the Theory of Access's focus on empirical political economy (Xiuli *et al.*, 2010). Xiuli *et al.* (2010) observe that property theory is insufficient in benefit analysis since legal ownership, tenure and title are just a few mechanisms among many that people use to support their ability to benefit.

The choice of categories and the interconnection between legitimacy of institutions (authority), property, choice and recognition, process, outcome and service legitimacies is based on the works of Sikor and Lund (2009), Ribot *et al.* (2008), Byrne *et al.* (2016), Kronenburg (2015) and Milgroom (2012). Following Sikor and Lund (2009), institutions enhance their legitimacies when they validate and sanction property claims. The recognition or the 'acknowledgement by other actors is part of the process of gaining and maintaining authority. This acknowledgement is partly predicated on the ability to recognize and uphold property claims' (Ribot, 2011, p.4). But, legitimacy of institutions is partly predicated on backing by the state or other institutions. Local institutions need financial or technical or legal support to mobilize people or to enable access to resources or to make and enforce decisions, for example. Drawing from cases from Benin, Brazil, Guatemala, India, Indonesia, Malawi, Russia, Senegal, and South Africa, Ribot (2011) shows how the transfer of powers, partnering in projects, engagement through contracts, or via participation in dialogue and decision making grants recognition to chosen institutions/actors. This in turn strengthens the legitimacy of selected institutions/leaders-that is, the ability of an institution to attract claimants and to help enforce their claims. Different people source legitimacy from different angles, a point argued by Weber (1958) as he identifies three sources of legitimacies: Rational-legal, traditional, and charismatic. Similarly, Tyler (1990) and Raz (1986) propose that institutions engage in many activities to enhance their legitimacies which they classify as process, outcome and service

legitimacies. The eight categories used in the conceptual model therefore combine the features of the Theory of Access, property, authority and choice and recognition.

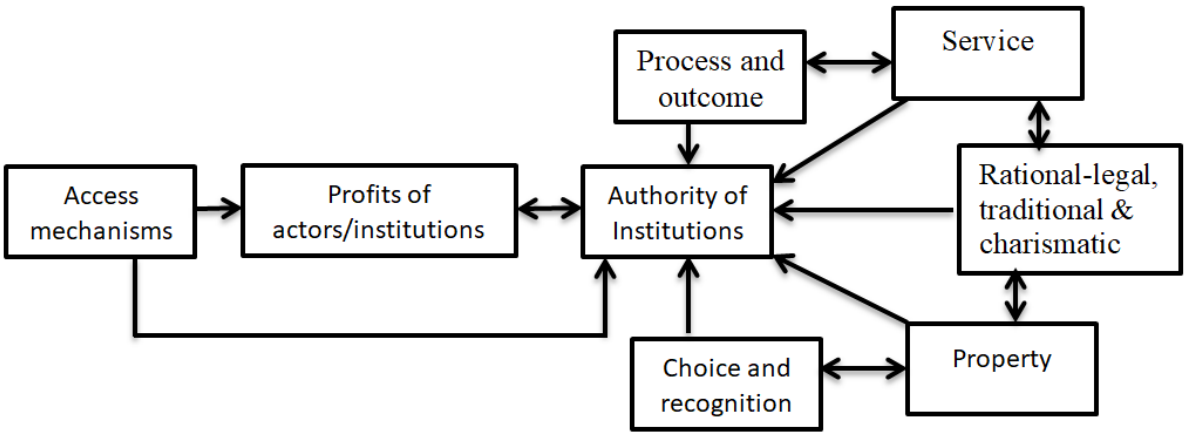

Figure 2.1: Conceptual framework for studying access and authority

2.3 Profit distribution, access and authority along the charcoal commodity chain: a review of literature

This subsection first reviews studies on profit distribution and characteristics of actor groups along the charcoal commodity chains from the sub-Saharan African region. This is followed by empirical studies which have used access framing in relation to charcoal. The final part examines empirical studies on property-authority contract.

2.3.1 Profit distribution and characteristics of actors along charcoal commodity chains

Charcoal studies in Africa report unequally distributed wealth along charcoal commodity chains (Baumert *et al.*, 2016; Kambewa *et al.*, 2007; Ribot, 1998; Shively *et al.*, 2010). In Kenya, wholesalers, retailers, and transporters control 78% of the US$1.6 billion profit in the market (Kenya Forest Service, 2013). Charcoal producers (being 30% of the actors) control only 22% of the profit in the market (Kenya Forest Service, 2013). In Senegal, wholesalers and merchants control the major share of the annual US$6.6 million profits in the market while retailers and producers worked below subsistence (Ribot, 1998). In

Burkina Faso, Mali, and Niger, profits are unevenly distributed with wholesalers and transporters making the greatest profits (Bodian *et al.,* 2012 in Schure *et al.,* 2013).

The charcoal production and trade generate substantive revenues to state and customary institutions in the form of taxes and fees. The taxations issued to the state (District Assemblies and Area Councils) were 33% in Malawi, 33% in Kenya and 8% in Senegal of the average charcoal producer price (Kenya Forest Service, 2003; Ribot, 1998; Smith *et al.,* 2015). Fees paid to traditional leaders (chiefs) amount to 3% of the total profit in the charcoal trade in Senegal (Ribot, 1998). Informal payments in the charcoal market are mostly demanded by the police, and in some cases forest officials (Baumert *et al.,* 2016; Kambewa *et al.,* 2007; Ribot, 1998; Shively *et al.,* 2010). In Malawi, informal payments account for about 12–20% of the final price of charcoal (Kambewa *et al.,* 2007).

The direct participants in the charcoal production and trade are producers, merchants, agents/middlemen/middle women, transporters, wholesalers and retailers (Baumert *et al.,* 2016; Ribot, 1998; Shively *et al.,* 2010). Producers carbonize wood and sell to merchants and/or agents/middlemen/middle women (Baumert *et al.,* 2016; Ribot, 1998; Shively *et al.,* 2010). Transporters carry merchants' supply from production sites - which are mostly in the villages - to cities, where merchants sell to wholesalers and retailers. Wholesalers sell charcoal in bulk and retailers sell in smaller units (Ribot, 1998). Other actors involved in the charcoal commodity chain are forestry departments, energy departments, local governments (District Assemblies and Area Councils) and traditional authorities (chiefs) (Kenya Forest Service, 2013; Ribot, 1998).

Males dominate the production and trade of charcoal in most countries. In Uganda, Shivery *et al*. (2010) reported that males dominate at the production as well as the merchant and wholesale nodes. In Mozambique, Baumert *et al*. (2016) reported that majority of households producing charcoal for both small-scale local village production (84%) and Large-scale production (65%) were male headed. In Mozambique, Jones *et al*. (2016) showed that close to 88% of males partake in charcoal production as part of the process of

opening a new field and 90% males as part of their livelihood. However, more females (58%) partake in charcoal production when the household needs cash. Few studies have looked into gender along the charcoal commodity chain in the sub-Saharan African region, and these studies do not provide explanations of why men dominate production and trade.

Charcoal studies suggest that the production used to be dominated by few ethnic groups, but has seen a trend where other ethnicities are increasingly involved (Faye and Ribot, 2017; Ribot, 1998; Wurster, 2010). Commonly, indigenous people and people residing in production areas are increasingly being involved in the production and trade of charcoal. For instance, in Uganda (Shively *et al.,* 2010) and Malawi (Smith *et al.,* 2015), producers and transporters, respectively, are from the regional ethnic groups in the areas in which they operate. There are also cases where migrant (non-indigenous) people dominate the trade, as seen in the case of Kenya and Mozambique where people from Kikuyu ethnicity (Bailis, 2005) and urban-based migrants (Baumert *et al.,* 2016) respectively dominate the production.

2.3.2 The means people employ to benefit along charcoal commodity chains

Benefits are important for people and society at large because 'people, institutions, and societies live on and for them and clash and cooperate over them' (Ribot and Peluso, 2003, p.155). Property and its role in the empowerment of poor communities to obtain benefits from resources has gained significant attention in development and environmental programming (Katon *et al.,* 2001). Property raises the critical question of who claims rights and responsibilities to what resources. Individuals with property evoke some form of socially acknowledged claim enabling the property holder to enjoy benefits (Ribot and Peluso, 2003). As a result, many reforms in developing countries have aimed to create or strengthen rights to natural resources for the rural poor as a means for enhanced and sustainable livelihoods (Coleman and Liebertz, 2014; Meinzen-Dick *et al.,* 1997).

Empirical evidence, however, suggests that property may or may not translate into benefits from natural resources (Mayers and Vermeulen, 2002), and actors who do not have property may obtain benefits (Neimark, 2010; Ribot, 1998; Xiuli *et al.*, 2011). A dominant strand of literature explains that the ability to benefit from things - access - is gained, controlled and maintained via a broad repertoire of social and structural means including property (Ribot and Peluso, 2003). Therefore, property is not the only means people employ to maintain or control benefits; it is part of an individual's ability to benefit (Ribot and Peluso, 2003). Ribot and Peluso (2003) note that in addition to property, people employ other structural and relational mechanism to benefit which include access to technology, capital, markets, labour and labour opportunities, knowledge, authority, identities, and social relations.

Along charcoal commodity chains, existing studies suggest that actors employ multiple means to control and maintain access to profits (Baumert *et al.*, 2016; Faye and Ribot, 2017; Ribot, 1998). Merchants in Senegal reap high charcoal income through having access to quotas and permits, and wholesalers derive substantive income by controlling charcoal distribution through having access to capital and social ties to retailers (Faye and Ribot, 2017; Ribot, 1998). In Mozambique, Baumert *et al*. (2016) noted that charcoal producers employ access to capital, markets and woodlands to raise their income in the market.

2.3.3 Property – Authority relation

Studies on property and authority suggest that politico-legal institutions[3] grant property to social actors and in return consolidate their authority over the people (Byrne *et al.*, 2016; Kronenburg, 2015; Milgroom, 2012). In Mozambique, Milgroom (2012) noted that the customary leader of Nanguene village within the Limpopo National Park could control the access of people by granting user rights to people to access land resources. Later when the

[3] Following Sikor and Lund (2009), politico-legal institutions are the formal and informal structures that shape resource access and markets, and they include state and customary bodies.

Nanguene village was relocated to a new place outside the Limpopo National Park, the customary leader could no longer control allocation to land. The people stopped recognising the authority of the leader since he could not grant user right and looked elsewhere for access to resources. In Chinhangane, another resettled village, Milgroom (2012) reported that residents accessed resources through those who had direct claim to the dominant lineage. Hence, in the resettlement village, the resettled people have to gain and maintain access to resources through others because they could not control their own access to resources. Milgroom (2012), therefore, argued that legitimacy of a leader is premised on having resources from which he can control the access of people and in return invoke the people to recognise his authority. Milgroom's (2012) analysis makes a claim for relationship between a more general 'access' and authority as opposed to property and authority.

In Kenya, Kronenburg (2015) observed that the Loita Maasai (traditional leaders) compete with states, other agencies and neighbouring communities to maintain access to and control over the land they inhabit and the forest they use. On territorial conflicts with Purko Maasai and (non-Maasai) Sonjo, the Loita Maasai are losers, but they successfully compete out states and NGOs over land reforms and development projects to retain access to and control over land and the forest. Kronenburg's (2015) analysis shows how struggles to maintain and control access to forest and land in Loita are means leaders employ to hold on to power and authority. The authority of traditional leaders in Loita hinges on their continued control over the allocation of rights to land and forest uses.

In Nepal, Byrne *et al*. (2016) analyse how the Forest Department, Maoist rebels, district officials and local notables employ territorial practices to compete to formalize forest access claims and claims to political authority. In relation to the border of the districts of Salyan and Rolpa, state officials and politically active citizens employ series of practices to invoke authority and that revolves around having access to place-related and ethnic-defined belonging rights, property regimes, and rescaling of borders. Through the establishment of

community forest, local people deploy forest related territory claiming practices to invoke the authority to govern what used to be a territory of the state.

2.3.4 Profit, access and authority along Ghana's charcoal commodity chain: a review of literature

The charcoal commodity chain in Ghana is complex, about 450,000 people trade in wood fuel as their primary occupation, and over 2 million people are involved in the chain (Reuters, 2009). Few studies have investigated the charcoal commodity chain and profit distribution in Ghana (Agyeman *et al.,* 2012; Anang *et al.,* 2011; Obiri *et al.,* 2014). These studies suggest a trend of skewed income distribution along the charcoal commodity chain. Obiri *et al.* (2014) reported that wholesalers' recorded higher profit margin (16.7%) compared to producers (13.2%). Agyemang *et al.* (2011) noted that charcoal buyers control significant part of the income in the charcoal market. Some studies report that the charcoal production and trade serve as a significant revenue source for local governments, customary authorities, and state forestry institutions (Agyeman *et al.,* 2012; DEAR, 2005).

Agyeman *et al.* (2012), in an examination of commercial charcoal production in the Upper West Region of Ghana revealed that two charcoal production cycles could be completed in a month with a total of 20 bags of 60 kg per producer. Obiri *et al.* (2014) reported an average production of 164 bags (50kg) per producer per month at Afram Plains and Ejura/Sekyeredumase. The differences in charcoal production output could be as a result of availability of feedstock, labour and market. A comprehensive list of the trends of charcoal prices across cities and regions in Ghana have been developed by Energy Commission (2014). The national average price of charcoal increased from GH¢18.24 in 2012 to GH¢21.16 in 2013 for the 60kg sack and from GH¢11.04 in 2012 to GH¢13.25 in 2013 for the 50kg sack. Thus, the percentage change over the previous year was 16.17% for the 60kg bag and 20.02% for the 50kg bag. In the year 2000, the Energy Commission reported national charcoal and woodfuel consumption levels to be 1,000,000 tonnes and 8,200,000 tonnes respectively. In 2018, Nketiah and Asante (2018) estimated national charcoal

production figure for Ghana. They estimated the total annual charcoal production level at 589,891.86 tons (or 11,797,837.2 bags [50-kg]). The national charcoal production figure from Nketiah and Asante (2018) is based on an aggregation of data from Charcoal Conveyance Certificates from all districts of the Forest Services Division (Forestry Commission) from January to December 2016.

Along the charcoal commodity chain in Ghana, existing studies have not investigated and analyzed - in time and space - the dynamics of access and exclusion in detail. That is, the processes and structures shaping the flow of benefits along the charcoal commodity chain in Ghana. Moreover, no known empirical studies exist on the processes whereby different politico-legal institutions contest for authority by way of vetting property.

Studies that investigated gender along the charcoal chain reported that charcoal production (wood carbonisation) is predominantly male dominated activity, comprising of ages between 20 and 60 years (Amoh-Anguh, 1998; Blay *et al.*, 2007; Obiri *et al.*, 2014). Lurimuah (2011) reported that among the Sissalas sampled in the Upper West Region of Ghana, male dominated youth ranging between 20 and 49 years are the key commercial charcoal producers. On the other hand, charcoal marketing - merchants, wholesalers, and retailers—is done by females (Amoh-Anguh, 1998; Blay *et al.*, 2007; Obiri *et al.*, 2014). Obiri *et al.* (2014) noted that about 93% of their sampled marketers were females.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter describes the study area and the actors involved in Ghana's charcoal commodity chain. This is followed by a description of the research design and methods employed for the study.

3.2 Case description: Ghana's charcoal commodity chain

3.2.1 Site description

In Ghana, charcoal is an important energy source for various consumer categories including industrial users (hotels and restaurants) and domestic cooks. The bulk of household energy supply comes from wood fuel which stands close to 65% of the country's energy supply mix (Ghana Statistical Service, 2012). Even with the introduction of alternative energy sources like LPG, the demand for charcoal in Ghana is still projected to increase due to estimated increase in population and increasing urbanization (Energy Commission, 2010a).

The charcoal production occurs in almost all parts of the country, but a greater part of the production transpires in the Savannah and Transition zones of Ghana (Obiri *et al.*, 2014; Ricerca, 2011). Kintampo Forest District in the Brong Ahafo Region is the main charcoal production area in the country (Nketiah and Asante, 2018; Figure 3.1). The Brong Ahafo Region falls within the dry semi deciduous savannah transitional ecological zone, and it is located between the forest landscape in the south and the savannah zone in northern Ghana. Rain occurs in two periods from May to July and from September to October. The vegetation in the region is woody savannah grassland mixed with patches of forests (Danquah, 2015). Over the last 20 years, there has been a large influx of migrants to the region to farm due to readily available land (Amanor, 2009).

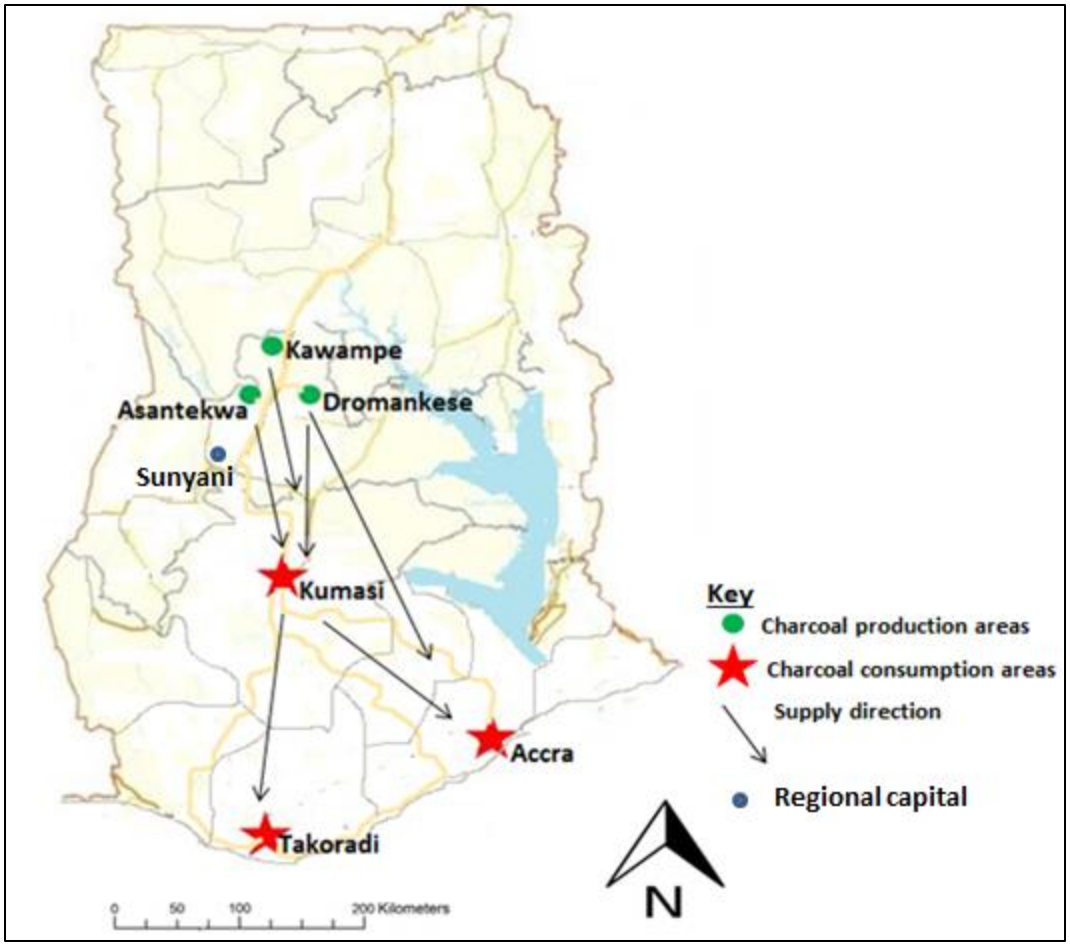

Figure 3.1: Study areas; charcoal production areas (Kawampe, Asantekwa and Dromankese) and charcoal consumption areas (Kumasi, Accra and Takoradi)

The Brong-Ahafo region, the second largest in Ghana by land size is home to about 9.4 percent of Ghana's population. From the sixties to eighties, the region recorded higher population growth rate than the national figure, but dropped afterwards. However, over the last fifty years, the population size has quadrupled with a current population of 2,310, 983. Having almost equal proportion of males and females (sex ratio of 98.2%), the region has majority of the people in the working age class (from 15 to 64 years; Government of Ghana, 2019). The area is dominated by Akan ethnic groups (Southern Ghana ethnic groups like Asante, Akuapem, and Akyem), except for Kintampo North where a northern Ghana ethnic group, the Grusi, dominates the area. Most households in the region are headed by males (65.3%), with the mean household size reduced from 5.3 to 4.7 (from 2000 to 2010). The urbanization rate is 44.5% with more females (46%) in urban areas

than men (42.9%). The Kintampo Forest District consists of four administrative districts: Kintampo North, Kintampo South, Nkoranza North, and Nkoranza South. The urbanization rate for the four administrative districts within the Kintampo forest districts are 47.1, 18.5, 8.9, and 56.8 percent for Nkoranza South, Nkoranza North, Kintampo South, and Kintampo North respectively. Over 90% of the employed worked under private informal sector such as the charcoal commodity chain. The private informal sector is the main employment type of the region for both urban (84.1%) and rural areas (95.2%). Over 50% of workers in the Kintampo forest district are into skilled agricultural, forestry, and fishery works, and close to two-thirds (68.5%) of households in the Region are engaged in agriculture (Ghana Statistical Service, 2012).

There are two customary paramount systems (Nkoranza and Mo) with each of them having divisional chiefs under them. The indigenous people in the villages under the jurisdiction of the Nkoranza and Mo paramount chiefs are the Bonos and Mos respectively (Ghana Statistical Service, 2014). People belonging to several other northern and southern Ghana ethnicities live in the area, and there are a number of villages dominated by people from northern Ghana ethnicities (Ghana Statistical Service, 2014). Three villages were selected to represent the area. Asantekwa represents the Mo paramount system, Dromankese the Nkoranza paramount system, and Kawampe represents villages dominated by northern Ghana ethnicities. Charcoal from the villages is transported to urban areas in southern Ghana for consumption of which Kumasi, Accra and Takoradi are important destinations (Obiri *et al.*, 2014; Nketiah and Asante, 2018).

3.2.2 Actors along Ghana's charcoal commodity chain

Both direct and indirect actors (chiefs, Forestry Commission, Energy Commission, Environmental Protection Agency, District Assemblies and Ghana Police Services) engage in the charcoal production and trade in Ghana.

3.2.2.1 Direct actors

The direct actors in the production and trade of charcoal consist of charcoal producers, merchants or middlemen or middle women, wholesalers, retailers and end users (Obiri and Nutakor, 2011 cited in Obiri *et al.*, 2014). Producers cut and carbonize wood into charcoal and sell to charcoal merchants. Transporters transport loads of merchants from villages to cities where merchants sell to wholesalers and retailers. Wholesalers sell charcoal in big sacks (50 kg) to retailers and retailers sell in smaller sizes (polythene bags and cans) to end users. Previous studies do not make distinction between merchants and wholesalers (Amoh-Anguh, 1998; Blay *et al*., 2007; Obiri *et al.*, 2014).

3.2.2.2 Chieftaincy

In Ghana, chieftaincy is an important cultural heritage and institution, which has strong ethnic support and provide the structures for leadership and exercise of authority. It denotes sacred and socio-political power conferred in chiefs and priests in many parts of Ghana (Bulley, 2014). Prior to colonial rule in Ghana, chiefs and the customary structure have been the local political leaders governing the people and resources. During this pre-colonial era, indigenous societies which existed under chieftaincies were of two groups; those under centralised leader like the Akan and those without centralised leadership like the Ga-Dangme (Bulley, 2014). Societies with the centralised leadership had a paramount chief and many other sub-chiefs under his command. Typically, chiefs in the centralised system were categorised as paramount chief, divisional chief and the village chief. The village chief is a caretaker chief who is appointed by divisional/paramount chief depending on whether he falls under the jurisdiction of a divisional or paramount chief. The divisional chief occupies a stool and has his own stool land. A 'stool' refers to a particular land-owning group represented by a 'stool' chief (Kasanga *et al.*, 1996). The equivalent of ‘stool’ in Northern Ghana is the ‘skin’. The divisional chief is higher in status than the village chief but lower in status than the paramount chief. All the levels of chiefs have

councils of elders who aid in administrative functions and advise the chief on developmental issues.

In contemporary Ghana, chieftaincy has strong legal and constitutional status. The 1992 Constitution of Ghana (270 (1)) indicates that "the institution of chieftaincy, together with its traditional councils as established by customary law and usage, is hereby guaranteed". The Chieftaincy Act, 2008 (Act No. 759) sets the guidelines for the functioning of Chieftaincy institutions, and legitimates the National House of Chiefs to 'undertake the progressive study, interpretation and codification of the customary law with a view to evolving, in appropriate cases, a unified system of rules of customary law, and compiling the customary laws and lines of succession applicable to each stool or skin.'

As custodians of land, chiefs emerge as the main institution to mediate land access in Ghana. They have customary support to distribute land to indigenous people under their jurisdiction, and could allocate land not occupied by families to strangers who settled and worked in their territories. Along the charcoal commodity chain, chiefs and the customary structure control raw materials and the production process (Obour-Wiredu, 2017). They play a crucial role in the charcoal production by serving as first points of contact to migrant charcoal producers. They also serve as the main body to sanction and validate claims to land and trees for charcoal production (Obour-Wiredu, 2017). They sell the trees in an area to charcoal producers and give them stay permits in their communities (Obour-Wiredu, 2017). Chiefs have been key in the establishment of local bye-laws for sustainable harvesting of desirable wood species within their communal boundaries (Obiri *et al.*, 2014). The role of customary leaders in the management of forest related resources such as that of the charcoal commodity is premised on the fact that, as landowners, customary leaders provide woodland for charcoal production (Obiri *et al.*, 2014; Obour-Wiredu, 2017). The existing literature suggests that chiefs' role in tree resource management including tree nursery and planting is limited (Obiri *et al.*, 2014; Obour-Wiredu, 2017).

3.2.2.3 Forestry Commission

The Ghana Forestry Commission – and Forest Services Division (a division under the Commission) – is established by Act 571 with the mandate to regulate the utilization of forest resources and co-ordinate policies related to them. Majority of Ghana's forest resources is gazetted as forest reserves with the remaining existing on communal, private and farmlands. By the forest laws of Ghana, the Forestry Commission has management responsibilities on forest reserves. Outside the reserves, the Forestry Commission has mainly been concerned with regulation of timber harvest. The Forestry Commission is mandated to issue permit for the collection of non-timber forest products such as poles and wood pieces from forest reserves and this includes collection of wood pieces for commercial charcoal production. Since the later part of 2015, the Commission has been issuing charcoal conveyance certificates to allow road transport of charcoal from production sites to consumption cities (Obour-Wiredu, 2017). There are no specific programmes to regulate the activities of charcoal producers and other people who trade in charcoal (Obour-Wiredu, 2017).

Through the Ghana Forest Investment Program (under the World Bank's Climate Investment Funds), the Forestry Commission aim to restore forest cover in off-reserve areas through forest plantation and rehabilitation of degraded forest land in the Kintampo Forest District (the study area). The Commission does so through the Engaging Local Communities in REDD+/ Enhancement of Carbon Stocks (ELCIR+) Project – an intervention under the Forest Investment Program. There are four Programme components of ELCIR+. Component one focuses on community restoration of degraded off-reserve forests and Agricultural Landscapes, and component three embarks on community alternative livelihoods and capacity building. The goal of the activities under component 1 was to establish 5,000 ha small-to-medium sized forest plantations in degraded off-reserve forests. The goal of component 3 is to establish 1,200 ha of woodlots for fuelwood and charcoal production in charcoal production areas (AfDB Group, 2013). Targeted areas have been selected for the tree planting exercises: 'twelve forest districts have been

selected to plant trees which include the Kintampo and Donkorkrom Forest Districts' (Forest Services Division staff, personal communication, 10/06/2017). The Forestry Commission, however, has not been successful with the off-reserve plantings and this has been attributed to failure of the Commission to address barriers to the sale of timber by farmers, such as unclear and complex legislation and high initial investment (Schwöppe and Wojewska, 2018).

The relevance of the 2012 forest and wildlife policy for the charcoal commodity is enshrined in its aim which seeks to conserve and sustain development of forest resources for environmental quality and continuous flow of benefits to society. Objective three of the policy seeks to promote viable forest based industries and livelihoods to satisfy domestic and international demand for quality products. By way of the strategic direction for development of forest based industries, the policy seeks to promote modern timber and non-timber forest products' industry to maximise forest resources in order to contribute to poverty reduction and wellbeing of people. Objective five seeks to train and provide technology development to support sustainable forestry and enhance information use in the sector. Policy strategy seeks to enhance capacity in resource economics and educate the public on the value of natural resources, threats to the resource and behavioural change to improve the quality of the resources (Ministry of Lands and Natural Resources, 2011).

3.2.2.4 Energy Commission

The Energy Commission is the state body responsible for the management and regulation of energy utilization in the country. The Commission is established by Act 541, with the main function of regulating and managing the utilisation of energy resources in Ghana and co-ordinating policies in relation to them. The provisions of Section 57 interpret that "energy resources" falling under the mandate of the Commission includes 'biomass' energy of which the charcoal commodity is a type. Subsequently the Renewable Energy Act (Act 832) mandates the Energy Commission to license and regulate the operations of renewable energy service providers. Section 8 of the act provides that 'a person must not

carry on operations in Ghana's Renewable Energy Industry for which a licence is required unless the person either: '(a) holds a licence granted under the Act authorizing the relevant operations; or (b) is exempted from holding a licence'. A breach of this requirement is an offence under the Renewable Energy Act, 2011 (Act 832) and may be sanctioned accordingly. However, there have never been any licences issued and to-date there are no recorded cases of legal charcoal production and trading.

The Energy Commission identifies challenges to be addressed in order to develop policies to ensure sustainability of biomass resource. These include:

a. Sustainable sources of supply
b. Efficient technologies for the production and use of charcoal
c. Replacement of traditional wood fuels with modern types such as LPG
d. Efficient transport of woodfuel
e. Enhanced packaging and marketing
f. Strong institutional coordination and regulation

With the aim of advancing these challenges, the Energy Commission sets policy objectives for sustainable supply and production of woodfuel, efficient conversion and utilisation of woodfuel, transportation, marketing and demand-side. With respect to the feed stock, it seeks to advance sound management and expansion of natural forest of the country to enable sustainable supply of woodfuel. Technology wise, the Commission aim to introduce new and innovative methods for efficient and cost effective woodfuel production. In addition, it aims to promote efficient and cost effective woodfuel stoves and enhance capacity of manufacturers of cook stoves. On transportation, the Energy Commission seeks to regulate safe woodfuel transportation and ensure that the quality and quantity of woodfuel meet demands. The policy objective for marketing is to generate comprehensive database for the supply and demand of woodfuel. It also seeks to reduce creation of charcoal dust and negative environmental and health effects. Further, the Commission aims at controlling the outbreak of fire in the production and handling of charcoal. The policy objective for demand side is to increase the use of LPG. In line with the institutional development, the Commission seeks to coordinate and manage woodfuel development and

use in the country. Further, it seeks to mobilize all actors, both formal and informal, to provide quality equipment, plant and service delivery (Energy Commission, 2010b). The Energy Commission advances policy guidelines to promote sustainable woodfuel production and trade, but the actual implementation of the policy has been slow.

3.2.2.5 Environmental Protection Agency

The Environmental Protection Agency (EPA) is the state body responsible for protecting and improving Ghana's environment. The EPA, which was established by Environmental Protection Agency Act, 1994 (Act 490) has regulatory and enforcement role(s). Among its objectives include ensuring:

a. that development process at national and local levels integrates mainstream environment concerns
b. efficient and environmentally conscious use of renewable and non-renewable resources
c. legal processes are used in fair and equitable manner to promote responsible environmental behaviour
d. that development is guided to prevent and eliminate pollutions

The Climate Change and Strategic Environmental Assessment Units of the Environmental Protection Agency collaborate with United Nations Development Program to provide a Nationally Appropriate Mitigation Action (NAMA) proposal for a sustainable charcoal value chain in Ghana. This is to improve charcoal production and use, and sustain it across the entire value chain. The NAMA proposes interventions and work programs under the charcoal value chain. This has four segments with each addressing a particular level of the charcoal value chain: (a) sustainable supply of feedstock; (b) enhanced carbonization efficiencies, (c) bulk transportation and vehicle fuel efficiency and (d) transformation of charcoal markets.

The focus on sustainable supply of feedstock addresses two work packages. The first is to establish 50, 000ha of commercial community planation. Work package two seeks to promote harvesting of 500, 000ha in natural trees and woodlot plantations in a sustainable

manner. For the enhanced carbonization efficiencies, work package one seeks to promote the use of efficient kilns. Work package two aims to launch 4 kiln and renewable charcoal manufacturing facilities. Work package three promotes research and development. Under bulk transportation and vehicle efficiency, work package one supports green transport of charcoal. Work package two launches 4 bulk storage centres. Work package three enhances fuel efficiency in transport of charcoal. For market transformation, work package one transforms and modernises the supply chain of charcoal. Work package two supports the use of eco-labelled charcoal.

3.2.2.6 District Assemblies and Ghana Police Services

The local government bodies (Metropolitan, Municipal, and District Assemblies) in Ghana are mandated by article 240 of the 1992 Constitution of Ghana to plan and execute policies in respect of all matters affecting the people within their areas. Act 462 section 34 of the Local Government Act grants these bodies the mandate to charge fees for any service provided or license issued. District and Metropolitan Assemblies engage in tax and revenue collections on local, district and regional markets. The District Assemblies tax the transport of charcoal from production areas to consumption cities in the form of council tickets.

The Police Service Act (Act 350 (1)) provides the Police officials the mandate to ‘prevent and detect crime, to apprehend offenders, and to maintain public order and the safety of persons and property’. At check points, the Police and Custom officials control conveyance of charcoal to market destinations and other consumption sites by checking to ensure that charcoal traders have obtained appropriate licences (Charcoal Conveyance Certificates and council tickets) for their goods (Obiri *et al.*, 2014).

3.3 Research design and methods

This section describes the research design for the study. It begins with the philosophical worldview, which is followed by the selected strategies of inquiry. The final part describes the specific methods employed for data collection and analysis.

3.3.1 Philosophical worldview

My philosophical worldview – "the general orientation about the world and the nature of research that a researcher hold" (Creswell, 2009, p.6) is pragmatic. I adhere to its recognition that the world is not an absolute unity and that "research always occurs in social, historical, political and other context" (Creswell, 2014, p.11). Considering the nature of problems in the social sciences, it is important to advocate for pluralistic methods to obtain knowledge about the problem (Morgan, 2007; Patton, 1990). First, I apply quantitative approaches to study relationships among key variables by framing that in the form of hypotheses and questions. Second, in addition to the quantitative methods, I employ qualitative approaches to understand and explain the socio-political context of my quantitative information. This is done in view of the complex nature of human behaviour. Third, I adhere to the post-positivist emphasis on theory testing and its rejection of absolute truth. As Creswell (2014, p.7) note, "there are theories that govern the world, and these needs to be tested or verified and refined so that we can understand the world". My inquiry begins with a theory, where I collect data to either support or refute it. I use theories to understand and explain the research problem outlined in the background chapter of the thesis.

My worldview is partly shaped by my academic discipline area. I am a trained forester and conservationist. The worldview is also shaped by my past research experience. In my past research roles, I have engaged with diverse groups including gender, ethnicity and socio-economic class. My involvement with diverse groups makes me appreciate the importance of context for meanings surrounding social problems, and thus the embrace of mixed methods in my research.

3.3.2 Researcher's positionality

Flick (2018) notes that qualitative researchers will always have to take certain role as either a participator or an observer as they enter the field. The role one takes influences what information he gets access to. Since I interacted with the 'subjects' of my research, I perceive my role to lie in between the two roles, but I tried to have as little influence as possible on the research subjects. In the field, I allowed participants to talk freely without interrupting their answers.

As an external, I certainly had a different understanding of 'the field' and other knowledge than the people in it. I tried not to direct interviews based on my prior understanding of issues. Instead, I allowed the respondents to lead discussions while I insert main themes or questions periodically. My positionality will have also influenced the mode of data collection I employed. I composed my interview guides to the best of my knowledge prior to fieldwork and to my personal research focus. By asking only these questions, I might have missed valuable information that I could have gained by asking others. However, in the field, I employed a more open approach to data collection, where additional themes of questions were asked based on the directions the interviews and responses took. My position as a male collecting data from males and females could have influenced the data collection. I ensured that respondents were encouraged to explain in detail gender related views from their own perspectives.

During data analysis, my positionality and experiences played a role too. The researcher has an influence on how data is analyzed including when making decisions on how to transcribe and what parts of the data to leave out as not relevant for the research topic (Hammersley, 2010). There is also the possibility of influencing the data during the coding and categorization of data (Mey and Mruck, 2011). That being said, I tried my best to stay neutral and objective during my data analysis.

3.3.3 Research strategies

This thesis applies both quantitative and qualitative methods for addressing the research problem. The study relied on quantitative methods in addressing the "what" questions, and qualitative methods for the "how" and "why" questions. In addressing hypothesis 1, quantitative methods were mostly employed. At that stage, qualitative methods played very limited role. On the other hand, qualitative methods dominated when addressing hypotheses 2 and 3.

3.3.4 Research methods

3.3.4.1 Quantitative methods and data

The quantitative data were collected from March to November 2017 with a semi structured questionnaire which gathered both quantitative and qualitative information. This was done in relation to hypothesis 1. Interaction with actors in the charcoal market made me to categorise them as charcoal producers, merchants, transporters, wholesalers and retailers. I interviewed charcoal producers (150), merchants (50), transporters (80), wholesalers (150) and retailers (150)—in total, 580 interviews. Producers were interviewed in the three villages: Kawampe (n = 50), Asantekwa (n = 50), and Dromankese (n =50); merchants (n = 50) and transporters (n =80) were interviewed in the villages and at the Kintampo charcoal market; and wholesalers (n = 150) and retailers (n = 150) were interviewed in Kumasi, Accra, and Takoradi. Respondents were approached in their homes, fields and markets. Interviews were done throughout the day from morning to evening.

I set the number of persons in each group to be in proportion to the estimate of the population of each group which was determined through interaction with actors in the charcoal market. However, the number of merchants I interviewed were fewer than expected because they were difficult to trace. Data collected included price, cost and

quantities of charcoal handled for the year 2016. A range of demographic data were also collected (Table 3.1).

Table 3.1: Charcoal actors variables by data type

Continuous data	Bimodal categorical data	Multi-categorical data
Age	Gender	Level of education
Experience in the business (years)	Lives in an urban or rural area	Marital status
Number of bags handled per year		Ethnic group
Price of 50kg bag of charcoal bought		Other income activities
		Identity (Autochthon/Settler/Migrant)
Price of 50kg bag of charcoal sold		Ethnic group
Cost of transport per trip		
Cost of producing/trading 50kg bag of charcoal		
Price of 50kg bag of charcoal sold		

Note: n=580 for all variables except for cost of transport where n=130

In evaluating the distribution of profits between (vertical distribution) and within (horizontal distribution) the different actor groups along the charcoal chain, I employed commodity chain analysis (Ribot, 1998). This method entails: (1) identifying the various actors involved in the production and trade of the commodity, in this case charcoal; (2) evaluating profits at all the levels of the commodity chain – this is done through analysis of prices, cost and quantities of charcoal handled by each actor group in the charcoal market; (3) evaluating the distribution of profit within each group – through comparison of individual income to group income.

Bernstein and Nick (1995; Bernstein, 1996) summarise the distinct features of commodity chain analysis to include its: (1) empirical and theoretical focus on the market; (2) sensitive to power with insight on sources, uses, and impacts in society; (3) dimension of politics and political institutions as endogenous to the existence and functioning of markets; and (4) recognition that both state and non-state forms of control is also an endogenous feature of markets.

Net income (profit) at each node of the market was obtained by calculating for the net margin per bag (50-kg sack) for all the levels of the market. Average margin per bag was obtained by subtracting the average expenses per bag from the selling price of one bag of charcoal to the next node. The average margin at each node was then multiplied by the annual quantity of charcoal handled to get the net income at each level of the market. I estimated net income at national level using the national charcoal production figure for the year 2016 from Nketiah and Asante (2018). This was done by multiplying the national production figure by the average margin at each level of the market. To get net income per person, I divided the net income per node by the number of people (group size) at that node. Based on the national charcoal production figure of Nketiah and Asante (2018), and average volume (annual) of charcoal handled per actor at each level of the market, I estimated the size of each group of actors along Ghana's charcoal commodity chain using equation 1. The average annual volume of charcoal handled per actor was obtained from the surveys I conducted in three villages (Kawampe, Asantekwa, and Dromankese) and three cities (Kumasi, Accra, and Takoradi).

$$\text{Size of Group } (A_i) = [VN/\ Vn_i] \text{ ..... Equation1}$$

Where:

- A_i = Size of group i; i being the actor groups along the charcoal chain; producers, merchants, transporters, wholesalers and retailers
- VN = National volume of charcoal production from Nketiah and Asante (2018)
- Vn_i = No. of bags (50 kg sack) produced/traded by the average actor in each group obtained from surveys in three villages and three cities.

Nketiah and Asante (2018) obtained the national charcoal production figure by aggregating data from Charcoal Conveyance Certificates from all districts of the Forest Services Division (Forestry Commission) from January to December 2016. They also mounted around-the-clock checkpoints for a period of 14 days along major roads to check for vehicles moving without the Charcoal Conveyance Certificate. This data enabled calculation of correction factor to account for charcoal carrying vehicles without a Charcoal Conveyance Certificate. Charcoal recorded by Nketiah and Asante (2018) were

2.12 times that recorded by the Forestry Commission. After making the necessary correction, Nketiah and Asante (2018) estimated a total annual charcoal production level of 589,891.86 tons (or 11,797,837.2 bags [50-kg]).

I evaluated profit distribution within each group by putting actors into income quartiles 1, 2, 3 and 4, which represent the bottom 25%, 50%, 75%, and top 25% of incomes, respectively. The average incomes of the various income quartiles were then compared. In 2016 the Forestry Commission, District Assemblies, and chiefs charged GH₵0.5, GH₵0.3, and GH₵1 respectively on each charcoal bag traded. Based on these figures and assuming a 100% collection rate, we estimated the total income to the institutions using the national charcoal production figure estimated by Nketiah and Asante (2018).

3.3.4.2 Qualitative methods and data

The qualitative data collection covered a cumulative period of 5 months from 2016 to 2018. The data were collected from producers, merchants, transporters, wholesalers, retailers, charcoal users, non-producers, chiefs and landowners, Forestry Commission, district assemblies, police services and Energy Commission. I also carried extensive interviews with other informants in Afram plains (Eastern region), and Atebubu and Dormaa (Brong Ahafo region). In total, I conducted 650 interviews, some of them with small groups of people. The first part of the qualitative data investigated how each actor gained, maintained and/or controlled access to charcoal income. This part of the qualitative data related to hypothesis 2.

A second part of the qualitative data which related to hypothesis 3 investigated the roles of chiefs and state institutions in the charcoal production and trade. This part of the data collection also employed observation where I observed how trees and other raw materials (grass, soil, and water) were obtained for charcoal production in the villages of Kawampe, Asantekwa and Dromankesse. I observed how actors negotiated with chiefs, other landowners, and members of chiefs' households. At this stage, the focus was to understand

how leaders have interacted with charcoal actors by way of granting access to trees, and their involvement in disputes and how they were resolved and by whom. I investigated the rules/requirements of access by asking men and women from various ethnic groups how they got access to trees for charcoal production. I was interested in understanding how people were having access to trees in practice so I followed people during negotiations with chiefs and landowners and interviewed people while on the field working such as carbonizing wood. I investigated conflicts or contestations among institutions or between institutions and charcoal actors in relation to tree access or charcoal trade. I interviewed feuding parties, followed up police cases and investigated historical accounts of conflicts to understand situations before, during and after conflicts.

On access to charcoal markets, I followed up producers and traders with repeated interviews on how they obtained access to charcoal markets. I focused the interviews on access to charcoal supply, charcoal transport from production sites to consumption sites and access to charcoal buyers. Through a number of informal conversations and participant observations, I observed how charcoal actors interacted with chiefs and staffs of forestry, assembly and police services, and how these institutions provided access to charcoal supply and markets, and allowed charcoal transport.

The interest in how institutions are legitimated or how the authority of institutions have changed over time led me to approach elders, older men and women and actors who have participated in the charcoal production and trade for long period of time to gain historical insight on how the authorities of chiefs and other institutions have changed. Legitimate institutions are those people perceive to be right and accept their rule (Lentz, 1998; Moore, 1988; Sikor and Lund, 2009). Through the historical accounts, I investigated how institutions' roles in charcoal production and trade have changed over time, and how actors perceive the legitimacy of institutions with respect to access to trees and charcoal trade have changed over time. I also reviewed relevant documents including the 2012 Forest and Wildlife Policy.

I applied access mapping following the charcoal commodity chain, an approach used to trace out the social and political-economic hierarchies and networks in which charcoal production and exchange are embedded (Ribot, 1998, Ribot and Peluso, 2003). Through access mapping, I: (1) identified the actors involved along the charcoal chain; (2) evaluated income at each node of the chain through an analysis of prices, cost and quantities of charcoal handled by each group of actors; (3) evaluated the distribution of income within each group; and 4) used the mechanisms by which access to benefits is maintained and controlled to explain the distribution.

3.3.4.3 Methods of data processing and data analysis

The study used IBM SPSS statistical software version 23 for the analysis of the quantitative data. Chi-squared analysis was used to compare categorical responses. Differences in the distribution of net income across categorical variables were tested with Mann–Whitney U tests and Kruskal–Wallis tests. Association between continuous data was assessed through the use of Spearman correlation. The qualitative data were analyzed thematically aided by the theoretical propositions described in Chapter two. I coded responses to ‘what’ and ‘who’ questions, such as ‘what gender roles exist along the charcoal chain’. The answers to the ‘roles’ were coded and recorded. Codes that repeated were added until all responses were studied. Content analysis was used to analyse ‘why’ and ‘how’ questions. This was done by combining the observations recorded during the interview and respondents' direct responses to each question to locate the reasoning underlying respondents' responses. For instance, when analyzing the question ‘how has authority of institutions changed?’ The underlying reasons given to support how institutions’ authority has changed were sought from the texts. I generated a list of underlying reason(s) for each respondent after systematically reading the responses and observations of all the respondents. Then, I looked for common patterns in the underlying reasons provided by respondents and clustered them according to common reason such as control over producers’ access to trees. Summary of the common reasons were integrated in the findings section and relevant contextual details provided where necessary.

3.3.4.4 Ethical consideration

The study ensured that all interviewees were informed about the purpose of the research prior to data collection. Interviewees were informed that they have the freedom to participate or withdraw from the study. They were notified that they are not supposed to answer all questions posed, and that they can choose which questions to answer or not. After the interviews, they had the option to ask any question or clarify any doubt. All respondents were assured of anonymity. Efforts have been made to maintain confidentiality and anonymity of the interviewees throughout the presentation of data and results.

3.4 Overview of the three papers and their linkages

The next three chapters provide empirical findings to address the objectives and research questions raised in chapter one. Each empirical chapter is presented as a separate paper; there are three papers in all. Table 3.2 provides an overview of the contents of the three papers, how the papers relate to each other and their relation to the hypotheses and research questions presented in Chapter 1.

Table 3.2: Overview of the three papers and their linkages

	Paper 1: Profit and Profit Distribution along Ghana's Charcoal Commodity Chain	Paper 2: Access along Ghana's Charcoal Commodity Chain	Paper 3: "Forestry officials don't have any land or rights here": Authority of politico-legal institutions along Ghana's charcoal commodity chain
Hypotheses	1	2	3
Empirics/ data sources	• Data from charcoal commodity chain actors on prices, cost and quantities of charcoal handled for the year 2016	• Paper applies empirics from paper 1 • Data from charcoal	• Data from Forestry Commission, District Assemblies, and chiefs on means of controlling the

	• Data from charcoal commodity chain actors on characteristics of actors in the production and trade of charcoal • Data from Forestry Commission, District Assemblies, and chiefs on revenues generated	commodity chain actors on means of access to charcoal resources and markets • Data from Forestry Commission, District Assemblies, and chiefs on means of access to charcoal revenue	charcoal production and trade • Data from charcoal commodity chain actors on means of validating the production and trade of charcoal • Data from charcoal commodity chain actors and institutions on how legitimacy and authority of institutions have change
Theory/literature	• Profit distribution • Woodfuel (charcoal) production and trade	• A Theory of Access (Ribot and Peluso, 2003)	• Property-Authority "contract" (Sikor and Lund, 2009) • Choice and Recognition framework (Ribot *et al.*, 2010)
Main contribution (theory/ literature)	• Profit distribution among and within actor groups • Taxes in the charcoal market • Gender and ethnic distribution in the charcoal market	• Documenting additional structural and relational access mechanisms (force, moral economy, social movement and innovation)	• Paper applies property-authority contract in the analysis of charcoal commodity chain • Empirical support to Sikor and Lund's (2009) property-authority contract
Main contribution (policy/practice)	• Paper quantifies the total income in the	• Paper documents the means shaping	• Paper contributes to discussion on

	charcoal production and trade, profits among and within actor groups, revenue to institutions, thereby feeding scientific information into the policy debate	charcoal income, processes limiting actors ability to derive income, thereby feeding scientific information into the policy debate • Paper challenges the completeness of A Theory of Access in accessing access mechanisms of people	authority and state formation/building processes
Links to other papers	• Paper provides input to Paper 2	• Paper applies data from Paper 1	• Paper makes use of findings from Paper 1 and Paper 2

CHAPTER FOUR

PROFIT AND PROFIT DISTRIBUTION ALONG GHANA'S CHARCOAL COMMODITY CHAIN

This chapter presents the empirical findings to address research question 1. The chapter is published as:

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

Abstract

Are lucrative charcoal markets in Africa reducing poverty for people in the trade? In spite of its economic significance, the extent to which charcoal income reduces poverty is debatable. This article applies commodity-chain analysis to Ghana's charcoal commodity chain to describe the characteristics of actors, and to quantify and explain the profits reaped by the different actors in the chain. We estimate that profits of US$66 million are generated annually. The distribution is highly skewed between and within actor groups, with 22% of profits reaped by merchants, who make up only 3% of the actors in the market. The majority of producers and retailers, by far the largest groups in the sector generate incomes below the national minimum wage. Women dominate the market in terms of number of persons involved. Women and men earn equal incomes at all levels of the market except at the production level, where men reap higher profits than women. People from several ethnic groups engage in the market, but members of the Sissala and Asante ethnic groups are the most frequently encountered ones throughout the chain. Improving equity along the charcoal chain will require breaking the interlocking credit-labour arrangement that enables merchants to have control over charcoal prices, and improving producers' access to urban markets. The paper makes policy recommendations in this regard.

Keywords: Gender, Inequality, Market Access, Poverty Reduction, West Africa

4.1 Introduction

In most sub-Saharan Africa countries, close to 90% of urban households depend on charcoal for cooking and heating (Shively *et al*., 2010; Zulu, 2010). Supplying this fuel—charcoal production and trade—contributes to the income of an estimated 7 million people, projected to increase to 12 million by 2030 (Mwampamba *et al*., 2013). Demand for charcoal is on the rise across the continent. Arnold *et al*. (2006) estimate that by 2030 it will double from its 2000 base of 23 million tons. This growth will change the structure of charcoal markets and affect wood resources (Arnold *et al*., 2006; Zulu and Richardson, 2013). Despite its economic significance, there is great uncertainty about the importance of charcoal production and trade for income, poverty reduction, and wellbeing (Agyeman *et al*., 2012; Zulu and Richardson, 2013).

Studies on charcoal income and livelihoods in Africa use different calculation methods, data sources, and terminologies (e.g., gross revenue, margin, profit), making it difficult to compare studies and provide sound conclusions and policy recommendations (Baumert *et al*., 2016; Obiri *et al*., 2014). Recent scholarly work on charcoal commodity chains in Africa and their income distribution suggests that charcoal production and trade is profitable but that profits are unequally distributed along the chain (Baumert *et al*., 2016; Kambewa *et al.*, 2007; Ribot, 1998; Shively *et al*., 2010). A general pattern emerges whereby particular groups of actors, notably merchants, wholesalers, and transporters, reap the larger share of charcoal profit. In Kenya, about US$1.6 billion is generated annually in the charcoal market, with wholesalers, retailers, and transporters gaining 78% of the profit, while producers (being 30% of the actors) control only 22% (Kenya Forest Service, 2013). For Senegal, Ribot (1998) reported that wholesalers and merchants captured the major share of the annual US$6.6 million profits in the market, while the net incomes of retailers and producers were below subsistence. In Malawi annual charcoal income in the four largest urban areas (Blantyre, Lilongwe, Mzuzu, and Zomba) is US$41 million, with values accruing to producers from 20% to 33% of retail price, while transporters earn 20% to 25%, and retailers obtain 25% to 33% of final selling price (Kambewa *et al*., 2007). In

Burkina Faso, Mali, and Niger, benefits are also unevenly distributed, with wholesalers and transporters making the greatest profits (Bodian *et al*., 2012 in Schure *et al*., 2013).

Much scholarly attention has been devoted to understanding the stratification and profit distribution among different groups in the charcoal trade. However, limited empirical evidence exists on intra-group stratification, that is, how much income is controlled by individual actors within the groups (nodes) along the charcoal chain; for an exception, see Ribot (1998). Further, most studies focus on a single commodity chain – typically originating in a major production site and ending in the capital city (Baumert *et al*., 2016; Jones *et al*., 2016; Ribot, 1998). Finally, many studies do not examine the entire charcoal chain but focus on the production node (Agyeman *et al*., 2012; Anang *et al*., 2011; Smith *et al*., 2015).

This paper addresses these gaps through a detailed study of the profit distribution in a charcoal commodity chain in Ghana with three end markets. In Ghana few studies have investigated the charcoal commodity chain and profit distribution (Agyeman *et al*., 2012; Anang *et al*., 2011; Obiri *et al*., 2014). Understanding the profit distribution, i.e., for whom Ghana's charcoal market works, is an important starting point for improving equity and wellbeing along charcoal commodity chains in Ghana and beyond. In this paper we specifically address the following two questions: 1) Who is involved in the charcoal commodity chain in Ghana, and what are their characteristics (gender, ethnicity and age)? 2) What profits are controlled between and within the various categories of actors? We undertake commodity-chain analysis (Ribot, 1998) of a charcoal chain originating in the Kintampo Forest District in the Brong Ahafo Region (the main charcoal production area in the country) and going to the three largest end markets in Ghana: Kumasi, Accra, and Takoradi.

The paper's next section provides an overview of charcoal production and trade in Ghana. Section 4.3 outlines the methods used for data collection and analysis. Section 4.4 presents

our findings, followed by the discussion section. The final section concludes the paper and outlines policy recommendations.

4.2 Background: charcoal production and trade in Ghana

Charcoal is the dominant energy source for the urban population in Ghana, constituting 52.6% of overall household energy demand (Energy Commission, 2010a). Charcoal is produced across the country, but the bulk of the production occurs in the Brong Ahafo and Eastern Regions, with Kintampo, Atebubu, Nkoranza (Brong Ahafo Region), and Afram Plains (Eastern Region) as the key production areas (Nketiah and Asante, 2018). Charcoal marketing (wholesaling and retailing) is done mainly in the cities. Important market destinations include Accra, Kasoa, Kumasi, and Takoradi (Obiri *et al*., 2014). Wood for charcoal production is sourced from agricultural and fallow lands, forest/bush/savannah lands, and forest reserves (Anang *et al*., 2011; NCRC, 2008). People considered members of the ethnic group that first settled in an area ("indigenous farmers" or "autochthons") usually have the right to produce charcoal from communal land for free, while people not considered members of the first ethnic group ("non-indigenous farmers" or "migrants") must obtain such rights from the chief and/or landowner for a fee (Amanor *et al*., 2005; Obiri *et al*., 2014).

The direct actors involved in Ghana's charcoal sector are producers, merchants, transporters,[4] wholesalers, and retailers (Obiri *et al*., 2014; Figure 4.1). Producers cut and carbonize wood into charcoal and sell to merchants. Merchants hire truckers to transport the charcoal from villages to cities, where it is consumed. In the cities, merchants sell charcoal to wholesalers and retailers. Wholesalers sell charcoal to retailers and charcoal users in big sacks (such as 50-kg), while retailers sell charcoal in small cans and polythene bags to end users. Most producers and transporters are male, whereas charcoal marketers—merchants, wholesalers, and retailers—are predominantly female (Amoh-Anguh, 1998;

[4] Transporters in this study do not own the charcoal, but most of them have specialized in the transport of charcoal and are thus included as direct actors. Transporters are drivers of vehicles. They are not necessarily the owners of vehicles.

Blay *et al*., 2007; Obiri *et al*., 2014). The Ghana Forestry Commission, District Assemblies (local government), chiefs and landowners, and the police are involved in the market as mediators of production and marketing. Chiefs and landowners grant producers rights to trees for charcoal production in exchange for rents (fees). The Ghana Forestry Commission and District Assemblies grant permission to transport charcoal from production sites to consumption sites in the form of a Charcoal Conveyance Certificate (Forestry Commission) and council ticket (District Assembly). The police and the customs services check receipts and collect informal fees from charcoal merchants and transporters in the form of "gifts" and "drink" monies (Obour-Wiredu, 2017).

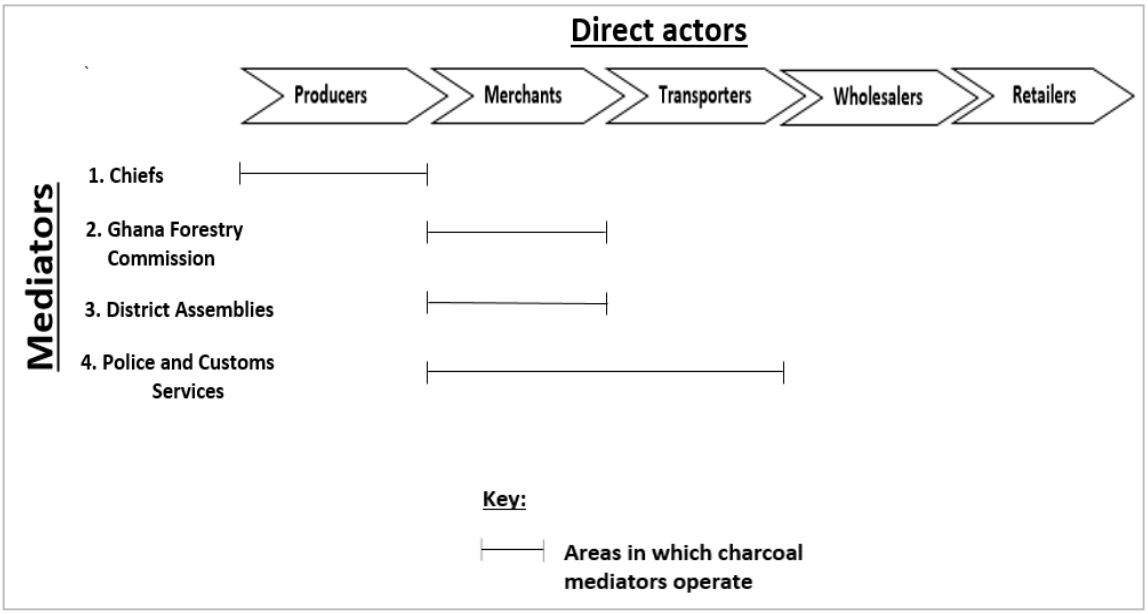

Figure 4.1: Commodity chain actors and mediators along Ghana's charcoal commodity chain, and areas in which charcoal mediators operate (Source: adapted from Obiri *et al*., 2014; Obour-Wiredu, 2017)

4.3 Methods

4.3.1 Study area

Data were collected along a charcoal commodity chain originating in the Kintampo Forest District, and ending in the three major urban centers of Ghana: Accra, Kumasi, and Takoradi (Figure 4.2). Two customary paramount systems (Nkoranza and Mo) exist in the Kintampo area, each of them having divisional chiefs under them (Table 4.1). The Bonos are the indigenous people in the villages under the jurisdiction of the Nkoranza paramount chief, and the Mos are the indigenous people in the villages under the Mo paramount chief (Ghana Statistical Service, 2014). People of several other northern and southern Ghana ethnicities live in the villages as well, and there are a number of villages dominated by northern Ghana ethnic groups. Three villages (Asantekwa, Dromankese, and Kawampe) were selected to represent the area. Asantekwa represents the Mo paramount system, and Dromankese the Nkoranza paramount system. Lastly, Kawampe represents villages inhabited by northern Ghana ethnic groups.

Charcoal from Kawampe, Asantekwa, and Dromankese is transported to urban areas in southern Ghana for consumption. The chains are not linear but intersect at several nodes. Supply from Kawampe village could end in Kumasi or continue to Accra or Takoradi, for example.

Table 4.1: Customary paramount system and ethnicities in the study villages

Village	Customary paramount system	Indigenous group	Other dominant ethnicities	Major livelihood activity
Asantekwa	Mo	Mo	Sissala, Dagaaba, Ewe, Grusi	Farming
Dromankese	Nkoranza	Bono	Sissala, Asante, Konkomba	Farming
Kawampe	Nkoranza	Gonja	Dagomba, Dagaaba, Sissala, Konkomba	Farming Animal rearing

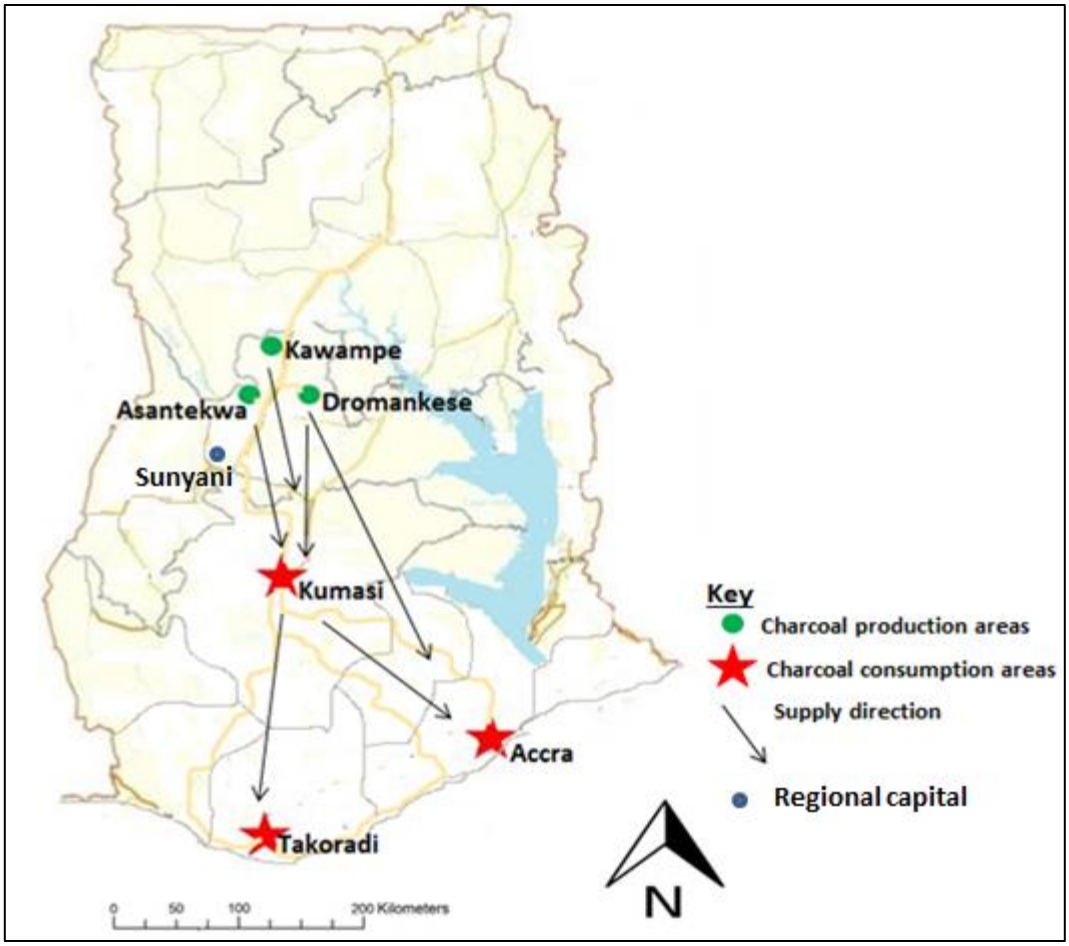

Figure 4.2: Study areas: charcoal production areas (Kawampe, Asantekwa, and Dromankese) and charcoal consumption areas (Kumasi, Accra and Takoradi)

4.3.2 Data collection

Data collection was carried out from March to November 2017. We interviewed charcoal producers, merchants, transporters, wholesalers and retailers—in total, 580 interviews. Charcoal producers were interviewed in Kawampe (*n*=50), Asantekwa (*n*=50), and Dromankese (*n*=50). Merchants (*n*=50) and transporters (*n*=80) were interviewed in the three villages and at the Kintampo charcoal market. Wholesalers (*n*=150) and retailers (*n*=150) were interviewed in Kumasi, Accra, and Takoradi. Interaction with actors makes us confirm the categorizations mentioned in the background section (this is further described in section 4.4.1). Respondents were approached in their homes, markets and

fields, and interviews were done in the mornings, afternoons, and evenings. The number of persons interviewed in each group was set in proportion to the rough estimate of the population of each group. We have fewer merchants than we wanted, because they were difficult to trace. It should be noted that most wholesalers are also retailers. Data were collected using a semi structured questionnaire designed to gather both quantitative and qualitative information (Appendix 4.1). We collected information about prices of charcoal, cost incurred, quantities of charcoal handled for the year 2016, and a range of demographic characteristics (Table 4.2).

Table 4.2: Charcoal actors variables by data type

Continuous data	Bimodal categorical data	Multi categorical data
Age	Gender	Level of education
Experience in the business (years)	Lives in an urban or rural area	Marital status
Number of bags handled per year		Ethnic group
Price of 50-kg bag of charcoal bought		Other income activities
		Identity (autochthon/settler/migrant)
Price of 50-kg bag of charcoal sold		Ethnic group
Cost of transport per trip		
Cost of producing/trading 50-kg bag of charcoal		
Price of 50-kg bag of charcoal sold		

Note: *n*=580 for all variables except for cost of transport, where *n*=130

4.3.3 Charcoal chain analysis

We employed commodity chain[5] analysis (Ribot, 1998) to evaluate the distribution of profit between (vertical distribution) and within (horizontal distribution) the different groups along the charcoal commodity chain (Figure 4.3). Commodity chain analysis entails: (1) identifying the actors involved along the charcoal commodity chain, (2) evaluating profits at each node of the commodity chain through an analysis of prices, cost incurred, and quantities of charcoal handled by each group of actors, and (3) evaluating the distribution of profit within each group by comparing individual income to group average income.

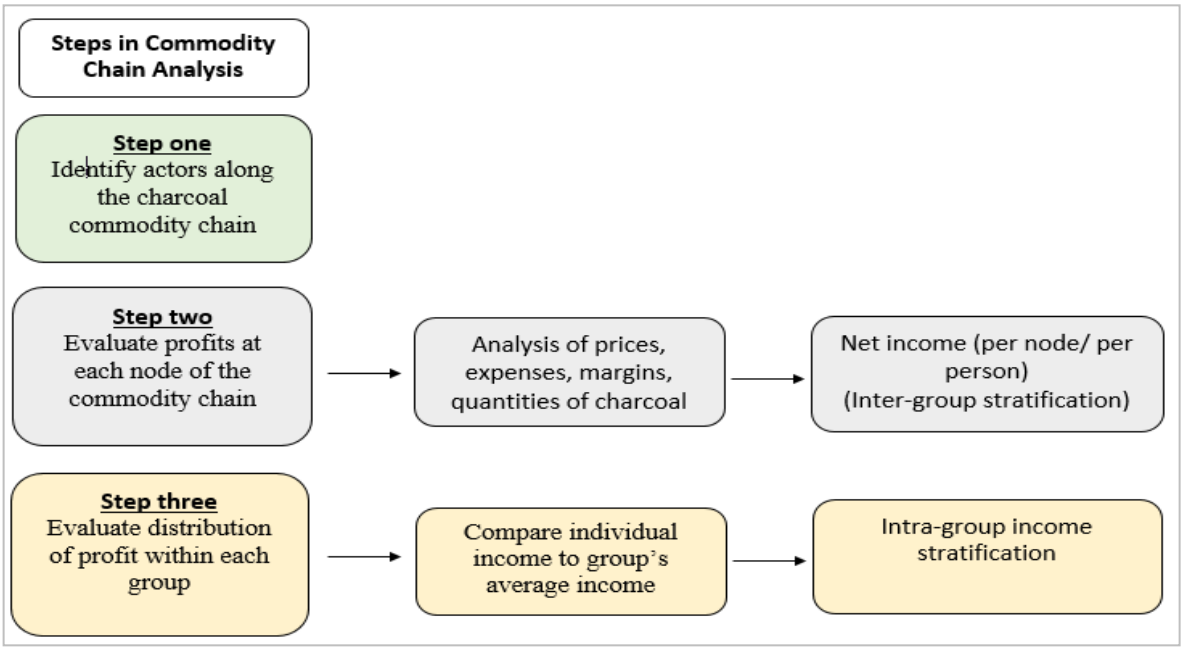

Figure 4.3: Steps in commodity chain analysis (Source: adapted from Ribot, 1998)

[5]A commodity chain is a series of interlinked exchanges through which a commodity and its constituents pass from extraction or harvesting through production to end use (Ribot, 1998). Our usage of the concept of commodity chain differs from that of Hopkins and Wallerstein (1994: 17 cited in Ribot, 1998), where a commodity chain is characterized as "a network of labor and production processes whose end result is a finished commodity." In this article we follow the French conception of commodity chain that follows the commodity through production, exchange, and final use (Ribot, 1998).

4.3.3.1 Evaluating profits along the charcoal chain (step two)

Step one in the commodity chain analysis was already carried out during data collection (section 4.3.2). We evaluated profit (net income or earnings minus expenses) at each level of the market by first calculating the net margin per bag (50-kg sack)[6] at each level. This was done by subtracting the average expenses (Table 4.3) per bag from the selling price of one bag of charcoal to the next node. The average margin per bag at each level was multiplied by the quantity of charcoal handled annually to get the net income at each level of the market. We used the national charcoal production figure for the year 2016 from Nketiah and Asante (2018) to estimate net income at the national level by multiplying the national production figure by the average margin at each level of the market. Net income per person was calculated by dividing the net income at a particular level by the number of actors (size of groups) at that level.

[6]Nketiah and Asante (2018) reported that three different sizes of bags (mini, maxi, and jumbo) are mainly used for bagging charcoal, with the maxi being the most preferred, especially for commercial/bulk transport in the Kintampo District. They reported a mean weight of 53.80kg for a maxi bag of charcoal.

Table 4.3: Direct expenses and miscellaneous cost of charcoal actors

Actor	Direct expenses	Miscellaneous cost items
Producers	Charcoal fees to chiefs	Labor cost for chainsaw operators, wood stacking, sand and grass covering
Merchants	Charcoal Conveyance Certificate, District Assembly fee, charcoal transport fee (from village to cities), truck loading and offloading fee, charcoal cost paid to producer	Village-level transport, cost of charcoal sacks
Transporters		Roadworthy fee, vehicle insurance, driver assistance money, oil change, fuel, payments at police barriers, maintenance (driving gear, tires, etc.), depreciation, income taxes (road tolls, parking fees)
Wholesalers	Charcoal cost paid to merchant	
Retailers	Charcoal cost paid to wholesaler	Cost of polythene bags

Note: To estimate miscellaneous cost, the cost for all items listed were added and the total cost were divided by total annual volume of charcoal produced/traded

We estimated the size of each group of actors along Ghana's charcoal chain based on the average annual volume of charcoal handled per actor at each node of the market, obtained from surveys conducted in three villages (Kawampe, Asantekwa, and Dromankese) and three cities (Kumasi, Accra, and Takoradi), and the national charcoal production figure of Nketiah and Asante (2018). The national charcoal production figure from Nketiah and Asante (2018) is based on an aggregation of data from Charcoal Conveyance Certificates from all districts of the Forest Services Division (Forestry Commission) from January to

December 2016. In addition, Nketiah and Asante (2018) mounted around-the-clock checkpoints for 14 days along major roads to check for vehicles moving without the Charcoal Conveyance Certificate. They used these data to calculate a correction factor to account for charcoal moving without a Charcoal Conveyance Certificate. Charcoal captured in the survey by Nketiah and Asante (2018) was 2.12 times that of the Charcoal Conveyance Certificate; that is, approximately every second bag was moving without a certificate. After applying this correction factor, they estimated the total annual charcoal production level at 589,891.86 tons (or 11,797,837.2 bags [50-kg]). Group sizes were estimated using Equation 1.

$$\text{Size of Group } (A_i) = [VN / Vn_i] \text{ ..... Equation1}$$

Where:

- A_i = Size of group i; i being the actor groups along the charcoal chain: producers, merchants, transporters, wholesalers, and retailers
- VN = National volume of charcoal production from Nketiah and Asante (2018)
- Vn_i = No. of bags (50-kg sack) produced/traded by the average actor in each group obtained from surveys in three villages and three cities

4.3.3.2 Evaluating profits within groups along the charcoal chain (step three)

We evaluated the distribution of profit within each group after sorting actors into income quartiles. Quartiles 1, 2, 3 and 4 represent the bottom 25%, 50%, 75%, and top 25% of incomes, respectively. The average incomes of the various income quartiles were then compared.

4.3.3.3 Evaluating income to institutions (forestry commission, district assemblies and chiefs)

In 2016 the Forestry Commission, District Assemblies, and chiefs charged GH₵0.5, GH₵0.3, and GH₵1 respectively on each charcoal bag traded. Based on these figures and assuming a 100% collection rate, we estimated the total income to the institutions using the national charcoal production figure estimated by Nketiah and Asante (2018).

4.3.4 Data analysis

We used nonparametric analysis throughout, as the data did not meet the assumptions of parametric tests. Chi-squared analysis was used to compare categorical responses (i.e., rural–urban status, male and female). Differences in the distribution of net income across categorical variable groupings were tested with Mann–Whitney U tests (i.e., net income and gender [male or female]) and Kruskal–Wallis tests (i.e., net income and actor type [producer, merchant, transporter, wholesaler, and retailer]). Spearman correlation (e.g., age and quantity of charcoal bags produced/traded) was used to identify association between continuous data. All statistical analyses were carried out using IBM SPSS statistical software version 23. Qualitative information from the actors was analyzed thematically to provide explanations for some of the quantitative data.

4.4 Results

4.4.1 Structure of the charcoal commodity chain and key characteristics of actors

An overview of the organization of the charcoal commodity chain originating in Kintampo, and the actors involved, is presented in Figure 4.4. The chain is made up of producers, merchants, transporters, wholesalers, and retailers. Each group of actors undertakes a specific set of activities (described below). Some individuals participate in different nodes (actor groups). Most producers (85%) carbonize wood and sell charcoal to merchants at production sites or along major roads in villages. A limited number of producers (15%) sell directly to wholesalers in the cities. Merchants buy charcoal from producers and organize transporters to transport charcoal from villages to the consuming cities. In the cities, merchants sell charcoal to wholesalers and retailers. Wholesalers sell charcoal to retailers and end users in big sacks (usually 50-kg sacks). Retailers pack charcoal in small polythene bags and cans and sell to end users. About 50% of charcoal is supplied from the Dromankese area. Close to 67% and 55% of charcoal is wholesaled and retailed, respectively, in Accra.

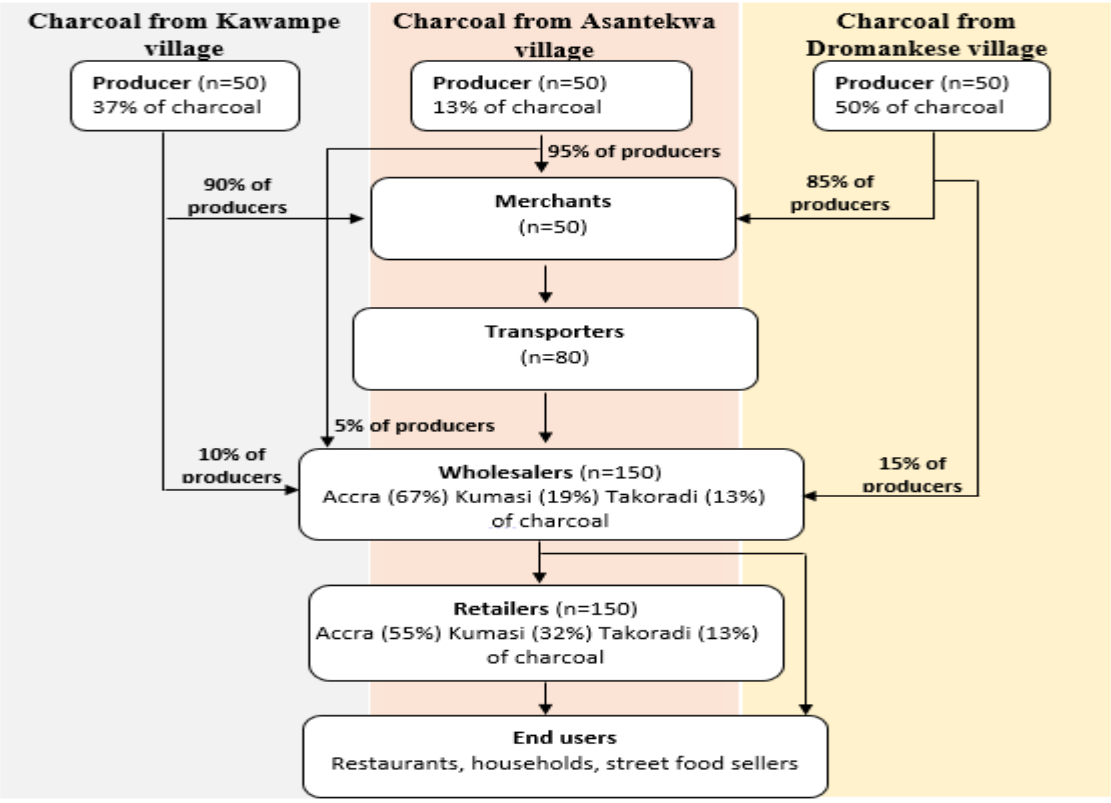

Figure 4.4: Overview of Kintampo charcoal commodity chain, differentiating between charcoal originating from Kawampe, Asantekwa, and Dromankese villages

Charcoal producers employ chainsaw operators to fell and cut trees into smaller pieces and also hire casual laborers to stack the wood before burning it (a specialist task). Most producers are unable to fund the production themselves and therefore depend on advances from merchants in order to produce. While most merchants provide advances to male producers, it is not common for female producers to get advances from merchants, and as a result they produce smaller amounts. The producers in the study area have to walk long distances (above 5km) to obtain trees for production, and some have to spend several days (from 7-21 days) away from home to gather and carbonize wood. Most female producers are unable to spend days away, since they have to attend to household duties such as caring for children. This explains why merchants are more inclined to support male producers than female ones. Consequently, male producers have higher net monthly income (US$54.47) than female producers (US$26.67, Table 4.4) (Mann–Whitney U = 1,643, $p<$

0.01). The majority of producers are male (60%) and are indigenous to the zone of production (57%).

Several ethnic groups participate in the production. Of the 150 producers interviewed, 25% were Bono people, 23% were Mo people, and 13% were from the Gonja ethnic group. Except for members of the Sissala ethnic group, who engage in full-time production, 90% of the producers had agriculture (crop cultivation) as their main livelihood strategy and charcoal production as an auxiliary, albeit important, livelihood activity. The Sissala people are the traditional charcoal-producing group, and people from other ethnic groups have learned from them. Finally, producers are more educated (chi-square = 99.32, df= 12, p< 0.05), more rural based (chi-square = 444.15, df= 4, p< 0.05), and younger (Kruskal–Wallis = 11.27, df = 4, p< 0.05) and have spent fewer years in the charcoal business (Kruskal–Wallis = 10.47, df = 4, p< 0.05) than other actor groups.

The majority of *merchants* are female (84%). Close to 56% of merchants are urban based, from Asante (32%), Fante (16%), and Sissala (16%) ethnic groups (Table 4). Urban merchants visit the villages at least once a month. In the villages, merchants move from one producer to another in search for supplies; and in the cities, they move from one customer (wholesalers and retailers) to another until all their goods have been sold. Participating in the charcoal market takes all their time, and therefore the majority (98%) of merchants are not involved in any other livelihood activity. Male and female merchants have different potentials to source charcoal. It is very common that producers fail to supply the agreed-upon amount. Male merchants, however, are less affected, because they are able to follow up with producers at the production site,where sometimes they have to spend several days (about 7 days) with producers in order to collect their charcoal. Female merchants are unable to spend days away from home, because they must attend to home duties. They therefore operate with producers they trust. There is no significant difference in the income of male US$739.50 (619.72) and female US$360.98 (400.66) merchants (Table 4.4) (Mann–Whitney U = 109, p> 0.05). Also, there is no significant difference in

the income of rural-based US$579.8 (612.16) and urban-based merchants US$297.2 (226.07) (Mann–Whitney $U = 241$, $p > 0.05$).

There are village-level and village-to-city *transporters*. Village-level transporters use small vehicles (tractors and motor kings) to carry charcoal from production sites to major roads and/or the charcoal market in Kintampo town. Most females, particularly those of the Konkomba ethnic group, who typically produce fewer than five bags per production cycle, use headpans to carry charcoal from production sites to the village. Transporters carry charcoal to the cities using various vehicles, typically Kia, Rhino and trailers. All transporters (drivers) (100%) are males, but 10% of the vehicles are owned by females. Transporters are also involved in transport of other commodities besides charcoal. During peak charcoal production periods, most transporters carry at least one load of charcoal every week, while in the lean season, it is at least twice per month. It takes one to two days for transporters to carry charcoal from production areas to the major cities in southern Ghana. Transporters spend two to three days in the cities to deliver the charcoal to the customers of the merchants. After delivery, most transporters do not return to the production areas immediately and empty, but rather search for loads of other goods to carry on the return trip; this takes on average three days. Urban- and rural-based transporters have more or less the same net income per month, US$563.94 (268.53) and US$517.35 (260.48), respectively (Mann–Whitney $U = 712$, $p > 0.05$). This seems logical, because they operate in the same way and according to the same schedule.

The majority of *wholesalers* (95%) and *retailers* (98%) are female. Most wholesalers and retailers from the Sissala ethnic group get their supply from husbands and close family members who are producers. Even during the lean seasons, family members supply regular quantities to Sissala wholesalers. This partly explains why Sissala wholesalers US$117.04 (133.62) trade more charcoal and earn higher monthly net income than wholesalers (below US$25.93 (30.10) of other ethnic groups (Kruskal–Wallis = 80.27, $p < 0.05$). Similarly, Sissala retailers US$56.78 (66.15) trade more charcoal and earn higher monthly net income than retailers (below US$18.13) (20.95) of other ethnic groups (Kruskal–Wallis = 44.37,

$p < 0.05$). There is no significant difference in the incomes of male \$86.00 (75.85) and female \$57.83 (95.73) wholesalers (Mann–Whitney $U = 392$, $p > 0.05$). There is also no significant difference in the incomes of female \$28.57 (42.65) and male \$34.67 (24.71) retailers (Mann–Whitney $U = 133$, $p > 0.05$).

Table 4.4: Key characteristics of actors along the Kintampo charcoal commodity chain

Variable	Actor group					
	Producers (*n*= 150)	Merchants (*n*= 50)	Transporters (*n*=80)	Wholesalers (*n*= 150)	Retailers (*n*= 150)	*P* values
Female (%)	38	84	0	95	98	0.000
Educated (%)	59	54	33	31	54	0.000
Married (%)	80	86	73	90	83	0.014
Indigenous (%)	57	28	54	36	37	0.000
Rural (%)	100	44	58	0	0	0.000
Alternative livelihood (%)	90	2	100	9	78	0.000
Ethnicity (%)	Gonja (13) Konkomba (12) Sissala (13) Dagarti (10) Mo (23) Bono (25) Other (4)	Gonja (10) Sissala (16) Asante (32) Fante (16) Brong (10) Other (16)	Asante (23) Bono (49) Mamprusi (14) Other (14)	Sissala (37) Asante (23) Fante (33) Other (7)	Sissala (27) Asante (24) Fante (36) Other (13)	0.000
Mean age (SD)	39 (8.65)	40 (4.69)	42 (6.52)	40 (10.69)	43 (13.22)	0.024
Mean no. of years in production/ trading (SD)	7 (3.33)	9 (4.52)	9 (4.98)	10 (9.35)	9 (9.66)	0.033
Net monthly income (SD) (USD)	Male 54.47 (58.75) Female 26.67 (22.52)	Male 739.50 (619.72) Female 360.98 (400.66)	Male 537.15 (263.26)	Male 86.00 (75.85) Female 57.83 (95.73)	Male 34.67 (24.71) Female 28.57 (42.65)	0.000

Note: Differences within all actor groups in all variables (except merchants: education and rural status; transporters: rural status; and retailers: education) and between actor groups are all statistically significant at 5% level.

4.4.2 Distribution of profit

4.4.2.1. Charcoal prices, expenses, and margins

This section examines prices and margins along Ghana's charcoal chain (Table 4.5). Charcoal prices are fixed by merchants at the production level. Merchants utilize producers' need for credit (advances) to dictate the price. It is set at the time of entering the agreement and payment of the advance, which may be one to two months before the agreed-upon delivery date, depending on the volume of charcoal involved. In situations where the producer produces more than agreed, the merchant buys the agreed-upon volume at the agreed-upon price, and the excess volume at the going price. If the producer delays delivery and if the going price has dropped below the agreed-upon price at the time of delivery, the merchant buys at the going rate. Some merchants do not pre finance producers but buy charcoal only at the roadside, at local charcoal marketplaces, or at the production sites.

The supply, and hence the price, of charcoal is influenced by season (wet or dry). The months between April and July mark the major rainy season, and September to November the minor rainy season. Most producers fell and stack woods before the rainy season sets in. At the beginning of the rainy seasons, producers have access to plenty of grass and loose soil, so production levels are high. Charcoal is in abundance in the villages, and the charcoal price is low at the production site. Periods of excessive rains, however, hinder transport of charcoal to the village/roadside. Charcoal price therefore rises during periods of excessive rains due to reduced supply, and in the dry seasons due to scarcity of grass. In 2016 peak-season price per 50-kg sack was about US$1.8 (GH₵8), and lean-season price about US$2.7 (GH₵12), making an average of US$2.3 (GH₵10).

The price of charcoal when sold to wholesalers and retailers is also dictated by the merchants. In setting the price, merchants take into consideration the demand and supply of charcoal. When demand is high, prices go up. Charcoal prices at the wholesaler, retailer,

and end-user nodes vary along the Kumasi, Takoradi, and Accra commodity chains. Prices are lowest in Kumasi and highest in Accra (Table 4.5). This partly reflects different transportation costs due to Kumasi's closer proximity to the production sites. But it probably also reflects differences in general price level, buying power, and cost of living, all higher in Accra than Kumasi. In 2016 average charcoal prices to wholesalers and retailers were about US$5.7 (GH₵25), US$6.8 (GH₵30), and US$6.4 (GH₵28) in Kumasi, Takoradi, and Accra, respectively (Table 4.5). The higher charcoal price in Takoradi is due to the high transportation cost and the low charcoal supply to the area. The prices faced by wholesalers, retailers, and end users are stable over the year; that is, they do not follow the fluctuations experienced at the production sites, which again points to the market control held by the merchants.

Charcoal production and trade entails various costs. Producers' costs include fees to chiefs and landowners, the chainsaw operator fee, labour cost for wood stacking, and weed and soil covering.[7] Non indigenous producers pay chiefs or landowners for the right to utilize trees on the land for making charcoal, either in the form of a share of the charcoal produced or its monetary equivalent. This fee varies with location. The Kawampe chief[8] takes 10 bags for every 100 bags produced from non-indigenous producers, while the chief and landowners at Dromankese take 20 bags for every 100 bags produced. The chief at Asantekwa does not collect fees from producers. This is partly because most charcoal producers at Asantekwa are indigenous to the place. Indigenous producers do not pay because they work on what is considered family land.

The Forestry Commission and District Assemblies charge fees on transported charcoal, which are paid by the merchants. Other costs, also paid by the merchants, include transportation cost, loading and offloading costs, cost of charcoal sacks, and informal payments to police and customs services. In 2016 the Forestry Commission charged US$18

[7] Labourers are employed on a daily basis to carry out duties of wood stacking and soil and grass covering.

[8] In Kawampe, all charcoal fees are paid to the chief, while at Dromankese in addition to the chief there are also individual landowners who charge rents to producers who produce from their lands.

(GH₵80) for a Kia vehicle with a load of 200 bags, US$34 (GH₵150) for a Rhino single or double axle lorry with loads of 300/400 bags, and US$57 (GH₵250) for a trailer with a load of 800 bags. In 2016, District Assemblies charged US$7 (GH₵30) for a Kia, US$9 (GH₵40) for a Rhino single axle, US$13 (GH₵60) for a Rhino double axle, and US$26 (GH₵120) for a trailer. Police and customs services personnel check receipts at checkpoints, which attract informal payments from transporters of approximately US$1 (between GH₵2 to GH₵5). Moreover, transporters are often stopped and inspected en route by staff of the Motor Transport and Traffic Unit of the police and instantly fined (informally) for violation of rules, such as not wearing boots, overloading of vehicles, or lack of vehicle maintenance. The fine amounts, on average, to approximately US$11 (GH₵50) per trip.

Rhino, Kia, and trailer vehicles (big vehicles) are used to transport charcoal from the villages to urban markets. In 2016 it cost US$1.4 (GH₵6) to transport one bag of charcoal from Kintampo Forest District to Kumasi, US$1.6 (GH₵7) to Accra, and US$2 (GH₵9) to Takoradi. The price of transportation is set by the transporters. There is an informal network among transporters, who interact and discuss prices. Trailers are different from Kia and Rhino trucks in that they transport only charcoals packed along major roads and offload at one or a maximum of two spots in the city. Trailers are cheaper than Kia and Rhino trucks. In 2016 trailers charged 50 cents (GH₵2) per bag from Kintampo to Kumasi, 70 cents (GH₵3) to Accra, and US$1 (GH₵4) to Takoradi. The trailers are used to transport goods from Accra and Takoradi to destinations in northern Ghana and across the border to destinations in Burkina Faso, Mali, and Côte d'Ivoire. On their return trips they carry charcoals that are waiting along major roads. Merchants who use trailers must reload onto smaller trucks in the cities to transport the charcoal to its final destinations. Relatively few merchants transport their charcoal using trailers, because it is expensive to reload. Rhino and Kia vehicles are preferred, and we used these in estimating transport cost (Table 4.5).

The main cost of wholesalers is the buying of charcoal from merchants. Wholesalers who trade in designated market areas in the cities pay market tolls. Most wholesalers, however, trade in front of their homes and outside market areas so they do not incur such cost. Retailers incur cost for polythene bags, since they pack charcoal in small polythene bags for sale for either GH₵1 or GH₵0.5. Like wholesalers, most retailers trade from their home and/or outside market areas. Most retailers are also into petty trading, so they sell charcoal along with other products such as food items (rice, beans, tomatoes, etc.).

The highest margin per sack was generated by producers, while transporters had the lowest margin per sack (Table 4.5). Wholesalers and retailers in Accra and Takoradi recorded higher margins than those trading in Kumasi.

Table 4.5: Average prices, expenses, and margins per bag of charcoal (50-kg sack) delivered to Kumasi, Takoradi, and Accra from the Kintampo Forest District

	Destination		
	Kumasi (GH₵)	**Takoradi** (GH₵)	**Accra** (GH₵)
Prices			
Producer price to merchant	10	10	10
Merchant price to wholesaler	25	30	28
Wholesaler price to retailer	28	33	35
Retailer price to end user	34	40	42
Expenses			
Charcoal conveyance fee (paid by merchant)	0.5	0.5	0.5
Cost of transport (paid by merchant)	6	9	7
Truck loading and unloading (paid by merchant)	1	1	1
District Assembly fee (paid by merchant)	0.3	0.3	0.3
Miscellaneous costs:			
-Paid by producers	2.5	2.5	2.5
-Paid by merchants	3	3	3
-Paid by transporters	4.9	5.2	5.7
-Paid by wholesalers	0	0	0
- Paid by retailers	1.5	1.5	1.5
Margins			
Producers	7.5	7.5	7.5
Merchants	4.2	6.2	6.2
Transporters	1.1	3.8	1.5
Wholesalers	3	3	7
Retailers	4.5	5.5	5.5

Note: Prices are in Ghana Cedis (GH₵).

4.4.2.2 Vertical and horizontal distribution of profits

This section presents the distribution of annual net income along the Kintampo charcoal commodity chain. First we present the income distribution among groups (vertical distribution) along the charcoal commodity chain. Then we show how this distribution looks along the Kumasi, Takoradi, and Accra market end points. Finally we present the income distribution within groups (horizontal distribution).

A highly skewed picture of income distribution emerges from the analysis of price margins, and quantities handled by different actors in the charcoal chain (Table 4.6). On average merchants have net annual income of US$5,383 (GH₵23,713), and transporters have US$5,266 (GH₵23,197). Producers, wholesalers, and retailers have net income of US$526 (GH₵2,317), US$1,056 (GH₵4,650), and US$406 (GH₵1,788), respectively. Merchants make up only 3% of the actors in the market but reap about 22% of the total net income (US$66 million, or GH₵291 million) in the charcoal market. Annual income between groups varies significantly (Kruskal–Wallis = 289.175, $df = 4$, $p < 0.05$).

Close to US$4.8 million (GH₵21.2 million), about 7% of the total income within the charcoal production and trade, goes to institutions mediating the charcoal business in the form of taxes and fees. The total net income accruing to the Forestry Commission was US$1.3 million (GH₵5.9 million), District Assemblies reap US$803,433 (GH₵3.5 million), and US$2.7 million (GH₵11.8 million) goes to chiefs and landowners,[9] assuming a 100% collection rate.

[9] The number of chiefs and landowners across Ghana is unknown.

Table 4.6: Vertical distribution of net income along Kintampo charcoal commodity chain

Group	Volume (annual) of charcoal produced/traded per person (50-kg sack)	Estimated group size	Average net income/person [a] US$	(GH₵)	Standard deviation	Distribution within group
Producers (*n*= 150)	309	38,181	526	2,317	2,644.3	Skewed
Merchants (*n*= 50)	4,286	2,753	5,383	23,713	24,152.4	Skewed
Transporters (*n*= 80)	10,878	1,085	5,266	23,197	13,914.2	Skewed
Wholesalers (*n*= 150)	1,073	10,995	1,056	4,650	5,012.9	Skewed
Retailers (*n*= 150)	346	34,098	406	1,788	2,236.6	Skewed
Total	16,892	87,112				

Comparisons:
Subsistence income (annual)

- Urban: US$1,593 (GH₵7,020)
- Rural: US$750 (GH₵3,303)
- National: US$1,214 (GH₵5,347) (Source: Ghana Statistical Service, 2014)

National annual minimum wage
US$588 (GH₵2,592) (Source: Ministry of Employment and Labour Relations, 2017)

[a] Net income was based on quantity of charcoal handled by actor groups and average margin (Table 5). There is significant variation in the net income between groups (Kruskal–Wallis = 289.175, $df = 4$, $p < 0.05$).

Table 4.7 breaks down the income distribution along sub chains with final destinations in Kumasi, Takoradi, and Accra. The average net income of merchants and transporters along all three end markets is higher than the average national income of US$1,214 (GH₵5,347) (Ghana Statistical Service, 2014). Merchants have the highest average income along the Accra and Kumasi end markets, while transporters reap the highest income along the Takoradi market. Wholesalers in Accra obtain higher net income than those in Kumasi and Takoradi (Kruskal–Wallis = 79.553, $df = 2$, $p < 0.05$). On the whole, producers, retailers,

and wholesalers (except for Accra) work below the national minimum wage. However, it should be noted that the large majority of producers and retailers have other livelihood activities in addition to charcoal. Producers who are engaged in other activities (mainly farming) earn annual net income of US$528 (GH₵226, 2652.5), while full-time producers earn US$696 (GH₵2,981, 2562.2), but there is no significant difference between the two groups (Kruskal–Wallis = 1.214, *df* = 1, *p*> 0.05). Retailers who are engaged in other work earn annual net income of US$602 (GH₵1,506, 2256.0), while full-time retailers earn US$773 (GH₵1,577, 2,199.6), but the difference is not statistically significant (Kruskal–Wallis = 2.279, *df* = 2, *p*> 0.05).

Table 4.7: Vertical distribution of net income along Kumasi, Takoradi, and Accra charcoal end markets

Groups	Kumasi			Takoradi			Accra		
	No. of actors	Net income GH₵/ person	SD	No. of actors	Net income GH₵/ person	SD	No. of actors	Net income GH₵/ Person	SD
Producers	30	2,585	2,850	15	2,240	4,127	105	2,257	2,331
Merchants	10	12,268	9,751	5	19,468	10,912	35	30,009	32,949
Transporters	16	12,821	6,802	8	31,540	14,437	56	16,536	8,489
Wholesalers	50	1,851	1,558	50	1,060	1,627	50	6,513	7,322
Retailers	50	1,440	1,929	50	616	521	50	2,509	3,063

Note: Differences between the incomes of Kumasi, Takoradi, and Accra are statistically significant for transporters, wholesalers and retailers at 5% level.

Finally, we turn to the intra group stratification. The distribution within all groups is highly skewed, with a few actors within each group controlling a large share of net income (Figure 4.5). The average net income of the top 25% of producers is 10 times the net income of the bottom 25%. About 69% of producers have net income below the group's average income. About 68% of merchants have net income below the group's average net income. Close to 63% of transporters have net income below the group's average net income. About 64% of wholesalers have net income below the group's average net income. The skewed wholesaler net income is partly a result of wholesalers in Accra having much higher profits than those in Kumasi and Takoradi. About 72% of retailers have net income below the group's income. There are significant differences between all income groups (quartiles 1, 2, 3, and 4) for all groups.

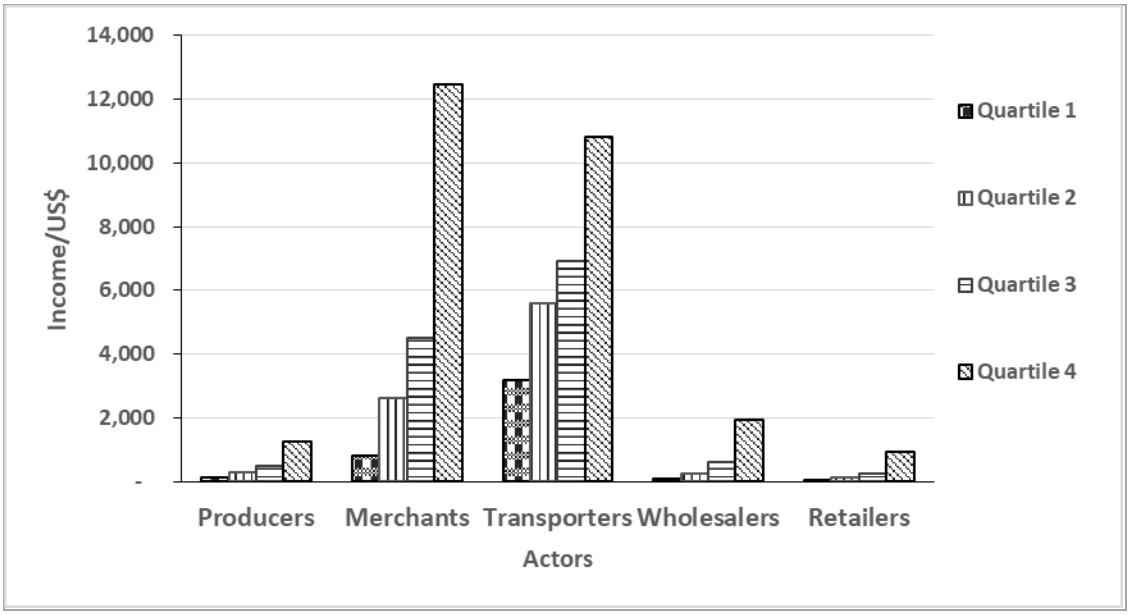

Figure 4.5: Distribution of average income within groups along Ghana's charcoal commodity chain; quartiles 1, 2, 3, 4 = bottom 25%, 50%, 75%, and top 25%.
Producer: Kruskal–Wallis = 140.091, *df* = 3, $p < 0.05$; merchant: Kruskal–Wallis = 45.839, *df* = 3, $p < 0.05$; transporter: Kruskal–Wallis = 73.724, *df* = 3, $p < 0.05$; wholesaler: Kruskal–Wallis = 138.660, *df* = 3, $p < 0.05$; retailer: Kruskal–Wallis = 140.025, *df* = 3, $p < 0.05$.

4.5 Discussion

Our results suggest that approximately 90,000 individuals are involved in the charcoal production and trade in Ghana, with most people engaged as producers and retailers. We estimate that profits of US$66 million are generated annually. The distribution is highly skewed within the groups of producers, merchants, transporters, wholesalers, and retailers. Most producers and retailers generate profits from charcoal production and trade that are below the annual minimum wage income, and they combine charcoal production and trade with other livelihood activities. Our results also suggest that the charcoal commodity chain is sharply segregated along lines of gender and ethnicity. In what follows we discuss (i) the reliability of our estimates of size of the charcoal sector and annual profits, (ii) the skewed profit distribution, (iii) the taxation in the sector, (iv) the gender distribution, and finally (v) the segregation along ethnic lines.

4.5.1 The reliability of our estimates on size of the charcoal sector and annual profits

Our study is the first to attempt a systematic estimation of the size of sector and annual profits in the charcoal commodity chain in Ghana. Our estimates are likely to be conservative. In our estimation of national-level profits and number of actors, we, as mentioned, make use of the annual charcoal production estimate for Ghana by Nketiah and Asante (2018). This is the most recent and reliable estimate but is likely to be conservative because it relies on the information captured in the Charcoal Conveyance Certificates—a system introduced in 2015 and therefore still in its infancy, meaning that many trucks travel without the certificate. Nketiah and Asante (2018) accounted for this by multiplying their estimate with a correction factor (2.12) informed by data from checkpoints, but the checkpoints were few (four), and the monitoring done over a short period of time (two weeks). Moreover, the annual charcoal production estimate does not capture charcoal produced and consumed locally, for example, in the producing areas or production from sawmill residues (most sawmills are located close to the urban centers). These issues in combination lead us to believe that the annual amount of charcoal traded along the charcoal commodity chain in Ghana is larger than estimated by Nketiah and Asante (2018) and, consequently, that the sector and annual profits may be higher than estimated in this study. Our estimate of 90,000 actors is low compared to the 450,000 estimated by the Ministry of Energy (2011). It should be noted that the latter figure comprises all actors in firewood, charcoal, and other biomass woodfuel production and trade, not only charcoal. The basis and method of estimation by the Ministry of Energy (2011) is not described.

4.5.2 The skewed profit distribution

Our finding of a highly skewed distribution of profits along the charcoal commodity chain, and in particular the high profits reaped by merchants and transporters, resonates with findings from research on charcoal in other sub-Saharan African countries (Bodian *et al*., 2012 in Schure *et al*., 2013; Kenya Forest Service, 2013; Obiri *et al*., 2014; Ribot, 1998). A study in Malawi shows a different picture, with charcoal producers and retailers reaping higher profits than transporters (Kambewa *et al*., 2007). But in that study charcoal was

produced close to the cities of consumption, and transport done by bicycles and oxcarts. The skewed charcoal commodity chain observed in Ghana echoes what has been documented in other African countries, including Kenya, Senegal, Uganda, and Burkina Faso. For instance, in Kenya transporters reap 37% of charcoal profit, while producers control only 22%, and in Senegal wholesalers and merchants capture the major share of charcoal income, while retailers and producers work below subsistence (Kenya Forest Service, 2013; Ribot, 1998).

In the Ghana charcoal commodity chain, merchants are able to generate high profits because of their control over the market, especially their control over the price. Charcoal producers are dependent on merchants for advances to finance production and have to accept the price offered by the merchants. In urban areas, merchants are able to maintain constant prices over the year, even when production levels are high and prices at the production sites decrease. Transporters control the price of transport through informal networks that set minimum prices for transport that secure them decent profits. In addition to the variation in profit levels between groups of actors, we also document a large variation within all groups along the charcoal chain. We largely attribute this to differences in financial and social capital of individual actors. Some merchants are able to pre finance more producers and/or buy more charcoal because they have more financial capital. Transporters who have well-maintained vehicles and good relations with merchants get loads more frequently than those without these means. For producers and retailers, differences may also occur as a result of their variable involvement in other livelihood activities. The situation in Ghana resembles what has been reported from Malawi, where many small- and medium-scale producers are contracted by urban-based traders who pay their labor cost in advance (Kambewa *et al*., 2007).

We studied a chain with multiple end markets within a country. We find that profits of merchants, wholesalers, and retailers are higher in Accra, compared to Kumasi, which again is higher than Takoradi. This pattern corresponds with the size and the general cost of living in these urban areas, that is, highest in Accra, the capital city. For transporters, our

data suggest high profits for transporters in Takoradi, much higher than in Accra and Kumasi. This may be because of relatively few vehicles transporting charcoal to Takoradi, allowing these operators to charge higher prices. We did not find any particular factor that could explain why there are few transporters to Takoradi.

4.5.3 The taxation in the charcoal sector

Next, on taxes and fees, our study documents taxes amounting to 8% of the average charcoal producer price. These are charged by the Forestry Commission (Charcoal Conveyance Certificate) and the District Assemblies (District Assembly fee). The Forestry Commission fee is new (started in 2015) and constitutes a significant increase in the taxation of the sector. It is charged with reference to the Commission's legal mandate to manage and regulate all forest resources in the country. Yet neither the Forestry Commission nor the District Assemblies conduct any direct management or regulation of charcoal production and trade in Ghana. Thus, the tax mainly functions as a generator of internal revenue. The taxation level observed in Ghana appears to be at the low end compared to other African countries: 33% in Malawi and Kenya, and over 8% in Senegal (Kenya Forest Service, 2013; Ribot, 1998; Smith *et al*., 2015). Also in these countries, the taxes are general revenue, not earmarked for specific activities in relation to charcoal.

Apart from taxes that are paid by the merchants, "migrant" (non-autochthon) producers in most cases need to pay a share of their produced charcoal (in kind or cash) to the traditional authorities (chiefs). This charge goes as high as 20% of produced charcoal in the most extreme case and thus constitutes a highly significant production cost for some producers (the migrants)—much higher than the government taxes. These fees are charged with reference to chiefs' role as custodians of communal lands, but as was the case with the government institutions, chiefs do not play an active role in the management and regulation of charcoal production—apart from functioning as gatekeeper for migrant producers—and there is no public accountability of the use of the generated funds. Charcoal income paid to traditional authorities in Ghana represents 4% of the total profit within the charcoal trade, which is slightly higher than in Senegal (3%) (Ribot, 1998). Finally, we document various

informal payments, which are mainly covered by transporters. Informal payments in the charcoal market appear to be a normal routine in most African countries, where most payments are demanded by the police, and in some cases forest officials (Baumert *et al*., 2016; Kambewa *et al*., 2007; Ribot, 1998; Shively *et al*., 2010). In Ghana informal payments account for about 2–5% of the final price of charcoal, which is lower than reported from Malawi (12–20%) (Kambewa *et al*., 2007).

4.5.4 The gender distribution along the charcoal chain

Our study documents a clear gender segregation along the charcoal commodity chain in Ghana, with women dominating all nodes except the production and transport nodes in terms of number of actors. Some feminist scholars argue that the social structure of the business world reflects a sex segregation of occupations in which women congregate in the lower levels of the hierarchy and in the non-lucrative sectors (e.g.,Gutek & Larwood, 1987; Reskin & Ross, 1992). Our study found the contrary. Cultural values and norms, which both stem from and reinforce social structure, exclude women from lucrative nodes in the job market by shaping expectation that women should behave in a subordinate manner and men should dominate at higher and lucrative nodes (Eagly & Karau, 2002; Ridgeway, 2001). This gender segregation along the charcoal commodity chain is rooted in strong norms about what male and female activities are. One such norm is the idea that men are not supposed to engage in activities traditionally performed by females, such as selling of household cooking items, which includes charcoal. This largely shields males from participating in the wholesaling and retailing of charcoal, which are predominantly done by women, especially retailing. Another norm relates to the perceived physical strength required to carry out particular activities, which calls for men to undertake activities such as felling of trees, stacking and loading of bags on trucks at the production node, and transport, while women engage in bagging and stitching (closing) of bags. However, this norm is changing, as women are increasingly becoming involved in production, as documented in this study. Yet women produce on average less than their male counterparts do. We have 38% representation of women in our sample of producers, while Obiri *et al*. (2014) reported a lower female participation in production of 12%. We understand the

increasing participation of women in the context of a general broadening of the participation in charcoal production since the 1980s (see further discussion below) in which women also have learned how to produce. The merchant node, while being trade and hence dominated by women, has considerably more men participating than do wholesaling and retailing. This is as a result of the high profits that can be generated at this node.

The distinct gender distribution found in Ghana's charcoal chain is also found in other food crop commodities such as cashew, groundnut, and shea in Ghana, where fewer women engage at the production node and mostly partake in trading (Ingram *et al*., 2015; Owusu-Adjei *et al*., 2017). For instance, Owusu-Adjei *et al*. (2017) observed that along the groundnut commodity chain in Ghana, women constitute 41% of the producers but 84% of the traders. These gender norms along the charcoal chain are so strong that both sexes chose to follow. As noted by Bowles (2012), gender - socially constructed roles and behaviours - has a strong prescriptive power on the thoughts and practices of individuals. People who choose not to follow existing gender norms are subject to gossip and laughter, and are seen as deviants in the market. This gender placement along the charcoal chain has critical implications for the incomes of men and women, as it shapes the potential of both sexes to participate along lucrative nodes or access opportunities at nodes traditionally dominated by the opposite sex.

Female participation in charcoal production in other African countries such as Uganda (4%) and Mozambique (35%) is lower than Ghana (38%). In contrast to Ghana, men dominate the merchant and wholesale nodes in Uganda (Shively *et al*., 2010). However, few studies have looked into gender along the charcoal commodity chain, so we do not have much to compare with. Moreover, these studies do not provide explanations of why men dominate production and trade.

4.5.5 The segregation along ethnic lines

Finally, on the ethnic composition of the market, our results illustrate an interesting story and trend. Historically, charcoal production was dominated by people of the Sissala ethnic group from Ghana's Upper West Region who were skilled in charcoal production and moved from village to village to produce charcoal under arrangements with the local chief (Amanor *et al*., 2002; Obiri *et al*., 2014). The findings of the present study, however, show that people of all ethnicities have taken up charcoal production. This suggests that the Sissala people have largely lost the niche they used to control. It is suggested that the opportunity to complement income from agriculture, in particular in the lean agricultural season, and when facing shocks and needs for extra income, has made people in the study area other than Sissala people move into charcoal production from the 1980s onward (Amanor *et al*., 2005). More recently, cattle herds' destroying farms and crops has increasingly made farmers turn to charcoal as an additional source of income (Brobbey *et al*., 2019). The dominance of Sissala people is still noticed in the relatively high share of Sissala women involved in charcoal wholesaling and retailing. Our findings are similar to what has been reported from Senegal, where charcoal production used to be dominated by one ethnic group, the Fulani migrants, but has seen a trend where other ethnicities are increasingly involved (Faye and Ribot, 2017; Ribot, 1998; Wurster, 2010). The ethnic composition of Ghana's charcoal chain is not surprising and is consistent with observations in Uganda (Shively *et al*., 2010) and Malawi (Smith *et al*., 2015), where producers and transporters are from the regional ethnic groups in the areas in which they operate. In contrast, in Kenya the production is dominated by members of the Kikuyu ethnicity (Bailis, 2005), and in Mozambique by urban-based migrants (Baumert *et al*., 2016). Most producers in the study by Baumert *et al*. (2016) in Mozambique were contracted to work for owners of forest camps. The dominance of urban migrants in the production was partly a result of their having better knowledge of charcoal production than did the locals. Further, the migrants have good relations with their employers, since they are willing to relocate to different areas of production.

4.6 Conclusion

This study set out to describe the characteristics of actors along the Kintampo charcoal chain, and to quantify and explain the profits reaped by the different actors in the chain. We applied commodity-chain analysis with data obtained from interviews with 580 actors along the charcoal chain from Kintampo to Kumasi, Accra, and Takoradi: the three largest urban centers in Ghana.

The study has found that approximately 90,000 individuals are involved in the charcoal production and trade in Ghana, with most people engaged as producers and retailers. Profits generated along the chain amount to US$66 million annually. However, the distribution of this profit is highly skewed within the groups of producers, merchants, transporters, wholesalers, and retailers. The merchants are able to generate high profits because of their control of the market, especially their control over the price, because producers are dependent on merchants for advances to finance production and have to accept the price offered by them. Transporters control the price of transport through informal networks that set minimum prices for transport that secure their profits. Most producers and retailers generate profits from charcoal production and trade that are below the annual minimum wage income, and they combine charcoal production and trade with other livelihood activities. In addition to the actors directly involved in the production, transport, and trade, formal (the Ghana Forestry Commission and the District Assemblies) and customary (chiefs) institutions generate significant revenues, while their role in resource management, regulation, and control is limited.

The charcoal commodity chain is sharply segregated along lines of gender. Women dominate in terms of persons involved in all nodes related to trade (merchants, wholesalers, and retailers), while men dominate production and transport. This is attributed to norms of trade as a female domain and the required physical strength to carry out particular activities in Ghana. The high participation of women in the charcoal commodity chain, in particular in trade, is unique in comparison with other countries. Finally, actors from multiple ethnic

groups are presently involved in the charcoal commodity chain in Ghana, compared to the past when the Sissala people dominated the chain.

To enhance the contribution of charcoal production and trade to livelihoods and poverty reduction, we recommend policies and activities to reduce the dominating role of merchants in the charcoal commodity chain, in particular efforts that could disrupt the interlocking credit-labour arrangement that enables merchants to have control over charcoal prices. We envisage that a share of the revenues generated by the Forestry Commission and District Assemblies could be used as a revolving fund to assist charcoal producers with credit opportunities. District Assemblies should support communities, or particular groups within communities, notably women, to come together in establishing associations. Depending on the specific needs, such associations could work on organizing alternative credit opportunities, obtaining information on charcoal prices in the cities, joint transport and sales in the cities, and improved methods of production.

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Appendix 4.1 Survey instrument for assessing profit along Ghana's charcoal commodity chain

	DEMOGRAPHY	Village name:
1	Age	Years
2	Gender	
3	Experience (no. of years) in the business	Years
4	Lives in an urban or rural area	a.Urban area b. Rural area
5	Level of education	a Primary b. JHS c. Secondary d. Tertiary
6	Marital status	

7	Ethnicity (tribe)	
8	Native–migrant status	
9	What other income activities are you involved in?	
10	How did you enter the business and why?	
	ACTORS IN THE MARKET	
11	Which actor category do you consider yourself to be? Prompt for people belonging to more than one group.	a. Charcoal producer (burner) b. Agent or middleman/woman (merchant) c. Transporter d. Wholesaler e. Retailer f. Other specify……..
	List all the people you engage with as you trade [conduct business] along the charcoal chain. [*I will prompt for chiefs, forestry officials, association heads, etc.*]	
12	Please explain how the people you engage with in the charcoal trade have changed over time. What accounted for the changes in the people you engage with along the charcoal chain [*that is, why the above changes in actors*]?	
13	Describe the specific activities you carry out in the charcoal market.	
	QUANTITIES, PRICES & EXPENSES (2016)	
14	How many production cycles did you complete during the peak period in 2016?	
15	How many charcoal bags were produced/traded/transported in each production cycle?	
16	Indicate the size of charcoal bags used.	Maxi bags (50-kg sack) b. mini bags or other specify
17	What was the buying and selling rice of 1 bag of charcoal?	Buying price; GH Cedis Selling price; GH Cedis
18	List all expenses for each production cycle (indicate amount in Ghana Cedi)	
19	How many production cycles did you complete during the 'lean' period in 2016?	

20	How many charcoal bags were produced/traded/ transported in each production cycle?	
21	Indicate the size of charcoal bags used for each concession.	Maxi bags (50-kg sack) b. mini bags or other specify
22	What was the buying and selling price of 1 bag of charcoal?	Buying price:GH Cedis Selling price: GH Cedis
23	List all expenses for each production cycle (indicate amount in Ghana Cedi).	Fuel wood/land cost: Packing cost: Labor cost (hired labor): Transportation cost: Storage fee Council ticket Charcoal Conveyance Certificate Other cost? Specify below: 1. 2.
24	In your latest production cycle, how many charcoal bags were produced?	
25	Indicate the size of charcoal bags used.	a. maxi bags (50-kg sack) b. mini bags or other specify
26	What was the buying/selling price of 1 bag of charcoal?	Buying price: GH Cedis Selling price: GH Cedis
27	List all expenses for each production cycle (indicate amount in Ghana Cedi).	Fuel wood/land cost: Packing cost: Labor cost (hired labor): Transportation cost: Storage fee Council ticket Charcoal Conveyance Certificate Other cost? Specify below: 1.
28	Constraints and opportunities	

CHAPTER FIVE
ACCESS ALONG GHANA'S CHARCOAL COMMODITY CHAIN

This chapter presents the empirical findings to address research question 2. The chapter is submitted as:

Agyei, F.K., Hansen, C.P. and Acheampong, E. Access along Ghana's charcoal commodity chain to Journal of Society and Natural Resources.

Abstract

Charcoal markets in sub-Saharan Africa are profitable, but it is uncertain how that wealth is being distributed among actors. Through access mapping of Ghana's charcoal commodity chain based on interviews with 650 actors, this article traces out the social and political-economic relations in which charcoal benefits are distributed. It illuminates how access and the mechanisms used by various groups of actors to maintain and control access are dynamic in time and space. The article shows how significant profits are derived by those in control of the market while those in control of the resource (the trees) and the production process generate much lower levels of profits. The article suggests force, moral economy, social movement and innovation as additional access mechanisms to those outlined by Ribot and Peluso (2003) in their seminal work on access. Improving equity along charcoal commodity chains requires more attention on access mechanisms operating on charcoal markets, especially access to capital, information and buyers.

Keywords: Access mapping, Commodity Chain Analysis, Power, Inequality, Property, West Africa

5.1 Introduction

Charcoal markets in sub-Saharan Africa continue to be profitable (Agyei *et al.,* 2018; Baumert *et al.,* 2016; Jones *et al.,* 2016). Over 90% of urban households across Africa use charcoal for cooking and heating because of its high energy content, less smoke, and easy transport (Arnold and Persson, 2003; Shively *et al.,* 2010; Zulu, 2010). Mwampamba *et al.* (2013) estimate that in 2030, over twelve million rural and urban dwellers across Africa will derive part of their income from charcoal production and trade. Several studies have been devoted to understanding income stratification among different groups in the charcoal trade in Africa (Baumert *et al.,* 2016; Jones *et al.,* 2016; Smith *et al.,* 2015; Shively *et al.,* 2010). These studies suggest that although lucrative, charcoal income is not alleviating poverty for most producers and traders (Agyei *et al.,* 2018; Baumert *et al.,* 2016). While the charcoal sector is producing wealth, it is uncertain how that wealth is being distributed among actors.

Along charcoal commodity chains, little empirical evidence exists on the means (processes and structures) shaping the distribution of income (Baumert *et al.,* 2016; Ribot, 1998). Generally, powerful actors in the production and trade harness multiple means (both legal and extra-legal) to control and maintain access to profits. Access refers to the ability to derive benefits from things and is about all possible means by which a person is able to benefit (Ribot and Peluso, 2003). In Mozambique, Baumert *et al.* (2016) observed that large scale producers draw from multiple 'bundles of powers'—access to woodlands, capital and markets—to raise their income. In Senegal, merchants control charcoal marketing and labour opportunities via control over quotas, identity cards and permits. The merchants cultivate relations with ministers and other powerful figures to pressure the Forest Service to deliver extra charcoal quotas, which enable them to profit more (Faye and Ribot, 2017; Ribot, 1998).

In Africa, while few studies have investigated processes of access along charcoal commodity chains[10] (Baumert *et al.*, 2016; Faye and Ribot, 2017; Ribot, 1998; Schure *et al.*, 2015), no known empirical evidence exists on the dynamics of access in time, that is, how the mechanisms employed by actors have changed in time. Moreover, existing charcoal studies do not show how processes of access vary across geographic space. Finally, in the specific case of Ghana, research on the charcoal commodity chain has largely focused on quantifying profits without investigated why and how this uneven distribution occurs (Agyei *et al.*, 2018; Agyeman *et al.*, 2012; Obiri *et al.*, 2014). With an overall aim of contributing in redressing inequalities of access, this article fills these gaps through an empirical study of the multiple market mechanisms shaping income distribution of the charcoal commodity chain in Ghana. It specifically addresses the question: how are different actors gaining, maintaining and controlling access to benefits along the charcoal commodity chain in Ghana? We undertake access mapping (Ribot, 1998) in time and space following the charcoal chain originating in the Kintampo Forest District (the main charcoal production area in Ghana) and going to Kumasi, Accra, and Takoradi, respectively (the three largest urban areas/consumption areas).

The Theory of Access is employed as the analytic tool to examine the mechanisms employed by charcoal actors to gain, maintain and control benefits[11] (Ribot and Peluso, 2003). The Theory of Access is employed for the study because it explores notions of power. Access emerges within power structures and has to do with the abilities of actors to benefit from things (Myers and Hansen, 2019). It categorises right-based access as when people benefit from things on the basis of the rights they possess as sanctioned by law, custom or convention (property). This includes access through licences, permits, titles, and social acceptance of certain practices. Extra-legal access includes benefits enjoyed in ways that are not in accordance to state and society rules. These include illegal access gained through the use of coercion or stealth (Ribot and Peluso, 2003). A key contribution of

[10] A commodity chain is a series of interlinked exchanges through which a commodity and its constituents pass from extraction or harvesting through production to end use (Ribot, 1998).

[11] *Gaining* access is the general process by which access is established, while access *control* is about mediating the access of others, and *maintenance* of access is to open up access for oneself or others vis-à-vis someone with access control (Ribot and Peluso, 2003).

Ribot and Peluso (2003) is their suggestion of a host of structural and relational mechanisms by which access may be gained, in isolation of, or in combination with right based mechanisms. These structural and relational mechanisms include access to technology, capital, markets, labour and labour opportunities, knowledge, authority, identities, and social relations. This article use the framework of Ribot and Peluso to illustrate the legal and extra-legal mechanisms that block some people from profiting while enabling a select few to reap high incomes in Ghana's charcoal market. In doing so, we also bring into focus a number of additional mechanisms of access not considered by Ribot and Peluso (2003).

5.2 Method: mapping access along the charcoal commodity chain in Ghana

We applied access mapping, an approach used to trace out the social and political-economic hierarchies and networks in which charcoal production and exchange are embedded (Ribot and Peluso, 2003). Through access mapping, we: (1) identified the actors involved along the charcoal chain; (2) evaluated net income (profit) at each node of the chain through an analysis of prices, cost and quantities of charcoal handled by each group of actors; (3) evaluated the distribution of net income within each group; and 4) traced the mechanisms by which access to benefits is gained, maintained and controlled to explain the observed distribution.

The detailed results of steps 1, 2 and 3 have been presented in Agyei *et al.* (2018), and are only briefly summarized in this paper to serve as a background. In this article, we focus on step 4; the mechanisms of access. Data was collected in three villages in Kintampo Forest District, and the three main consumer cities of the charcoal (Accra, Kumasi and Takoradi; Figure 5.1). There are two customary paramountcies in Kintampo Forest District: Nkoranza and Mo (Ghana Statistical Service 2014). Asantekwa represents the Mo paramount system and Dromankese the Nkoranza paramount system. Kawampe which falls under Nkoranza paramount system was selected to represent villages inhabited by people of northern Ghana ethnic groups. We interviewed direct actors {producers (150),

merchants (50), transporters (80), wholesalers (150) and retailers (150)}, charcoal users (20), non-producers (28), chiefs and landowners (6), the Forestry Commission (8), district assemblies (5), and the Energy Commission (3) (Table 5.1). The first author spent five months in the villages where he observed and interacted with participants of the study. The interviews collected data including which actors operate in the charcoal market, what means do different actors employ to enjoy benefits, how have these means changed over time and from place to place? Respondents were approached and those who showed interest in the study were interviewed: the authors moved from house to house in the villages and market areas in the cities to interview respondents. Data collection was carried out from March 2017 to February 2018. The collected data was analyzed thematically. We coded responses to 'what' and 'who' questions, such as 'who gets access to trees for charcoal production'. The answers to the 'identities' were coded. Codes that repeated were added until all responses were studied. Content analysis was used to analyse 'why' and 'how' questions. This was done by combining the observations recorded during the interview and respondents' direct responses to each question to locate the reasoning underlying respondents' responses. For instance, when analyzing the question 'how have means of access changed over time?' The underlying reasons given to support change in access are sought from the texts. We generated a list of underlying reason(s) for each respondent after systematically reading the responses and observations of all the respondents. Then, we looked for common patterns in the underlying reasons provided by respondents and clustered them according to common reason such as ties with families and friends. Summary of the common reasons were integrated in the findings. Respondents were assigned codes (A1, B1, C1, etc) to differentiate among them when presenting their responses.

Table 5.1: Number of actors interviewed and the rationale for selecting them

Actors	Number of people interviewed	Rationale
Producers	150	The number of persons interviewed in each group was set in proportion to the rough estimate of the population of each group. We have fewer merchants than we wanted, because they were difficult to trace
Merchants	50	
Transporters	80	
Wholesalers	150	
Retailers	150	
Non-producers (villagers)	28	Availability and interest
Chiefs	6	All village chiefs in the study area were interviewed
Charcoal users	20	Availability and interest
Forestry Commission (Forest Service Division)	8	Availability of forestry staff
District Assemblies	5	We interviewed staffs from all the four District Assemblies in the study area
Energy Commission	3	Availability of staff

For steps 1, 2, and 3 we conducted surveys with all groups of actors. We used profit (net income) as an indicator for benefits since this study is an inquiry into economic accumulation in commercial charcoal production and trade. The surveys collected data on prices of charcoal, cost incurred, quantities of charcoal handled for the year 2016. This information was used to quantify the net incomes of actor groups. We used the national charcoal production figure for the year 2016 from Nketiah and Asante (2018) to estimate net income at the national level. Please refer to Agyei *et al.* (2018) for further details.

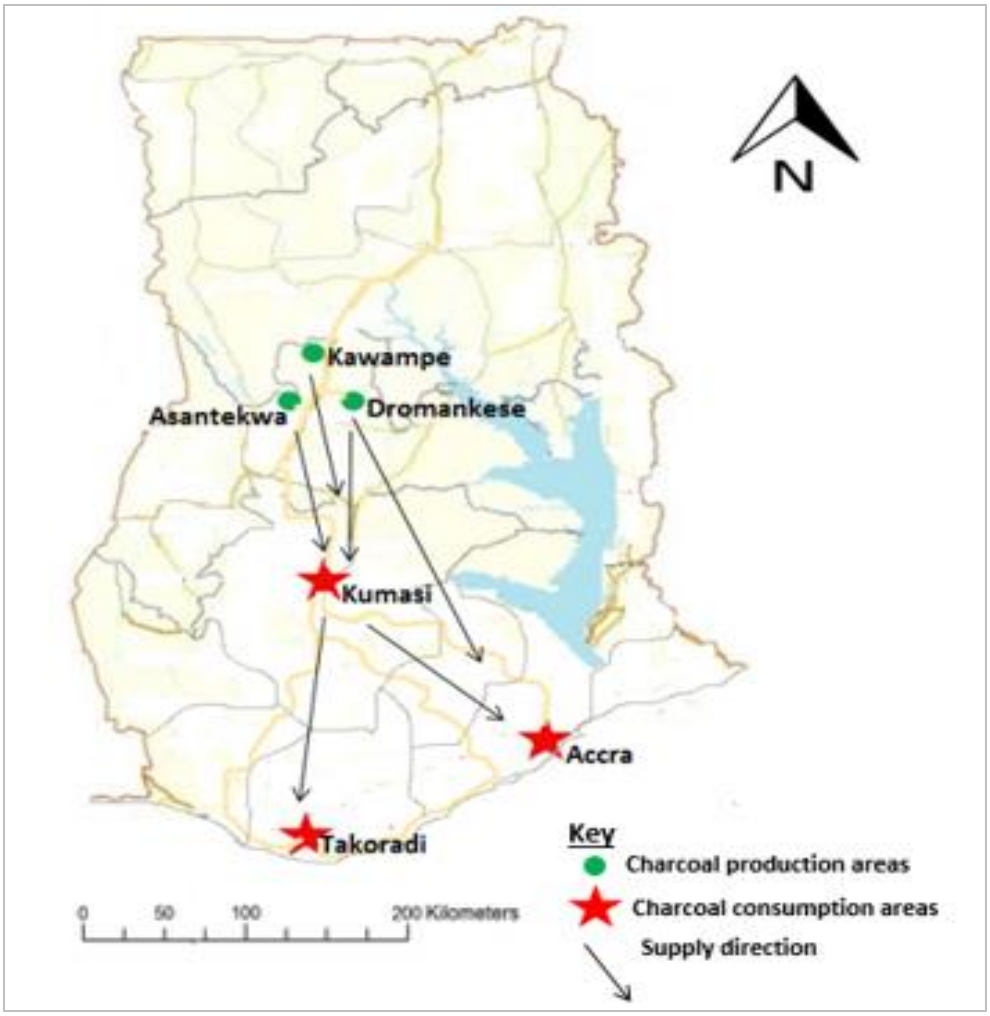

Figure 5.1: Map of study areas; charcoal production (Kawampe, Asantekwa and Dromankese) and consumption areas (Kumasi, Accra and Takoradi) in Ghana

5.3 Findings

5.3.1 Distribution of income

This section presents the distribution of annual net income along the charcoal chain originating from Kintampo Forest District to Kumasi, Accra and Takoradi. Table 5.2 presents the average results of the net income along Kumasi, Accra and Takoradi end markets. On average, merchants (US$ 5,383) and transporters (US$ 5,266) have annual net income which is about nine times greater than national minimum wage (US$ 588)

(Ministry of Employment and Labour Relations, 2017). Producers (US$ 526) and retailers (US$ 406) income fall below the national minimum wage. However, it should be noted that the large majority of producers and retailers have other livelihood activities in addition to charcoal. Merchants make up only 3% of the actors in the market but reap about 22% of the total net income (US$ 66 million) in the charcoal market. The distribution of net income within all actor groups is highly skewed.

Income distribution varies along the Kumasi, Accra and Takoradi end markets (Table 5.3). The average net income of merchants and transporters along all three end markets is higher than the average national income of US$1,214 (GH₵5,347) (Ghana Statistical Service, 2014). Merchants have the highest average net income along the Accra and Kumasi end markets, while transporters reap the highest income along the Takoradi market. Wholesalers in Accra obtain higher net income than those in Kumasi and Takoradi. On the whole, producers, retailers, and wholesalers (except for Accra) work below the national minimum annual wage.

Seven percent (US$ 4.8 million) of the income within the charcoal market goes to institutions mediating the charcoal business in the form of taxes and fees (Table 5.4). Assuming a 100% collection rate, which in reality is unlikely to occur because of e.g. corruption, chiefs and landowners (US$ 2.7 million) generated more income than the Forestry Commission (US$ 1.3 million) and district assemblies (US$ 0.8 million).

Table 5.2: Distribution of annual net income along the Kintampo charcoal chain in Ghana

Group	Average Net income/person		Distribution Within Group
	US$	(GH₵)	
Producers (n= 150)	526	2,317	Skewed
Merchants (n= 50)	5,383	23,713	Skewed
Transporters (n= 80)	5,266	23,197	Skewed
Wholesalers (n= 150)	1,056	4,650	Skewed
Retailers (n= 150)	406	1,788	Skewed

Comparison: National annual minimum wage
US$ 588 (GH₵ 2,592) (Source: Ministry of Employment and Labour Relations, 2017)

There is significant variation in the net income between groups (Kruskal - Wallis = 289.175, df = 4, P< 0.05).

Table 5.3: Distribution of net income along Kumasi, Takoradi, and Accra charcoal end markets in Ghana

Groups	Kumasi		Takoradi		Accra	
	No. of actors	Net income GH₵/ person	No. of actors	Net income GH₵/ person	No. of actors	Net income GH₵/ Person
Producers	30	2,585	15	2,240	105	2,257
Merchants	10	12,268	5	19,468	35	30,009
Transporters	16	12,821	8	31,540	56	16,536
Wholesalers	50	1,851	50	1,060	50	6,513
Retailers	50	1,440	50	616	50	2,509

Differences between the incomes of Kumasi, Takoradi, and Accra are statistically significant for transporters, wholesalers and retailers at 5% level.

Table 5.4: Income generated by institutions mediating Ghana's charcoal chain

Institutions	Fees charge per-bag of charcoal (50 kg sack) (GH₵)	Annual Income generated through fees/taxes US$
Chiefs	1	2.7 million
Forestry Commission	0.5	1.3 million
District Assemblies	0.3	803,433

5.3.2 Means of access control and maintenance to resources, markets and income

This section presents the mechanisms that the different groups of actors employ to secure access to resources (tree) and income in the charcoal market. Chiefs, producers, merchants, transporters, wholesalers, retailers and state institutions are all drawing on different means of access gaining, maintenance and control.

5.3.2.1 Chiefs and landowners

Income derived by chiefs and landowners from charcoal is obtained through their control over access to farmlands and trees. It is the rent charged by chiefs and landowners. Chiefs also use force to control the access of charcoal producers.

Charcoal production in the villages began with the arrival of the migrant (people not considered as members of the first ethnic group) Sissala people in the 1970s from Upper West Region of Ghana. As nomad producers, the Sissalas move from one village to another in search for suitable trees for charcoal production. Chiefs gave them access to trees on fallow and uncultivated land around the villages and in return chiefs charged rents. The farmlands belonged to the indigenes (people considered members of the ethnic group that first settled in an area) and settlers (migrants whose grandparents have settled in the area), but the trees on their lands were controlled by chiefs. As customary head of the people, chiefs are supreme authorities in villages and they make the final and binding decisions on village resources. One indigenous person explained: 'the Assemblyman [elected local government representative] may bring rules but the chief's rules are the most heeded one' (Gonja man A3, March 2017).

Initially, the Sissalas operated in 'gangs' (groups). Most gangs were not making outright payments to chiefs prior to production, but rather paid in instalments as the production went on. Gang leaders were responsible to register new arrivals and to collect money from gang members and make payment to chiefs. The gang system was practiced in all villages

where the Sissalas operated. The system favoured members of the gang because they could exclude outsiders from working in areas demarcated for them. Gradually, chiefs turned away from the gang system and began to deal with migrant producers on an individual basis. This was because many new migrants joined the gangs but the fees paid to the chiefs by the gang leaders did not increase. One Gonja man explained: 'the gang [system got] spoilt because the chief realized that the gang members were not paying enough relative to the work they were doing, because he was taking the production dues only from the gang leaders' (Gonja man A11, April 2017). By late 1970s, the gang system had been abolished in most villages.

In the 1980s, indigenous farmers started to take on charcoal production because they saw it as a profitable business and because of drought that reduced the agricultural production in the area. More recently, cattle destroying farmers' crops has emerged as an additional reason for engaging in charcoal production (Brobbey *et al.,* 2019). As noted by a Konkomba man: 'the earnings from farming take a year, but for charcoal production, when you are in need of money and even if you do not produce in large quantity, in two weeks' time you can get money from it … that is why we added charcoal production to the farming' (Konkomba man A24, April 2017). Some indigenous people also engaged in the charcoal market as merchants, transporters and traders.

In the late 1980s, chiefs in all the villages decreed that all producers irrespective of identity were to pay them fees whenever they engage in charcoal production. Beginning from that time, chiefs have been using force to collect fees from producers who fail to pay. They do so by establishing local policing groups consisting of members of the chiefs' households to enforce payment of charcoal fees. These taskforces used various means to collect fees from producers including forcefully confiscating charcoal and threats of violence. This is because several producers fail to willfully pay charcoal fees to chiefs. The chiefs' taskforces roam the villages to track producers as they bring in their charcoal to collect charcoal fees. Sometimes, they forcefully pick bags of charcoal equivalent to amount of charcoal fees to be paid from producers who fail to pay their fees. This often results in

fights between producers and taskforces, and taskforces are often insulted and obtain "bad" names from producers. One leader indicated 'we took the charcoal [fees] by force from them [producers who resist paying charcoal fees], even though they talked a lot but they can't do anything about it' (Kawampe Chief D1, March 2017).

Currently, indigenes are exempted from charcoal fees, and settlers and migrants are contesting to be exempted from payment of fees. In the early 2000s, most indigenes in the villages decided not to pay charcoal fees. The autochthons argued that as members of villages, they used trees on their ancestral lands to produce charcoal so they were not supposed to pay fees for using resources that belonged to their forefathers. Chiefs did not accept the claims of the people and instructed taskforces to continue collection of fees. This resulted in tension and intense clashes between the indigenes and the taskforces. Most indigenes rebelled chiefs' command, resisted and fought with taskforces and failed to report at the chiefs' palaces when they were summoned. At Kawampe, Gonja men (indigenes) grouped and had series of meetings with the chief and elders arguing that incomes from charcoal production were used to develop the village through the houses and businesses they built. After several negotiations, the Gonjas succeeded and had the fee abolished. The Konkombas (settlers) at Kawampe also contested for the abolishment of the fee, but the request was rejected. The Kawampe chief explained: 'since they [Konkomba people] have settled here for a long time they think they are just like us so they don't want to pay [charcoal fees]. If they decide not to pay, the rest of the ethnic groups too won't pay, and if they don't pay they will one day even claim rights to be chiefs in this town' (Kawampe chief D1, March 2017). Also at Asantekwa and Dromankese violent clashes occurred and there were similar social opposition as in Kawampe; the indigenes grouped and contested the chief and stopped the payment.

In these interactions, the local people (indigenes, settlers and migrants) made claims to the moral economy (moral dispositions, values and norms) by basing their decision not to pay charcoal fees on what they considered to be fair and just. Particularly, at Asantekwa, the settlers argued that the charcoal trade was not profitable since tree resources in the area

have drastically reduced. Some settlers also argued that they have lived in the villages for years and that they should be exempted from charcoal fees. The Asantekwa chief and some chiefs in Kintampo Forest District accepted the claims of settlers and exempted them from the payment. Migrants in these villages also asserted that if the indigenes and settlers were not paying fees then they were also not paying. However, like in Kawampe, the settlers at Dromankese still pay charcoal fees as do migrants.

5.3.2.2 Charcoal producers

Producers gain and maintain access to charcoal income by forming ties with merchants. Other mechanisms include ability to labour, knowledge of the charcoal production process, relations and ability to mobilize family members and friends.

Most producers employ labour because they are unable to conduct all production activities themselves. They employ chainsaw operators to fell and cut trees into pieces and they hire labour to stack the wood before burning (specialised task). Most producers are unable to fund the production and therefore depend on advances from merchants in order to produce. Thus access to loans/credit is crucial for gaining access to income from charcoal. One producer explained: 'if I don't have money to cut trees and carbonize, I will go and inform those who buy it [merchants] to give me money to buy the trees, cut and burn it. If I get 3 or 4 loads [about 300 bags], I will bring it to the buyer to sell it. After selling it, she will deduct the money she gave me and the remaining, she gives to me' (Konkomba man A19, April 2017). Generally, producers roam the village in search for merchants to sponsor their work. Producers must pay back the advance that they received with an equivalent number of bags of charcoal at the price set at the time when the credit was received even if the market price has gone up at the time of delivery.

Among producers, social identity shapes access. As explained, indigenes are exempted from paying charcoal fees to chiefs. At Kawampe, also women, the aged, and people who are physically challenged, irrespective of ethnic background, are freed from charcoal fees.

These categories of people also make claim to moral economy. They are exempted because they are unable to produce large quantities of charcoal. One woman observed: ‘when you produce in a group they take the money but if you are single they don’t take, how many can we ladies produce? But, if you are a group and you produce a tractor load [around 100 bags] you all give your part together and give to him [the chief]’ (Konkomba woman A8, April 2017). In this manner, women are being denied access to benefits from collective labour. Women, the aged and the physically challenged in the other villages (Asantekwa and Dromankesse), however, pay charcoal fees.

Access to authorities is another means producers use to maintain access to charcoal income. The number of suitable tree species and sizes for charcoal production are declining due to pressure on the available stock. Producers, therefore, use any available tree species for the production. Charcoal producers, mainly migrants, cultivate strong relations with chiefs and landowners to obtain permission to produce on lands with many trees.

Access to labour shapes benefits of producers. Producers commute on daily basis from the village to the production sites, which are usually over 5 km away to ensure that the carbonization is going well. Further, the activities prior to carbonizing such as stacking of wood and scoping of soil can be physically demanding. While some producers rely on paid labour to carry most activities, those who are not successful in securing advances from merchants must carry such activities themselves. Therefore, those with reduced physical strength produce less compared to those who are physically stronger. Some producers rely on wives, husbands, children, other family members and friends to help them when stacking woods, covering stacked woods with grasses and sand (part of building the burn mound), and bagging of charcoal.

Producers with adequate knowledge of wood carbonization process (mound building and firing) produce more charcoal than those with limited knowledge. Sissalas have been producing charcoal for long and are known for producing charcoal with less dust and unprocessed woods: ‘when you pack it [wood] and wants it to burn and burn nicely, you

cut many grass unto the trees [stacked wood] and when you want to cover it with sand, you have to add as much sand as possible. If the grass is many and the sand is not many it can also burn nicely. But, when the grass and the sand are both not many, by the time you finish burning it will all have turned into ashes' (Sissala woman A27, April 2017).

Few producers transport their charcoal to the cities in order to reap additional benefits from the marketing of the charcoal. Most producers cite fear of not getting customers (charcoal buyers), difficulty to get a place to lodge, small production numbers and frustrations by the police services as reasons deterring them from doing so.

5.3.2.3 Merchants

Merchant income derived from charcoal trade is obtained through having bargaining power over prices, access to credit, information, and relations with transporters, urban wholesalers and retailers.

The majority of merchants are women. There are urban- and village-based merchants. Urban merchants travel to the villages and spend two weeks to one month to buy charcoal and transport it back to cities. Village merchants, who are mostly indigenes, also transport charcoal to the cities. Some village merchants operate as middlemen (intermediaries) or market women for urban merchants.

Merchants' main control of the production is through the advances they provide to producers. Providing loans is a means of guaranteeing access, for the merchants, to the product since the producer is required to sell back the charcoal to the merchant he or she borrowed from. This sustains an interlocking credit-labour arrangement. Merchants utilize producers' need for advances to dictate the price which is set at the time of entering the agreement. In situations where the producer produces more than agreed, the merchant buy the agreed volume at the agreed price and the excess volume at the going price. If the

producer delays delivery and the going price has dropped below the agreed price, the merchant will buy at the going rate.

Merchants are selective when it comes to whom to give advances. Producers who have the potential to produce large quantities of charcoal get merchants' support. Most often, male producers are preferred because, compared to females, men can spend more time in the field ('bush'), and therefore produce more charcoal. This is because women have to attend to house duties such as caring for children and are unable to spend days away from home. Producers who fail to deliver to the merchants lose the opportunity for future advances. One merchant explained: 'there are some [producers] that you can trust and they wouldn't be a problem to give your money because they will deliver the charcoal to you. A producer you trust then introduces his/her partner. But, if one is trustworthy, the other will not be so, so if you are not very careful you will be duped' (Merchant woman B12, March 2017).

Most costs in the charcoal production and trade are pre-financed by merchants. Besides financing the production, merchants also bear transportation charges, fees to the Forestry Services Division and district assemblies and other miscellaneous costs. Further, merchants with access to credit can sponsor more producers and can also buy more charcoal and hence, generate more profit.

Merchants need information on active production areas in order to stay in business. Such information is gathered from transporters and producers. One merchant noted: 'I used to go somewhere but the charcoal there was less heavier so I spoke to one charcoal transporter and he directed me to Kintampo, so I came with one woman' (Merchant woman B43, June 2017). Merchants withhold information on charcoal prices to negotiate for low prices in the villages and high prices in the cities. In Ghana, charcoal producing villages are far from cities where charcoal is mostly consumed. The nearest big city (Kumasi) from the villages under this study is about 250 miles. In the cities, charcoal prices change reflecting demand and supply and other factors, but often the secluded villagers lack concrete information on

price changes. Charcoal prices vary from one village to another. Mostly merchants go to the villages with the price.

Access to quality charcoal is currently being employed as an innovative way to maintain high income. Some merchants, particularly those operating as market women in the Kintampo market, repack the charcoal supplied from villages before they send it to the urban markets. This is done to remove all unprocessed wood and charcoal dust. As noted by one merchant: 'yes, we pour to check. At times just the surface is good but the rest will be bad, so after paying for it and transporting home when they [wholesalers and retailers] buy a bag there, they can bring it back so we will make loss' (Merchant woman B22, June 2017). Repacked charcoals are sold to urban merchants at higher prices compared to charcoal that has not been repacked. Most customers covet repacked charcoal and urban merchants sell them at high prices to wholesalers and retailers.

Some merchants nurture ties with police to avoid payment of Charcoal Conveyance Certificate[12] and council fees. Others transport their goods at times when police is absent on the road so they are not arrested by the police. Generally, police and custom personnel inspect receipts from merchants and transporters before allowing passage, but some police officers do not care whether charcoal carrying vehicles hold certificate or not once informal payments are made. Merchants take advantage of this because it is cost effective compared to paying the fees.

A handful of merchants own their own trucks and double as wholesalers. Merchants who are also engaged as wholesalers are mostly urban based. They usually do not visit the village but rely on their drivers and village contacts to get the needed supply. There are also a number of village based merchants (middlemen) who own tractors. They use the tractors to transport charcoal from production sites to village centres or along major roads

[12] It is a certificate provided by the Forestry Commission to charcoal merchants to allow transport of charcoal from production sites to the cities. The certificate is issued by district forest offices or at forestry check points along major roads.

in the village. Most of these trucks are not put into long distance transport such as from the village to the cities.

5.3.2.4 Transporters

Transporters gain and maintain income from the charcoal trade through ties with merchants, and access to credit, information and technology. There are a number of transporters who are also engaged in the market as merchants. Some merchants have transporters they work with regularly, and transporters with ties to large merchants are able to get loads throughout the year. In order to derive significant benefits, transporters have to cultivate relations with several merchants. One transporter explained: ‘it all depends on you getting more customers. Even now the vehicles are many so all you need is more customers’ (Transporter C13, July 2017).

Rhino and Kia trucks and trailer vehicles (big vehicles) are used to transport charcoal to urban markets. A Kia truck takes a load of 200 bags (50kg sack), a Rhino single or double axle lorry takes 300/400 bags, and a trailer takes 800 bags. After loading merchants’ goods, transporters who have access to credit top up loads with additional bags of charcoal and sell them to wholesalers in the cities. Usually, the extra loads do not attract fees from Forestry Commission and District Assemblies. This is because the fee collectors do not count the actual load on the vehicle when issuing the receipt, but use standard volumes for each vehicle type. Most trucks carry more than the standard values, but the numbers vary for different transporters.

A well-maintained vehicle is an important factor shaping transporters income. During peak charcoal production seasons, transporters can carry loads from villages to cities every week. Those with faulty vehicles are unable to follow the weekly schedule since frequent vehicle breakouts cause them to spend days on the road and several hours at the mechanic shops. One transporter noted: ’when your vehicle is not strong you can’t go for regular

loads, and also because we take loads from the bush the vehicle get weak early so if we don't regularly maintain the car it will get out of hands' (Transporter C5, June 2017).

Transporters rely on information from producers and merchants to trace where production is taking place. Those who have knowledge of current production areas also inform their merchant friends where to go to buy and transporters get the load to carry in return. One transporter indicated: I was in search of market and was prompted by a friend that when we come here [Kintampo] we shall get customers to carry their load' (Transporter C10, February 2018).

5.3.2.5 Wholesalers

Wholesalers gain and maintain access to charcoal income through relations with merchants, retailers, charcoal users and access to credit and storage spaces. There are a number of wholesalers who are also engaged in the market as retailers. It is important for wholesalers to sustain good relations with merchants because during lean charcoal production periods, only those with strong ties to merchants get charcoal. Also, those who have good relations with merchants get supplies of good quality. Wholesalers sustain good relations with merchants by buying large volumes of charcoal at regular basis and by timely payment (on delivery).

Wholesalers with access to credit are able to purchase more charcoal from merchants and have a chance of generating more income than those who do not have access to credit. Those with credit buy more charcoal when they become abundant and store to be sold during periods when charcoal supply gets low. However, those who lack funds are unable to purchase large quantities of charcoal, as noted by one wholesaler: 'I used to buy 100 bags but now I don't have enough money so I buy 30 to 50bags' (Wholesaler E42, June 2017).

Most wholesalers, particularly those of Sissala origin in Accra rely on family relations to get high quality charcoal and a constant supply. The family members are involved in the trade as merchants, transporters and producers. After producing charcoal in the villages, husbands and brothers of Sissala wholesalers transport charcoal directly to their families trading in Accra. It happens that 'the price that the Sissalas get their charcoal is different from what we [non Sissalas] get ours because the Sissalas have relatives that produce charcoal so they give to them at a cheaper price' (Wholesaler E11, August 2017).

Access to storage is a major factor limiting the quantity of charcoal bags wholesalers can demand at a time. Most wholesalers who sell at market places are limited by the number of charcoal bags they can take even if they have the capital. Due to limited places in market places, most wholesalers sell from their homes or at places falling outside market areas.

Wholesalers used to travel to charcoal producing villages to obtain their own supplies, but presently most of them get their supplies from merchants. There are more merchants in the market now than before (about 10 years ago), and merchants supply loads more frequently than before and so wholesalers are regularly supplied with charcoal. Further, in the past there were producing areas closer to the cities where wholesalers could get supplies from, but nowadays these areas have run out of trees and production has stopped. Wholesalers, therefore, have to get supplies from villages far from cities and so they rely on merchants for supplies.

5.3.2.6 Retailers

Retailers gain and maintain access through ties with merchants, wholesalers, charcoal users, and access to credit, and manipulation of weighs to have leverage over prices. Retailers cultivate relations with merchants and wholesalers to get frequent supplies and good quality charcoal. Retailers complain that charcoal from the Kintampo area is of poor quality—lots of charcoal dust, partly carbonized wood pieces, and charcoal producing sparks. One retailer noted: 'all the charcoal can be full of dust and you might not get your

money back but at times you get your money and get some profit'(Retailer F3, June 2017). Some retailers have access to buyers (smoked plantain/yam sellers) for broken and dust charcoal.

Most retailers are involved in other trade apart from charcoal, such as petty trading. Selling other goods attracts more customers since people who come to buy other goods are likely also to buy charcoal. This is a new trend, because in the past, most retailers were full time traders of charcoal. People moving into charcoal retailing also cite that charcoal has long storage: 'I went to buy oranges from Cape Coast but it had bad market, I even incurred a huge lost. My uncle later said to me, if I were a woman, I would never sell anything that rots' (Retailer F9, June 2017).

Retailers employ innovative way to maintain income. Retailers used to sell charcoal in cans and buyers came with their own bags. Retailers would add extra charcoal as gifts to buyers when pouring charcoal from the can into buyer's bag. Currently, retailers pack charcoal in polythene bags for sale for either one Ghana cedis or fifty Ghana pesewas. Packaging charcoal encourages more people to buy since buyers find the former approach of bringing their own bags to be cumbersome. By packaging charcoal in sealed polythene bags, retailers avoid adding extra charcoal as gifts. Retailers still use cans to measure the volume of charcoal to go into the polythene bags. Some retailers adjust the size of the cans by hitting the bottom or crushing the sides to reduce the volume of charcoal.

5.3.2.7 State institutions – Ghana Forestry Commission, District Assemblies, and Ghana Police Services

State institutions benefit from the charcoal market through control over transport via taxes/fees, informal payments and threats of violence. In 2016, for every vehicle carrying charcoal from the production sites to cities of consumption, the Forestry Commission charged US$ 18 for a Kia vehicle (200 bags), US$ 33 for a Rhino single or double axle lorry (300/400 bags), and US$ 56 for a trailer (800 bags). The District Assemblies charge

US$ 7 for a Kia, US$ 9 for a Rhino single axle, US$ 13 for a Rhino double axle and US$ 26 for a trailer.

The Charcoal Conveyance Certificate was introduced in 2015. Before that, forestry staff collected informal payments from producers and traders. Even, after the introduction of the certificate, some forestry staff collect illegal monies and through threats of violence confiscate charcoal of traders who transport their charcoal without Charcoal Conveyance Certificate. One forestry staff explained: 'before the Charcoal Conveyance Certificate there was fear on the side of the producers and the other actors. They thought it was illegal to engage in the charcoal production and so some state officials collected monies [bribes] from producers and traders' (Forestry staff G2, August 2017).

At check points along major roads, police and custom services personnel collect informal payments from charcoal transporters of approximately US$ 1 per truck. Transporters who violate transport rules such as not wearing boots, overloading of vehicle or lack of vehicle maintenance pay 'instant fines' (informal fee) of approximately US$ 12 to the Motor Transport and Traffic Unit of the Ghana Police. One man noted: 'the money the police take, we don't understand because we have already paid council ticket and forestry dues so the police shouldn't have taken any money from us' (Gonja man A37, April 2017).

5.4 Discussion

Our results suggest that social actors along the charcoal chain in Ghana use various mechanisms to gain, maintain and control access to benefits. Table 5.5 provides an overview of the mechanisms that different actors use to access charcoal income. These mechanisms include fiscal tools such as fees and licences; direct control over access to essential production infrastructure and roads; price and market controls; social ties of dependence, trust and loyalty; social identity and status; ties with other actors in the market, political figures, and state agents; social movements and moral economy; and force and threats of violence.

We document that in the 1970s, Sissala producers maintained access to charcoal income mainly by obtaining rights from chiefs (property relations). Later in the 1980s, the involvement of indigenous people in the production opened up the process to include multiple mechanisms: access to authority, moral economy, social movements, identity, social relations and illegal access. Repacking of charcoal into sacks by merchants and packaging of charcoal into polythene bags by retailers are some innovative ways actors employ to maintain high income. In the past, state institutions have drawn from misinformation, violence and informal payments, but recently they have started controlling access via licenses and fees. Chiefs direct control of forest resources have not changed. However, in addition to providing rights to people, chiefs grant access on the basis of identity, status, and relations. In short, the repertoires of mechanisms shaping the flow of benefits along the charcoal chain constitute a complex, highly social and political arena of labour and exchange.

Mechanisms of access do not differ significantly across geographic space. This is partly due to the fact that the Sissala people, who introduced charcoal production in the Kintampo Forest District, operated in all the villages in the 1970s and had developed similar interactions with chiefs and the locals. The involvement of the locals in charcoal production also occurred at the same period (1980s) across villages, so members of a particular village learnt from the other village and engaged in similar practices. In what follows, we discuss (i) our findings with those of other studies, and (ii) engage in a discussion of A Theory of Access and mechanisms of access that the theory puts forward.

Table 5.5: Access Map: Mechanisms of Access Gaining, Maintenance and Control in the charcoal commodity chain from Kintampo to Accra, Kumasi and Takoradi

Chiefs and landowners……...…	**Forest access control** o *Threat of violence* o *Control of village infrastructure* o *Force; Fees*
Producers……..	**Gaining and maintenance of access to merchants** o *Ties with merchants; Social identity; Technical skills* o *Social movements; Moral economy; Force*
Merchants……..	**Control of access to labour opportunities** o *Credit/capital* o *Control of access to markets* o *Innovation* **Control of access to markets** o *Licences* o *Ties with wholesalers, retailers and transporters* **Leverage over prices** o *Price fixing* o *Inter-locking credit arrangement* o *Misinformation*
Transporters……..	**Gaining and maintenance of access to merchants** o *Ties with merchants, producers, wholesalers and retailers* o *Technology (vehicle)* **Leverage over prices** o *Misinformation; Credit*
Wholesalers……	**Control of access to distribution** o *Credit arrangement/capital* o *Ties with merchants, retailers and charcoal users*
Retailers…….	**Gaining and maintenance of access to wholesalers** o *Social ties with wholesalers* o *Relations with clients* **Leverage over Prices** o *Manipulation of Volume* o *Packaging of Charcoal*
State Institutions (Ghana Forestry Commission, District Assemblies, Ghana Police Services)……	**Control of access to markets** o *Taxes/fees* o *Informal payments (bribes)* o *Threats of violence* o *Misinformation*

5.4.1 Comparison of our findings with other studies

Our finding that merchants are the actor groups reaping the highest incomes in Ghana's charcoal commodity chain through their leverage over price, access to credit and information and control over buyers is similar to what has been reported from other African countries (Baumert *et al.,* 2016; Ribot, 1998). Ribot (1998) observed that in Senegal the price paid to charcoal producers is fixed collusively among merchants who are organized in unions. Also, these unions lobby the Forest Service and the Ministry of Commerce to keep the consumer price of charcoal in Dakar high. In the Ghana case, we did not come across merchants' unions, and hence we did not see any evidence of prices being fixed collusively. Also, there are no government regulated charcoal consumer prices. Merchants rather utilize producers' need for advances to control the producer price on an individual basis. Similar to what we found in the Ghana case, Ribot (1998) noted that merchants in Senegal have access to credit and are able to advance loans to producers, pay the cost of transport and provide charcoal to retailers who will pay the merchants in periodic instalments. Similarly, Baumert *et al.* (2016) observed that merchants in Mozambique control the market through access to credit, which enable them to buy commercialisation rights (licences and private agreements), transport charcoal and control access to charcoal buyers.

5.4.2 Expanding the structural and relational mechanisms of A Theory of Access

This article suggests four structural and relational access mechanisms which complement those proposed by Ribot and Peluso (2003). These are the use of force, moral economy, social movements and innovations. We discuss each of them in turn.

In the case studied in this paper, chiefs have been using force through established taskforces to collect charcoal fees from producers since the late 1980s. Through threats of violence, taskforces confiscate charcoal from producers who fail to pay fees. Producers also employ force through acts of violence, rebellious acts and fights with chiefs'

taskforces to exempt themselves from payment of charcoal fees. The Theory of Access discusses force under "illegal access" which is a sub-category of rights-based access. We find this somewhat confusing. Along the charcoal commodity chain in Ghana, force is not only being applied to secure illegal access, it is also being employed to control access through property. For instance, chiefs use force and threats of violence as a means to secure payment of charcoal fees. Along similar lines, Hall *et al.* (2011) note that various actors apply force to gain, maintain and control their access (in this case to land). Based on this assertion they suggest force as one of their proposed "powers of exclusion" and that force/violence, or the threat of it, is under-emphasised in A Theory of Access. We support this claim, and suggest that force should rather be considered as a separate access mechanism under structural and relational mechanisms of access.

Next, moral economy refers to how economic activities are influenced and structured by moral dispositions, values and norms – a normative behavior which emerges from lived experience and people's intuitive sense of justice (Thompson, 1971). For the case of charcoal in Ghana, we show how the dwellers in Asantekwa village requested chiefs to stop demanding fees from them because the availability of trees for charcoal production has reduced drastically in the area. This prevents people from producing the amount of charcoal they used to and hence, they do not generate significant income from the production. Chiefs perceived the claims of the people to be fair and just and therefore stopped taking fees from them. The Theory of Access makes some hints towards the moral economy, notably in the section 'Access to knowledge' (pp. 168-9), but the concept remains underdeveloped. Notions of moral economy is also present in the category 'legitimation'; the fourth 'power of exclusion' proposed by Hall *et al.* (2011).

In some villages in the Kintampo Forest District, the people organize in social movements (collective action) as a mean to maintain their access. For instance at Kawampe, the fight against charcoal fees was largely influenced by collective actions, where the indigenes grouped and had series of meetings with the chief and elders. These actions helped the people to effectively bargain out from charcoal fees. Social movement is used in

combination with other access mechanisms such as force and social identity. These social movements represent protests and resistances to withstand culturally established rules. Resistance movements may employ both violent (force and threat of it) and nonviolent methods (Ashar, 2007; Ayres *et al.*, 2002; Kenya Forest Service, 2013).

The last mechanism of access that we emphasize is innovation. We have documented how merchants employ innovative way to increase their gains by repacking the charcoal (removing impurities and charcoal dust) supplied from villages before they send it to the urban markets. Similarly, the retailers, who used to sell charcoal in cans and the buyers bringing with their own bags, now pack charcoal in polythene bags. This enhances sales and may be considered as a form of value-addition to the charcoal commodity. Access through innovation, as we propose here, share some similarities with access to technology proposed in the Theory of Access (Ribot and Peluso, 2003). But we consider innovation – a new method, idea, and product – slightly different from access through technology. While technology depicts what people are actually doing, innovation denotes what people newly know how to do (Stenberg, 2017; Wahab *et al.*, 2012).

5.5 Conclusions and policy recommendations

This study has investigated how different actors gain, maintain and control access to opportunities along the charcoal commodity chain in Ghana. We employed access mapping following the charcoal chain from Kintampo Forest District to the three largest urban centres in Ghana. The analysis suggests huge inequality in the distribution of net income in the market. Producers have direct control over forest resources, but only reap small portion of income in the market. Merchants and transporters reap high income than the other actors through controlling the market via access to capital and labour, information, vehicle and price control. The article documents the legal and illegal infrastructure that allows state actors and chiefs to take fees and to informally tax this market. In expanding the Theory of Access (Ribot and Peluso, 2003), the article suggests force, moral economy, social movement and innovation as additional structural and relational access mechanisms.

Based on our findings, and in order to enhance the contribution of charcoal production and trade to livelihood enhancement and poverty reduction, we recommend policies and activities to reduce the dominating role of merchants in the charcoal commodity chain, in particular the interlocking credit-labour arrangement that enable merchants to have control over charcoal prices. District Assemblies should work with producers through charcoal producer groups/associations to assist them in collective action such as organising joint transport and sales in the cities, sourcing for alternative and low interest loans, and investing in means of negotiation to bargain for increasing their own producer prices.

We recommend that the Forestry Commission should collaborate with District Assemblies and chiefs to jointly govern the charcoal production and trade. Since chiefs are closer to tree resources and the people, they could ask the people to establish woodlots for charcoal production. It might be practically difficult for migrants to accept to plant trees since they may not live in a particular village for long or do not have clear land rights. However, the indigenes and settlers could be asked to establish woodlots. The woodlot owners could sell trees to migrants who want trees for charcoal production. The Forestry Commission could work to provide proof of ownership/tree planting.

The study suggests that tax on transporters could be used to generate substantive revenue for districts. However, further studies need to assess the potential magnitude of revenue and peoples' behavioural responses to taxes.

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CHAPTER SIX

6.0 "FORESTRY OFFICIALS DON'T HAVE ANY LAND OR RIGHTS HERE": AUTHORITY OF POLITICO-LEGAL INSTITUTIONS ALONG GHANA'S CHARCOAL COMMODITY CHAIN

This chapter presents the empirical findings to address the research question 3. The paper is submitted as:

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Abstract

Property theory suggests that in legal pluralist societies people secure rights to resources by seeking out institutions that can sanction and validate their claims. This validation legitimates their property claims. Simultaneously, the institutions build and solidify their authority as property-granting entities vis-à-vis competing authorities. In Ghana, the charcoal commodity chain involves rights recognized by both formal and customary institutions. We do a detailed study of property and authority in the context of Ghana's charcoal chain by focusing on institutions that mediate people's access to resources, how these institutions mediate access, and how the authority of institutions have changed over time. This paper shows how chiefs, having no legal mandate in trees, are gaining authority over Ghana's charcoal production. Chiefs' authority is drawn from long-established customs and social structures in land/tree management, as well as validating of claims by establishing policing groups to enforce fees. Chiefs contest each other, and at the same time, contest and push the state out from village areas. Consequently, the Forestry Commission has very limited de facto authority over trees despite their de jure mandate in this arena. The legitimacy of institutions stems from the coercive and customary-social ability to control access to resources and opportunities.

Keywords: West Africa, Chiefs, State, Wood fuel

6.1 Introduction

‘Forestry officials don’t have any land or rights here’ said a chief in the Kintampo area of Ghana, reflecting a struggle with the Forest Service over natural resources and over the legitimacy and authority of institutions. Through these struggles some politico-legal institutions consolidate or expand their authority while others vanish (Lund, 2002; Sikor and Lund, 2009). In this regard, Sikor and Lund (2009) suggest a ‘contractual’ relationship between property and authority. Property is ‘…a right in the sense of an enforceable claim to some use or benefit of something’ (MacPherson, 1978, p.3). Authority refers to a minimum voluntary compliance to power such that a command with a specific content is likely to be obeyed by a given group of people (Weber, 1976). Sikor and Lund (2009) argue that in legal pluralist societies, people make efforts to secure their claims to natural resources as legitimate property by sourcing out institutions that can sanction and validate their claims. In return the institutions build and solidify their legitimacy and authority in relation to competitors. Hence, ‘the process of recognition of claims as property simultaneously works to imbue the institution that provides such recognition with the recognition of its authority to do so’ (Sikor and Lund, 2009, p. 1). Related ideas are embedded in von Benda-Beckmann’s (1981) notion of ‘forum shopping’ and ‘shopping forums’, where people seek out institutions to authorize their claims, and institutions look for claims to authorize. With legal pluralism, several institutions (states and customary) compete in sanctioning actors’ resource claims as property (Berry, 1993, 2002; Juul and Lund, 2002).

Legitimacy is not a fixed absolute quality (Lentz, 1998), it refers to a normative belief by an actor that an institution ought to be obeyed – it is defined by an actor’s perception of the institution derived from the substance, procedure or source by which it is constituted (Hurd, 1999). Weber (1958) identifies three fundamental sources of legitimacy; rational-legal, traditional, and charismatic. Rational-legal legitimacy, typical of government-officials, is legitimacy granted by rules and laws of state usually coded in the constitution. Traditional legitimacy, such as the right of hereditary monarchs to rule, is produced from

long-established customs and social structures. The right to rule, in this case, is premised on the fact that things 'have always existed in that manner'. Charismatic legitimacy is derived from a person's own inspiration or heroism, that is, the charisma of the individual or a claim of authority inspired by a 'higher power' or 'gift of grace' (Hoffmann, 2009). On sources of legitimacy, Ribot *et al.* (2008), in their choice and recognition framework explain how central governments and higher-level agencies or NGOs choose to work with certain local institutions by transferring decision-making powers – resources and domains of decision making over which citizens can interact and attempt to influence public decisions. Thus, before institutions at the district or sub-district levels can effectively grant access, the institutions need a mandate (the powers) to do so from central governments or higher-level institutions. The higher-level institutions make a choice as to which institutions or actors in the local arena they should work with and therefore transfer power or offer support (Ribot *et al.,* 2008). A range of institutions could be the target of the choice. Targeted institutions become strengthened in the sense that they enhance their legitimacy towards subjects or citizens and towards competing institutions while non-recognised institutions become weakened (Lankina, 2008).

Another way that institutions or people consolidate their authority is through the procedures they apply in decision making and outcome or effects of enacted decisions or actions made (Nielsen, 2003; Tyler, 1990). In process legitimacy, constituents become satisfied with decisions because the decision-making process encourages participation, openness and accountability. On the other hand, satisfaction with the content of the decisions made by the institution in question results in outcome legitimacy. Related to Tyler's outcome and procedural legitimacies is Raz's service conception that holds that the ability to deliver services or to adjudicate claims is part and parcel of garnering legitimation from society (Raz, 1986). The orders of politico-legal institutions should help subordinates to conform better and the directives made by the authoritative figure should be based on reasons applicable to the affected subjects (Hershovitz, 2011; Venezia, 2013). The outcome and service legitimacy relate to Sikor and Lund's (2009) "contract" between

property and authority, in the sense that they all connote the idea that 'superiors' or politico-legal institutions provide 'services' to subordinates.

While Sikor and Lund (2009) propose a contract between property and authority, Milgroom (2012) has shown it empirically. She observed that the customary leader of Nanguene village within the Limpopo National Park in Mozambique controlled access to land and granted user rights to members of the community. However, when the village was relocated to a new location outside the park and within the jurisdiction of another village, the leader of Nanguene no longer controlled land allocation, and as a consequence lost his authority. The leader lost authority in the sense that the people stopped recognising him and instead looked elsewhere for access to resources. In another resettled village, Chinhangane, Milgroom (2012) observed that the residents could access resources, but through those who had direct claim to the dominant lineage. Hence, in the resettlement village, the resettled people have to gain and maintain access to resources through others because they could not control their own access to resources. Milgroom (2012), therefore, argued that legitimacy of a leader is premised on having resources to which s/he can control people's access and in return can invoke the people to recognise his authority. Her analysis makes a claim for relationship between a more general 'access' and authority as opposed to property and authority. Here, access, following Ribot and Peluso (2003), refers to the ability to benefit from things, and it encompasses property and other relational and structural mechanisms such as identities, knowledge and social relations.

In another example, Kronenburg (2015) investigates leaders' mediation of land and the effect on their authority. The Loita Maasai (traditional leaders) in Kenya compete with states, other agencies and neighbouring communities to maintain access to and control over the land they inhabit and the forest they use. On one hand – on territorial conflicts with Purko Maasai and (non-Maasai) Sonjo – they are losers, but on the other, they successfully compete out states and NGOs over land reforms and development projects to retain and

control access to land and the forest[13]. Kronenburg (2015) argues that the struggle to maintain and control access to forest and land in Loita are means leaders employ to hold onto power and authority. She observes that the authority of traditional leaders in Loita hinges on their continued control over the allocation of rights to land and forest uses. Her analysis shows that while traditional leaders constantly compete with state and other institutions for control over the people, traditional leaders also depend on policies and interventions of competing institutions.

In another study, of a Gansnu forest, located in a border area between the districts of Salyan and Rolpa in Nepal, Byrne *et al.* (2016) analyse how the Forest Department, Maoist rebels, district officials and local notables employ territorial practices to compete to formalize forest access claims and claims to political authority. Byrne *et al.* (2016) outline levels of territorializing practices through which authority to govern is invoked. Territorialization encompasses a range of actions employed to control space, resources and people (Ramussen and Lund, 2018). First, in relation to the border of the districts of Salyan and Rolpa, state officials and politically active citizens employ series of practices which evolve around having access to place-related and ethnically defined belonging rights, property regimes, and rescaling of borders. Second, through the establishment of community forest, local people deploy forest-related territory claiming practices to invoke the authority to govern what used to be a territory of the state.

This article contributes to this literature through a detailed study of the relationship between access and authority and their dynamics in the case of charcoal production and trade in Ghana. The charcoal commodity chain of Ghana involves rights (property) recognized by both formal and customary institutions (Obiri *et al.*, 2014). Our focus on how property relations and authority are mutually constituted brings attention to governance, and state formation and building processes. Government is about how a

[13] Further, *gaining* access is the general process by which access is established, while access *control* is about mediating the access of others, and *maintenance* of access is to open up access for oneself or others vis-à-vis someone with access control (Ribot and Peluso, 2003).

system of people exercises power and authority to govern a community or a state (Bradway and Shah, 2009).

In Ghana, we observe that chiefs are gaining authority over charcoal production. They effectively register their presence in rural areas by actively legitimizing charcoal claims and establishing local taskforces to track producers and enforce the payment of charcoal fees via threats of violence, confiscating of charcoal bags, and other means. Chiefs also employ force and the threat of it to regulate tree access by demarcating land areas as "no go zones", and forbidding the cutting of some tree species for the production of charcoal. In addition to vetting of property, chiefs grant access to trees and land on the basis of identities, social relations and on grounds of subsistence moral economy. Chiefs contest the state Forestry Commission, keeping it out of village areas – away from village land and trees, which form a territory of the locals. The Ghana Forestry Commission has very little de facto authority over trees despite their de jure mandate in this regard. The Ghana Forestry Commission and District Assemblies are absent at the production level, but present and actively fight for authority at the marketing nodes along the charcoal commodity chain.

The next section describes the research setting and methods for data collection and analysis. The subsequent sections provide an overview from pre-colonial to post-colonial Ghana to show how chiefs and states maintain and strengthen their authority through control of access to tree and land resources. The final section discusses findings.

6.2 Research setting and methods

The empirical work for this article mainly took place in three villages in Kintampo Forest District, the main charcoal production area in Ghana (Nketiah and Asante, 2018; Fig. 6.1). There are two customary paramount systems – Nkoranza and Mo – in the Kintampo Forest District, and there are a number of villages dominated by northern Ghana ethnic groups (Ghana Statistical Service, 2014). Three villages were selected to represent the area.

Asantekwa represents the Mo paramount system and Dromankese the Nkoranza paramount system. Kawampe represents villages inhabited by northern Ghana ethnic groups. We draw empirical evidence from the three villages to show how the story we present in the findings is similar in the Kintampo Forest District. We, however, indicate where there is any difference.

Ghana Forestry Commission and District Assemblies are important actors in charcoal production and trade. The Ghana Forestry Commission – and Forest Services Division (under the Commission) – was established by Act 571 with the mandate to regulate the utilization of forest resources and co-ordinate policies related to them. The 1992 Constitution of Ghana embarks on decentralisation and local government to make way for local people to participate in local governance and decision making by transferring decision making powers from central government to district levels. Ghana's decentralisation process delineates District Assemblies as the highest political authorities in the district (the local Government Act 462 of 1993). District Assemblies are mandated to plan and execute policies in respect of all matters affecting the people within their respective district areas (Article 240 of the 1992 Constitution of Ghana). There are four administrative districts within the Kintampo Forest District, from where data were collected for the study. The Forestry Commission and District Assemblies mediate at the transport and trade nodes of the charcoal commodity chain.

Data collection covered approximately 5 months cumulative over 2016 to 2018. The data mainly stemmed from open and semi-structured interviews with high level leaders (chiefs and staff of Forestry Commission), as well as observation and informal discussions and life stories on the ground. We interviewed chiefs and other landowners, charcoal producers and traders and staff of the District Assembly, Forest Services Division and police services at the Kintampo Forest District. We also conducted extensive interviews with forestry and other statutory bodies including the Forestry Commission and Energy Commission in the capital city of Accra, and other informants in Afram plains (Eastern region), and Atebubu and Dormaa (Brong Ahafo region). In total, we conducted 105 interviews, some of them

with small groups of people (1-12). We also reviewed relevant documents including the 2012 Forest and Wildlife Policy. Information from the study were analyzed thematically aided by the theoretical propositions described in the introduction section.

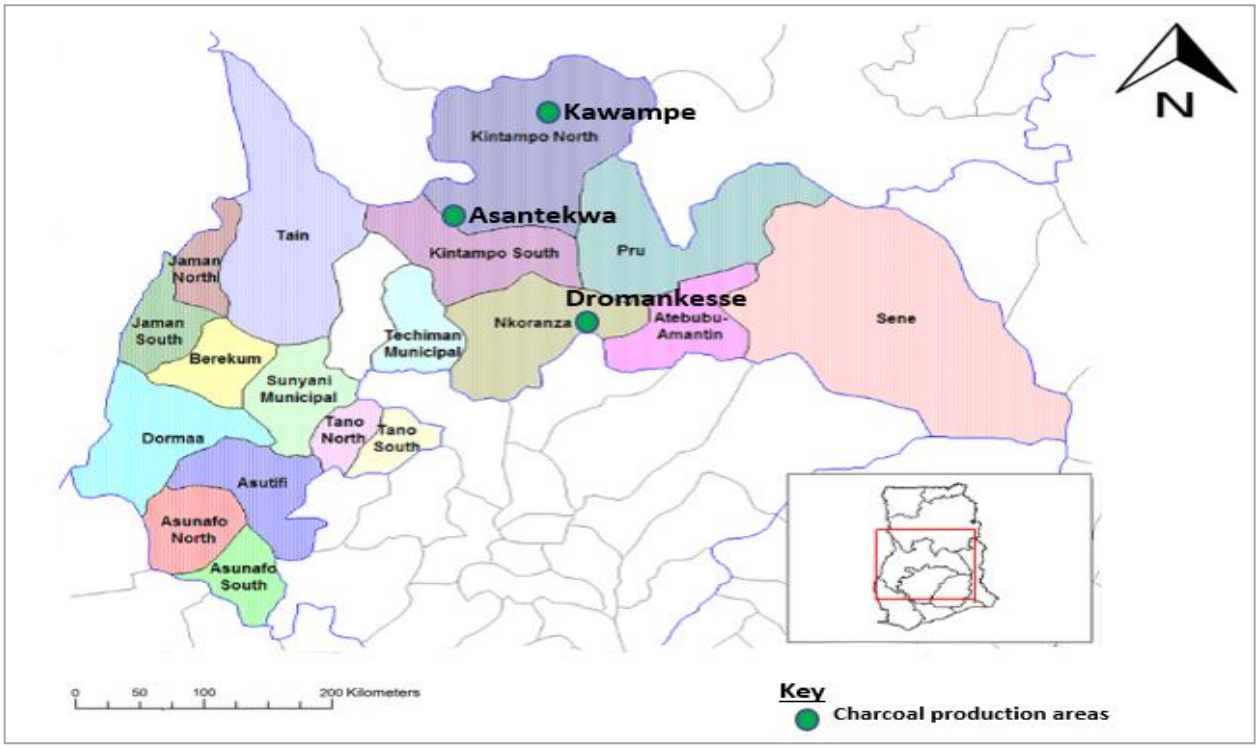

Figure 6.1: Map of study areas; Kawampe, Asantekwa and Dromankese (charcoal production areas in Ghana)

6.3 Property, authority and chiefs: pre-colonial and colonial Ghana

This section intends to briefly describe how chiefs have historically controlled access to land and tree resources in Ghana. Prior to the arrival of the British colonial rulers and the eventual establishment of a colony on the Gold Coast, the British Togoland, and the Ashanti and Fante Protectorate (now called Ghana), the local people lived under chieftaincies and occupied territories. Territories were acquired through wars and occupation, and were headed by chiefs. Chiefs originated from families that first settled in a territory. There is a hierarchy of chiefs: paramount chiefs, divisional chiefs and village chiefs (Odikro). The village chief is a caretaker chief who is usually appointed by a

divisional or paramount chief depending on who is the land owner. The divisional chief occupies its own stool[14] land and is higher in status than the village chief but lower in status than the paramount chief. Typically the divisional chiefs will be members of the Paramount Chief's council (Edu-Afful, 2013).

Families of a territory owned land acquired through occupation. Land was not a commodity to sell and was not an individual property, but a resource held in trust by the chief for the members of the group (Stool). Chiefs were custodians of land and a chief of a territory distributed land to clans and families (Amanor, 1996; Kimble, 1963). Lands granted to family members were not under individual ownership, but were categorised as family lands. Family lands revert to the stool (territory) when no longer used by the family and chiefs will have the responsibility to make fresh grants. Land was in abundance so the amount of land distributed to family members were not rationed but were based on families' ability to clear or organize labour to clear the land. Chiefs could allocate land not occupied by families to strangers who settled and worked in their territories. Strangers (people not considered members of original group) paid rent to chiefs for using land through the 'abusa' or 'abunu' system where chiefs received one third or half of the share of the produce from lands, respectively. There is also the option where agreements were made on annual cash payments. However, strangers were limited with their usage of allotted lands in that the strangers' family could not exercise group ownership and usually the agreement was renewed when the person who received the land dies. At this historical time, chiefs were the singular authoritative body controlling land access, and the people consulted them to legitimize land claims (Amanor, 1996; Kimble, 1963).

During British colonial rule from 1843 onwards[15], the British codified land rights to secure adequate titles for their industrial companies and to control the process of alienation of natural resources. In the years that followed, the colonial government begun to control land in the country by enacting several land policies. In 1876 a Public Lands Ordinance was

[14] A 'stool' refers to a particular land-owning group represented by a 'stool' chief (Kasanga *et al.*, 1996). The equivalent of 'stool' in Northern Ghana is the 'skin'.
[15]It was done later in Ashanti Protectorate

enacted to enable the government to occupy some land areas for the construction of public buildings. The Public Lands Ordinance was limited to land for public buildings. In 1894, the then Chief Justice drafted legislation to vest all 'waste lands' (unoccupied lands), forest lands and minerals in the Queen of the Britain. The name of the legislation was called The Crown Lands Bill of 1894. From the Crown Lands Bill in 1894 and onwards there was a long struggle between the British and the chiefs. However, these laws the British tried to establish were not successful (Amanor, 1996; Kimble, 1963).

At this time, the British colonial government brought about unified control over local services, but employed 'indirect rule' by which the administration of local services were delegated to traditional chiefs. Being chosen and recognised by the colonial government meant that chiefs and elders were given the exclusive powers to govern the local people including enacting traditional laws and ensuring the general welfare of the people (Berry, 1994). The use of indirect rule was particularly beneficial to the British because chiefs were accountable to the colonial masters who supported them, and therefore consulted the British rather than their people for all decisions made (Berry, 1994). The indirect rule system in particular favoured the Paramount chiefs, so it was also a way in which they controlled their divisional chiefs. The support granted to chiefs by the British caused the powers of chiefs to be greatly enhanced. Being the ruling aristocracies, chiefs were able to generate more private gains from their governance compared to before colonial rule where they were considered the custodians of the stools (Kimble, 1963).

All through the colonial period the chiefs maintained the right to grant timber and mining concessions. There were a lot of British timber companies who were engaged in timber extraction. Chiefs' right to control land and issue concessions for timber and mining companies were recognised by the colonial government (Kimble, 1963). During this period, chiefs recognised the rights of farmers to the trees they preserve on their farm land. Farmers could fell and sell preserved trees on their farms with permission from chiefs (Amanor, 1996).

6.4 Property, authority and chiefs: from independence till date

In this section, we describe a specific case of charcoal production in Kintampo Forest District of Ghana to show how, contemporarily, chiefs continue to control village resources including trees on fallows and farm lands and in natural stands. Chiefs grant property to trees and land on stool lands in return for a fee. Chiefs also issue management rules on trees. Through the provision of property and involvement in issuing management rules on trees, chiefs strengthened their authority.

After Ghana obtained independence in 1957, the newly independent Ghana President (Kwame Nkrumah) attempted to curb the power of chiefs by vesting all trees in the President in 1962 (Concessions Act 1962, Act 124). In the same year, public lands were also vested in the President of Ghana in trust for the people: 'Where it appears to the President in the public interest to do so, the President may, by executive instrument, declare any stool land to be vested in the President in trust and accordingly the President may, on the publication of the instrument, execute a deed or do an act as a trustee in respect of the land specified in the instrument' (the Administration of Lands ACT, ACT 123 section 1). This was done in recognition to article 257 of the 1992 Constitution of Ghana which provides that: '(1) All public lands in Ghana shall be vested in the President on behalf of, and in trust for, the people of Ghana'. The Concession and the Land Administration ACT significantly altered the powers of chiefs.

Yet, in practice, chiefs continue to exert control over land and trees on village lands. Currently, the inhabitants of the Kintampo Forest District are farmers. Maize, yam and other food crops, have been the main source of subsistence and cash income for majority of the people. Many years back, hunting of wild game was popular in most villages: 'When the first settlers sojourned for fertile lands, they were hunters and by what they saw on the land they realized it was a good land for settlement and farming' (Male farmer in Kawampe on 05/03/2017). So the forefathers settled in the area and hunted and farmed for their livelihood. Hunting quickly faded, and for years most villages have remained farming

villages. Currently, over 70% of the dwellers in the Kintampo area engage in farming, forestry and fishing activities as their main occupation (Ghana Statistical Service, 2014). One resident at Asantekwa emphasized: 'We are maize farmers. We grow maize for cash but yam for food' (Male farmer in Asantekwa on 12/03/2017). Livelihood alternatives to agriculture are scarce in the area, but the regions' fertile soil attracts people, mainly those of northern Ghana ethnic groups including Dagartis, Dagomba and Konkomba, to farm in the area. During farming seasons, all village dwellers cultivate food and/or cash crops. Therefore, access to cultivable land is people's most important resource.

As custodian of village resources, chiefs make the ultimate decisions on land and represent the people on all matters concerning village natural resources. The indigenes (people of the lineage that first settled in the locality) have the right to farm on family lands. Family lands have been created through cultivation (labour) of the land and are maintained by the family. Families trace family lands back through their lineage to the person who first occupied the land for farming. The oldest male in each family serves as the family head, who controls family lands—cultivated and fallow lands that used to be cultivated—and distributes parcels of land to family members who need land to farm. Non-indigenes can get access to land through arrangements with either the chief or a family head and they pay in the form of a share of the crops cultivated or its money equivalent. When portions of family lands are given out to non-autochthones it is typically in a form of a lease, but there are some outright sales. A resident at Kawampe noted: 'If it is for farming, the land lord [chief] is the one in charge, when you go to him for land he gives you a portion or at times you can get it through a relative [autochthon] who has a plot [land]' (Male farmer in Kawampe on 03/05/2017).

From the 1970s, migrant Sissala ethnic group from Upper West Region of Ghana initiated charcoal production in the area. Recently, cattle of nomadic Fulani herders destroy farms so most farmers have included charcoal production as part of their livelihood strategies. A resident at Kawampe explained that: 'I was a farmer and cattle were worrying me and when you complain too the chief will say we are all strangers on this land so there was no

profit in that business so I had to stop, we used to grow groundnut and maize' (Male farmer in Kawampe on 04/06/2017). The cattle invasion was severe and the people perceived charcoal production as a potential alternative source of livelihood. Unlike crops that can be destroyed by cattle, '…the cattle can't eat charcoal… so we produce charcoal to support ourselves because of unforeseen issues like sickness' (Male farmer in Kawampe on 10/04/2017). Both indigenes and non-autochthons engage in charcoal production.

The indigenes in the area usually have the right to produce charcoal on communal land for free, while non-indigenous farmers or migrants must obtain such rights from the chief for a fee. Before charcoal production was adopted by the indigenes – that is, before charcoal became an important livelihood strategy in the area – chiefs had control over the trees on family lands and they could allocate those to migrant charcoal producers. But when charcoal production gained importance, family heads started to exercise that right. A resident at Kawampe informed that no one starts charcoal production '… unless you consult those already in the business that you know so that they tell you the regulations with regards to being a charcoal producer, that is to give 10 bags for every 100 bags produced to the chief, and as well introduce you to the chief' (Male farmer in Kawampe on 04/04/2017). Chiefs have council of elders they govern with, but often chiefs are the ones that give out property to people. Elders often play supplementary roles such as helping the chief settle disputes or attending an errand for the chief. Chiefs may appoint some elders to collect charcoal fees on their behalf.

In the late 1980s, chiefs in all the villages decreed that all producers were to pay them fees whenever they engage in charcoal production. The indigenes and the settlers (migrants whose grandparents have settled in the area) contested payment of charcoal fees. In the early 2000s, most indigenes in the villages decided not to pay charcoal fees. The autochthons argued that as members of villages, they used trees on their ancestral lands to produce charcoal so they were not supposed to pay fees for using resources that belonged to their forefathers. Chiefs did not accept the claims of the people and instructed their taskforces to intensify collection of fees. This resulted in tension and intense clashes

between the indigenes and the taskforces. Most indigenes still rebelled against chiefs' command, resisted and fought with taskforces and failed to report at the chiefs' palaces when they were summoned. At Kawampe, Gonja men (indigenes) grouped and had series of meetings with the chief and elders arguing that incomes from charcoal production were used to develop the village through the houses and businesses they built. After several negotiations, the Gonjas succeeded and had the fee abolished. At Asantekwa and Dromankese, violent clashes occurred, and there were similar social movements; the indigenes grouped and contested with chiefs and stopped the payment. The Konkombas (settlers) at Kawampe also contested for the abolishment of the fee, but the request was rejected. The Kawampe chief explained that: 'since the Konkombas have settled here for a longer time they think they are just like us so they don't want to pay. If they decide not to pay, the rest of the ethnic groups too won't pay, and if they don't pay they will one day even claim rights to be chiefs in this town' (Kawampe chief, 05/05/2017).

The local people also leveraged gains via moral economy by basing their decision not to pay charcoal fees on what they considered to be fair and just. Particularly, at Asantekwa, the settlers argued that the charcoal trade was not profitable since tree resources in the area have drastically reduced. Some settlers also argued that they have lived in the villages for years and that they should be exempted from charcoal fees. The Asantekwa chief and some chiefs in Kintampo Forest District accepted the claims of settlers and exempted them from the payment. Migrants in these villages also asserted that if the indigenes and settlers were not paying fees then they were also not paying. So through claims of moral economy, chiefs granted free access to trees for the production of charcoal. However, like in Kawampe, the settlers at Dromankese pay charcoal fees together with migrants.

However, some producers fail to willingly pay charcoal fees to chiefs. Therefore, chiefs in the study area use force to collect fees from such producers. They do so by establishing local taskforces consisting of members of the chiefs' households to enforce payment. These taskforces use various means to collect fees including forcefully confiscating bags of charcoal and threats of violence. The chiefs' taskforces roam the villages to track

producers as they bring in their charcoal to collect charcoal fees. Some producers do not bring their charcoal to the villages, but sell to merchants at production sites. The taskforces follow those producers to production sites to collect charcoal fees. They forcefully pick bags of charcoal equivalent to the amount of charcoal fees to be paid from producers who fail to pay their fees. This often results in fighting between producers and taskforces, and the taskforces are often insulted and obtain 'bad' names from producers. One leader indicated: 'we took the charcoal [fees] by force from them [producers who resist paying fees], even though they talked a lot but they can't do anything about it' (Chief at Kawampe village, 05/05/2017).

Another area that chiefs employ force and the threat of force is through regulation of tree access in the villages. One leader noted: '… there are lands we can't give to them [producers], there are places where crocodiles are, we can't give such lands or place to people. Some areas too are solely for farming, we don't kill snakes so if we realize some snakes are at some area we don't give it out' (Kawampe Chief, 02/06/2017). A resident at Kawampe observed that: 'Some trees benefit us so we don't fell those trees such as Shea tree 'kranku dua' [*Vitellaria paradoxa*], 'dawa dawa' [*Parkia biglobosa*] and Mahogany [*Khaya senegalensis*]. You will be arrested [by chiefs] if you are seen cutting those trees' (Male farmer in Kawampe on 02/03/2017). In the past, chiefs often confiscated charcoal of people who deliberately worked in areas demarcated as 'no go zone'. Places demarcated as no go areas and trees designated as forbidden to be cut were partly based on the knowledge that certain trees are of important uses and that they are not to be used for producing charcoal. Forbidden forest areas were restricted through ancestral belief system that the 'spirit' of the ancestors lived there (Edwards *et al.*, 2011). Currently, most inhabitants do not follow such beliefs and chiefs are unable to track all offenders. Hence, in recent times, rules that forbid the use of protected areas or trees are not strongly enforced.

In addition to providing rights through payment of charcoal fees, chiefs also grant access to trees based on identity of people, and social relations. People who obtain right by way of identity and social relations are exempted from payment of charcoal fees. For instance, at

Kawampe village, persons belonging to certain identities such as religious leaders, the aged, women and those considered to be physically challenged are permitted access to trees for charcoal production without payment of charcoal fees. As one woman asserted: 'He [chief] takes [charcoal fees] from men but I haven't seen him take [charcoal fees] from women' (Female farmer in Kawampe on 06/08/2017). The rational for granting access to women, the aged and the sick is that this category of people are considered not physically strong and are unable to produce large volumes of charcoal. In the other villages, women and the aged pay charcoal fees.

Imams (Muslim religious leaders) at Kawampe do not belong to the Gonja ethnic group (indigenous ethnic group), and hence do not have customary right to access trees on village lands. However, the Kawampe chief grants access to Imams due to the strong ties he has with Imams. As a Muslim, the chief visits the mosques of Imams often to pray. The chief and Imams jointly handle marriages and other religious activities together, and hence have strong ties with each other. Migrants who have recently settled in the villages cultivate relations with chiefs and other local leaders to enable access under them. Dwellers in the villages within Kintampo Forest District cultivate strong ties with chiefs' wives, brothers, members of chiefs' taskforce, and along related lines to enjoy this selective access.

Through the recognition of rules on tree/land access and settling of charcoal disputes, the authority of chiefs over the people is strengthened. A man revealed that: 'The Assemblyman [elected local government representative] may bring rules but the chief's rules are the most heeded one' (Male farmer in Kawampe on 08/03/2017). All land and tree related conflicts are reported to chiefs. Chiefs employ various sanctions including seizing charcoal, reporting to leaders of tribes living on their land, and banning and expelling offenders from villages. Most producers are aware of established local regulations on land and trees and link sources of rules to chiefs. One Dagarti man noted that: 'There used to be a law where they [chiefs and the elders] said we the Dagartis are crop farmers so they didn't permit us to enter the charcoal production, but now since the chief realized that the cattle are destroying our crops he permitted us to produce charcoal'

(Male farmer in Kawampe on 04/05/2017). The local dwellers also acknowledge chiefs to sanction offenders of charcoal regulations. A resident at Kawampe observed that: 'The elders [customary leaders] and chief, they have even demarcated some places as no go zone… and if the land owners tell us to stop and we don't listen, they will report us to the chief and he will make you pay damages' (Male farmer in Kawampe on 04/04/2017). Another farmer noted that: 'if you fell the 'kranku dua' [shea tree] they [chiefs] will not permit you' (Male farmer in Dromankesse on 05/08/2017).

Constant contestations ensue among chiefs. Chiefs in the villages are caretaker chiefs who report to higher chiefs (paramount or divisional chiefs). In some villages such as Dromankese, different families have their own local chiefs who own a territory of family lands and are to report to the paramount chief at Dromankese. But often, conflicts emerge when one chief permits people to produce charcoal on another chief's land or when caretaker chief fails to give 'gifts' to divisional/paramount chief. A resident at Dromankese revealed: 'There are conflicts about lands and this charcoal business because some chiefs go into the main [paramount] chief's land and allow some people to produce on that land' (Male farmer in Dromankese, 04/06/2017).

Chiefs do not permit the intrusion of state institutions in villages. Village lands and trees on village surroundings are perceived by chiefs to be a territory of the locals that must be protected from being grabbed by outsiders—Forestry Commission and other state bodies. One customary leader asserted that: 'The forestry officials [Forestry Commission and Forest Services Division] don't have any land or rights here [Kawampe village]' (Kawampe chief on 04/03/2017). The Forestry Commission does not engage with producers. The Commission is rather present at the marketing node and actively control the transport of charcoal from production areas to consumption cities. This is explained further in the next section.

6.5 Ghana Forestry Commission: authority and the charcoal market

In this section, we describe how the Ghana Forestry Commission has very limited *de facto* authority over trees despite their *de jure* mandate, and how the Forestry Commission in recent years has thus attempted to gain authority over the transport and trade of charcoal.

As already mentioned, in 1962 the Ghanaian state attempted to reduce the authority of the chiefs over trees. Section 16 (4) of the Concessions Act 1962 (Act 124) states that: 'all rights with respect to timber or trees on any land other than specified in the preceding subsections of this section are vested in the president in trust for the stools concerned.' Lands that fell under this category were lands described as forest reserves and lands by virtue of which concessions have already been granted. This implies that all naturally occurring trees irrespective of place of standing are vested in the president in trust for the stools. In practice, this mandate is carried out by the Ghana Forestry Commission, which is established by the Forestry Commission Act, 1999 Act 571. Section 2 (1) of the Act states: 'The Commission shall be responsible for the regulation of the utilization of forest and wildlife resources, the conservation and management of those resources and the co-ordination of policies related to them'. The Forestry Services Division, a division under the Forestry Commission, has offices at the district level and support the Forestry Commission in the management of forest resources in Ghana.

However, the Forestry Commission is not in the villages to enforce regulations on trees on village lands. Their focus is on the more profitable timber resources in the High Forest Zone to the south of the study area (Karsenty, 2016). They also grant timber concessions in the study area, but charcoal has apparently not been sufficiently profitable (or too complicated) for Forestry Commission to try to regulate. By the forest laws of Ghana, charcoal producers who source trees from forest reserve areas or use natural tree stands are to apply for a permit from the Forestry Commission. However, the legislation is not really enforced in reality in the sense that producers use trees from several sources, so no one applies to the Forestry Commission for a permit for charcoal production. The Forestry

Commission is not consulted for property and, therefore, do not have control and authority over producers.

Currently, the Forestry Commission makes attempts to control charcoal production by engaging in woodlot establishment in off-reserve areas – areas where producers often source trees from. Through the Ghana Forest Investment Program (under the World Bank's Climate Investment Funds), the Forestry Commission aim to restore forest cover in off-reserve areas through forest plantation and rehabilitation of degraded forest land. The Commission does so through the Engaging Local Communities in REDD+/ Enhancement of Carbon Stocks (ELCIR+) – an intervention under the Forest Investment Program. The goal of the activities under component 1 was to establish 5,000ha small-to-medium sized forest plantations in degraded off-reserve forests. The goal of component 3 is to establish 1,200ha of woodlots for fuel wood and charcoal production in charcoal production areas (AfDB Group, 2013). Targeted areas have been selected for the tree planting exercises: 'twelve forest districts have been selected to plant trees which include the Kintampo and Donkorkrom Forest Districts' (Forestry Services Division staff, 10/06/2017). The Forestry Commission, however, has not been successful with the off-reserve plantings and this has been attributed to failure of the Commission to address barriers to the sale of timber by farmers, such as unclear and complex legislation and high initial investment (Schwöppe and Wojewska, 2018).

In the early part of 2015, the Forestry Commission introduced the Charcoal Conveyance Certificate to allow passage of charcoal from production village to the cities. A staff from Forest Services Division explained: 'The purpose of the Charcoal Conveyance Certificate [issued to charcoal merchants] was to bring the various actors together to work in harmony. Charcoal producers are plenty and they are difficult to organize, but through the Charcoal Conveyance Certificate, we can organize them into some form of associations in order to regulate their activities' (Forestry Services Division staff, 01/06/2017).

Prior to the year 2015 when the Charcoal Conveyance Certificate was introduced, charcoal producers and traders operated under fear. Forestry, police and other government staffs demanded informal payments ('bribes') from them claiming that the charcoal production and trade were illegal. Forestry staff argued that some producers source trees from forest reserves, and others use timber species for producing charcoal thus making the charcoal production and trade illegal. The rampant collection of bribes made the production and trade of charcoal costly and so charcoal traders demanded the Forestry Commission to grant them a form of licence to legitimize the charcoal trade. An officer from Forestry Commission explained that: 'Before the Charcoal Conveyance Certificate came into force, there was fear on the side of producers and the other actors. They thought it was illegal to engage in charcoal production. So the introduction of the Charcoal Conveyance Certificate was partly a response to the needs of the producers and traders to have legal environment to operate. Now the producers can openly conduct their business so as the other actors' (Forestry Services Division staff, 15/08/2017).

6.6 District Assemblies: authority and the charcoal market

This section shows how District Assemblies struggle alongside the Forestry Commission for authority at the transport and trade levels of the charcoal commodity chain. Like the Forestry Commission, District Assemblies are not present at the production side of the charcoal market.

In Ghana, districts are governed by District Assemblies, the highest political authorities in the district. District Assemblies consist of the District Chief Executive (appointed by the president of Ghana), and other elected (Assembly members and Unit Committee members) and appointed members. Ghana is politically divided into regions, districts, and electoral areas. The Assembly member and members of the Unit committee represent the electoral area, and they are to provide organized representation of the local population (Institute of Local Government Studies, 2016). By law, District Assemblies are tasked to plan and execute policies in respect of all matters affecting the people within their areas (Article 240

of the 1992 Constitution of Ghana). They are also to support productive activities and control bushfires in the district (Local Government Act of 2016; Control and Prevention of Bushfires Act, 1990 P.N.D.C.L. 229).

As a policy strategy, the 2012 Forest and Wildlife Policy of Ghana integrates District Assemblies in decentralised forestry governance system to ensure transparency, accountability and equity (Forest and Wildlife Policy, 2012). In line with the policy, District Assemblies are involved in Ghana's Collaborative Forest Management Scheme. The Scheme is an umbrella concept for all forms of partnership between the state Forestry Commission and local communities which seek to ensure a dual mandate of sustainable forest management and equity in benefit sharing (Agyei and Adjei, 2017). For instance, District Assemblies are involved as a representative body in the negotiation of the Social Responsibility Agreement (Agyei, 2017; Forestry Commission, 2004) and the drafting of by-laws for the Community Resource Management Area (CREMA) (Asare *et al.*, 2013). District Assemblies also partake in the benefits accruing from timber harvesting. Section 267(6) of the 1992 Constitution states that the net revenue accruing from Stumpage/Rent after providing for Forestry Commission's management fees and 10% for the Office of the Administrator of Stool Lands, shall be deemed as 100% and distributed by the arrangement: 25% to the stool through the traditional authority for the maintenance of the stool in keeping with its status, 20% to the traditional authority, and 55% to the District Assembly within the area of authority of which the stool lands are situated.

Along the charcoal commodity chain, District Assemblies mainly engage in revenue collection. Act 462 section 34 of the Local Government Act grants District Assemblies the mandate to charge fees for any service provided or license issued. They engage in tax and revenue collections on local, district and regional markets. District Assemblies issue council tickets to merchants to allow the transport of charcoal to cities and also issue tickets to traders at designated market places. Most traders comply with council fees than payments to the Forestry Commission. A local government officer explained that: 'Firstly, they [Charcoal Conveyance Certificates] came not long ago, and secondly their [Forestry

Commission] prices are so high' (District Assembly staff, 04/05/2017). In coming out with council fees, a committee at the District Assembles usually comprising of Assembly members and some staff at the District Assemblies decide on appropriate fees. Since Assembly members live with the locals, they are able to fix realistic figures which are usually accepted by the people. Most traders share the view that they do not see the uses the Forestry Commission put monies collected and so are not convinced to pay for the Charcoal Conveyance Certificate. A merchant at Dromankesse noted that: 'I don't see the benefit they [Forestry Commission] provide as to the money they collect. They must replant the trees, but they don't do. So they are not right in taking money from us' (Female charcoal merchant in Dromankesse, 07/06/2017).

Therefore, like the Forestry Commission, District Assemblies are claiming authority over the transport and trade of charcoal. One charcoal trader asserted: 'When we need something like a public toilet or water or any developmental project like school, part of the money will be from the District Assemblies and part from the government so we benefit from it ourselves. But the money to the Forestry Commission, we don't get anything from it that is why we are complaining. The trees were not planted by them, they do plant some trees and I fear to cut them but these trees are a blessing from God unto us and the land is for us and not them so they are cheating on us' (Female charcoal merchant, 03/09/2017).

6.7 Discussion and conclusions

Chiefs, Ghana Forestry Commission and District Assemblies mediate and contest for authority at different levels along the charcoal commodity chain in Ghana. Chiefs control the production process. They have no legal recognition to engage in forest management yet they are the sourced bodies to validate claims to trees for charcoal production. Chiefs' authority in the charcoal production process is drawn from long-established customs and social structures in land/tree management, as well as process (encouraging people from several socio-economic backgrounds to produce charcoal) and outcome (peoples' satisfaction with charcoal making rules) legitimacies. The Ghana Forestry Commission is

recognised by the 1992 Constitution of Ghana and the Forestry Commission Act, Act 571, to manage and regulate forest resources, but do not vet property at the production level. They have low outcome and process legitimacy, and a low authority in charcoal production. District Assemblies have higher legitimacy/authority in the charcoal trade than the Forestry Commission, but it is not based so much on its role in land/natural resources because their mandate is fairly weak. District Assemblies strengthen their authority by promoting process (encourage openness and participation of local people in setting council fees) and outcome (investing tax monies into social amenities) legitimacies. In what follows, we discuss (i) our findings with those of other studies, and (ii) engage in a discussion of the 'contract' between Property and Authority.

6.7.1 Comparison of our findings with other studies

Our finding that chiefs, Forestry Commission, and District Assemblies are all strengthening their authority by providing property (certificates and fees) to producers and traders is similar to what has been reported in Mozambique, Kenya and Nepal (Byrne et al., 2016; Kronenburg, 2015; Milgroom, 2012). In Mozamblique, Milgroom make a distinction between those who could gain and maintain access from those who control access. She observed that those who control access could grant property, and they were those who had direct claim to the dominant lineage. Milgroom's (2012) analysis suggests that vetting of property is a means of access control. Before the resettlement, the customary leader of Nanguene village within the Limpopo National Park controlled access to land and could grant user rights to members of the community. However, after the resettlement, the leader lost this ability to control access and therefore could not grant property. A similar observation is seen in the case of Ghana where chiefs have direct claim to the dominant lineage and, therefore, control access to trees/land via property. In Ghana, family heads who have direct claim to the dominant lineage started to exercise control over the access of non-indigenous people when the charcoal trade became significant in the study area. The indigenous people who have direct claim to the dominant lineage controlled their own access and, therefore, need not maintain access through others.

In Mozambique, Milgroom (2002) further shows that the resettled residents could only gain and maintain access to resources, but could not control their own access and that of others. Those who could only gain and maintain access are perennially living in the land of others and do not have the "ability" to grant property, and could not invoke authority. To regain this 'ability', Milgroom (2012) note that in Chinhangane, residents who had no direct claim to the dominant lineage searched for a place outside their resettled village where they could control their own access and those of others. In the Ghana case, we see a similar trend happening at two levels. One, attempts made by the Ghana Forestry Commission to establish woodlots in village surroundings (off-reserve areas) are means to claim control over the access of producers. At the moment, the Forestry Commission has no control over charcoal producers. Two, in the charcoal producing villages, most settlers refuse to pay charcoal fees by arguing on grounds of subsistence moral economy that the charcoal trade is not profitable since tree resources in the area have drastically reduced. Others also argued that they have lived in the villages for years and that they should be exempted from charcoal fees. These workings are means employed by the people to control their own access.

The ability to control the access of others is important for the legitimacy of politico-legal institutions, a point further highlighted by Kronenburg (2015). She observed that in Kenya, the Loita Maasai (traditional leaders) constantly compete with other politico-legal institutions to maintain access to and control over the land they inhabit and the forest they use. And through their continued control over the allocation of rights to land and forest uses, the Loita Maasai strengthen their authority. She argues that the struggle to maintain and control access to forest and land in Loita are means leaders employ to hold on to power and authority. In the Ghana case, chiefs do not permit the Ghana Forestry Commission to partake in the production process, and therefore contest the Commission out from village areas. Also, neighbouring village or caretaker chiefs contest each other to claim control over access of trees/land. Through these constant contestations, these institutions legitimize their actions over the people.

Our findings that both chiefs and the Forestry Commission employing territorial practices to legitimize their control and authority over the charcoal trade is also reported by Byrne *et al.* (2016). In Nepal, Byrne *et al.* (2016) note that politically active citizens use arguments pertaining to place-related and ethnic defined belonging rights to legitimize their control over land access. In Ghana, chiefs also argue out their legitimacy on grounds that they have historically been custodians of village resources, and that culturally, they are the leaders of the people and so have the 'right' to exercise control and claim for fee from non-autochthons who use village resources. Byrne *et al.* (2016) also show that local people deploy forest related territory claiming practices through the establishment of community forest to consolidate their authority. In the Ghana case, chiefs issue tree management rules, and through that they enhance their legitimacy before the people.

6.7.2 Revisiting the 'Contract' between property and authority

The authority of institutions stems from several sources, and also depends on how they are empowered and recognized by higher-level authorities: via laws, being named, being given contracts by donors or central government and being given resources by donors and government. Following Lund (2016) recognition is an expression of acknowledgement of the other. Recognition from above – higher level authorities – acknowledges and empowers the selected local institution with resources and makes it meaningful in the local arena and therefore legitimizes it over others that have not been recognised (Ribot *et al.*, 2008; Ribot *et al.*, 2011).

But as our case illustrates, the authority of institutions is also dependent on what they are able to deliver – property, services or adjudication. Through the provision of service, institutions gain recognition from below – by constituents. This downward recognition is perhaps the most essential process necessary to legitimize activities of politico-legal institutions. Being named or legally mandated does not confer automatic legitimacy, politico-legal institutions must constantly engage in activities that would promote their acceptance towards constituents. So while recognition from higher level authorities are

necessary, provision of service such as vetting of property is particularly important for the overall authority of institutions. The recognition by constituents also stem from ability to be coercive. So, legitimacy is not just being liked – it is also about being feared such that people go along with the institution without resistance (whether they are happy or not).

6.7.3 Conclusions

This study examines the relationship between property and authority and their dynamics in the case of charcoal production and trade in Ghana. To understand the dynamics of this relation over time, we interviewed chiefs, state institutions, and charcoal producers and traders along the Kintampo charcoal commodity chain. The analysis suggests that chiefs, Ghana Forestry Commission and District Assemblies are all granting access, and in exchange, strengthen their legitimacy and authority over the production and trade of charcoal. Chiefs are present at the production node and exercise authority at that level, while Forestry Commission and District Assemblies claim legitimacy at the marketing nodes of the charcoal market.

If chiefs are controlling charcoal production by granting access to resources for charcoal production and enforcing charcoal rules, then the capacity of the state Forestry Commission over resources for charcoal production shrinks. The failure of the Forestry Commission to implement forest policies related to charcoal production and trade threatens forest resources in Ghana, and weakens its core functions of providing forest and environmental services to citizens. Policies that aim at strengthening the legitimacy of institutions should do so by enhancing their ability to control access to resources and markets and their ability to be coercive. These are the powers that can legitimate chiefs and they are the powers that could legitimate democratic bodies if policy makers choose to move in that direction.

6.8 References

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CHAPTER SEVEN
GENERAL DISCUSSION

7.1 Introduction

This chapter draws together the main findings of the study in the context of the hypotheses and previous research. It highlights the general significance of the findings by making inferences beyond the case of Ghana's charcoal commodity chain.

7.2 Summary discussion: the three hypotheses

Recall the hypotheses stated in Chapter 1.4:

1. Charcoal traders can access more income in the market because they wield more social and financial capital that they gained through histories and norms of gender and identity relations.

2. Charcoal traders draw from different access mechanisms to control profits in the market because they are differently positioned than producers in relation to capital, market, social ties, and information.

3. Charcoal producers and traders seek validation of their claims from institutions while these institutions use access control as a means to enhance their recognition and authority.

First, I have shown that a highly skewed distribution of profits exists along the charcoal commodity chain, and in particular I have identified disproportionately high profits reaped by merchants and transporters - differences that could not be explained in a competitive market. The distribution among groups is skewed and the distribution within each group is highly skewed, with a few actors in each group controlling a large share of net income. Producers generate higher margins per bag of charcoal (50-kg sack), yet, they handle few sacks of charcoal per period. Merchants invest more in the trade - handling more sacks per

period - and also fix charcoal prices at the production and marketing nodes to generate high margins and thus reaping high incomes. Transporters rely on scarcity of transport and existing informal network to set high transportation price. Further, the study highlights that profits of merchants, transporters and wholesalers are higher than that of producers along the Kumasi, Accra and Takoradi chains. The margins per bag and overall profits of retailers are lower than that of producers.

The study further shows that women dominate the marketing and trade nodes - levels where disproportionately high profits are recorded - in terms of number of actors. This is attributed to a history along with attendant norms of trade as a female domain in Ghana. Urban women are more socially connected, have access to information and capital. Finally, actors from multiple ethnic groups are presently involved in the charcoal commodity chain in Ghana, compared to the past when the Sissala people dominated the chain. This shows that people of all ethnicities have taken up charcoal production. The need to complement income from agriculture (Amanor *et al.,* 2005) and more recently, cattle herds destroying farms and crops (Brobbey *et al.,* 2019) has made farmers in the study area move into charcoal production. I attribute the variation in income among and within actor groups along the charcoal chain to differences in financial and social capital of individual actors and the norms of gender and relations of identity in the market.

Thus, the research affirms **hypothesis one**. The highly skewed distribution of profits along Ghana's charcoal commodity chain resonates with findings of other sub-Saharan African countries including Kenya, Senegal, Uganda, and Burkina Faso where merchants, wholesalers and transporters reap higher income from the charcoal market (Kenya Forest Service, 2013; Obiri *et al.,* 2014; Ribot, 1998). In Malawi, producers and retailers reap higher income than transporters (Kambewa *et al.,* 2007). Kambewa *et al.* (2007) explain that charcoal was produced close to the cities so transport was done by bicycles and oxcarts and the cost was low. The high participation of women in the charcoal trade in Ghana is unique in comparison with other countries such as Senegal, Uganda and Mozambique where lower female participation is recorded (Baumert *et al.,* 2016; Ribot, 1998; Shively *et*

al., 2010). In Uganda, men dominate the merchant and wholesale nodes – this is contrary to the case in Ghana (Shively *et al.*, 2010). The domination of women at lucrative nodes of the charcoal chain is contrary to observations of Gutek & Larwood (1987) and Reskin & Ross (1992) that the business world reflects a sex segregation of occupations in which women congregate in the lower levels of the hierarchy and in the non-lucrative sectors. Milne and Boaitey (1982) explain the origin of Asante women dominance in commerce by describing that the Asante inheritance traditions do not favour women. According to the Asante tradition, when a husband dies, all wealth of the husband passes to his sister's children but not the man's children. The need for economic independence moved women into commerce and for years they have established themselves in that arena. This explains why women happen to be subservient to men in the home, but have dominance in the market.

Second, the study has showed that producers, merchants, transporters, wholesalers and retailers are drawing from different mechanisms to gain, maintain and control access to benefits along the charcoal production and trade. While producers draw from ties with merchants and ability to labour and mobilize family members and friends to shape their benefits, merchant income is obtained through control over prices, access to information, credit, and ties with transporters, wholesalers and retailers. The study has also illuminated that the mechanisms used by various groups of actors to gain, maintain and control access are dynamic in time and space – they change with evolving circumstances. Further, the study shows that property is a fundamental mechanism in the sense that all actors rely on property (plus other mechanisms) in order to benefit in the charcoal production and trade.

The research affirms **hypothesis two**. While traders and producers draw from social ties and family relations to shape their income, these actors also differ in their choice or availability of other mechanisms. That is, the different actors also employ different set of means to shape their income. Merchants do not have customary right to trees, and producers do not have access to market and capital, for example. I concur with Ribot and Peluso (2003, p.154) that 'people and institutions are positioned differently in relation to resources at various historical moments and geographical scales. The strands thus shift and

change over time, changing the nature of power and forms of access to resources'. More so, the Ghana case shows that merchants control the charcoal trade through their leverage over price, and access to credit, information and buyers. This is a confirmation to what has been reported earlier in Senegal and Mozambique (Baumert *et al.*, 2016; Ribot, 1998). In Mozambique, Baumert *et al.* (2016) noted that merchants who have access to credit are able to buy commercialisation rights (licences and private agreements), transport charcoal and control access to charcoal buyers. In Senegal, Ribot (1998) observed that merchants collusively fix low charcoal prices, and also the merchants' union lobbies the Forest Service and Ministry of Commerce to keep the consumer price of charcoal in Dakar at a much higher level.

In relation to **hypothesis three**, the study has shown that chiefs, having no legal mandate in trees, are gaining overall authority over Ghana's charcoal production. Chiefs' authority is drawn from long-established customs and social structures in land/tree management, as well as granting and enforcing property rights to producers. Forestry Commission in recent years have attempted to gain authority over the transport and trade of charcoal through granting charcoal conveyance certificate to allow the transport of charcoal from production sites to consumption cities. District Assemblies grant council fees to charcoal merchants and claim for authority at the distribution and trade nodes of the charcoal commodity chain.

The study suggests that chiefs and state institutions obtain legitimacy and authority over charcoal production and trade by enforcing property rights of various actors. The customary institutions do so much more than the state institutions. This affirms **hypothesis three**. Being chosen and mandated with legal backing alone does not necessarily consolidate or strengthen the authority of institutions. Despite being named and having all the legal apparatus, the Ghana Energy Commission is not in the villages or the cities to grant property to producers and traders and so the Commission does not exercise authority over the charcoal production and trade. As Sikor and Lund (2009, p.1) note, 'politico-legal institutions are only effectively legitimized if their interpretation of social norms (in this case property rights) is heeded'. While institutions may receive power (resources) to

function appropriately, vetting of property plays important role ‘in the making and unmaking of authority’ (Sikor and Lund, 2009, p.3). The findings of this study affirm empirical studies from other African countries on how institutions compete for authority through control of resources that enable them to grant property rights (Byrne *et al.*, 2016; Kronenburg, 2015; Milgroom, 2012). The agreement of my study with these other studies provides further support for the hypothesis.

My study did not find evidence to support a relation between access and authority as described in the theoretical framework (Chapter 2 section 1.5). However, the study provides an empirical evidence to support the theoretical proposition made by Sikor and Lund (2009) concerning a movement from access to property. That is, people first seek for access claims and then convert that into legitimate property. My study shows instances where people use access mechanisms as a means for gaining property, and examples where institutions grant property based on access relations including social relations, family ties and others. This shows that while a contract exists between property and authority - as Sikor and Lund (2009) put it theoretically and this study has confirmed empirically - access relations are part and parcel of the processes that complete this contract. Further, the evidence from this study suggests that property is fluid, highly contested and is always being negotiated. This makes the distinction between property and access to be blurred. What is accepted as legitimate property by a segment of society is still in a process of legitimation or perceived by others as mere claims. Perhaps, the difficulty in teasing out property relations from processes of access is that, activities that are not legitimate (access relations) are constantly and speedily being converted into property (made legitimate). Therefore, there is always the risk to assume that all grants made by institutions are legitimate grants. The interesting issue here is whether one could see this transition (from access to property) without a notion of access itself—those transitional arenas in which benefits are obtained, then contested, and then the resulting distribution or the previous one is then legitimated by an institution to turn it into property.

Certainly, many other mechanisms are at play in these struggles for access and legitimation of claims – such as social movements, threats of violence or violence itself or stealth that later is affirmed as 'property' due to its continuity and later recognition. These are the conditions of transition that later access claim becomes property as when society recognises both the claim and the authority enforcing it.

In summary, the conceptual framework (Chapter 2 section 1.6) used for framing this study was useful. The use of the Theory of Access provides understanding of the mechanisms employed by different actors to shape charcoal income. It sheds light on the limited role of property and the embedded role of extra-legal processes and structures in shaping access to benefits. The study shows how authority is predicated on several processes including service provision (property), choices and recognition of higher bodies, as well as rational-legal, traditional, and charismatic sources.

7.3 Inferences beyond the Ghana charcoal commodity chain case

This study is a case of the charcoal commodity chain in Ghana. But, I would argue that the charcoal commodity chain in Ghana share similar characteristics to markets elsewhere; certainly in many African countries. The charcoal commodity chain in Ghana has, for now, not been "fully" formalised in the sense that most activities conducted by producers and traders are done through informal arrangements. As of now, there are no officially laid down processes defining and directing activities under the production and trade of charcoal. We only see "mild" attempts of the state towards formalisation of the charcoal commodity chain. I argue that charcoal commodity chains in most African countries exhibit these same informal arrangements, even for countries where state rules exist for the production and trade. In most African countries where legal rules exist for the charcoal production and trade, activities of producers and traders do not conform to legal standards. In these countries, government institutions are yet to implement existing legislations (Smith *et al.*, 2015; Kenya Forest Service, 2013). Besides the direct actors involved in the charcoal chain in Ghana, multiple institutions (chiefs and state institutions) engage in the

charcoal chain to tax and collect fees, or extort and bribe, a feature common to charcoal commodity chains in other African countries (Kenya Forest Service, 2013; Ribot, 1998).

Therefore, I argue that the emphasis of this case that the charcoal commodity chain in Ghana is embedded in social and political-economic relations may be relevant for explaining skewed profits along charcoal commodity chains in other African countries. I also suggest that the emphasis of this study may be relevant to the study of other natural resources, e.g. timber and agricultural crops. There is a large literature on skewed income in natural resource markets, and I suggest that this study contributes to this literature (Fitter, 2001; Palander, 2015; Xuan, 2005). This said, the analysis of access mechanisms in each political-economic moment must be empirically determined and such analysis must be understood as processes rather than being static (Berry, 1993; Peluso, 1996; Lund, 1994; Ribot and Peluso, 2003).

This study is also a case of poverty reduction, equity and wellbeing. It argues that more profit is retained at the marketing nodes of the charcoal market and outlines access to capital, markets, information and price control as the structures operating at the trade nodes. Knowledge of the structures and processes shaping the distribution of benefits provides a basis for governments and actor groups to design equitable natural resource policy and practice by providing guidance on access mechanisms that promote wealth generation to marginalised actors (Sommerville *et al.*, 2010; Thomas and Twyman, 2005). Commonly, people who live close to forest resources and whose livelihoods depend directly on forests do not benefit significantly from the resource. Much scientific debate have been dedicated to how forests and forest based livelihoods can improve the lives of the poor and the marginalized (Angelsen and Wunder, 2003; Ingram *et al.*, 2015; Levang *et al.*, 2005; Mitchell and Coles, 2011; Yemiru *et al.*, 2010). This study has shown that one way to improve the lives of forest dependent people is to enhance their economic and socio-political relations via enabling them to have access to markets, financial capital, information and technology to make them control their own access to resources and markets.

This study is a case of state formation through the constitution of rights and authority (Ingram *et al.*, 2015; John, 2013; Kaplinsky and Morris, 2000; Neilson and Pritchard, 2011; Schure *et al.*, 2013). The study's emphasis that politico-legal institutions provide property to actors in order to consolidate and expand their authority is relevant for state building and formation processes. The study shows that institutions can enhance their legitimacy by engaging in relevant services such as validating of claims to attract recognition and legitimacy from constituents. The processes whereby property over resources are settled and contested are fundamental to how institutions establish and compete for authority, and thus facilitate insights into processes of state formation (Berry, 2009; Ribot, 2009; Sikor and Lund, 2009). The study shows how institutions can be strengthened by engaging in "relevant" service provision to attract the recognition of constituents. Granting of property and being able to effectively enforce property related rules are services that are part and parcel of processes that successfully legitimize institutions. Knowledge of successful legitimizing processes provides guidance to governments to embark on policies that draw from successful practices to expand authority of state institutions.

This study is also a case of institutional pluralism, and in particular, re-invention of custom (Lund, 2006). It shows how, in a legal pluralist context, non-active or new forms of institutions can surface to claim for control and authority in arenas they traditionally do not exercise control. In the Ghana case, this thesis shows how chiefs who do not have legal mandate in trees claim for control and authority by engaging in validation and enforcement of land and tree access rules. In this way, chiefs attempt to re-invent their pre-colonial control over land and trees. In a related case, Lund (2006) describes that in 1927 prior to independence in Ghana, the Land and Native Rights Ordinace (cap. 143) placed all lands in the Northern territories under the Governor. After Ghana had independence from Britain, the 1979 constitution deprived the state of its trusteeship over most lands in the Northern and Upper Regions. This new legal condition paved way for chiefs and earth priests to compete for ownership and assert control over lands and resources.

7.4 Usefulness of the Theory of Access

The Theory of Access is useful for providing the thought process and underlying principles for accessing the means shaping an actor's ability to benefit. It provides a method for access analysis – access mapping – and suggests right-based and structural and relational mechanisms to enable grounded analyses and provide important operational steps for tracing out the political-economic and social relations in which a chain of inter-related instances of benefit are located. The 'bundles of powers' suggested by the Theory of Access served mainly as a guide since access retains an empirical ". . . focus on the issues of *who* does (and who does not) get to use *what*, in *what ways*, and *when* (that is, in what circumstances)" (Ribot and Peluso, 2003 p.154). In the field, I was open to new forms of structural and relational mechanisms conditioning actors' access to benefits. As shown in chapter six, the study documents force, moral economy, social movement and innovation as additional structural and relational access mechanisms that have not been fully described by the Theory of Access. In tracing the mechanisms of access in a particular political-economic circumstance, one should be opened to the dynamic and complex nature of the 'bundles of powers'. Not all rights are accepted as legitimate property by all section of society. Moreover, an instance of benefit allocation that appears to be shaped by social ties, may also be conditioned by ideological and discursive manipulations, for example. Thus, careful scrutiny of the socio-political and economic relations is needed to surface the nuanced processes and structures of access maintenance and control. Ribot and Peluso (2003, p.173) have noted 'these categories are heuristic; none is distinct or complete. Each form of access may enable, conflict with, or complement other access mechanisms and result in complex social patterns of benefit distribution. Where and how these analytic categories fit together depends on the web of access relations in which each is embedded'.

CHAPTER EIGHT

CONCLUSIONS AND IMPLICATIONS

This chapter concludes the thesis and discusses the implications of the study for research and practise.

8.1 Conclusion

8.1.1 Profit distribution, access and authority of institutions

The thesis has revealed that about 90,000 people are involved in charcoal production and trade in Ghana. Producers and retailers form majority. Charcoal production and exchange generate about US$ 66 million profits annually, yet this profit is unequally distributed among and within producers, merchants, transporters, wholesalers, and retailers. Charcoal merchants have control over prices because producers depend on them for advances to finance the production and so have to accept prices set by merchants. For most producers and retailers, the income they generate from charcoal production and trade falls below the annual minimum wage income. However, most producers and retailers combine charcoal production and trade with other livelihood activities.

The estimates of the number of actors and the income in the charcoal market are likely to be low. To estimate national-level profits and number of actors, the study makes use of the annual charcoal production estimate for Ghana by Nketiah and Asante (2018). This estimate relies on the information captured in the Charcoal Conveyance Certificates and is likely to also be low. The Charcoal Conveyance Certificate was introduced in 2015 and it is still in its infancy, since many trucks travel without the certificates. Nketiah and Asante (2018) multiplied their estimate with a correction factor (2.12). This was informed by data from check points at which they monitored trucks with charcoal. However, only four checkpoints were mounted and the monitoring was done over a mere two weeks. Their

estimate did not capture charcoal produced and consumed locally or production from sawmill residues.

In the charcoal markets, women dominate in numbers along levels related to trade (merchants, wholesalers, and retailers), while men dominate in production and transport. This is due to a history in which trade in Ghana has been a domain of women and men have been dominant where physical strength is necessary to carry out particular activities. The gender distribution along the charcoal chain in Ghana, in particular women's domination in trade is unique to Ghana compared to other countries. At present, people from several ethnicities engage in the charcoal production and trade in Ghana, compared to the past when people from the Sissala ethnic group dominated the production and trade. Charcoal production and trade also generates significant revenue to formal (the Ghana Forestry Commission and the District Assemblies) and customary (chiefs) institutions. While these institutions benefit in the charcoal market, their role in resource management, regulation, and control is limited.

This thesis documents four structural and relational access mechanisms which have not been fully described by Ribot and Peluso (2003). These are the use of force, moral economy, social movements and innovations. The thesis illustrates that different actors use different mechanism to gain, maintain and control access to charcoal income. These mechanisms include fiscal tools such as fees and licences; direct control over access to essential production infrastructure and roads; price and market controls; social ties of dependence, trust and loyalty; social identity and status; ties with other actors in the market, political figures, and state agents; social movements and moral economy; and force and threats of violence. Merchants and transporters reap high income than the other actors because they control the market via having access to capital and labour, information, relations and price control. Producers have direct control over forest resources, but only reap small portion of income in the market. The thesis documents the legal and illegal infrastructure that allows state actors and chiefs to take fees and to informally tax charcoal production and trade. These include taxes/fees, informal payments and threats of violence.

Finally, Chiefs, Ghana Forestry Commission and District Assemblies mediate and compete for authority at different levels along the charcoal commodity chain in Ghana. Chiefs control the production process. They have no legal recognition to engage in tree management yet they are the sourced bodies to validate claims to trees for charcoal production. Chiefs' authority in the charcoal production process is drawn from long-established customs and social structures in land/tree management, as well as process (encouraging people from several socio-economic backgrounds to produce charcoal) and outcome (peoples' satisfaction with charcoal making rules) legitimacies. The Ghana Forestry Commission is recognised by the 1992 Constitution of Ghana and the Forestry Commission Act, Act 571, to manage and regulate forest resources, but do not vet property at the production level. They have low process (openness and participation of local people in setting Charcoal Conveyance Certificate) and outcome (investing tax monies into social amenities) legitimacies (Tyler, 1990). Hence, they have low authority in charcoal production. District Assemblies have higher legitimacy/authority in the charcoal trade, but it is not based so much on its role in land/natural resources because their mandate is fairly weak. District Assemblies strengthen their authority by promoting process and outcome legitimacies.

8.1.2 Controlling the market: property and capital

Through profit and access mapping, this study has shown that access to benefits is not shaped by one market mechanism, rather multiple mechanisms (both legal and extra-legal structures) operate in parallel to shape income. While formal property or ownership confers the ability to benefit, other extra-legal structures and mechanisms serve to strengthen and weaken the functions of property rights. Thus, property is part of a larger repertoire of mechanisms of access to resources and markets, whether recognised or not. Property relations matter, but they are not enough in shaping the flow of benefits. This case, however, illustrates that property is a fundamental mechanism of access. All actors rely on property rights in addition to other mechanisms to benefit. Property relations exist at the

level of laws and regulations and so they are guaranteed by politico-legal institution. That makes property to constitute an important element in people's livelihoods.

Further, this case illustrates that control is endogenous to markets as argued by Bernstein and Nick (1995). Skewed distribution is supported by an array of mechanisms, which are both policy and non-policy forms. State and customary interventions such as granting of property (licenses and fees) are not the only form of control in the market. At some levels of the market, among transporters, skewed distribution is directly supported by access to well-functioning vehicles as well as access to merchants. At other levels, such as merchants, it is shaped by access to capital and information. Powerful actors employ various and combination of mechanisms to control the market. Eliminating licences and fees would change the distribution of benefits within the market, but merchants and transporters would continue to draw from range of means at their disposal to recapture some of the rents now within their grasp. Further, this study shows that access to capital is by far the singular most important mechanism that sustains skewed distribution along the entire charcoal chain. Access to capital can be used to derive other access mechanisms. For instance, actors with adequate financial capital can purchase rights and influence those in control of markets to engage in service of extraction, production, conversion, labour mobilization, and other processes associated with deriving benefits from things and people.

8.1.3 Property, access and authority nexus

This case illustrates that authority of institutions stem from several sources, and also depends on how they are empowered and recognized by higher-level authorities. Following Lund (2016) recognition is an expression of acknowledgement of the other. Recognition from above - higher level authorities - acknowledges and empowers the selected local institution with resources and makes it meaningful in the local arena and therefore legitimizes it over others that have not been recognised (Ribot *et al.*, 2008; Ribot *et al.*, 2011).

But as our case illustrates, the authority of institutions is also dependent on what they are able to deliver – property, services or adjudication. Through the provision of service, institutions gain recognition from below – by constituents. This downward recognition is perhaps the most essential process necessary to legitimize activities of politico-legal institutions. Being named or legally mandated does not confer automatic legitimacy, politico-legal institutions must constantly engage in activities that would promote their acceptance towards constituents. So while recognition from higher level authorities are necessary, provision of service such as vetting of property is particularly important for the overall authority of institutions. The recognition by constituents also stem from ability to be coercive. So, legitimacy is not just being liked – it is also about being feared such that people go along with the institution without resistance (whether they are happy or not). Therefore, the ability to control access via property and the ability to be coercive are the powers that can legitimize institutions and they are the powers that could legitimize democratic bodies if policy makers choose to move in that direction.

Further, the case highlights the fluidity of property and how property and access relations are cojoined. Access claims are negotiated to become property when people recognize both the claim and the authority enforcing it. The opposite also hold, when property is no longer accepted as legitimate and loses its enforcement, it becomes mere claim. Prior to the recognition and enforcement, property exists as mere access claim. Therefore, access is a forerunner of property. While property and authority are mutually constituted, access relations initiate and complete this contract.

8.2 Implications of study for research

The study suggests that research should be dedicated to empirically investigating the relation between access and authority. While this study did not find evidence to support a contract between access and authority, my analysis suggests a likelihood of this contract. I have argued that not all ‘grants’ made by institutions are enforceable claims (property). What is accepted and enforced as property was first a mere access which was negotiated among institutions and the people and when successful became a legitimate property.

There is a constant negotiation between what constitutes access and what constitutes property, and so the distinction between access and property is very fluid. To study a general access and authority contract, it is important to carefully unpack the process of claim legitimation. It is necessary to empirically ascertain as to whether grants made by institutions have been fully legitimized or are mere claims waiting for legitimation. To assume that all grants made by institutions are automatically accepted by constituents as legitimate property forfeit the purpose of studying this theoretical proposition. Therefore, it is important to make a distinction between grants that are mere access from those that qualify as property.

The assumption is that property accepted by one institution will be accepted as property by another - and under legal pluralism it is often not the case. Then the 'enforceable' nature of the claim is brought into question and it becomes something other than property. Property is property when the authority of one of the plurality of institutions is also recognized by the other institutions to have the right to enforce. A contract that cannot be enforced is a mere agreement between parties. It is property when it is upheld by all institutions in question. One cannot assume that the institution that wins people's confidence is the one that can ultimately prevail – even if that confidence is part of the ability to prevail. It must also have the ability to enforce over the abilities of other institutions to interrupt or undermine a contract. Further study should be directed along those lines.

Further, the study suggests that tax on transporters could be used to generate substantive revenue for districts. However, further studies need to assess the potential magnitude of revenue and peoples' responses to taxes.

8.3 Reflections on governance reforms to improve Ghana's charcoal commodity chain

The Ghana Forestry Commission attempts to govern charcoal production and trade, but its approach is likely to be unsuccessful. The Commission has been engaged in timber utilization and management in the country for years and it has not been successful in

enhancing the forest stock and minimising illegal chainsaw activities (Acheampong & Marfo, 2011; Marfo, 2009, 2010). If the Commission intends to duplicate similar governance approaches employed in the timber sector to govern charcoal production and trade, it is likely that such approaches will not be effective. Since the Forestry Commission has the legal mandate to govern tree resources in the country, it seems logical that the Commission is the appropriate state body to issue permit to charcoal producers to access trees from village surroundings (fallow/farm lands). However, since the Commission does not engage in management of trees in off-reserve areas where producers normally source trees from, the Commission has no idea for which places it should give permits. It is rather the chiefs that know where the trees are located in these areas. More importantly, chiefs know the forest and land tenure arrangements and how it is integrated with the agricultural production. So, if the Forestry Commission is to give out lands or trees on village lands, it will find it difficult to know which lands are not occupied and also the boundaries of the village lands since the chiefs know the terrain. The Forestry Commission issues Charcoal Conveyance Certificates, but that does not take into consideration the sustainability of the resource. The justification behind the Charcoal Conveyance Certificate is to use part of the revenue to establish woodlot (Agyei *et al.*, 2018). However, the woodlots are yet to be established (Schwöppe and Wojewska, 2018). Currently, taxes and fees in charcoal production and trade are not based on any systematic plans to either enhance forests or the social good of charcoal commodity chain actors. The taxes operate as a revenue generator.

Chiefs collect significant revenue from charcoal production and trade, but they play limited role in the management of tree resources. While chiefs have established local taskforces, the activities of taskforces have been limited to revenue collection through the enforcement of charcoal fees. Hence, to a large extent, chiefs have neither embarked on mass tree planting on village lands nor enforced sanctions of indiscriminate tree felling for charcoal production. Hence, chiefs, in their present practices, seem to pay little importance to the sustainability of the tree stock. Distribution of revenue to chiefs is unequal with huge differences between different stool lands. My study shows that in some stool lands, producers pay 10% of produced charcoal or its monetary equivalent and others pay 20%.

There is no consensus or uniformity; individual chiefs decide the value and the amount of fees to be collected. Like the revenues collected by the Forestry Commission, monies taken by chiefs are not related to any consideration for the sustainability of the resource. The study envisions that chiefs, the Ghana Forestry Commission and District Assemblies should be transparent about how they use the revenues, and the ways in which they are being reused for maintaining forests and/or social good. There are obviously some challenges, in particular for chiefs, whose accountability has been questioned (Ayine, 2008; Ribot, 1999). Ntsebeza (2004) and Kassibo (2002) have observed that since chiefs inherit their position for life and the possibility to sanction them is limited, they are often not representative and accountable to their constituents. In any event, citizens could play important role in serving as local capacity to demand accountability from these institutions and properly monitor their actions.

The study envisages that the Forestry Commission should collaborate with District Assemblies and chiefs to jointly govern the charcoal production and trade. Since chiefs are closer to tree and land resources and the people, they could help by asking their people to establish woodlots for charcoal production. It might be practically difficult for nomadic migrants like the Sissalas who move from one village to the other to accept to plant trees in villages in which they might not live for long or where they do not have clear land rights. It is likely that the benefit sharing may be skewed in favour of the chiefs and the indigenes. The indigenes and settlers should be asked to establish and own the woodlots. The woodlot owners could sell trees to migrants who want trees for charcoal production. The Forestry Commission could work to provide proof of ownership/tree planting. People who tend native (non-planted trees) on their farms or any other owned land should be given ownership status for the trees. The type of woodlots (species), management decisions and rules on access to established woodlots should integrate the perspectives of the local people. Chiefs could rely on their established taskforces together with forest guards of Forestry Commission to enforce rules on tree access and sanction indiscriminate felling of trees. Historically, chiefs have played active role in land access, and this study suggests that they are well positioned in terms of having the structures and customs for governing

the charcoal production. But, as to whether chiefs should have that public resource privilege if they do not in any formal sense represent the people - i.e. are not accountable to them - becomes an open question.

Further, the thesis suggests that most producers and traders in Ghana's charcoal commodity chain operate under subsistence income. Policy reforms that aim to improve the income of producers should focus on breaking the dominating role of merchants, in particular, the interlocking credit-labour arrangement that enable merchants to control producers' income. Charcoal producers should be exposed to alternative credit facilities with minimal interest. District Assemblies should assist communities to form associations. In each community, associations could work on needs specific to them such as organizing alternative credit facilities, improved methods of production, joint transport to the cities, and obtaining information on charcoal prices in the cities. District Assemblies should ensure that charcoal is well packaged in bags and its transportation to the cities is done in a manner that minimise breakages and charcoal dust. Production and transport of good quality charcoal with minimal charcoal dust could raise the income of retailers. To a large extent, undertaking these actions will lower inequalities along Ghana's charcoal commodity chain.

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Appendix 1**:** Semi-structured interview guide for actors/institutions along the charcoal chain

Focus areas	Questions
Property	What rights exist along the chain, how have charcoal rights evolved over time and in different areas, which factors have triggered changes in charcoal rights, do the rights of men differ from that of females?, if yes, how do they differ, which institutions recognize different charcoal rights, which rights have been challenged by *which* actors and by *which* means, By what means are charcoal rights solidified, how had people have conflict over charcoal, With whom? Was it sorted out and how?
Access	What opportunities exists along the chain, how have opportunities changed over time and from place to place, what means do different actors employ to enjoy opportunities, how have these means changed over time and from place to place, what opportunities do people have right to and what do they have access to and why?
Gendered Access	What opportunities exists along the chain for males, what opportunities exists for females, how have opportunities for males and females changed over time and from place to place, how are the means employ by males to enjoy opportunities along the charcoal trade differ from that of females.
Exclusions	Are people excluded from opportunities along the chain?, if yes, which categories of people (social groups) are excluded, how are they excluded or what (or who) exclude them, why are people excluded from the charcoal business, are the means of exclusion different for males and females?, if yes, how do they differ?, what about people of different social status?, if yes, how do they differ?, Do people or institutions gain benefits when they exclude others?, if yes, how do they benefit.
Regulation enforcement	Is there an arrangement for enforcing regulations; is it traditional/governmental; does the interviewee have a role in it; if yes, then what role; if no, then who does and in what manner; does the

	interviewee have examples of how it works.
Institutions & Authority	Which institutions are exercising political influence (de jure and de facto) and how; roles of different institutions, changes in institutions and their roles; why are institutions exercising political influence and with what benefits; Does the recognition and legitimacy of institutions enhance through their political influence, if yes how; which institutions are people engaging with, how and why; How do constituents perceive the actions of different institutions to be in accordance with their views about laws, rules and customs; How do constituents perceive the actions of different institutions to be in accordance with their views about shared morality (what is right); How do constituents accept [accept , at least in general] decisions of different institutions and willing to be bound to obey the decisions.

Appendix 2: Interview guide on charcoal rights and customary institutions (chiefs, elders, queen mothers)

How much land the interviewee owns?

How much s/he uses?

How do people obtain land and with what arrangements?

Who can obtain land and who cannot?

What uses can land be put into?

benefit sharing arrangements on released lands;

Which social groups or identities are affected, who is not affected, by what arrangements?

What are the purposes of the land (or benefit sharing) arrangements?

How are land rights (and benefit sharing) arrangements changing?

What rights to charcoal production do people have?

Which institutions recognise charcoal rights and with what justification?

How have charcoal rights evolved over time and in different areas? Which rights have been challenged, manipulated, circumvented or outright extinguished by actors and by which means?

Which politico-legal institutions have recognized property claims?

Have there been conflicts?

Which factors have triggered changes in property?

What other experiences on land does the interviewee have?

Appendix 3: Interview guide on institutions and their role

Is there an arrangement for enforcing regulations;

is it traditional/governmental;

does the interviewee have a role in it;

if yes, then what role; if no, then who does and in what manner;

What rules and regulations have institutions formulated with regard to charcoal?

Have they enforced these rules and regulations, and if so how?

What sanctions do they have at their disposal, and what sanctions have they actually used?

Appendix 4: Tentative lists for the semi-structured interviews along the charcoal chain

Level of chain	Tentative people to interview
Community level	Kawampe chief, Dromankesse chief, Soronuase chief, sub-chiefs of villages surrounding Dromankesse, few elders including female leaders such as the queen mother, Paramount chief at Nkoranza and Kintampo, few clan leaders (land owners).
District level	District forest manager and assistants at Kintampo forest district, forest officials (representatives) at Nkoranza, forest or fuel wood or charcoal related NGOs working in the Kintampo forest district.
National level	Resource Management Support Center (Kumasi) Forestry Commission (Accra) FORIG Energy Commission Customs, Police service, Environmental Protection Agency
Main Group actors along the charcoal chain	Producers; merchants; transporters; wholesalers; retailers; end users.
Other informants working in the study areas	INBAR, Green Cross Ghana, village agents and larger traders, local researchers, NGO staff and social activists,

Appendix 5: Research matrix for profit, access and authority along the charcoal commodity chain in Ghana

Research Questions/ Hypotheses	Operational Questions	Data Required	Methods
Q1: *How do different actors gain, maintain and control access to benefits along the charcoal commodity chain?*	**Distribution Questions** 1.1 What is the economic distribution along the charcoal commodity chain? 1.1.a. Which actors operate along the charcoal commodity chain? 1.1.b. At what prices does each actor purchase the charcoal? 1.1.c. At what price does each actor sell the charcoal? 1.1.d. What are the expenses? 1.2 What is the income and profit (calculated from the above information) at each level of the charcoal commodity chain? 1.3 What is the distribution of income and profit between actor groups (vertical distribution) and within each actor group (horizontal distribution)? 1.4 What is the Legal minimum wage, minimum subsistence cost of living (rural and urban)?	**Distribution Data** 1.1.1.a. Information on kinds of actors at each level of the chain (that is, production, merchants through to end users); Information on the number of actors at each level of the chain 1.1.1(b, c, d) Information on prices of purchase, expenses incurred, and sale of charcoal at each level of the chain 1.2.1 Information on the volumes controlled at each level of the chain; calculations based on volumes handled by each actor 1.3.1 Information on margins, average net income, and average net profit at each level along the chain/based on calculations from prices, expenses and quantities. 1.4.1 Information on minimum wage in Ghana, minimum	1.1.1(a, b, c, d) observation and interviews 1.2.1 observation of transport routes; interviews; forestry documents; surveys of actors at each level of the chain/spot price checks/sampling over entire annual cycle to correct for seasonality 1.3.1 measure of volume by actor; documents on national consumption; estimates based on forest service documents and tax

		subsistence cost of living in rural and urban places in Ghana	records; estimate of number of truckloads observed; etc. 1.4.1 interviews/ documents on markets, cost of living/government estimates
	How do we Explain that Distribution? Or, at each node how do we explain the access that different actors have. 1.5 Through what mechanisms do actors along the chain control access 1.6 What are the roles of capital, social relations, social identities, regulatory policies, resistances (like sabotage, protest, threatening), etc.? 1.7 In what way have actors and patterns of access changed over time? 1.8 What gender roles exist along the chain? 1.9 what are the roles of cultures, traditions, norms, values and policies in shaping gender roles? 1.10 What mechanisms are employed by gender to gain or control access to benefits? 1.11 How do women and men at different parts of the charcoal chain explain why men and women have particular roles? 1.12 Do men and women use different mechanisms of access along the chain? 1.13 Do actors of different status use different	**Data to Explain Distribution** 1.5.1 Data on mechanisms for gaining, controlling and maintaining control of shares of profit 1.6.1 Data on how these structures/mechanisms shape profits 1.7.1 Data on how actors at each level entered the market 1.8.1 Information on gender roles along the chain 1.9.1 Information on how cultures, norms, traditions and policies shape gender roles along the chain 1.10.1 Information on how benefits are controlled by gender	1.5.1 observation; surveys; structured interviews; unstructured interviews; etc. historical interviews; personal histories 1.6.1 interviews; observations; etc. 1.7.1 historical interviews; personal histories (life stories) 1.8.1 interviews and observations, surveys of men and women about roles 1.9.1 interviews and observations, surveys of men and women about how

	mechanisms of access?	1.11.1 information on how men and women explain why they have particular roles	roles are shaped by traditions, policies, etc. 1.10.1 Data from surveys from earlier section. 1.11.1 interviews I will also include in this part interviews with the authorities about these folks. I will ask one group about the other – the producers can tell you some things about the traders…. Ultimately the categories of data collected overlap – so you can use one instrument for 'authorities' that asks questions both about authorities and about distribution and mechanisms of access along the commodity chain.
Q2: How are people excluded from opportunities along the charcoal	2.1 Which social groups are excluded along the charcoal chain? 2.2 What means do actors/institutions use to exclude others?	2.1.1 Actors who have stopped the production and trade 2.2.1 identification of mechanisms and processes excluding people from the	2.1.1 Interviews with authorities, commodity chain actors, and feuding parties 2.2.1 Interviews with

commodity chain?	2.3 How do actors/institutions use exclusions?	production and trade along the chain 2.3.1 Historical stories about how actors/institutions use exclusions	authorities, commodity chain actors, and feuding parties 2.3.1 Interviews with authorities, commodity chain actors, and feuding parties
Q3: *How does mediation of Access claims along the charcoal commodity chain enhance the authority of various politico-legal institutions?*	3.1 Which institutions (FSD, Chiefs, Energy Commission, etc) have claimed authority over or play a role in mediating access along the production and trade of charcoal over time? 3.2 How, that is through what mechanisms, are institutions mediating access to profits (property, dispute resolution, information providers, etc.)? 3.3 how has authority of institutions changed?	3.1.1 list of institutions that play a role in mediating access to profits along the charcoal chain 3.2.1 identification of mechanisms and processes institutions use to mediate access to profits 3.3.1 Historical stories on how the authority of institutions have changed over time Stories about disputes and how they are resolved and by whom Information on interactions between actors in the market and authorities	3.1.1 Interviews with authorities, commodity chain actors; forestry documents; 3.2.1 observation of disputes and court records, interviews with authorities and with feuding parties; interview with commodity chain actors 3.3.1 interviews with authorities, commodity chain actors, relevant project documents review; etc Observation of interactions between and among actors in the market and authorities. – participant observation. Interviews of actors in the

			market about how authorities allocate access [Here you will have to talk with both authorities and with actors in the market to understand this interaction – it is a relation. You can put the questions on the same questionnaires you elaborate above, but you will need to interview both groups concerning the history and interactions with authorities and their access roles.]