INSTITUTIONS, GOVERNANCE, AND UPGRADING IN NON-INDUSTRIAL PRIVATE FORESTRY VALUE CHAIN IN THE SOUTHERN HIGHLANDS OF TANZANIA

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A THESIS SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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EXTENDED ABSTRACT

Among the factors for the rise of Non-industrial private forestry (NIPF) include, the demand for timber and limited capacity of governments and corporations to supply to cover for the deficit. In developing countries, NIPF is dominated by smallholder farmers and presents a huge potential for alleviating poverty in rural areas where the majority of farmers live. Nevertheless, institutional framework and governance of the NIPF value chain have a huge influence on the benefits accrued from NIF and their distribution. However, in Tanzania, most studies on the role of institutional framework and governance have been on natural forests and industrial plantations, which for a long time have been the main source of timber in the country. Using the theory of access and the global value chain, particularly the institutional framework and governance structure dimensions, the study analyzed the role of institutions and governance in non-industrial private forestry value chain in the Southern Highlands of Tanzania. Specifically, the study intended to 1) analyze the role of state regulations in governing timber value chain 2) examine the role of informal institutions in timber value chain and 3) analyze the types of upgrading in the NIPF value chain and the institutions driving them.

In large measure, the study adopted an exploratory cross-sectional study design whereby qualitative data were collected through in-depth interviews, focus group discussions, observations and document reviews. In addition, quantitative data were collected for the study from six district councils in Njombe and Iringa regions. Qualitative data were analyzed following six steps of thematic analysis including transcribing interviews into text, going through the text, coding the text, grouping the codes to form themes, reviewing the themes, describing the themes and assessing their relationships. SPSS software was used for analyzing quantitative data.

The study findings show that the government is the sole regulator of the NIPF value chain, and all actors in the chain operate under the same regulatory framework. This was not unique as similar cases are found in many developing countries. However, in Tanzania, regulations are implemented differently at the district council level whereby some district councils, unlike others, charge higher the cess per a piece of timber. Lack of distinction between industrial and non-industrial private forestry has resulted in placing industrial and non-industrial forestry under the same regulatory framework despite their many differences including economic status of the owners, the size of plantations, and management plans. Lack of distinction has also partly resulted in high transaction costs, which are unaffordable to the majority of actors in the NIPF value chain. Although the regulations affect incomes of all actors, tree growers are the most-affected category. Besides, the study found that trust between value chain actors played a role of integrating actors in the value chain. However, in some instances, it also excluded some actors from accessing timber market under the guise of lacking or having low level of trust. Furthermore, the study found that institutional framework comprising the government, development partners through donor-funded programmes, and grower organizations are behind attempts to upgrade the NIPF. Although four types of upgrading are promoted, only functional upgrading was found to have resulted into higher income among tree growers.

In view of the study findings, it is concluded that although forest regulations were set to facilitate the operations of NIPF and to improve its contribution to rural livelihoods. Some of the regulations have resulted into unintended negative effects by limiting the actors of the value chain from gaining more income. Similarly, informal institutions, particularly trust, play an important role of integrating actors in the value chain by enabling them access regional market. Besides, the study concludes that in the absence of

a lead firm, upgrading driven by institutions comprising the government, development partners through donor funded programmes, and grower organization is still occurring. The study recommends that in order for NIPFs to contribute significantly to the income of actors, the government, through the Ministry of Natural Resources and Tourism (MNRT), should review the regulations governing the timber value chain. Specifically, barriers that limit tree growers and other actors from gaining access to the markets should be minimized or completely removed. In addition, in order for upgrading strategies to contribute to the improvement of rural livelihoods in the Southern Highlands of Tanzania, institutions promoting upgrading in NIPF value chain should pay attention to the needs of the tree growers.

Key words: Institutions, governance, value chain upgrading, private forestry

DECLARATION

I, Respikius Martin, do hereby declare to the Senate of Sokoine University of Agriculture that, this thesis is my own original work done and that it has neither been submitted nor being concurrently submitted in any other institution.

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This work is dedicated to my late beloved mother Dorothea Ernest Ngoboka who passed away on 6th November 2018 before the fruits of this work were realized. Also, to my son David, who was born on 13th May 2019 when I was away in Denmark.

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DC	District Council
DIIS	Danish Institute for International Studies
DFO	District Forest Officer
FDT	Forest Development Trust
FGD	Focus Group Discussion
FWITC	Forestry and Wood Industries Training Centre
GVC	Global Value Chains
KI	Key Informant
KIIs	Key Informant Interviews
KU	University of Copenhagen
MADEBE	Make Forest Develop Best
MVC	Matembwe Village Company
NGO	Non-Governmental Organization
NIPF	Non-Industrial Private Forest
PFP	Private Forest Programme
SUA	Sokoine University of Agriculture
TBS	Tanzania Bureau of Standards
TC	Town Council
TFS	Tanzania Forest Services
TGA	Tree Grower Association
TP	Transit Pass
TR	Timber Rush
TRA	Tanzania Revenue Authority
TTGAU	Tanzania Tree Grower Association Union

UWAMBANJO	Umoja wa Wafanyabiashara wa Mbao Njombe
UWAMIMA	Umoja wa Wapanda Miti Matembwe
VAT	Value Added Tax
VCI	Value Chain Integration

CHAPTER ONE

1.1 Introduction

1.1 Background Information

Grown timber can be categorized as either non-industrial or industrial timber plantations. More specifically, the non-industrial timber is owned by individuals while the industrial timber is owned by the government and corporations (Harrison *et al*., 2002; Zhang *et al*., 2005; Pedersen, 2017). Furthermore, unlike industrial forestry, non-industrial private forestry (NIPF) is not been integrated with wood-processing facilities and rarely involves intensive management (Harrison *et al.*, 2002; Schubert and Mayer, 2012). Besides, the two types of forestry plantations can be distinguished based on the goal of the owner. Unlike industrial forest owners whose primary goal is economic benefit, the NIPF owners are driven by other additional goals such as land and environmental protection (Karppinen, 1998; Wiersum*et al*., 2005; Butler and Leatherberry, 2006; Khanal *et al*., 2017).

Globally, NIPF accounts for about 14 percent of the total forestland (FAO, 2018). Although there is a variation in terms of size, ownership patterns and management practices, a common feature across regions is that NIPF is increasing (Mehmood and Zhang, 2001; Zhang *et al*., 2005; Nawir *et al*., 2007;Filippo *et al.*, 2018; Bashir *et al*., 2020). As reported by Butler and Zhao (2011), in the Northern part of the United States of America (USA), NIPF accounts for 55 percent of privately owned forestland whereas in the Southern part, Butler and Wear, (2013) report that NIPF covers 58 percent of the total forestland. In Europe, NIPF also contributes a big share in term of size (Schmithüsen and Hirsch, 2009; Suuriniemi *et al.*, 2012). Literature (i.e. Forest Europe, 2015; Sjølie *et al*., 2019) show that in Europe, more than 60 percent of the forests belong to non-industrial

private forest owners. A similar trend has been reported in Asia and Africa (see for example Nawir *et al*., 2007; Ceruttie*t al*., 2014; Maryudi *et al*., 2015; Fujiwara *et al.*, 2018). However, while NIPF has a long history elsewhere, in sub Saharan Africa NIPF is regarded as a new phenomenon because growing trees for the market is a recent phenomenon. Before this development, trees were planted mainly for household consumption (Warner, 1993).

1.1.1 Factors for expansion of non-industrial private forestry

It is difficult to gather all factors associated with the upsurge of NIPF across the world because they vary from one region to another and from one country to another. Therefore, it is prudent to highlight the main factors for the upsurge of NIPF and to identify some similarities and differences across regions or countries. Despite a long history of NIPF, the USA had a period of low level of investment in the reforestation of NIPF lands after harvesting (Haines, 1995). Thus, as a way of encouraging NIPF owners to increase investment in NIPF, several states and federal governments implemented cost-sharing programmes during 1970s and 1980s (for details about the cost-sharing programmes see Harrell, 1989; Haines, 1995). As a result, it was estimated that by the year 2030, NIPF would account for 60 percent of timber in the entire USA (Harrell, 1989). As argued by Zhang and Schelhas (2005), the number of NIPF owners has increased in the USA because first, a significant amount of forestland is no longer used economically and primarily for timber production. Second, owning a forestland is more efficient to a person who uses non-timber products and services frequently, because ownership minimizes transaction costs involved in getting non-timber products and services from the market. Third, forestland parcellation takes place when the value of non-timber increases faster than does the value of timber. Lastly, a marginal value for non-timber product is diminishing faster than is the case with the value of timber production.

In Europe, three main drivers for an increase in forest area are identified; these include policy decisions, management decisions, and natural causes (FAO, 2005). In particular, it is reported that, over the last 50 years, the most important driving forces have been attributed to changes in the policies within and outside the forest sector (FAO, Ibid). Nevertheless, the European Forest Sector Outlook Study (cited in FAO, Ibid) shows that there is a variation in policies between Western and Eastern European countries. While in the Western Europe, agricultural policies have deliberately encouraged the conversion of agricultural land to other uses including the establishment of forest plantations, in the Eastern Europe an increase in forests is associated with urbanization, which resulted into the abandonment of agricultural land, and the conversion of some of this land to forests (FAO, 2005).

In Asia and Africa, NIPF has increased partly due to stricter regulations for harvesting natural forest (conservation policies) and a decline in timber production from government plantations (Well and Wall, 2005; Ngaga, 2011; Ghosh and Sinha, 2018).

1.1.2 NIPF and poverty alleviation in developing countries

The increasing demand for timber and limited wood supply from governments and corporate plantations coupled with strict regulations on harvesting natural forest is an opportunity for tree growing in developing countries. This is particularly important in rural areas of Africa where the majority of people live (Mercandalli and Losch, 2017). NIPF has the potential of improving rural livelihoods by providing income through selling standing trees and other products derived from trees (Puri and Nair, 2004; Lescuyer *et al.*, 2014; Cerutti *et al.*, 2014; Ghosh and Sinha, 2018; Nawir, 2013). In addition, NIPF can transform rural areas through offering direct employment and supporting forest based micro-enterprises such as carpentry and furniture making

(Lescuyer *et al.,* 2014). Indirectly, tree growing can improve rural livelihoods by mitigating negative effects of deforestation including climate change, which has negatively affected smallholders in developing countries (Nawir *et al.,* 2007).

Due to its potential of improving rural livelihoods, NIPF has been promoted and attracted significant investments in developing countries at least in the past two decades. However, many factors are recognized to influence the manner in which rural communities access the benefits of NIPF (for a summary of these factors see Pacheco, 2012). Nevertheless, several studies cite the critical role institutions and governance play in shaping the distribution of benefits among actors including those outside the rural setting (see Lund, 2007; Larson and Ribot, 2007; Lund and Treue, 2008; Mosimane and Silva, 2015; Maryudi *et al*., 2015; Rana and Chhatre, 2016; Nawir *et al*., 2007; Afroz *et al*., 2017; Stryamets *et al*., 2020). The consensus among these studies is that, powerful value chain actors have more access to the benefits than have their marginalized counterpart actors. Facilitating equitable distribution of the benefits demands an in-depth understanding of the actors and the mechanisms used for gaining and maintaining access to these benefits. A value chain[1] approach has emerged as a helpful entry point for analyzing these issues in various sectors including forest (Ribot, 1998).

1.1.3 NIPF in Tanzania

As is the case with other sub-Sahara African countries (SSA), in Tanzania, forestry production can be traced back to the early colonial period (Ngaga, 2011). At that time, forestry production was dominated by the state until as recently as the 1970s and early 1980s (Pedersen, 2017; Kangalawe, 2018). In the Southern Highlands, commercial

[1]Value chain is used to describe a full range of activities that are required to bring a product (or a service) from conception through the different phases of production to delivery to consumers (Kaplinsky and Morris, 2001).

forestry production by smallholders started around the 1990s (Aalbaek, 2001). High demand for timber in domestic market stimulated tree growing among smallholders. This resulted from diminished supply of timber from natural forestry and strict regulations for harvesting them (Ngaga, 2011). In addition, around the 1980s, the diminishing supply of natural forestry was a result of a shift from supporting government plantations into conservation of natural forestry among donors (Kangalawe, 2018).

In addition, the economic liberalization policies of 1986, which were associated with the closure of some sawmills (e.g. Mufindi Pulp Mills) the main buyers of logs from government plantations (Hurst, 2004; Kangalawe, 2018), were among the factors that led to the deterioration of government forest plantations during the 1990s. This consequently affected the supply of timber in the country (Well and Wall, 2005; Ngaga, 2011). Due to high demand for timber, some few tree growers who had planted trees earned a huge profit out of their woodlots hence stimulating other growers to engage in growing trees. Today, forestry production among smallholders in the Southern Highlands of Tanzania is no longer for own consumption but, rather for the market, and this contributes significantly to an increase of households' income and government revenue in the area (Arvola *et al*., 2019).

1.2 Problem Statement

The demand for timber and inability of the governments and corporations to supply the required timber and to offset the deficit are among the factors of the rise of NIPF worldwide, Tanzania inclusive. According to empirical evidence, the current consumption of wood in Tanzania exceeds the supply leading to a deficit of 19.5 million m^3 this situation is expected to persist for many years (MNRT, 2015). As a resul*t*, tree growing by smallholders in the Southern Highlands of Tanzania has become an important strategy for offsetting the supply deficit and overcoming the challenges of importing timber.

Thus, tree growing by smallholders presents an opportunity of alleviating poverty among tree growing households. However, as reported elsewhere (see Maryudi *et al*., 2015), this dream may not be realized if the factors influencing the benefits and distribution are not analyzed and addressed. Institutional framework and governance of the chain are important factors affecting NIPF benefits and their distribution (Foundjem-Tita *et al*., 2013; Maryudi *et al*., 2015; Eckhardt and Poletti, 2018). As Davis *et al*. (2018) argue, the distribution of the chain incomes is an outcome of governance of the chain. Moreover, the governance of the value chain and institutional framework shape upgrading[2] strategies adopted by the chain actors (Larsen, 2016; De Ville, 2018). In addition, as scholars (i.e. Foundjem-Tita *et al*., 2013 citing North 1990; Doward and Omamo, 2009) highlight, depending on the way policies and regulations are drafted; they may provide incentives or disincentives to the actors of the value chain.

Despite the importance of institutional framework and governance in influencing the benefits accrued from NIPF, in Tanzania, the thrust of the scholarship on the role of institutional framework and governance has been on natural forest (see Well and Wall, 2005; Lund and Treue, 2008; Schaafsma *et al.*, 2013; Lund *et al.*, 2017) and industrial plantations (Kangalawe, 2018). For a long time, these have been the main source of timber supply. A few available studies on NIPF delved on the economic analysis of NIPF (Kihiyo, 1996) and future market potential of timber from NIPF (Arvola *et al*., 2019). Other studies (i.e. Ngaga, 2011; Indufor, 2011; PFP, 2016; Mwamakimbullah, 2016) are consultancy based focusing on general forest management and some paying more attention to technical aspects (e.g. the types of sawmills used and their technical efficiency) with limited focus on the role of institutions and governance in the NIPF value chain.

[2] Upgrading refers to something that happens to a specific actor (an economic group, organization or individual) inside the chain which directly improves the performance or position of the actor, thereby increasing rewards and/or reducing the exposure to risk (Riisgard *et al.*, 2010).

1.3 Justification of the Study

NIPF is a recent phenomenon in SSA and Tanzania in particular; however, it constitutes a big share of income to tree growing households and government revenue in the Southern Highlands of Tanzania (Nkwera, 2010; Pedersen, 2017). A study on the factors influencing the benefits of NIPF and their distribution among the actors of NIPF value chain is important in enhancing NIPF contribution to poverty alleviation in rural areas of the Southern Highlands of Tanzania. Therefore, the findings of the current study will provide crucial information to government, non-governmental organizations (NGOs) and development partners who are involved in promoting development through investment in NIPF.

Furthermore, in Tanzania, NIPF operates under the forest policy and regulations, which were developed when the industrial forest was the main source of timber in the country. Today, NIPF contributes a big share in timber supply in the country. Therefore, Tanzania provides an ideal case for studying the role of institutions and governance in NIPF. The study could inform policy makers especially the responsible ministry to make evidence-based decisions in promoting NIPF and increase its contribution to poverty alleviation. Besides, the study contributes to the existing body of empirical literature on NIFP value chain by applying an institutional framework of the Global Value Chain (GVC) analysis, which has received marginal attention in the previous studies. Furthermore, the study contributes to the broader definition of the term institutions to the existing literature. In addition, the study contributes to the GVC and access theories by testing their applicability in the NIPF value chain in the Southern Highlands of Tanzania.

1.4 Objectives

1.4.1 Overall objective

The overall objective of the study was to analyze the role of institutions and governance in non-industrial private forestry value chain in the Southern Highlands of Tanzania.

1.4.2 Specific objectives

Specifically, the study intended to:

i) Analyze the role of state regulations in governing the timber value chain,

ii) Examine the role of informal institutions in the timber value chain and

iii) Analyze the types of upgrading in the NIPF value chain and the manner in which institutions influence them.

1.5 Research Questions

i) How does the Tanzanian government regulate the timber value chain?

ii) How do the government regulations affect the timber value chain?

iii) How does trust in the timber value chain affect benefits of actors of the NIPF?

iv) What types of upgrading found in NIPF value chain and the manner in which institutions drive them?

1.6 Theoretical Framework

The overall objective of the thesis was to provide an in-depth understating of the role of institutions and governance of NIPF value chain in the Southern Highlands of Tanzania and the way these shape access to the benefits accrued by various actors. To achieve this objective, a theory that explains both value chain concepts and mechanisms of access to benefits is deemed necessary. Unfortunately, it was not possible to consult a single theory that can best achieve this objective. Consequently, the thesis has employed two

theoretical streams that were found useful. First, it draws from the global value chain theory specifically, the governance and institutional dimensions. Secondly, the study has used the theory of access by Ribot and Pelusso (2003). The subsequent sub-sections explain in detail the relevance of the theories in the current study.

1.6.1 The global value chain (GVC) theory

Originating from the concept of Global Commodity Chain (GCC) formulated by Gereffi (1994), the GVC theory is used to explain how economic activities are divided between actors of the value chain, by whom the value is created and the wide variation of benefits accruing from participation in different value chains and end markets (Bair, 2005; Ponte *et al*., 2014). The theory consists of four analytical dimensions: the input-output structure, which describes the process of transforming raw materials into final products and territorial structure, which describes the geographical concentration and/or dispersion of the activities. The third dimension is the governance structure, which refers to the power relations that determine how financial, material and human resources are allocated and controlled within the chain (Gereffi *et al*., 2005). In addition, Keane (2008) describes governance structures as the overall form of inter-node linkages, which result in systematic efficiency. The last dimension is the institutional framework, which identifies how local, national, and international contexts influence activities within the chains (Gereffi *et al*., 2005; Nielson and Pritchard, 2009). The current study focused on the last two dimensions, which are described in detail in the next sub-section to set forth the theoretical and analytical framework of the study.

1.6.1.1 Value chain governance

According to Humphrey and Schmitz (2001), the concept of governance is central to the global value-chain approach. Originally, governance of value chains was conceptualized

as buyer-driven and producer-driven value chains (for a detailed account of the two types, see Gereffi, 1994). This conceptualization received criticism, as it is appropriate for specific set of industries in a specific period (Ponte and Sturgeon, 2014). Building on Humphrey and Schmitz' notion of governance, Gereffi *et al*. (2005) developed a dynamic typology of value chain governance that helps to explain the shifts between buyer-driven and producer-driven governance forms. According to Gereffi *et al*. (2005), five basic types of value chain governance occur on a continuum from market to hierarchical type of value chain governance. The three in the middle are referred to as network types and they include modular, relational and captive. Market governance is characterized by arms-length transactions with little or no formal cooperation between sellers and buyers. The central governance mechanism is the price of the product. Modular governance is characterized by more substantial buyer-seller relationships as compared to simple markets. However, the switching costs are also low as there is no transaction-specific investment (Gereffi *et al*., 2005). Relational governance is based on mutual reliance regulated through reputation, social and spatial proximity, family, and ethnic ties. The cost of switching to a new partner is high due to the long time required to forge relational linkage or partnerships. Captive governance is characterized by small suppliers who depend much on larger buyers. In this type of governance, suppliers face significant switching costs and are, therefore, 'captive'. Hierarchy governance is characterized by vertical integration and managerial control.

Gereffi *et al*. (2005) propose that the type of governance is determined by three main variables namely: complexity of transactions, ability to codify (systematize) transactions and capability of suppliers. Altenburg (2006) extended the theory by proposing other factors, which also influence value chain governance. They include the extent of market uncertainty, incentives to spread the risk, consumer demands, and institutional

environments (Altenburg, 2006). In addition, Gereffi *et al*. (2005) posit that the degree of coordination and power asymmetry increases as the value chain becomes more integrated. Besides, they note that the governance type is not static to a specific node but can vary from one node of the chain to another. A node is defined as the site where goods or information is exchanged (Tobin *et al.*, 2016).

However, Gereffi and colleagues' theory of value chain governance has been criticized for ignoring the horizontal dimension of value chain governance, particularly, the role of institutions (Tallontire, 2007). Nonetheless, despite its limitations, the theory was useful because it provides a more nuanced typology of value chain governance. The limitation of Gereffi *et al*. (2005) typology of value chain governance is addressed in the thesis by adopting the institutional framework to take care of the horizontal governance.

1.6.1.2 Institutions and governance of value chains

The institutional context is the fourth dimension of value chain analysis. It sets out the framework for the identification of how local, national, and international contexts influence activities within the chains (Jespersen *et al*., 2014; Nielson and Pritchard, 2009). The thesis adopts a broader definition by North (1990) who defines institutions as the humanly devised constraints that structure human interaction: they include formal constraints (notably, rules, laws, constitutions), informal constraints (including, norms of behaviour, conventions, self-imposed codes of conduct), and their enforcement characteristics.

Both formal and informal institutions define incentive structures where individual compliance may be motivated by the rewards or threats of sanctions (North, 1990). In their study on value chain struggles, Nielson and Pritchard (2009) show how

institutions shaped participation of actors in the coffee and tea value chain in south India. Besides, they illustrate the usefulness of North's definition of institutions by arguing that trust, in an informal institution, plays a similar role as in a formal institution. The importance of institutions is also revealed by Selwyn (2008) in a study of grape production in Brazil, which underscored the importance of institutions in shaping participation and upgrading the grape's value chain.

In the context of Tanzania, Ilembo *et al*. (2017) found that the lead firms' strategies and state institutions were intertwined and shaped the tobacco value chain's governance structures. Furthermore, a study on challenges and opportunities of organic agriculture in Tanzania revealed that local institutions and agencies were instrumental in upgrading and integrating producers in organic crop production (see Mbiha and Ashimogo, 2010). In summary, the review of literature on institutions shows that formal and informal institutions influence the manner in which actors engage in the value chains. Thus, they influence access to benefits through three important ways, integration, exclusion, and upgrading.

1.6.2 Access theory

A central tenet of the theory of access is the differentiation between one's right to benefit from things (e.g. resources) and one's ability to benefit from these (Ribot and Peluso, 2003; Myers and Hansen, 2020; Mutea, 2020). As Ribot and Peluso (2003) argue, although people may have their rights to benefit from resources as may be stipulated in various documents, they may not necessarily benefit from them because they lack structural and relational mechanisms such as technology, capital, market, knowledge, authority, labour, and labour opportunities, social identities, and social relations. Indicating the difference between one's right to benefit from things and one's ability to

benefit, Ribot and Peluso (2003:160) clarify "*someone might have rights to benefit from land but, may be unable to do so without access to labour or capital."* For Ribot and Peluso (2003), access is the ability to derive benefits from things using all possible means. Ribot and Peluso (2003) imply that access should be analyzed broadly by considering not only a "bundle of rights" but also "the bundle of powers." This broad definition of access was found useful in this study and helped to understand how power mediates access to benefits derived from NIPF. In the next section, I briefly highlight how the definition was used.

In the context of NIPF, benefit was conceptualized as income gained by value chain actors. Then, the mechanisms used by the actors notably, tree growers, saw millers/middlemen and timber traders (wholesalers and retailers) gain, control or maintain access to income were identified. Specifically, the study analyzed how access to technology for processing timber facilitated or constrained actors' ability to gain more income. Access to technology, sawmill in this case, was seen as important because it helps actors to add value of trees by processing logs. However, as espoused by the theory, mechanisms of access are heuristic. Thus, technology alone is important but not sufficient for actors of NIPF to earn more income; financial capital is equally important. In the context of NIPF, actors need financial capital to be able to pay for casual labourers, transport logs, or sawn timber and get different documents when they transport sawn timber outside the district. In fact, capital is also required to hire sawmill if one does not own one. Therefore, access to capital by the value chain actors was analyzed by actors' ability of using either own or borrowed finances to cover various costs. Apart from the technology and capital, access to market is the goal of every actor of NIPF. In this case, access was assessed by their ability of gaining access to reliable markets. Actors' ability

of accessing other mechanisms including knowledge, authority, labour, and labour opportunities, social identities, and social relations was also analyzed.

1.6.3 Usefulness of the theories

Generally, each theory has its unique strengths and weaknesses (Modell, 2015). To get a complete picture of the phenomenon being studied, the use of multiple theories is encouraged (Meijer *et al.,* 2002). Accordingly, in this study, multiple theories, also referred to as theoretical triangulation, were used to gain a complete understanding of the role of institutions and governance in NIPF value chain. Thus, since the governance dimension of the GVC theory is criticized for ignoring horizontal dimension, the institutional framework of the GVC theory was used to overcome this limitation. Besides, it was noted that the two analytical tools of GVC theory (i.e. the governance and the institutional framework) do not offer a convincing explanation about why some actors of the value chain have more access to benefits than other actors do despite operating under similar institutional framework. Therefore, the theory of access was used in order to explain the underlying mechanisms of access used by actors of the value chain.

1.6.4 Conceptual framework

The study's conceptual framework (Figure1.1) was developed based on the theoretical framework described in the previous section. From the theoretical framework, it can be inferred that a holistic understanding of the value chain governance requires attention to governance mechanisms internal to the value chain and the institutional framework under which the value chain operates. Together they influence the benefits obtained. However, literature informs further that access to benefits is mediated by structural and relational mechanisms advocated by the theory of access. Furthermore, benefits can be obtained by involvement in upgrading activities or otherwise.

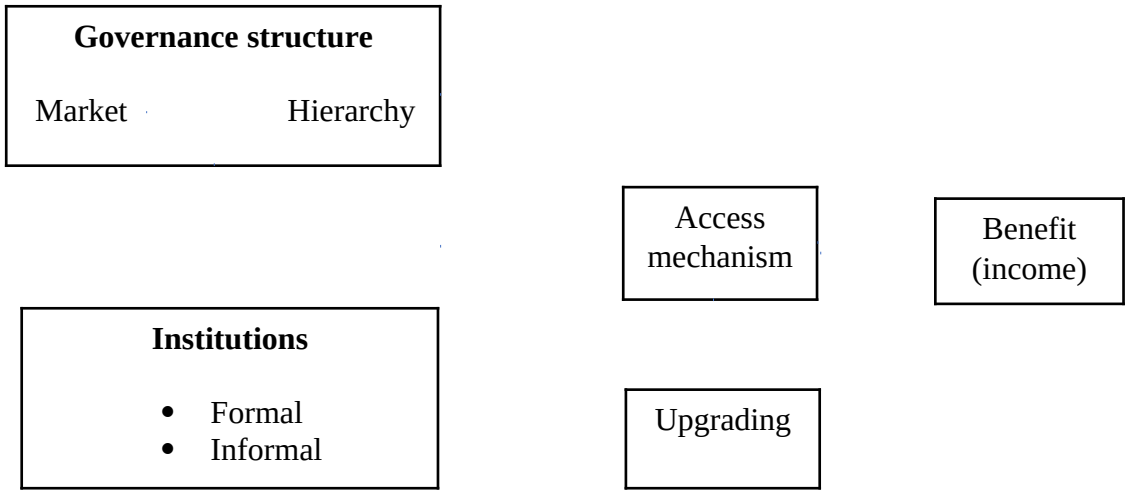

Figure 1.1: Conceptual framework for institutions and governance in NIPF value chain

1.7 General Methodology

1.7.1 The context of the study area

The study was conducted in the Southern Highlands of Tanzania, which comprises six regions namely Mbeya, Njombe, Ruvuma, Songwe, Rukwa, and Iringa. Although all regions in the Southern Highlands grow trees, Iringa and Njombe are the leading regions. When the two leading regions are compared, Iringa Region, Mufindi District in particular, is leading in terms of the area planted with industrial forest. However, in terms of the area planted with non-industrial private forestry, Njombe Region particularly Njombe District is leading. Therefore, most interviews took place in Njombe District in Njombe Region. Statistics shows that Njombe Region has about 78 065 ha while Iringa has 46 593 ha of NIPF (PFP, 2017). In terms of districts, Njombe and Makete are the leading districts with 36 449 ha and 27 696 ha respectively planted with NIPF. Other districts have less than 20 000 ha of NIPF plantations each. Other districts where the interviews were conducted include Wanging'ombe and Makete (in Njombe Region), Kilolo and Mufindi in Iringa Region.

In both Njombe and Iringa Regions, Pine (*Pinus patula*) is the dominant tree species; however, some other species such as Eucalyptus Spp and Cyprus Spp are also grown. The major products produced are sawn timber. Therefore, the thesis focused on the value chain of sawn timber. Even though some timber is exported, more than 80 percent is consumed in the country and at least two thirds of this is consumed in the construction sector (PFP, 2016). Besides trees, tree growers also grow food crops such as maize, beans, sweat potatoes, wheat, Irish potatoes, and peas.

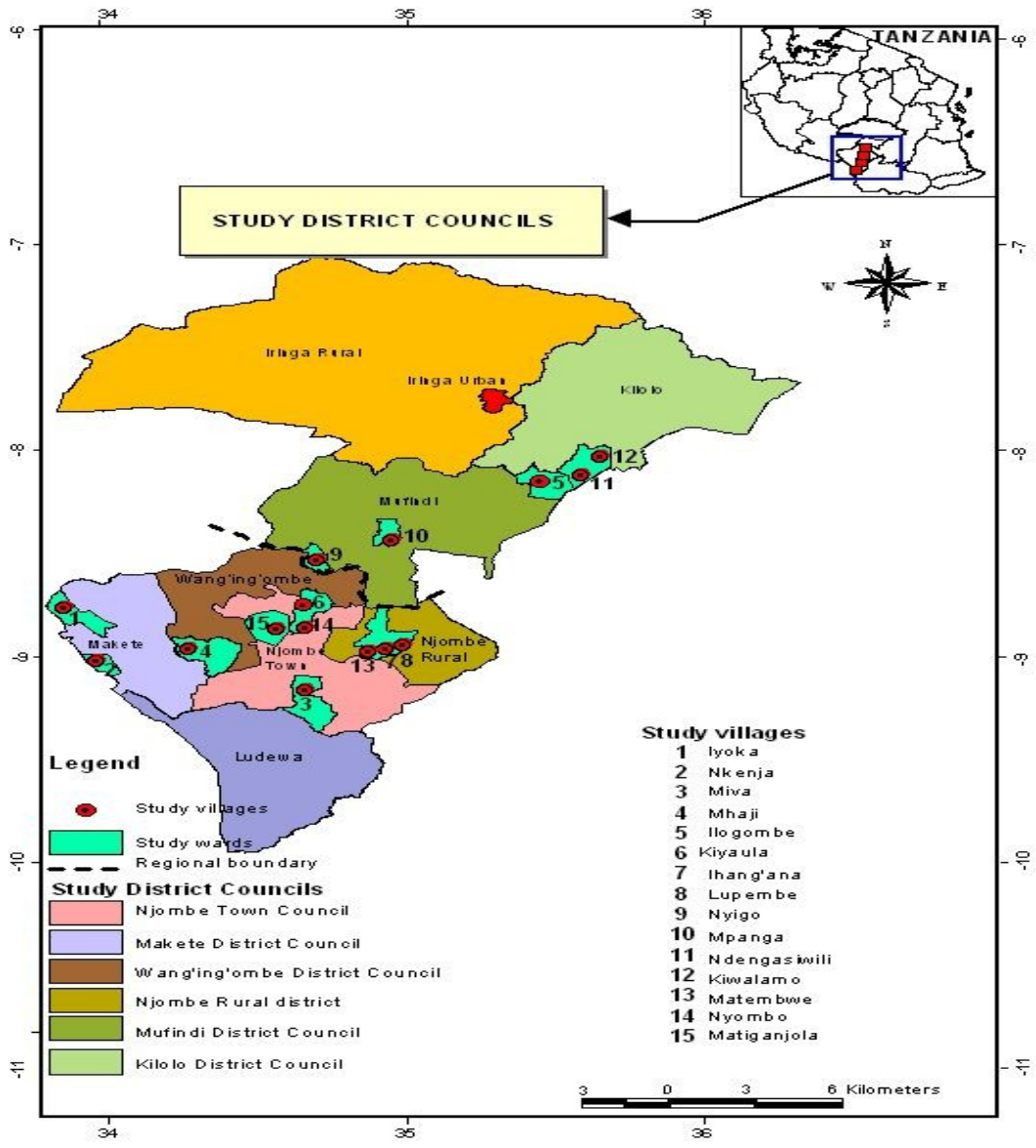

Figure 1.2: Map of study districts and villages

1.7.2 Research philosophy

Research philosophy is a system of beliefs and assumptions about the development of knowledge (Žukauskas *et al*., 2018). In research, a researcher consciously or unconsciously makes assumptions about how knowledge will be generated (Saunders *et al.*, 2016). The assumptions made fall under three categories – axiological assumptions that deals with the role of researcher's values and ethics and how these are dealt with in the research process (Muhaise *et al.,* 2020). For instance, in dealing with axiological assumptions, the researcher must decide whether he/she should try to be morally neutral in doing research, or he/she should allow his/her values shape the research (Saunders *et al.*, 2016). Ontological assumptions deals with realities, in other words, what we believe can exist. On the other hand, epistemological assumptions deal with ways of knowing - that is how we know what we know (Berryman, 2019). Together, the assumptions influence fundamentally the research methods to be used and the manner the research findings are interpreted (Saunders *et al.*, 2016).

Based on the assumptions, four types of research philosophy can be distinguished namely, positivist, interpretivist, pragmatist and realistic research (Žukauskas *et al*., 2018). The positivist research philosophy emphasizes objectivity in research. It posits that the social world can be understood in an objective way. In this case, the research process and findings are independent of the researcher' values (Žukauskas *et al*., 2018). Methodologically, positivism is associated with quantitative methods that focus on precision, generalizability and reliability and replicability (Kaushik and Walsh, 2019). On the extreme end of positivist is the interpretivist research philosophy that claims that it is not easy to understand the social world objectively. For an interpretivist, peoples' experience with the social world is important thus, subjectivity is inevitable (Kaushik and Walsh, 2020). In terms of methodology, the focus of interpretivism is qualitative

methods. The pragmatist research philosophy strives to reconcile objectivism and subjectivism. It is often associated with mixed methods, combining both qualitative and quantitative methods (Morgan, 2014). The realist research philosophy posits that reality exists independently of the researcher's mind, that is, there is an external reality (Bhaskar, 1978). Given the nature of the research questions that the study sought to answer, pragmatism was seen appropriate and thus adopted by the study.

1.7.3 Research design and the selection of study sites

The thesis is primarily based on an exploratory cross-sectional study design. In addition, the study adopted more of the qualitative approach; therefore, a greater part of the thesis is based on qualitative data. Before selecting the study sites, a visit was made to six district councils of Njombe and Iringa Regions. The councils visited from Njombe Region are Makete, Wanging'ombe, Njombe District Council, and Njombe Town Council. From Iringa Region, the councils visited were Mufundi and Kilolo District Councils. The councils visited were those known for growing trees. During the visit, key informant interviews were held mainly with the District Executive Directors (DEDs) and District Forest Officers (DFOs). The interviews helped to establish the extent of tree growing, processing, selling, and the manner in which timber business is regulated. From the interviews, it was revealed that, regulations on NIPF are implemented differently at the council level within Njombe District. This was seen a good case for studying the manner in which different regulations influence the timber business. Thus, most of the interviews took place in Njombe District particularly in Matiganjola, Nyombo, and Matembwe villages. These villages are known for having many actors that are highly involved in various nodes of the timber value chain. However, because the study adopted a value chain approach, other actors of timber value chain for instance retailers were not found in the selected villages, therefore, other interviews took place outside Njombe District.

In addition to collecting qualitative data, some few aspects needed quantification in order to provide a better understanding of the issues explored. Such aspects included the number of growers selling sawn timber and standing trees, the extent of fire hazards and the number of growers using improved tree seeds. Quantitative data for these aspects were obtained from a survey of 12 villages conducted by the Timber Rush Project. The villages were representative of the six councils initially visited. Although the survey collected much data on aspects related to tree growing, this study utilized data related to the objectives of the study and for only a few aspects that required quantification.

1.7.4 Sampling and data collection

To collect qualitative data, purposive and snowballing sampling techniques were used to get actors of the timber value chain. Multi-methods were used to collect data from various actors of the value chain. These were key informant interviews (KIIs), focus group discussions (FGDs), semi-structured in-depth interviews, review of documents and observations. Generally, 23 KIIs were held with various actors representing government organs, tree grower organizations, development partners, private companies, and timber traders' organizations. In addition, nine (9) FGDs, three with tree growers, three with saw millers, and three with timber traders (the wholesalers) were conducted. Furthermore, semi-structured in-depth interviews were conducted to 25 tree growers, 23 timber traders, and 11 timber retailers. The number of respondents for each category of actors was determined by the saturation point – a stage where more data do not necessarily generate any new information (Mason, 2010).

Since good cooperation between the researcher and the respondents improves the information collected, rapport was built and maintained with the respondents by adopting the tactics suggested by Abbe and Brandon (2014). Some of the adopted tactics were

explaining the goal of the research and the manner in which data would be used, continued with contact (the researcher stayed one month in Matembwe village), followed by four rounds of visits in the study villages, active listening, mimicry (for instance, mirroring speech rate and linguistic patterns), and self-disclosures to help establish common ground.

Furthermore, the validity of research findings was enhanced by triangulating the data collected (Mathison, 1988). As suggested by Schaefer and Alvesson (2020), the researcher adopted an intra and extra source critique methods of triangulation. This implies that where the information gathered from FGDs contradicted information gathered through other methods such as semi-structured interviews, the respondent was contacted to seek for more clarification on the issue and when similar information was given, the issue was explored in detail in the following interviews with key informants and other respondents. When the issue was also confirmed through either of the methods, it was regarded as new insight.

As recommended by Lincoln and Guba (1985), the findings were validated by presenting them in two conferences held at the Vocational Education and Training Authority (VETA) in Iringa in December 2018 and 2019. The participants of the conferences were researchers, Forest Officers representing the six district councils, representatives of NGOs and programmes promoting NIPF in the study area, and representatives of tree grower organizations. Feedback from participants of the conferences was used to refine the findings.

1.7.5 Reflections on fieldwork

In this section, I provide my experience regarding the exercise of data collection. As any project, planning is at the heart of the research exercise (Van der Waal, 2009). Therefore,

before embarking on data collection, I developed a research plan, which I intended to follow. However, during the process I realized that it was challenging to implement the initial plan. Three main issues demanded changes in the initial plan. First, although gaining access was enabled by being introduced by the district and village leaders, I had to conduct multiple visits and spent longer than the expected time in the field in order to gain more trust. Therefore, flexibility to my plan was important to be acceptable in the community and obtain reliable data (Binns, 2006).

The second issue related to new insights, which were not covered in the previous interviews. Due to my long stay in the field and as the fieldwork was progressing; I made many friends who were involved in different activities along the timber value chain. These friends shared many important issues related to the objectives of the study. During informal interaction, I realized that people were more open to talk on issues, which they were reluctant to disclose during the planned interviews. I perceived this as an opportunity of unearthing many issues and therefore spent more days in the field than planned in order to explore more on the raised issues. Nevertheless, the obtained new insights were not taken for granted. As a result, triangulation was necessary by reviewing the source of information (Schaefer and Alvesson, 2020).

The third issue that presented some challenges involved road conditions and availability of the respondents during the rainy season. During heavy rains, most of the roads in the study villages were almost not passable. In addition, it was difficult to get the respondents especially tree growers because they were engaged in crop cultivation. For my own and the respondents' convenience, flexibility was important (Binns, 2006).Thus, I changed my research plan to accommodate the peak months of planting and harvesting[3].

[3] This was more so in Iyoka village in Makete district where it was not possible to find tree growers at home during the season of harvesting wheat.

1.7.6 Data analysis

As already reflected in the previous section, the thesis largely relied on qualitative data. However, in some cases, quantification was seen important in order to provide better understanding of the phenomena. Therefore, SPSS software was used to analyze the quantitative data. The findings are presented in descriptive form. On the other hand, qualitative data were analysed using thematic analysis. This involved six main steps as described in the following section.

First, it involved transcribing all interviews into text, and next going through the texts. These texts were obtained after transcribing the interviews, observational field notes, and notes written after informal interactions. Because data were from different sources and collected through various methods, at this stage, data triangulation was also performed. This involved checking for consistence of explanation provided on similar issues across the methods used to explore the issue. This stage helped to obtain some insights of what the data say. In addition, issues, which were perceived as interesting were also noted. After familiarizing with the data, the coding process began. This involved labelling of sentences and paragraphs whereby the labels communicated explicit meanings of the respective sentences and paragraphs. However, as suggested by Boyatzis (1998), the labels captured the qualitative richness of the phenomenon. The fourth stage involved grouping together similar labels to form twelve (12) themes with others having subthemes. Deductive analysis was employed in developing the themes. This process was determined by the theoretical framework underpinning the study (Braun and Clarke, 2006). Appendix 11 provides details of the themes and subthemes developed. In the fifth stage, the themes were reviewed through reading the texts, codes, and themes again to assess coherence among them. A few themes were found not to relate to any of the theories used. Therefore, a theme named miscellaneous was added to capture such

themes. In addition, some themes were renamed in order to reflect the qualitative meaning they represent. In the sixth stage, each theme was described in detail and the relationships between and among themes assessed. Reflections on the relationships between and among themes continued throughout the writing process.

1.8 Limitations of the Study

Since NIPF is a new phenomenon in Africa and Tanzania in particular, to my knowledge little research has been done so far to form a strong basis of literature review on the topic. Therefore, this study adopted an exploratory research design that relied much on qualitative data from respondents and key informants that were obtained through non-probability sampling particularly snowball and purposive sampling. Accordingly, most of the findings cannot be generalized to a larger population from which the data were collected except for limited cases where survey data collected by the Timber Rush Project were used. Furthermore, the study analysed the value chain of one product, sawn timber, which is mainly used in the construction sector. Future studies could consider additional products and their uses (e.g. furniture making and packaging) because different strands of the value chain (according to end use) may have different governance and institutional characteristics that influence the chain all the way to farmers. Nevertheless, these limitations do not diminish the relevance of this study.

1.9 Organization of the Thesis

The thesis is organized into five chapters. Chapter one presents the general introduction under which the background related to the context of the study is highlighted. In addition, the chapter covers the rationale and justification of the study. Besides, the chapter provides the theoretical and conceptual framework frameworks that guided the study. The chapter ends by providing the general methodology adopted by the study. The next

three chapters include three publishable manuscripts each one covering one objective of the study. Thus, chapter two analyses the effects of state regulations on actors of the non-industrial timber value chain in the Southern Highlands of Tanzania. Chapter three unpacks the role of informal institutions by investigating the role of trust in timber value chain in the Southern Highlands of Tanzania. Chapter four examines the types of upgrading occurring in the NIPF value chain and institutions driving them. Lastly, chapter five presents the summary of the thesis, conclusions and recommendations based on the study findings.

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CHAPTER TWO

2.0 Regulations Matter: Their Effects on Actors of the Non-industrial Timber Value Chain in the Southern Highlands of Tanzania

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2.1 Abstract

In recent years, non-industrial private forestry (NIPF) for timber production has gained economic importance in the Southern Highlands of Tanzania. Access to benefits accrued from NIPF represents an opportunity for poverty alleviation. However, little is known about how the NIPF timber value chain is governed and how this, in turn, shapes benefit distribution across the chain. Our paper focuses on state regulations that in the context of Africa, and Tanzania in particular have received scant attention in value chain literature. We seek to answer three main questions: i) how is the timber value chain regulated? ii) what strategies do the value chain actors use to maintain access to benefits? and iii) how do regulations affect the incomes of chain actors? A cross-sectional study design and the qualitative approach were adopted whereby data were collected through document analysis, focus group discussions, observations, and in-depth interviews with key informants. The findings show that while the government is the sole regulator of the timber value chain, regulations are implemented differently at the subnational level. In addition, lack of distinction between industrial and non-industrial private forestry has resulted in placing them under the same regulatory framework despite their many differences. This has partly resulted in high transaction costs, which the majority of actors in the NIPF value chain cannot afford. Despite strict regulations and many taxes paid, actors adopt different strategies in maximizing their incomes from the timber business. Although the regulations affect incomes of all actors, tree growers are the most-affected category. The paper concludes that the contribution of non-industrial private forestry to poverty alleviation is stifled by some cumbersome district and state regulations that limit actors' easy access to profitable markets.

Key words: Regulations, Non-industrial, Private forestry, Tanzania

2.2 Introduction

Non-industrial private forestry (NIPF) is characterized by individual ownership of forest plantations, such as by small individual farmers or urban-based investors, unlike industrial plantations, which are owned by governments and corporations. Unlike industrial forestry, NIPF has no integration with wood-processing facilities (Harrison *et al.*, 2002; Schubert and Mayer, 2012; Pedersen, 2017) and rarely involves intensive management, such as improved germplasm, fertilizers, weeding, thinning, and pruning (Harrison *et al.*, 2008; Perdana and Roshetko, 2015). Yet NIPF supports the livelihoods of many people (Byron, 2001; Cerutti and Lescuyer, 2011; Pulhin and Ramirez, 2016). Many African countries, Tanzania included, have experienced an upsurge of NIPF plantations at least in the past decade (Carle *et al.*, 2002). As in other value chains[4], the benefits accrued from this upsurge depend on the governance of the value chain[5] (Kaplinsky, 2000). However, literature on governance of the NIPF value chain in Tanzania and Africa in general are scarce (Pedersen, 2017). As such, using Tanzania as a case, this paper introduces NIPF value chain analysis in African literature by analyzing the governance of the NIPF value chain in the Southern Highlands of Tanzania. In this respect, the paper investigates the value chain of the main product from NIPF, the sawn timber. The paper does not dwell on quality standards, which is another component of value chain governance; rather, the paper only focuses on the regulatory framework governing the chain.

[4] "Value chain" is used to describe a full range of activities required to bring a product (or a service) from conception through the different phases of production to delivery to consumers (Kaplinsky and Morris, 2001)

[5] "Value chain governance" is used to describe authority and power relationships among the producers, buyers, sellers, service providers, and regulatory institutions that operate within or influence the range of activities required to bring a product or service from inception to its end use (Kaplinsky and Morris, 2001).

In Tanzania, studies on the timber value chain have largely focused on either public plantations or natural forestry (see, for example, Well and Wall, 2005; Kapinga, 2010; Lukumbuzya and Sianga, 2017). Other studies such as Ngaga (2011) and Mwamakimbullah (2016) focused on the demand and supply of forest products from both public and private forests and on the identification of key actors in both cases. Additionally, yet another study (PFP, 2016) paid more attention to technical aspects of forest products from both private and public plantations. A common feature of all these studies is that they paid little attention to the governance of the NIPF value chain and specifically on how the actors of the chain interact with the regulatory framework.

In the Southern Highlands of Tanzania, small- and medium-scale tree growers are estimated to occupy between 160 000 and 175 000 ha of land (FDT, 2016). The rise in the number of NIPFs is associated with many factors, including diminishing of natural forests and strict regulations for harvesting them, dwindling of public forest plantations due to unsustainable harvesting, changing land laws facilitating a land market, increased demand for timber for construction, and a growing middle class/upper class with money to invest (Ngaga, 2011). Access to benefits accrued from NIPFs by all the actors of the chain presents a potential for poverty alleviation. The regulatory framework under which the actors of the value chain operate is an important aspect through which the benefits are realized.

Although there is very little literature on the NIPF value chain in Tanzania and Africa in general, we can learn from some Asian literature. According to this literature, NIPF provides a range of benefits to rural communities, such as fuelwood, income, wood for construction, and environmental and amenity benefits, among many others (Puri and Nair, 2004; Nawir *et al*., 2007; Fujiwara *et al*., 2018; Ghosh and Sinha, 2018). Despite these

benefits, the contribution of NIPF to poverty alleviation is influenced by a host of factors, and one of them is the regulatory framework under which the actors of NIPF operate (Beach *et al*., 2005; Maryudi *et al*., 2015). Lack of regulations can negatively influence the contribution of NIPF to poverty alleviation, and so can cumbersome multiple regulations to the flourishing of the industry. Maryudi *et al*. (2015) argue that timber regulations can lead to transaction costs at the farm and processing levels well beyond the financial capacity of an individual smallholder. Similarly, Meija *et al*. (2015) have reported that regulatory requirements can and have become economic and institutional barriers that tend to reduce access and exclude smallholders from the timber markets. Examining the hurdles posed by regulations and informal practices in the community-based timber enterprise and smallholder forestry in the Philippines, Pulhin and Ramirez (2016) found that formal and informal barriers along the timber value chain restrict growth and deny community-based timber enterprises (CBTEs) and smallholder forestry opportunities to flourish.

Applying the institutional framework of the value chain and access theory to a segment of the timber value chain in the Southern Highlands of Tanzania, the current paper seeks to understand how the regulatory framework provides or denies actors of the chain access to benefits. Specifically, the paper seeks to answer three main questions i) how is the timber value chain regulated? (ii) what strategies do the actors use to maintain access to benefits? and iii) how do regulations affect benefits (in terms of incomes) of the chain actors? This paper contributes to knowledge in this area of study in different ways: first, it bridges the knowledge gap on NIPF in Africa, and Tanzania in particular. Secondly, the paper contributes to the literature on value chain governance. Finally, the paper contributes to the theory of access by testing its applicability in NIPF in the Southern Highlands,

particularly in Njombe. The next section highlights the conceptual and theoretical framework used to guide the paper.

2.3 Conceptual and Theoretical Framework

Actors of NIPF in the Southern Highlands of Tanzania, including tree growers, are mainly involved in the value chain for the purpose of earning income. The major product, sawn timber, reaches consumers via multilevel marketing channels. The institutional environment influences the activities of the chain, because it determines the roles and interaction of the chain actors (Ari *et al*., 2016). In this respect, the regulatory framework under which the actors operate plays a crucial role. Nevertheless, not all actors within and across the nodes[6] are affected equally by the regulations. It is worth noting that although regulations determine who gains and loses, their effects are mediated by a host of factors, which Ribot and Peluso (2003) refer to as mechanisms of access. "Access" is defined as the ability to derive benefits from things. It encompasses all possible means by which a person can benefit from things (Ribot and Peluso, 2003). In this definition, "access" connotes a bundle of powers that is broader than the bundle of rights conferred by code and custom. In social or business relationships, an actor may hold a bundle of powers whose strands include various means of controlling and maintaining access (Ribot and Peluso, 2003). Accordingly, Ribot and Peluso (2013) highlighted eight mechanisms that influence access. They include technology, capital, market, knowledge, authority, labour, and labour opportunities, social identities, and social relations.

This paper is inspired by the access theory to ask how actors of the NIPF timber value chain draw on different mechanisms to navigate the regulations and gain access to benefits (in this case, "benefit" connotes income). We proceed by describing the

[6]A node is defined as sites where goods or information are exchanged (Tobin *et al.*, 2016).

methodology in section 2. Section 3 presents results and discussions under four subheadings:actors, regulations, strategies, and outcomes or effects. Lastly, we draw conclusions and offer recommendations for how to reduce the negative effects imposed by the regulations.

2.4 Methodology

2.4.1 Study area

The Southern Highlands of Tanzania encompass six regions, namely, Iringa, Mbeya, Rukwa, Ruvuma, Songwe and Njombe. Although NIPF are found in all the regions of the Southern Highlands, the majority are found in Njombe, where in recent years NIPF as a livelihood strategy has gained economic importance (Indufor, 2011; Ngaga, 2011; FDT, 2015). This study was conducted in Njombe District, which is one of the four districts in Njombe Region; other districts include Ludewa, Makete and Wanging'ombe. Njombe District was purposively selected because it has the highest number of NIPF as compared to the other districts of Njombe Region. Three villages—Matiganjola, Nyombo, and Matembwe—were selected based on the presence of many actors who are involved in the timber value chain. The actors include nurserymen, tree growers, sawmillers, middlemen, and timber traders. On average, tree growers in Njombe district have land holdings of about six acres and timber production occupy more than 50% of the total land (FDT, 2015). Due to the importance of these villages in timber production, a big market for sawn timber has been constructed in Matembwe village. The market facilitates timber marketing in all the villages around the area. Currently, the main product, which is sawn timber, is transported from the remote areas of the villages to the village centres, where traders from various places can buy stocks according to their requirements. Timber is both sold within the district and transported to cities outside the district, such as Morogoro, Dodoma, and Dar es Salaam.

2.4.2 Research design, data collection and analysis

The study adopted a cross-sectional design, and different methods were used to collect qualitative data as follows. First, documents, including the National Forest Policy of 1998 and the Forest Act of 2002, were reviewed. This exercise helped the researchers to become familiar with the regulations governing the timber value chain. Later, these regulations were assessed against their implementation and how their implementation affects the incomes of the value chain actors. Secondly, key informant interviews and focus group discussions were conducted. The key informants were purposively selected based on the knowledge of the subject of the study. They involved Forest Officers, business and market facilitators for Forest Development Trust (FDT), Village Executive Officers of the three villages, the Zonal Manager for Tanzania Forest Services and leaders of the Matembwe Tree Growers' Association (TGA).

A total of nine (9) focus group discussions (FGDs) involving three main actors of the timber value chain (namely, tree growers, sawmillers, and timber traders) were conducted in the three villages of Matigonjola, Nyombo and Matembwe. In each village, the first FGD was for tree growers, the second was for sawmillers, and the third was for timber traders. Members of FGD were selected based on their extensive experience of a particular node. For all actors, efforts were made to include all categories in the FGD. Thus, for tree growers FGDs involved members and non-members of tree grower associations. In addition, tree growers were recruited into FGDs based on the sizes of their woodlots (i.e., growers with small, medium, and large woodlots). Similarly, three categories of FGD members for timber traders were established based on the number of sawn timbers sold per month. Because sawmillers were very few and all were using the same sawmills (i.e., dingdongs), all sawmillers reported in the village were recruited into

FGDs. On average, seven participants were involved in FGDs. The FGDs were conducted at village offices.

Issues covered during the FGDs included regulations governing the timber value chain, opportunities and challenges imposed by business and social relationships, opportunities and challenges imposed by regulations, strategies used in getting more income from the timber business, and suggestions on how to overcome the challenges. The time taken for each FGD ranged between 45 and 90 minutes. Lastly, observations were also made at the roadblocks for the inspection of forest products and the collection of tax at different checkpoints along the road.

Analysis of the data involved transcribing all interviews into text. This was followed by reading and rereading the text. This process resulted in labeling of sentences and paragraphs. The labels communicated explicit meaning of the respective sentences and paragraphs. Similar labels were grouped together to form themes and subthemes (Braun and Clarke, 2006) that represented meaning related to the research questions.

2.5 Results and Discussion

2.5.1 Actors in NIPFs in the Southern Highlands of Tanzania

The value chain of NIPF in the Southern Highlands of Tanzania comprises many actors (see Mwamakimbullah, 2016; PFP, 2016, for more detail about actors involved). In this paper, five main actors (notably, nursery operators, tree growers, transporters, sawmillers, and timber traders) are analyzed in detail, and they provide a complete picture of how actors interact with the regulatory framework.

Owners of tree nurseries produce seedlings for their own requirements and for selling to other tree growers. The nurseries range from small (less than an acre) to larger nurseries (one acre and above). They are owned by individual tree growers, TGAs, and institutions such as non-governmental organizations, primary schools, and village councils. However, in the study area, most tree growers rely on either their own source or buying from other growers. At the time of this research, the price of one seedling was 150 TAS (0.1 USD), and on average growers used 470 seedlings per acre.

Tree growers are the second category of actors directly involved in the NIPF value chain. The majority of tree growers in the Southern Highlands grow *Pinus patula* which is locally termed as *"Paina"*. In some villages, tree growers are organized in groups that together form Tree Growers' Associations (TGAs). Members of TGAs work together in carrying out such activities as nursery preparation, planting, and tree husbandry. In the Southern Highlands, these groups are found only in a few villages, and where present they are fewer than the number of tree growers in a village. Therefore, in most cases tree growers in the Southern Highlands work individually. There is varied access to the market across tree growers. Akin to the findings of Perdana and Roshetko (2015) in Gunungkidul, Indonesia, the majority of tree growers in the Southern Highlands of Tanzania access the market by selling mature standing trees. However, some sell sawn timber, while others sell premature trees termed locally as "*miti ya kufuga"*.

The third category of actors is transporters. Transportation service is provided either by private entrepreneurs or by some timber traders who own trucks. Two categories of transporters are found in the non-industrial timber value chain. The first category uses trucks or tractors to transport sawn timber from remote areas with poor roads to areas with good roads. Sometimes these trucks are not serviced and lack legal documents such

as insurance; thus, they cannot transport timber to distant markets. The second category of transporters use trucks that are regularly serviced and have required documents that allow them to transport timber from village markets or areas with good roads to regional markets. These trucks pass through various checkpoints, notably the TFS checkpoints where cess is collected, and the weigh bridges where the weight of the cargo is assessed. The second category of transporters interacts with regulations more regularly than those in the first category. The cost of transport varies depending on the distance; for example, for those who transport timber from Njombe to Dar es Salaam, a distance of 714 km, the cost is about 2.5 million TAS (1 667 USD) per trip.

The fourth category of actors is sawmillers. Sawmillers process timber and their presence has been regarded by other scholars (Gosh and Sinha, 2018) as an indication of a developed timber market, which motivates farmers to engage in tree growing (Versteeg *et al.*, 2017). In the Southern Highlands, the majority of sawmillers own locally fabricated machines referred to as dingdongs. Tree growers who do not own these machines can access them through hiring. In some cases, sawmillers act as intermediaries between tree growers and traders. In this regard they buy standing trees from which they get timber for selling to traders who, in turn, deliver timber to local or regional markets. Therefore, in addition to offering sawmilling services, some sawmillers are also engaged in timber trading.

Other actors in the value chains are timber traders. Four main categories can be identified in the Southern Highlands of Tanzania. The first category includes traders who buy timber from the village collection centres or sometimes from remote areas of the villages. These traders usually sell timber to other traders who are found in the district centres. Because of their relatively small capital, they transport few pieces of sawn timber from

the village centre to the village markets or district centres; therefore, they usually use trucks of not more than seven tons as a means of transport. The second category includes traders who buy timber from the first category of timber traders. These are found either in the village timber markets or at the district centres. They possess relatively higher capital compared to the first category. From the village markets or district centres, timber is either sold to the final consumers or is transported to the regional centres, including big cities. Because of their relatively higher capital, traders use trucks of 47 tons to carry timber from the district to the regional centres. The third category includes those based in the regional centres who buy timber from either the village markets or district centres. In most cases this type of trader sells the timber to the final consumers in the regional centres and can therefore be regarded as a retailer.

The last category of timber traders is exporters of timber outside the country. Although some individuals are involved, companies are the main players in timber export. Limited involvement of individuals in timber export could be influenced by factors such as limited financial resources, inadequate market information (Karakaya and Harcar, 1999), and strict export regulations coupled with low knowledge of both domestic and international regulations governing the timber business (Hagen and Alvarez, 2011). It is worth noting that although the highlighted actors are placed and discussed under distinct categories, in practice at the village and district levels some actors are engaged in all the nodes of the value chain (i.e., production, processing and marketing). The criterion used to place them under a particular category was based on their main activity in the NIPF value chain. Figure 2.1 shows the main actors in the non-industrial timber value chain in the Southern Highlands of Tanzania.

Main	Nursery establishment	Tree growing	Sawmilling	Transportation	Trading	Retailing
Actors	Nurserymen	Tree growers	Sawmillers	Transporters	Traders	Retailers
Role or Activities	Produce seedlings for their own requirements and for selling to tree growers	Grow trees (mostly, *Pinuspatula*) for the purpose of earning income	Process logs into sawn timber; in this case they act as intermediaries between tree growers and traders. Also, they provide the service of hiring sawmills to people who do not own them	Provide transportation services	Buy sawn timber or standing trees, from which they get sawn timber for selling to retailers	Sell sawn timber to final consumers
Government regulation that actors must follow	No observed regulations guiding the operations	Harvest mature trees	Register sawmills	Transportation after 6 PM is prohibited. Open trucks are allowed to transport timber. Maximum weight permitted at weigh bridges is 47 tons.	Transit pass. Pay taxes	Business license. Pay taxes.

Figure 2.1: Actors in the NIPF value chain and their interaction with regulations

2.5.2 Regulatory framework

The Tanzania's 1998 Forest Policy (URT, 1998) and Forest Act no. 14 of 2002 CAP 323 (URT, 2002) are the two main documents governing the timber value chain. The Forest Regulations of 2004 help in operationalizing the Forest Act. A review of the policy showed that the Government of Tanzania has a political will of enhancing the growth of private forest plantations. This is manifested in various policy statements that seem to recognize the role of private forestry plantations in meeting the demand for wood products. Here is an example of one of the policy statements.

Policy Statement (38): An enabling environment and regulatory framework for the private sector involvement in forestry will be created through secured raw material procurement, training, research, and transfer of technology. Incentives and credit facilities for investments will be promoted and joint ventures will be encouraged.

Other relevant statements that show government commitment to the promotion of private forestry plantations are numbers 7, 9, 25, 27, and 39 (for details on this, see URT, 1998). However, besides the goodwill, the policy lacks a clear distinction between NIPFs and IPFs. Furthermore, the policy is mainly focuses on large-scale plantations. The lack of distinction has resulted in placing the two types of plantations under the same regulatory framework despite their many differences. This has partly resulted in high transaction costs, which the majority of actors in the NIPF value chain cannot afford. Similar findings have been reported in Cameroon, where Foundjem-Tita *et al*. (2013) argue that legislation and regulations are often conservation-oriented and do not provide clear distinction between products gathered from trees found in the wild and products gathered from farmers' fields. Also, Pedersen (2017) reports that in Tanzania, the forest policy pays more attention to the industrial forest plantations, and smaller actors in forestry only come

in under participatory forest management, which is more about conservation than production forestry.

2.5.3 Implementation of forest policy in NIPF

The government is the sole regulator of the timber value chain, and all actors operate under similar regulatory frameworks regardless of their levels of operations. Three main government organs are involved in implementing the policy. These organs include the Forestry and Beekeeping Division under the Ministry of Natural Resources and Tourism, the President's Office through Regional Administration and Local Governments (PMORALG), and the Tanzania Forestry Service Agency (TFS). The Forestry and Beekeeping Division is mainly concerned with policy development, law enforcement, monitoring, and evaluation of implementation of sectoral policy. The other organs, PMORALG and TFS, are mainly involved in the actual implementation of the policy. Their main roles include but, not limited to issuing permits, collecting revenues, and enforcement of forest legislations that are related to logging, processing, and marketing of forestry products. In addition, the Tanzania Revenue Authority (TRA) also collects various taxes, such as value added tax (VAT). Generally, the government regulations intend to set conditions to facilitate smooth operations of the various activities for the benefit of actors and the government itself; however, implementation of some regulations is accompanied by unintended effects to the chain actors, including the government.

2.5.3.1 Regulations at the harvesting node

A review of forest regulations and results of interviews with tree growers in the Southern Highlands of Tanzania show that there are few regulations at the harvesting and processing nodes, as opposed to the marketing node. Although the government would wish to control tree harvesting by imposing strict regulations, enforcement of the

regulations could be a challenge, given that NIPFs are scattered almost everywhere in the Southern Highlands, and controlling harvesting would require a lot of resources beyond government capacity. It therefore seems easier to control marketing, because it involves transportation where government officials can be placed at strategic points. Similar findings are also reported in Northen India whereby Rana and Chhatre (2016) found that in smallholder forest production; stringent regulations were not applied at the harvesting node.

During FGDs tree growers in reported that they are not bothered by government officials, even when they harvest premature trees. However, they acknowledged having received advice and directives from non-governmental organizations (NGOs) and government officials as well that they should harvest their trees after at least 15 years since planting. Interviews with Forest Officers revealed that premature harvesting has been a big challenge in the study area. Premature harvesting was attributed to rotation age of the pines (*Pinuspatula*), which is between 18 and 25 years. This implies that harvesting the pines before the age of 18 years would result in flooding the market with low-quality timber (juvenile wood). The official also observed that allowing tree growers to harvest premature trees would result in environmental degradation; this argument could not, however, be substantiated. They also argued that when tree growers harvest their trees between 7 and 8 years of age, they incur losses because they end up getting timber of small sizes (i.e. 1 x 4, 1 x 6, 2 x 3, 2 x 4, and 2 x 6). It was further explained that getting timber of large sizes (i.e., 1 x 8 and 1 x 10) that fetch premium price in the market is possible only when harvesting is done at the recommended age, which is at least 15 years.

Regarding how they deal with the challenge of premature harvesting, the Forest Officers reported that although the regulation demands harvesting of trees after 15 years at minimum, it is difficult to implement, as shown in the following quote:

Just imagine the government abandons the tree growers (they neither receive extension services, nor do they receive any inputs). From a moral standpoint it is difficult to intervene at harvesting time. However, after realizing that it is difficult to enforce the regulations, we just inform them about the advantages of harvesting mature trees. But we are aware that tree growers harvest premature trees because they have immediate pressing needs, for example, paying school fees for their children and paying for health services. Therefore, through the Tanzania Forest Fund (TFF) and in collaboration with development partners, we have facilitated some tree growers to start other income-generating activities such as beekeeping (KI Njombe DC).

This statement implies that it would have been easy for the officers to enforce the regulations had the government been accountable to tree growers through the provision of extension services and inputs such as fertilizer.

Responding to the accusation of harvesting premature trees, tree growers expounded that almost everybody is aware of the advantages of harvesting pines at 15 years. However, they face challenges that override their desire to wait. Wildfires and lack of alternatives to meet various household requirements were reported to be the major challenges. All members of FGDs from the three villages of Matiganjola, Nyombo, and Matembwe unanimously agreed that wildfires cause big losses. The following quote supports the explanation given by the tree growers about the loss caused by wildfires:

"*We have no good words to explain the losses caused by wildfires, maybe after this meeting, if you have time, I can show you some burnt woodlots …then you will understand what we are saying*."*(*a tree grower and a member of FGD from Nyombo).

The above statement implies that wildfire is a challenge in the tree-planting business in the Southern Highlands of Tanzania. There are different narratives regarding incidences of wildfires. Some people say fire is caused by reckless smallholder farmers who use it during land preparation for agriculture. Others say that wildfire is caused by arsonists, especially villagers who hold prejudices against urban-based local investors owning tree plantations in their villages. Yet, others said fire is caused by sawyers (working as casual labourers); fire escapes them during cooking.

Regarding lack of alternatives to meet household requirements, the views of members of FGDs were in line with the views of forest officers. They also acknowledged to have heard about Government interventions of supporting bee keeping activities and felt that it is an additional income activity. However, it may not reduce incidences of wildfires. This implies that premature harvesting may persist because bee keeping addresses the challenge of lack of alternative to other income generating activities but does not reduce the risk of wild fire. Fire can threaten the sustainability of small-scale timber farming (Mahlangu and Mubangizi, 2015). Thus, regardless of the narratives about fire, overcoming the challenge is paramount because it negatively affects tree growers in the Southern Highlands of Tanzania.

2.5.3.2 Regulations at the processing node

At a processing node the findings show that sawmills which produce plenty of saw dust are not permitted. It was pointed out by the District Forest Officers that sometimes a chainsaw is used for sawing timber. *"This is not allowed because it results in poor-quality timber and plenty of sawdust,"* said the District Forest Officer. Furthermore, it was explained that although currently many sawmillers use dingdongs, procedures to ban them are under way. If this regulation is strictly enforced, it could have a negative impact

on the incomes of many actors, especially smallholder tree growers and small-scale sawmillers. This is because small-scale sawmillers allow smallholder tree growers to sell sawn timber as an alternative to the selling of standing trees to larger-scale operators (Lescuyer *et al.,* 2013).

2.5.3.3 Regulation at the marketing node

The study findings show that before anyone opens a yard for selling timber, he/she must pay a registration fee, which is 261 000 Tanzanian shillings (TZS), equivalent to USD 118.1 per year. Besides the registration fee, each time timber is transported from the village to the yard, a transit pass (TP) must be obtained. The pass costs 7500/= TZS (USD 3.8) for a truck of not more than seven tons; and 15 400/= TZS (USD 7.5) for a truck of more than seven tons. Furthermore, the Tanzania Revenue Authority (TRA) collects the government tax known as value added tax (VAT), which costs 18% of the total value of the timber being transported. Also, since the introduction of the electronic receipt system, timber traders are required to show an electronic receipt of purchasing the timber. This was cited as a challenge, because tree growers do not provide electronic receipts to their buyers (timber traders). Interviews with the District Forest Officer (DFO) revealed that initially an introduction letter from the Village Executive Officer (VEO) was used, indicating that the timber was bought from tree growers' woodlots. However, recently TRA officials have been demanding electronic receipt from timber traders. To avoid delays, timber traders settle this by entering into informal agreements with TRA officials, resulting in corrupt practices. Similar challenges were also observed in the Philippines, where actors of the NIPF value chain face many challenges related to government regulations when they seek markets for their products, especially sawn timber (Maryudi *et al*., 2015). For example, in Southern Philippines Bertomeu (2008)

reports that farmers are required to pay harvesting fees to local officials although there is no legal basis for doing so.

Apart from the VAT collected by TRA, district councils also collect cess, which differs from one council to another. For instance, at the time of this study, Njombe District Council was charging 200/= TZS (USD 0.1) for a piece of sawn timber regardless of its size, while Njombe Town Council was charging 100/=TZS (USD 0.05) per piece of sawn timber. The difference in cess between the two district council results in higher transaction costs for timber collected from Njombe DC than for timber from Njombe TC. In turn, this reduces profitability among the actors, especially the tree growers.

2.5.3.4 Regulations for transportation

Another regulation concerns timber transportation. Although timber traders would wish to load a truck to its maximum capacity in order to enjoy economies of scale, they are limited by the weight permitted at the weighing bridge, which is 47 tons. This weight is equivalent to 3 500 pieces of timber. However, in some months this number drops during the rainy season because of two reasons. First, the timbers absorb water thus, gain more weight. Second, the roads to the timber sourcing points become almost impassable, hence, trucks carry fewer timbers (between 3000 and 3300 pieces).

These findings underscore the importance of using railway for cargo transportation that would enable the actors to enjoy economies of scale hence, increasing the competitiveness of the sector. Yet, another regulation concerns transportation only during the day. Trucks carrying sawn timber are not allowed to travel after 6:00 PM; this limits the number of trips that can be made hence, aggravating the negative effects of regulations on the actors of the chain. So that the government can monitor compliance,

there are many roadblocks where officials ensure that all transported timber complies with the regulations.

2.6 Strategies Used by Actors to Benefit from Timber

2.6.1 Tree growers

Actors adopt different strategies to ensure that they continue to benefit from the tree/timber business. Tree growers capitalized on the use of social relations or social networks to earn more income from selling trees. As advocated in the theory of access, tree growers heavily rely on friendship and trust. When they want to sell their standing trees, they hire knowledgeable people to help them estimate the value of woodlots. The hired person is paid some amount of money as a token of appreciation; however, depending on the density and cohesiveness of the social relationships, sometimes the estimator is not paid anything. In most cases, tree growers hire relatives or family friends who would not in any way collude with timber traders and/or middlemen to undervalue the woodlot. In line with these findings, Granovetter (2005) reports that social networks influence economic outcomes by impacting the flow and quality of information, so much so that the actors do not believe in impersonal sources and instead rely on people they know. In the Southern Highlands of Tanzania, a central mechanism for maintaining a positive social relationship is trust, which is a norm enforced through sanctions.[7]

Another strategy used by tree growers is the floating out of tenders so that timber traders and/or middlemen can bid; in most cases, the highest bidder is chosen to buy the woodlot. Also, some tree growers consult timber traders to buy their trees. However, in order to avoid collusion among timber traders, consultations are done with traders from different places (at least not from the same village).

[7] Some of the applied sanctions include not being trusted by others and social discrimination and/or exclusion. These sanctions lead to falling of one's reputation/credibility in the village community, which then becomes a source of livelihood insecurity.

Also, some tree growers chose to sell sawn timber instead of standing trees. Possession of financial capital is also important, though not sufficient for anyone to benefit from this strategy. Financial capital is used to hire chainsaws for cutting the trees, pay casual labourers, obtain the required permits, and pay all the taxes. However, as pointed out by Maryud *et al*. (2017), knowledge of the rules and regulations governing the sale of timber was an asset in order to sell sawn timber to profitable markets. Tree growers are not certain as to whether they are supposed to pay tax when they sell sawn timber. This uncertainty was pointed out as a reason for some tree growers to sell standing trees. Discussion with a Forest Officer revealed that growers are supposed to pay the value added tax of 18% when they sell sawn timber. He further pointed out that selling sawn timber to profitable markets requires some knowledge of the regulations governing the business and awareness of the documents required. Failure to adhere to the regulations involves penalty and therefore a loss to the person involved. Similar findings are also reported in Indonesia where Maryudi *et al.* (2015) found that low knowledge of the existing regulations negatively affected tree growers who could not earn more income. Furthermore, the findings underscore the complementary nature of capital and knowledge in gaining access to profitable markets among tree growers in the Southern Highlands of Tanzania. This resonates well with the argument that the mechanisms used to gain more income are heuristic; none is distinct or complete, and each form of access may conflict with or complement other access (Ribot and Peluso, 2003).

2.6.2 Sawmillers

Sawmillers are those who own timber-processing equipment. Sawmillers are very few at the village level—they know each other by name and seem to be economically better off than most of the tree growers. Their relatively higher income and ownership of sawmills put them in a favourable position relative to the tree growers. Their main business

strategy is to work for timber traders who hire them to process standing timber bought from tree growers. As a way of ensuring continued access to cheap timber and maintaining existing power relations sawmillers charge a high price for tree growers who seek to lease their sawmill for the processing of standing timber.

Some sawmillers also act independent of timber traders by buying standing trees and processing them, only then to sell to timber traders. In this regard, possession of the technology enables some sawmillers to become middlemen between tree growers and timber traders. This strategy enables them to obtain sustainable income, because their machines do not remain idle even when there are no people who are hiring them. Technologies and their associated networks of institutions and relations are termed "modes of extraction" (Bunker, 1985 cited in Ribot and Peluso, 2003). Another strategy of maximizing income was avoidance of paying the licensing (registration) fee. This was also confirmed by one of the key informants, who reported that currently small sawmillers are not registering their sawmills, although this is contrary to the law. Avoidance of paying the registration fee is made possible because there is lack of enforcement of the law on the side of responsible authority. Also, because sawmillers are not authorized timber traders, they don't transport their products into distant markets where they can be spotted by the regulators. They sell their products to timber traders who have the required paperwork.

2.6.3 Timber traders

The findings from discussions with timber traders revealed that various strategies are used. Timber traders in Njombe DC avoid paying cess at any gate in their District Council even when timber was collected from Njombe DC. Instead, they pay cess at any gate of Njombe Town Council (NTC), because the charge for a piece of timber is higher in

Njombe DC compared to Njombe TC. In Njombe DC, a piece of timber, regardless of its size, is charged 200 TZS, whereas in Njombe Town Council it is charged 100TZS. Therefore, a truck of 48 tons that carries between 3500 and 3700 pieces of timber is supposed to pay at least 700 000 TZS for cess in Njombe DC and 350 000 TZS in Njombe TC. Therefore, by avoiding paying cess to any of the gates in Njombe DC, a trader serves 350 000 TZS per truck. Remarking on this, a trader in Matembwe village said, "*The amount we save when we pay cess at the gates of Njombe TC helps ups to bribe officials all the way to Dar es Salaam*."

This implies that apart from barriers imposed by formal regulations, timber traders also have to overcome informal barriers in the form of corruption. Therefore, in this case, traders were using both legal and illegal mechanisms to gain more income from the timber business. This fits well with the access theory, which states that access is about all possible means by which a person is able to benefit from things (Ribot and Peluso, 2003). In providing reasons as to why Njombe District Council charges higher cess per piece of timber compared to Njombe TC, a key informant from Njombe DC said that each council has full authority to charge any amount it wants. However, more discussion revealed that the decision to charge a higher rate by Njombe TC was attributed to the separation of the two councils (Njombe DC and Njombe TC). After the separation, Njombe DC raised cess on timber so that it could meet the requirements of the local government act which demands District Council to be self-sufficient by 80% in terms of revenues, short of which the council has to be merged with another District Council. The difference in cess between the two councils affects actors in Njombe DC. Tree growers are affected, because all the costs incurred by traders are eventually included when tree growers and timber traders bargain for the price for trees. On the other hand, traders who buy timber from Njombe DC are affected, because in the market all timber is sold at the same price.

It is also evident that Njombe DC is losing a significant amount of revenues because of timber traders avoiding paying cess at the council's gates. This also affects development in the wards from which the timber is collected, because a certain percentage of revenue from timber is supposed to go back to the ward to facilitate development such as provision of social services.

2.7 Effects of Regulations on Incomes of Chain Actors

Actors of the timber value chain cited different ways in which regulations affect their income. During the FGDs tree growers reported that most of them were not selling their sawn timber because they could not afford the costs of the documents and taxes.

> "*Although we are aware that selling sawn timber is more profitable than selling standing trees, when we think of regulatory requirements—they are beyond our reach…*''A tree grower in Matiganjola village explained.

Also, tree growers reported that because of many taxes, timber traders pay them less when they buy their standing trees. The demand for electronic receipt by TRA officials was also perceived as an impediment to tree growers to selling their trees as shown in the following quote:

> "*Just imagine, as a tree grower, I sell my trees maybe once after 10 years, does it really make sense to buy an electronic fiscal device (EFD) which costs 800,000 TZS (USD 398) in order to provide electronic receipt to a person who will buy my trees?*" a woman tree grower in Matembwe asked.

As pointed out in the previous section, currently the issuing of an EFD receipt not only provides room for corruption but is also being used by timber traders as a basis for paying tree growers less when they buy timber from them (they demand to deduct 18% of the gross payment on the grounds that this amount is paid to TRA, although this is not always the case).

The requirement of trade registration was also reported to have a negative effect on tree growers. FGD participants in three villages of Matiganjola, Nyombo and Matembwe also reported that any tree grower who intends to transport timber to the regional market and the recipient of the timber (timber trader) are required to be registered by TFS. Copies of registrations with photographs of both the tree grower and the recipient of timber must accompany each load of timber delivered. This negatively affects the incomes of tree growers, because they are attached to one buyer; in case of disagreement between the tree grower (supplier) and recipient, the supplier cannot sell the cargo to another distributor, because doing so entails seeking another registration, which is costly. Various circumstances can lead to disagreement between the two parties; in some instances, a timber trader may demand to pay the supplier in installments until all the supplied cargo is sold out. Such terms may not be acceptable to the supplier. Also, sometimes, timber traders may propose to adjust the prices that were originally agreed upon, on grounds that delivery of the cargo has been delayed and that the market is already flooded with timber. Again, the supplier may not easily yield to these propositions.

Although small sawmillers did not feel any pinch from these regulations on their incomes, medium sawmillers (those owning stationary sawmills) had different opinions. The positive perceptions of small sawmillers toward regulations could be explained by the statement of a TFS official who reported that the regulation that demands owners of

sawmills to have a license had not yet started to be enforced on owners of dingdongs. On the other hand, medium sawmillers cited bureaucracy as an impediment in obtaining a sawmill license.

> "*We use a lot of money in making follow-ups of the license; sometimes the money we lose is almost equivalent to the cost of the license itself,"* Owner of a stationary sawmill explained.

Interviews with timber traders also revealed how timber traders are affected by the regulations. They considered various charges as exorbitant and negatively impacting their incomes and the sector in general. It was reported that because of many charges, the price of timber from the Southern Highlands was high in the market, and this affected the competitiveness of the sector. The regulations were reported to affect their incomes because of the existence of police checks, weigh bridges and banning transportation of timber at night, which negatively affect timely delivery of timber to various markets. This is revealed in the following quote:

> "*Sometimes we are not sure if the government really wants people to become successful in their business. Currently, a truck can only afford to do a maximum of two round trips per week (Njombe to Dar es Salaam). Without these regulations a truck can make up to four round trips per week*" a timber trader from Nyombo reported.

Timber traders also explained how the difference in cess between Njombe District Council and Njombe Town Council affects their income. This negatively affects incomes of traders who buy timber from Njombe DC, because timber from both councils is sold in

the same markets at the same price although traders from Njombe DC would have incurred more cost. Although this regulation may seem to affect only the incomes of traders who buy timber from Njombe DC, tree growers are also affected, because this cost is also included when negotiating the price of standing trees. As discussed in the previous section, Njombe DC loses revenue because of strategies adopted by timber traders.

2.8 Conclusions and Recommendations

This chapter has explored how the timber value chain is regulated and the consequence of the regulations on the incomes of the actors in the timber value chain. It can be concluded that although regulations are set to facilitate smooth operations of value chain activities, some of them have resulted in unintended negative effects for actors' ability to earn more income. Due to differences in access mechanisms among actors, some of them, especially tree growers, are most greatly affected by the regulations. Furthermore, differences among district councils in implementing the regulations aggravate the situation. Application of the theory of access has helped to understand the underlying reasons for unequal distribution of benefits among actors even though they operate under a similar regulatory framework. Among the eight access mechanisms, four of them, namely, technology, financial capital, knowledge of the regulations, and social relations, were relevant in the NIPF.

Generally, it can also be concluded that to gain more income actors have adopted both legal and illegal strategies to overcome the challenges imposed by the regulations. The illegal strategies reduce revenue of the council and, as a result, negatively impact the wards' development. It is further concluded that the illegal strategies are used more by those with more ability to benefit from the value chain activities (in this case, timber traders) than those with less ability, the tree growers. In order for NIPFs to contribute

significantly and sustainably to the income of actors, the government, through the Ministry of Natural Resources and Tourism (MNRT), should review the regulations governing the timber value chain.

Based on the study findings and conclusions it is recommended that barriers that limit tree growers and other actors from gaining access to the market should be minimized or completely removed. In addition, district councils should harmonize taxes that are charged on timber, because differences in the taxes charged compromise business competitiveness in the sector while allowing corrupt practices.

Because tree growers are the most-affected actors in the chain, the formation and/or strengthening of their associations for timber marketing would help them participate in the nodes with higher returns. Also, through associations they can lobby for regulations that are relevant to their context.

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CHAPTER THREE

3.0 Integrative and Exclusionary Roles of Trust in Timber Value Chain in the Southern Highlands of Tanzania

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3.1 Abstract

Integration of smallholders into value chains has emerged as an important development strategy for improving rural livelihoods. Contract and trust are the two main governance mechanisms that influence actors' integration into value chains. Nevertheless, most studies treat trust as a complement to formal contract, paying less attention on the circumstances in which trust becomes a sole mechanism of governance. Studying trust as a complement to formal contract makes trust appear as inherently good, something that undermines its dark side. The aim of this paper is first to identify the types of linkages present in timber value chain. Secondly, to determine the level of trust in the linkages, and thirdly, to examine how trust shapes integration in these linkages. The study was conducted in the Southern Highlands of Tanzania, a leading region in the Non-Industrial Private Forestry (NIPF). The study adopted an exploratory cross-sectional study design and the qualitative approach whereby data were collected mainly through in-depth interviews and focus group discussions with actors of the timber value chain. The findings show that spot market and relational governance were the two main linkages in the timber value chain. Spot market linkage is characterized by absence or little trust while some trust is present in the relational linkage. In relational linkage, trust helps integration of actors in the value chain through enabling them access market information, capital in the form of credit, technology for processing timber, and coordination and collaboration among the actors. However, trust is associated with some challenges and to some actors, it plays exclusionary role. The study concludes that although trust is promoted for its positive role in value chain, in some cases it may also play a negative role. Therefore the study recommends for the promotion of trust along with other social control mechanisms such as social knowledge in order to address these challenges.

Key words: Trust, value chain, integration, Tanzania

3.2 Introduction

Donors, development agencies and policy makers are now promoting a value chain approach as a pro-poor development strategy (Humphrey and Navas-Aleman, 2010; Bolwig *et al*., 2010; Degrande *et al.*, 2014; Mungandia *et al*., 2012). The proponents of the approach argue that by integration in the value chains, smallholder farmers are linked to high value markets hence, the possibility of improving their livelihoods (Chamberlain and Anseeuw, 2019). They further argue that integration in a domestic value chain is a precursor for participation in the global value chains (Beverelli *et al*., 2017). Despite these observations, there have been concerns regarding integrating smallholder farmers into a value chain, with the caveat that integration exposes smallholders to risks that might outweigh the benefits (Ricketts *et al*., 2014). In the study of charcoal value chains in Senegal, Ribot (1998) shows that a value chain integration can result into both positive and negative impacts to producers. Generally, literature shows that, governance of a value chain[8]influence the value chain integration and its outcome (Watabaji *et al*., 2016). However, value chain integration is also influenced by a host of other factors (Trebbin, 2014; Kilelu *et al*., 2017; Gramzow *et al*., 2018).

Literature identifies five types of value chain governance that exist on a continuum (Gereffi *et al*., 2005). At the extreme end of the continuum is the market, which is characterized by arms-length transactions and the hierarchy, which is characterized by vertical integration and managerial control. The three governance types in the middle are referred to as network governance; and they include modular, captive, and relational governance. While modular and captive rely on contract as their governing mechanism, relational governance relies on trust and social ties (Gereffi *et al*., 2005; Altenburg, 2006).

[8]Here governance connotes the relationship between actors of the value chain and the mechanisms used to control it ((Gereffi and Humphrey, 2005; Ingram *et al.*, 2014)

Modular and captive governance are more prominent in developed countries while relational governance is common in developing countries where most transactions occur through social relations embodied in trust (Murith *et al.,* 2019; Saka-Helmhout *et al.,* 2019). Nevertheless, in developing countries Tanzania included most studies on value chain have focused on the role of contract in integrating smallholders in the value chains (see Wang*et al*., 2014). When the role of trust is analyzed, it is with regard to how trust complements the formal contract in integrating smallholders in the value chains (for details see Watabaji *et al.*, 2016). These studies attach greater importance to contract and use the term institutional void to describe the market environment where formal contracts are absent or not prevalent (Trienekens, 2011; Murith *et al.,* 2019). Generally, these studies overlook the context in which trust serves as a sole mechanism of governance and thereby undermining its importance. This has important implications on how trust is promoted in the value chains. Therefore, the goal of this paper is to examine the integrative and/or exclusive roles of trust in timber value chain in the Southern Highlands of Tanzania. Since trust is built in relationships (Hilary *et al*., 2017), the study aimed at i) identifying the types of linkages present in timber, ii) determining the level of trust in the linkages, and iii) examining how trust shapes integration in these linkages.

The significance of this study is twofold. First, it is based on economic importance of NIPF in the Southern Highlands of Tanzania. Research shows that NIPF from which timber is obtained accounts for 72 percent of the tree planted area and 88percent of the private forest plantation area in Tanzania (Asiad, 2016). The contribution of NIPF to livelihood is also substantial; for instance, according to Nkwera (2010), NIPF contributed 61 percent of the households' income and 73 percent of the households' physical assets in Mufindi District. Thus, a study on how smallholder tree growers and other value chain actors are integrated or excluded in the NIPF value chain is important in order to identify

leverage points for improvement. Secondly, the study contributes to the literature on value chain governance by unpacking the role of informal institutions (trust) in governing value chains. The rest of the paper is structured as follows. The next section explains the two key concepts of trust and value chain integration (VCI). This is followed by a section that links the two concepts. Thereafter, the study's methodology is presented followed by the presentation and discussion of the findings. The last section presents the conclusions and recommendations.

3.2.1 Trust and value chain integration

Trust has been defined differently by researchers in different disciplines. According to McKnight and Chervany (2002), 'trust' elicits confusion because every discipline views trust from its own unique perspective. In this regard, the consensus among scholars is that trust is a complex construct, which is difficult to define and operationalize (Nunkoo, 2017; Robbins, 2016). In the analysis of definitions across disciplines Rousseau and colleagues, observe that, trust widely refers to a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another (Rousseau *et al.,* 1998). However, Akrout and Diallo (2017) argue that defining trust based on psychological viewpoint captures only the cognitive dimension of the construct, ignoring its emotional and social dimensions. Li (2012) argues that, it is insufficient to define trust as a psychological attitude. Accordingly, Li (2012) considers trust as a choice or decision about trust behaviour. Li (2012) highlights further that, trust can only matter if it results in specific trusting behaviours that make the one who trusts vulnerable to the trustee, for instance engaging in exchange for co-operation via an informal handshake rather than a formal contract. In this paper, trust describes a long-term business relationship between actors of the value chain where

parties know each other better such that transactions are based on informal agreement and no party exploits another's vulnerability (Sabel, 1993).

Like trust, value chain integration, also referred to as participation or inclusion in other studies (Tobin *et al*., 2016), has been conceptualized differently. Consequently, it elicits different meanings to different people and contexts (Fernandez-Stark *et al.,* 2012; Watabaji *et al.,* 2016; Chamberlain and Anseeuw, 2019). Rousseau *et al.* (1998) suggest that a complex concept can be well studied by examining its different dimensions. Accordingly, I conceptualize integration based on the four pillars model for sustainable integration of smallholders in the value chain proposed by Fernandez-Stark *et al.* (2012). This "holistic" model is geared at overcoming major constraints that limit the competitiveness of small and medium-sized producers in value chains. The dimensions of the model include access to market, access to training, building collaboration and coordination, and access to finance (Fernandez-Stark *et al.*, 2012). Fernandez-Stark *et al.* (2012) argue that access to these pillars, creates an opportunity for smallholders to become competitive and participate in value chains in a sustainable manner. The next section briefly explains the four pillars.

Access to market: The model describes access to market as the presence of value chain linkages between producers and buyers; and how the linkages are established. It is argued that building linkages between producers and buyers enables producers to capture as much value as possible. However, due to various factors such as geographic, cultural, and education smallholders are not directly linked to the final buyers. As Humphrey and Navas-Aleman (2010) observe, effective intermediary plays an important role such as translating buyer's needs for the small producers and facilitating a relationship where social, economic, and language barriers may prevent direct interaction. They suggest that

the proximity with the final buyer depends on the level of development of producers. This implies that intermediaries can be bypassed in the value chains where producers have a high level of expertise and where they are well organized.

Access to training: The model emphasizes on specific training to improve productivity, product quality, comply with standards and other certification requirements. These would help smallholders gain access to national and international markets (Fernandez-Stark *et al.*, 2012). In the context of this paper, access to strategic information that improves competitive advantage of tree growers was used as a proxy indicator of access to training.

Coordination and collaboration building: Horizontal coordination and collaboration and vertical coordination and collaboration play an important role. Among others, the horizontal coordination and collaboration helps smallholders achieve economies of scale and sharing of information among themselves. On the other hand, vertical coordination and collaboration help organized producers to interact with other chain actors and understand how the chain is structured and what role the actors play. Furthermore, vertical coordination and collaboration can reduce information asymmetry (Fernandez-Stark *et al.,* 2012).

Access to finance: as Fernandez-Stark *et al.* (2012) argue, access to finance is important in gaining entry into a value chain; this is because of the required investments including infrastructure, buying equipment and obtaining of the necessary documents. Most smallholders lack or have limited access to finance; therefore, it becomes difficult for them to be integrated into the value chains. Hence, access to finance is required to overcome the limitation (Fernandez-Stark *et al.,* 2012).

3.2.2 The role of trust in value chains

Like formal institutions, informal institutions influence the environment in which business relationships occur (Marosevic and Jurkovic, 2013; Saka-Helmhout *et al.*, 2019). The institutional context and social relationships shape both distributive and regulatory outcome (Degrande *et al.*, 2014; Hamilton-Hart and Stringer, 2016). Literature (Li, 2007, 2008, 2012) shows that the role of informal institutions becomes important in the environment with high business uncertainty, high chances of failure of formal contract and long-term interdependence. However, there exists a tension between sociologists and economists regarding how the informal institutions influence production and exchange in the value chain. Rooted in the work of Granovetter (1985), sociologists posit that any economic exchange is embedded within the social structures and relationships where trust plays a fundamental role for the transaction to occur. Therefore, it is important to consider these relationships when analysing transactions.

On the other hand, the economic conceptualization of the role of institutions is influenced by the work of Williamson (1981) where the relationships between buyers and sellers do not result into trust but, rather provide an institutional mechanism through which the behaviour can be monitored (Hamilton-Hart and Stringer, 2016). In other words, in economics, trust is treated as a rational choice. The tension between the two disciplines is rooted in the main dimensions of trust – relational, affective, and cognitive. While sociologists emphasize on relational dimension, the economists base their arguments on cognitive dimension. However, studies have shown that in most circumstances trust is a blend of these dimensions (Lewis and Weigert, 1985; Emborg *et al.*, 2020). As Lewicki and Wiethoff (2000) have shown, at the beginning, calculus-based (rational) trust dominates. Rational trust is grounded on the rewards to be derived from maintaining trust and fear of punishment upon its violation. However, after repeated transactions, calculus-

based trust leads to relational trust where there is little or no need for monitoring behaviour of each other (Lewicki and Wiethoff, 2000). For the purpose of this paper and in line with Villena *et al*. (2011) trust is conceptualized as a relational phenomenon. The next sections highlight the role of trust in value chain integration, and the way trust is empirically approached.

Literature shows that trust serves important roles in value chain integration. According to Humphrey and Schmitz (2002), any transaction is associated with costs and trust reduces such costs. The cost may be related to negotiation, information sharing, designing, and enforcement of contract (Gulati and Nickerson, 2008). Higher transaction cost limits smallholders' integration into value chain due to low economies of scale, poor connectivity to markets, and information asymmetry (Pingali *et al.*, 2019). Therefore, by reducing such costs, trust facilitates integration in the value chain, by enabling collaboration between actors (Akrout and Diallo, 2017). A value chain characterized by high level of trust, actors share knowledge, information, and reduces opportunistic behaviour (Gërdoçi *et al*., 2016). Furthermore, trust aids access to finance by the chain actors (Mohammed *et al*., 2013; Heikkilä *et al*., 2016). According to Fernandez-Stark *et al*. (2012), finance can be used for investing in the value chain for instance buying necessary equipment for producing various products or moving into higher value activities. Broadly, studies show that high level of trust helps strategic alliances to flourish (Hunt *et al*., 2002) and makes the value chain more competitive (Barney and Hansen, 1994; Hardman *et al*., 2002). However, trust can also lead to the exclusion of some actors from the value chain. In this case, exclusion is not the opposite of inclusion but of access (Hall *et al*., 2011). Literature on integrating actors into value chains suggests three kinds of exclusion. Expelled actors – those who withdraw from the value chain due to pressure or coercion; excluded actors – those who never participated in the value chain

either by choice or lack of capability (Bolwig *et al.*, 2010), and those who continue participating under adverse terms (Hospes and Clancy, 2011). In this paper, the role of trust in value chain integration is examined by analyzing how relational governance influences actors' access to market, finance, information sharing and in building collaboration and coordination between actors of the timber value chain.

3.3 Methodology

3.3.1 The context of the study area

The study was conducted in the Southern Highlands of Tanzania, specifically, in Njombe District in Njombe Region. Both the region and the district were purposively selected based on the presence of many NIPF plantations. Statistics shows that between the two leading regions, Njombe has about 78 065 ha while Iringa has 46 593 ha of NIPF plantations (PFP, 2017). In terms of NIPF planted areas, Njombe and Makete are the leading districts with 36 449 ha and 27 696 ha respectively. Other districts have less than 20000 ha of NIPF plantations each. Although most of the interviews took place in three villages of Matembwe, Matiganjola, and Nyombo, other interviewed value chain actors came from outside the three villages. It is also important to note that most of the timber from Southern Highlands of Tanzania is consumed within the country. Thus, local linkages are predominant in the timber value chain. In these linkages, there are no written contracts; this, provides good environment for relational mechanism to thrive.

3.3.2 Research design and methods for data collection

Trust is one of the many concepts that are not easily quantifiable and therefore they can be studied well through qualitative methods (Seppa¨nen *et al.*, 2007). In this regard, I adopted an exploratory cross-sectional research design and the qualitative approach to data collection which are well suited for understanding the phenomena within their

context. The design was considered appropriate in uncovering how trust shapes integration of actors in the timber value chain (Campbell and Gregor, 2002). The main methods used for data collection were key informant interviews (KIs), Focus Group Discussions (FGDs), and individual in-depth interviews with the main actors of the timber value chain comprising tree growers, saw millers, timber traders, and retailers. A slightly different semi-structured interview guide was used to collect the data from each category of chain actor. The discussion guide included topics, which sought to uncover the forms of linkages, and the actors involved in these linkages, the governance mechanisms, the reasons for engaging in the linkages and the benefits/cost accrued, the duration of these linkages, and the level of trust in the linkages. Except for retailers, all other interviews were conducted in Njombe District. Interviews for timber retailers were conducted in Morogoro Region because most of the interviewed timber traders reported to have business relations with retailers in Morogoro.

3.3.3 Sampling and data collection

Purposive and snowballing sampling were used to get respondents. The number of respondents for each category of actors was determined by the saturation point – a stage where more data do not necessarily lead to more information (Mason, 2010). Since good cooperation between the researcher and the respondents improves the information collected, rapport was built and maintained with the respondents by adopting the tactics suggested by Abbe and Brandon (2014). Some of the adopted tactics include explaining the goal of the research and the manner in which data would be used, and continued contact (the researcher stayed for one month in Matembwe village), followed by four rounds of visits in the study villages. Others include active listening, mimicry (for instance, mirroring speech rate and linguistic patterns) and self-disclosures to help establish common ground.

Furthermore, the validity of research findings was enhanced by triangulating the data collected (Mathison, 1988). As suggested by Schaefer and Alvesson (2020), the researcher adopted an intra and extra source critique methods of triangulation. This implies that where the information gathered from informal talks or from FGDs contradicted information gathered through semi-structured interviews, a call was made to the respondent to seek for more clarification on the issue and when similar information was given, the issue was explored in detail in the following interviews with key informants and other respondents. When the issue was also confirmed through either of the methods, it was regarded as new insight.

Key informants interviewed were leaders of tree grower organization, Forest Field Officers in Matembwe village, the Manager of Matembwe Timber Market and the Manager of Matembwe Village Company (MVC). In addition, nine (9) FGDs, three (3) for tree growers, three (3) for timber traders and three (3) for saw millers were held in the study villages. Recruitment of FGD participants was based on the experience of the member in a node. Although deliberate efforts were made to include men and women for each FGD, in the three study villages, no women were reported to be involved in sawmilling; thus, all FGD participants for saw millers were men. In each category, FGD participants ranged from 7 to 15. All FGDs were conducted at village offices and the time taken for each FGD ranged between 45 and 90 minutes.

About 25 interviews were held with tree growers, 13 of whom had membership in the tree grower association and 12 non-members. Each category of tree growers consisted of small, medium, and large tree growers[9]who were selected based on the size of their woodlots. For timber traders a list of timber traders with timber yard was obtained from

[9]Based on FDT (2015) baseline survey that indicated total land size owned by tree growers, those with less than 5 acres were regarded as small, 5 – 20 acres as medium and more than 20 acres as large tree growers (FDT, 2015:17).

the manager of Matembwe timber market. Accordingly, interviews were held with 23 traders, 12 of whom owned timber yard at Matembwe village market and the rest (11) did not own timber yards. The names of traders without timber yards were obtained through snowballing. Similarly, traders were purposively recruited based on their level of capital. During discussion with timber traders, it was explained that the level of capital determines the type of market accessed. That is traders with smaller capital sell timber at the village market while those with average capital sell at the district hub and those with larger capital sell in regional markets. Therefore, the place of selling and the frequency of supplying timber in the respective markets were regarded as the proxy indicators for capital.

All saw millers found in the three villages were contacted and interviewed because they were very few. Saw millers play double roles in the timber value chain: they provide the services of sawmilling but also, serve as middlemen between tree growers and timber traders. The names of the saw millers were obtained from the village leaders and others were obtained by snowballing. Thus, 11 sawmillers, three (3) from Matembwe village, five (5) from Nyombo, and three (3) from Matiganjola village were interviewed.

Semi-structured individual interviews were also conducted with timber retailers in Morogoro Municipality. In order to interview retailers who received timber from the study area, the research adopted Ekici's (2013) approach. In this case, timber traders were asked for the names and contacts of retailers in Morogoro Region to whom they supply the timber. By using this strategy, nine (9) retailers were contacted and interviewed whereby eight (8) were from Fire timber Market and one (1) retailer was from kwa Chambo. Furthermore, informal interviews were held with two friends who are also

timber retailers at Nanenane grounds. The first is a member of academic staff at Sokoine University of Agriculture while the second was a PhD student at the same university.

3.3.4 Measuring trust in timber value chain linkages

Questions about assessing trust were adapted from a Handbook for Value Chain Research by Kaplinsky and Morris (2001). According to Kaplinsky and Morris (2001), a value chain characterized by high level of trust there is long-term[10] trading relationship between parties. In addition, there is limited or no competition for buyers (no bidding); the contract is informal and flexible. With respect to inspection of the cargo, there is little or no inspection of the delivered cargo. Regarding the degree of dependence, there are fewer customers for suppliers hence sellers are dependent on their customers. In addition, buyers provide technical assistance to the suppliers, for instance the technology required to produce quality product. Furthermore, buyers extend soft credit or cash advances to sellers and in turn, sellers supply the products on credit because they trust the buyers. Besides, communication between parties is usually informal, price determination is non-adversarial, and payment is on time[11]. These characteristics resonate with the definition of trust used in this paper because they are grounded on long-term informal relationship and on the belief that the interest of each party is protected despite the informality guiding the transactions. Therefore, the level of trust was measured by exploring the respondents' perceptions regarding each characteristic in the linkages of timber value chain.

There are two strategies suitable for measuring perceptions. Taber (1991) demonstrates that in the deductive or positivist strategy the researcher specifies constructs in advance

[10]In the context of this paper long term relationship was intuitively regarded to be three years and above.

[11] In this paper, supplying timber on credit was regarded as timely payment if the agreed period of payment was observed. In situations where the agreed period of payment was not honoured, this was regarded as delayed payment, an indication of low trust.

and the respondents are given standardized instruments to operationalize the constructs. On the other hand, in inductive (also referred to as interpretive) the researcher develops a theoretical construct from the respondents' interpretations of their experiences (Taber, 1991:579). Evered and Louis (1981) describe the former strategy as inquiry from outside and the latter as inquiry from the inside. In this study, open-ended questions to explore the respondents' perceptions were set from the 10 indicators of trust (Kaplinsky and Morris, 2001).

Next, textual responses were coded following steps of coding open-ended questions as suggested by Braun and Clarke (2006). Following M4P (2008), the responses were assigned numerical levels that represent the level of trust as follows: -1 represents distrust, 0 – no trust, 1 – little trust, 2 – some trust and 3 – full trust. The levels of trust were assigned following established criteria (for details see M4P, 2008). For instance, for the indicator of length of trading relationship, 0 was assigned if no relationship existed, 1 was assigned if the relationship was between 0 and three years, 2 if it was 3 years, and less than 5 years and 3 if the relationship was 5 years and above. The length of trading relationship was not expected to be negative. Therefore, negative numbers were not assigned for this indicator. As suggested by Boone and Boone (2012), after assigning the numbers, the mean scores of responses at various interfaces were computed. To get the level of trust at each interface, the mean scores were compared with the four levels of trust.

3.3.5 Data processing and analysis

Other qualitative data were transcribed, after which a thematic analysis was done by following the steps as described by Braun and Clarke (2006). After familiarization with the data through reading and re-reading, a non-systematic labeling of data was adopted

(i.e. in some instances, sentences were labeled whereas in other sections or paragraphs were labeled). This process generated 66 labels (referred to as codes in this article). The coding process was done at a semantic level that is the codes communicate explicit meaning of the sentences, paragraphs, or sections. Similar codes were grouped together to generate themes and sub themes. The generation of themes used a deductive or top down approach (Hayes, 1997; Braun and Clarke, 2006; Maguire and Delahunt, 2017) whereby the identification of themes was driven by the researcher's theoretical interest (a theory-led thematic analysis). However, this was carefully done to allow new insights, which might not be explained by the guiding theoretical framework. Theme mapping resulting into thematic matrix allowed descriptive analysis of relationships between and among themes.

3.4 Results and Discussion

3.4.1 Forms of linkages

In this sub-section, linkages for different value chain actors are identified and discussed. As indicated in Figure 1, two main forms of market linkages were found in the timber value chain. The thin solid arrows illustrate spot market relationships whereas the thick solid arrow illustrates areas where transactions are performed through relational governance. The thin dotted arrows indicate movements of logs.

3.4.1.1 Linkages of tree growers

Figure 3.1 shows that tree growers were in relationship with middlemen and wholesalers (category 1) through market and relational linkages. The findings show that market relationship was dominant between tree growers who sold standing trees and middlemen or wholesalers. In this case, tree growers sold standing trees by selling either a whole compartment or individual trees (selective harvesting). However, it is also worth noting

that some middlemen operated as saw millers, therefore they provided sawmilling services and bought standing trees from the growers. The findings from in-depth interviews with tree growers indicated that tree growers who sold standing trees were free to sell to anybody and the price was the final determinant of transaction. Tree growers also sold sawn timber to wholesalers and these were linked by both market and relational governance. In-depth interviews with tree growers revealed that those who sold sawn timber were those who could afford the cost associated with timber processing including payment for labourers and hiring mobile sawmill. The findings showed further that selling sawn timber required some knowledge of the market. That is, before harvesting trees, one needed to know where and to whom timber would be sold because keeping sawn timber for long time leads to quality deterioration resulting to lowering of the price of sawn timber. These resonate with Ribot and Peluso (2003) who underscore the importance of capital in getting access to benefits. Nevertheless, the findings also imply that although capital is required, it is not sufficient for accessing the market – other factors, for instance access to market information are equally important (Fernandez-Stark *et al*., 2012).

The study findings further show that in some cases, tree growers who sold sawn timber were those who had relatives dealing with timber business. Their relatives gave them credit for processing trees, guaranteed them market for sawn timber or both. These findings were partly confirmed by the observation from one of the key informants who reported to have sold sawn timber because her son was a wholesaler and her young brother was a retailer;

> *For me, I have no problem with selling trees because my son is a wholesaler and my young brother is a retailer who operates timber yards in different regions. When I want to sell my trees, I call my son to buy my trees or help*

> *me process them. The sawn timber is sold to his uncle who owns timber yards in Morogoro and Dar es Salaam (A female key informant, Matembwe village 22nd November 2017).*

This observation implies that social relations were used for getting access to market and value addition to trees. The use of social relations in gaining access to benefits was also observed by Ribot (1998) in his study on forest profits along Senegal's charcoal commodity chain. It was found that merchants used their social ties with powerful individuals who exerted influence on Forest Service to deliver extra quotas to the merchants.

In terms of cost and benefits accrued, the findings from the FGDs with tree growers show that growers who sold sawn timber to wholesalers gained more income than those selling standing trees to middlemen. More income was gained due to value addition obtained by processing the trees. Nevertheless, the findings show that most of the tree growers were linked to middlemen due to factors such as limitation of capital for processing their trees. Similarly, it was reported that although selling sawn timber through relational linkage provided more income, growers engaged in this linkage could not sell sawn timber to any person except to those with capital. Sometimes other traders offered higher prices than the price offered by a relative, this would tempt growers to sell timber to such traders. However, if this happens, the result is family conflicts.

Apart from vertical linkages, the study findings show existence of horizontal linkages through tree grower association (this is not indicated in Figure 3.1). Growers with membership in grower association reported to have benefited more from linkages through associations than linkages through middlemen and wholesalers. Notwithstanding the

benefits of horizontal linkages, few tree growers had membership with grower associations. For instance, in Matembwe village, records showed that out of 675 households, only 75 (11.1%) households had membership with Matembwe Tree Growers Association (UWAMIMA) in the village. In-depth interviews with growers without membership in the association suggest the existence of barriers that discourage them from joining this growers association. Some of the barriers include the subscription fee, which is set at 50 000 TAS and a monthly fee of 1000 TAS. Furthermore, a new member was supposed to pay all monthly fees equivalent to 1000 times the number of months since the existence of the association. In addition, low number of tree growers joining the association could be associated with history of cooperatives whereby due to past experience of cooperatives in Tanzania, farmers had become sceptical of joining cooperatives (Mruma, 2014).

3.4.1.2. Linkages of wholesalers

The findings show that, the first category of wholesalers was linked to both retailers in the district market and to the second category of wholesalers through market relationships. However, in contrast with the market-based linkage for tree growers, sawn timber was the only item transacted. It was reported that selling sawn timber to the second category of wholesalers generated less profit than selling it to retailers in district markets. However, those who were linked to the second category of wholesalers reported to have done so to avoid the cost of transport, transit pass, and tax clearance. These costs were avoided because transactions were done at the village level implying that category 2 of wholesalers paid them when they transported timber to the regional markets. Timely payment where payment is done promptly after the cargo was delivered, was among the reported advantages of selling sawn timber both to the second category of wholesalers and to retailers in the district market. Wholesalers demanded prompt payment because

they have less capital, that is selling timber on credit would mean being out of the business for some time. On the other hand, the buyers could afford to pay them because sellers in the district market supplied few pieces of timber unlike sellers supplying timber in the regional market.

The findings from the in-depth interviews with the first category of wholesalers revealed that they would like to sell timber to regional markets, but they were limited by low capital. One needs to have enough capital to buy about 3500 pieces of timber that can fill the track. This implies that due to long distance to the regional markets, economies of scale must be achieved in order to get profit. In addition, a high working capital is required because timber is supplied on credit and payment is by instalment. Moreover, for a wholesaler without enough capital one must wait for at least two to four months before supplying another consignment.

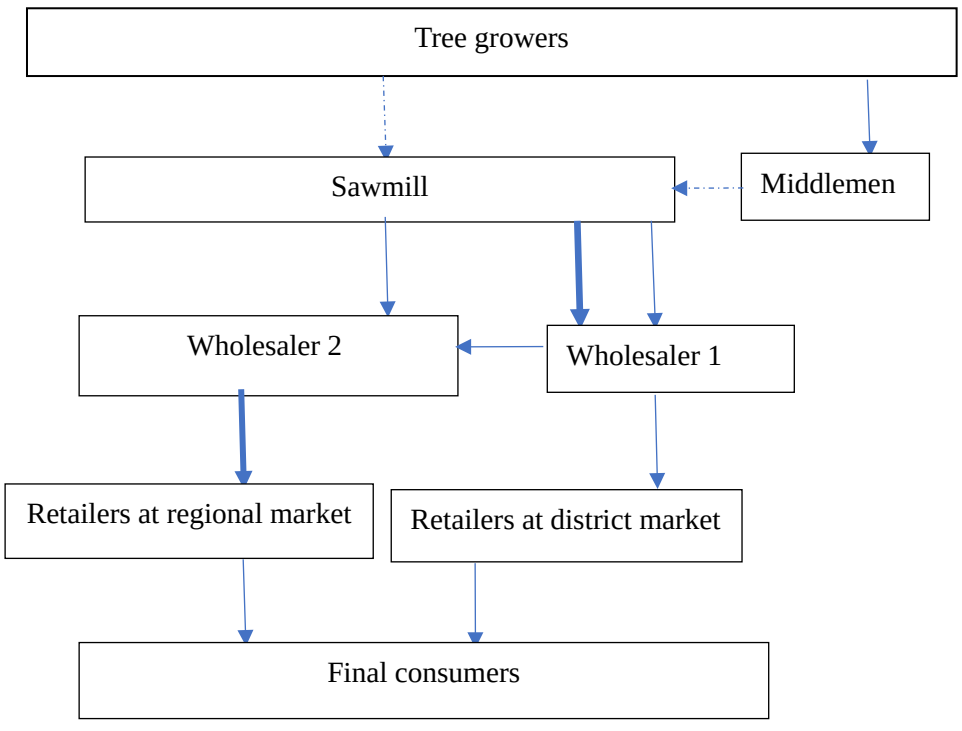

Figure 3.1: Market linkages in timber value chain

Key: Relational
Market
Movement of logs

Regarding the linkages of the second category of wholesalers, these were linked to regional markets through relational governance characterized by informal agreements, which is based on mutual trust and ethnic ties. Timber was sold to retailers who finally delivered it to the final consumers. The findings from secondary sources showed that about two thirds of timber is consumed in the construction industry while the rest goes to the furniture industry (PFP, 2016). The findings from in-depth interviews with wholesalers and retailers showed that relational linkage provided benefits to both. The benefits obtained by the wholesalers were good price for timber in regional markets compared to any other domestic market.

In addition, selling sawn timber to the regional market assured wholesalers of reliable market due to informal agreement with retailers to supply them timber. Furthermore, occasionally retailers provided credit to their suppliers and the repayment is made by supplying timber. Besides, wholesalers received market information regarding the type of timber mostly demanded by the consumers. Apart from the benefits enjoyed, timber was supplied on credit and the payment was by instalment. Another concern was delayed payment where it was reported that it could take two to four months to receive the whole payment. The third concern was related to losses resulting from unfaithful retailers who decide to relocate to unknown places to evade timber debt payment. Losses were incurred through enforcement of informal quality standards that leads to the rejection or receiving lower prices for some timber. On the other hand, retailers reported to have been receiving reliable source of timber supplied on credit through relational linkage. As reported in other studies (Vieira and Traill, 2008), a long-term relationship between retailers and wholesalers helps to build trust which in turn helps the retailers to lower transaction costs and more importantly to get quality timber.

3.5 The Levels of Trust in the Timber Value Chain

This section discusses the level of trust at three interfaces: between tree growers and middlemen, between tree growers and wholesalers, and between wholesalers and retailers. The ten indicators of trust highlighted in the previous section were used to calculate the level of trust at each interface. Although the level of trust was assessed using a five-point scale, only three levels were found.

At the interface of tree growers and middlemen, the findings show that only one indicator of trust related to the payment had a positive value. The findings from the in-depth interviews with tree growers revealed that payment was done in time because middlemen were only allowed to harvest trees after paying the agreed amount. The rest of the indicators had zero or negative values leading to a zero mean score for all observable indicators of trust. This implies the absence of trust at the interface of growers and middlemen. The findings showed negative value regarding price determination perhaps because the interface was characterized by opportunistic behaviour by middlemen.

At the interface of tree growers and wholesalers, the findings of the in-depth interviews with tree growers and wholesalers show a mean score of one for all observable indicators of trust. This indicates that this interface was characterized by little trust; which could be explained by a mix of market and relational linkages found at this interface. While relational linkages provide good environment for building trust, market relationships do not offer enough time for building trust, and as already explained, it is associated with opportunistic behaviour.

Regarding the interface of wholesalers and retailers in regional markets, the findings show a mean score of 2 for all observable indicators of trust. This indicates that there was

some trust at this interface except for three indicators including contractual relationship, provision of technical assistance, and duration of payment. The presence of some trust might be associated with the nature of relationship between the wholesalers and regional market retailers. Relational linkage was dominant and was characterized by trust and ethnic ties where most of the wholesalers and retailers reported to originate from either Iringa or Njombe regions. Domination of some ethnic groups in relational linkage might be explained by the fact that sharing the same ethnicity favours establishment of trust thus facilitating smooth transactions (Werbner, 1990; Chao and Moon, 2005; Altinay *et al*., 2014). In sum, the findings show that at the interface characterized by spot market there was absence or low level of trust, but there was some trust with the interface dominated by relational linkage. The next section discusses the implication of the level of trust by analyzing the association between trust and value chain integration. In other words, it analyzes how trust is related to access to market, finance, information, and collaboration and coordination.

3.6 The Role of Trust in Timber Value Chain Integration

The study findings show that the level of trust in timber value chain ranged from absence of some trust to the existence of some trust. At the interface of the grower and middlemen, the findings show that, there was no trust. FGDs of tree growers and middlemen confirmed this by showing how the relationship between tree growers and middlemen is characterized by opportunistic behaviour and distortion of market information. Tree growers explained how middlemen misinform them about the price of standing trees in order to increase their negotiation power and gain more income.

On the other hand, saw millers, who also operated as middlemen revealed that not only do middlemen distort price information when they approach growers to buy their trees, but

also they charge high price for tree growers who seek to lease their sawmill for processing standing trees. In line with the four-pillar model, it is argued that tree growers are theoretically integrated in the value chain because of limited participation in higher value chain activities. Although limited participation is associated with many factors, adversarial price determination and limited or distortion of market information which are the salient features of mistrust or absence of trust aggravate the situation. These findings are in line with the findings of a study by Nguni (2014) who found that growers of fresh fruits and vegetables in Zanzibar suffer from limited information that could help them to upgrade from market to long-term cooperation with buyers.

At the interface of tree growers and wholesalers, the study also shows the presence of little trust. The study found that tree growers who sell sawn timber have, in most cases at least one member of their family engaged either in timber processing, wholesaling, or retailing. These family members act as a source of market information and in some cases facilitate timber processing by providing credit or offering to process timber without overcharging the grower as highlighted in the following quotation:

> *As a strategy to make good profit we undervalue the woodlots. However, I cannot cheat my mother about the price of a woodlot; but also, I cannot pay beyond the normal price because I also want to stay in business. Also, this applies when she wants to sell sawn timber, I would charge her the market price for timber processing (saw miller in Matiganjola village, 21st July 2017).*

Although the above quote was given by the sawmiller, he also operates as a middleman by buying trees from growers, processes them, and then sells sawn timber to wholesalers. Various implications can be inferred from the quotation. First, it shows the existence of

cheating practices an indication of low level of trust. Secondly, it shows how collaboration and transparency among actors, an indication of high level of trust, can benefit the value chain actors. In addition, it shows how limited access to market information maintains the existing power relations among actors. Akin to the findings of Agyekumhene *et al.* (2018) who observed that access to credit in maize value chain in Ghana were highly influenced by trust between actors, the quotation of the saw miller also implies that, trust is a social capital which facilitates access to credit and technology for processing timber.

At the interface of wholesalers and retailers, the findings show that some trust exists. Retailers explained how trust helps them to remain competitive in business by avoiding various transaction costs. Getting timber on credit is perceived by the retailers as a loan without interest. This is indicated in the following quote from a retailer during interviews;

> *I receive timber on credit and pay as the cargo is sold out. With this kind of arrangement, I have no need to take a load because my supplier is reliable. Upon delivery of the cargo, I pay only the cost of transport and a return fare for my supplier… (*A Timber Retailer, Fire Timber Market in Morogoro, 17thNovermber 2019).

On the side of the wholesalers, the long-term relationship with retailers has resulted into building trust that ensures reliable access to “profitable” markets. However, in some cases, trust as a tool for timber value chain governance, has excluded some wholesalers from supplying timber in the regional market under the guise of lacking or having low level of trust. In-depth interviews with wholesalers revealed that although some trust exists, retailers are more powerful than are wholesalers. Therefore, in some cases, wholesalers need to agree with the retailers’ decisions without much negotiation.

Explaining how he was stopped from supplying timber in Morogoro, the wholesaler pointed out the following;

> *I was stopped from supplying timber to two retailers in Morogoro because I wanted them to increase the price of timber. When I approached other retailers at the Fire timber market, I was told that the former retailers informed them that I couldn't be trusted. I have therefore decided to start supplying timber at the village and district markets.* (A *Timber wholesaler, Matembwe timber Market, Njombe, 20th July 2018*).

A follow up question that sought to understand why the wholesaler did not think about supplying timber in Dar es Salaam revealed that it is not easy to find a retailer who can be trusted for supplying timber on credit. This implies that some wholesalers may be supplying timber under adversarial terms due to limited alternatives. Further discussion with the above mentioned wholesaler revealed that some have incurred a loss by supplying timber to retailers who are not trustworthy. This was confirmed by another wholesaler in Matembwe village who was supplying timber to retailers in Dar es Salaam but stopped doing so because his capital was lost after the retailer relocated to an unknown place. The two cases show that although trust in value chain offers many advantages, it is also associated with potential risks (dark side) which should not be ignored. This, points to the fact that promotion of trust as a mechanism of governance in value chains should go hand in hand with the promotion of other social control mechanisms such as social knowledge. Social knowledge is used to describe ones' ability to understand and predict other's general patterns of behaviour (Sohn, 1994). However, in line with Sohn's (1994) argument, it should be noted that social knowledge does not eliminate the potential risks associated with trust but, it increases one's ability to predict the behaviour patterns of the potential transacting partner in different situations.

3.7 Conclusions and Recommendations

Generally, the findings of the study show that spot market and relational governance are the dominant linkages in timber value chain. Spot market is characterized by absence or little trust while some trust exists in relational linkage. In this linkage, trust facilitates integration into a value chain through enabling access to credit, technology for processing timber, sharing of market information, lessening opportunistic behaviour, and enhancing coordination and building collaboration between actors of the value chain. Furthermore, on the side of retailers in regional centres, trust significantly reduced the cost of getting timber by avoiding costs related to control systems such as formal contracts. In addition, it is because retailers did not travel to where timber is obtained, thus, saving them time and transportation costs. The time saved was used to supervise their business or engage in other livelihoods activities.

Nevertheless, trust was also associated with some challenges because, sometimes it was used as a basis for stopping some actors from accessing regional markets hence, negatively affecting their integration into the timber value chain. The actors denied access to region markets actors were less powerful compared to the “one denying them access”. This implies that the integrative role of trust is negatively affected by power asymmetry between actors of the value chain. The current study show that capital (both social and financial), technology and market information are the sources of power that help actors of the value chain gain benefits from their resources. Therefore, the government through the Ministry of Natural Resources and Tourism and development actors should facilitate access to these resources in order to balance power between actors and enhance equitable distribution of benefits accrued from the timber value chain. Similarly, access to market information would increase transparency in the timber value chain hence, improving trust between actors. In addition, the findings indicate that trusting without conducting a

comprehensive assessment of the person to trust causes a loss on the side of the suppliers. This is associated with quitting from the business by the suppliers. Thus, promoting trust along with other social control mechanisms such as social knowledge can help reduce the challenges.

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CHAPTER FOUR

4.0 Upgrading Trajectories in Domestic Value Chains: Experience from Non-Industrial Private Forestry in the Southern Highlands of Tanzania

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4.1 Abstract

Our understanding of the possibilities of moving into higher-value activities in value chains in the global economy has been influenced mainly by literature on the nature of relationships between firms and upgrading. We argue that the institutional context and other non-state actors influence upgrading opportunities in young domestic agricultural value chains thus, this aspect deserves scholarly attention. The paper draws experience from the non-industrial private forestry (NIPF) in the Southern Highlands of Tanzania to explicate how the state, development agencies, and grower organizations influence upgrading trajectories. The paper is based on in-depth interviews with key informants, focus group discussions with different actors of the value chain and a household survey of tree growers. The study showed that in the absence of a lead firm, an institutional framework comprising state agencies, and donor funded programmes and grower organizations are the main drivers behind attempts to upgrading the NIPF value chain. Although four types of upgrading are promoted and have the potential of improving income of the tree growers, only functional upgrading has so far resulted into higher income of tree growers. High cost of the upgrading strategies coupled with limited access to capital and timber market are some of the challenges that impede smallholder tree growers from gaining more income from their trees. Furthermore, the findings showed that there are perceptual differences between forest extension agents and the tree growers on some aspects of upgrading. For the promoted upgrading become relevant for smallholder tree growers, there is a need for harmonizing local practices and scientific knowledge embraced by forest professionals.

Key words: Institutions, Value Chain Upgrading, Non-industrial Private Forestry

4.2 Introduction

For many years, investing in agricultural sector has been regarded as a key to poverty alleviation in developing countries. In Tanzania, after independence and until Structural Adjustment Programme (SAP), the investment focused on production of cash crops (i.e. sugar, coffee, sisal, tea and cotton) for export (Gibbon, 2011) giving little attention to forestry production by smallholder farmers. However, timber production by smallholders (herein referred to as non-industrial private forestry) is gaining economic importance in different parts of Africa (Arvola *et al*., 2019). In Tanzania, timber production is largely occurring in the Southern Highlands. In fact, some studies (see for example, Asiad, 2016; Pedersen, 2017; Lusasi *et al*., 2019) suggest that the forest area under smallholder tree growers in the Southern Highlands in Tanzania has surpassed the industrial forestry which is owned and managed by the government and corporate companies. In addition, as observed by Harrison *et al*. (2004) and Malkamäki *et al*. (2018), issues of indigenous land rights and land claims also constrain expansion of the industrial forestry in developing countries, Tanzania included. Empirical evidence shows that the current consumption of wood in Tanzania exceeds the supply, leading to a deficit of 19.5 million m^3 and this situation is expected to persist for many years to come (MNRT, 2015). This needed timber, we argue, will depend much on the supply from non-industrial private forestry, implying that there is a huge potential for smallholder tree growers to expand their woodlots hence, improve their households' income.

In some parts of Tanzania, improvement in income through woodlots has already been reported by some studies. For instance, in Mufindi District, Nkwera (2010) found that NIPF contributed 61percent of the households' income and 73 percent of households' physical assets. Nonetheless, Arvola *et al*. (2019) emphasize that significant impact of NIPF on poverty alleviation will be achieved by also engaging smallholders in higher

value chain activities, the process referred to as upgrading. Upgrading can improve the livelihoods of growers in various ways including improving productivity or quality of timber products (Mohan, 2016; Ponte and Ewert, 2009). Thus, there is a need for understanding smallholders' upgrading activities in order to provide evidence-based recommendations that could facilitate poverty alleviation among tree growers. However, our understanding of upgrading in the global economy has been influenced mainly by literature on the nature of relationships between firms (governance) and upgrading (see Selwyn, 2008; Larsen, 2016; Behuria, 2019 for similar assessments). Thus, scholars such as Tokatli (2012), Larsen (2016) and Mohan (2016) have called for understanding upgrading processes beyond those driven by lead firms. Studies on the relationship between firms as a way of understanding upgrading leaves three main gaps, which is the main concern of the current paper. First, the influence of the institutional context on upgrading has received little scholarly attention because studies have mainly focused on the nature of relationships between firms and upgrading (Neilson and Pritchard, 2009). Secondly, manufacturing industries have been given much attention compared to agricultural commodities (Hamilton-Hart and Sringer, 2016). Thirdly, the mature and standardized global value chains are privileged over young (i.e. predominated by spot market) domestic value chains (Mishra and Dey, 2018). In this regards, this paper examines the upgrading trajectories of domestic young value chain of the non-industrial private forestry (NIPF)[12] in the Southern Highlands of Tanzania.

While planting of trees for household consumption in East Africa dates back to the colonial period (Warner, 1993), NIPF on a significant scale is a new phenomenon in sub-

[12]The term non-industrial private forestry originated in the United States (US) and describes forestlands owned by farmers, other individuals and corporations that do not operate wood-processing plants (Harrison *et al.*, 2002). This means that, forestry is an important activity on these lands, but that forest management may include objectives other than timber production. A further characteristic may – but need not - involve a smaller scale when compared to large-scale plantations and concession forestry (Zhang *et a*l., 2005).

Saharan Africa. The newness of the term lies in increased emphasis of growing trees for the market (see Pedersen and Friis-Hansen (forthcoming)). Although some studies (see for example, Ngaga, 2011; PFP, 2016; Mwamakimbullah, 2016) have addressed NIPF, these are based on consultancy work thus, do not provide theoretical insights of the observed upgrading processes. The paper aims at answering three main questions i) what types of upgrading are happening in NIPF in the Southern Highlands of Tanzania? ii) to what extent could upgrading in the NIPF be explained by the Global Value Chain (GVC) upgrading concept? and, iii) what are the drivers of upgrading processes? The paper argues that the institutional context and non-state actors (development agencies and grower organizations) shape the upgrading opportunities in the NIPF value chain. Furthermore, the paper draws on semi-structured in-depth interviews with key informants (at village and district levels) and focus group discussions (FGDs) with various actors in the NIPF value chain to show how various institutions influence upgrading trajectories in NIPF. Besides, the paper uses quantitative data to support the arguments raised.

It is important to investigate how the institutional context influences upgrading potentials because it would help in developing policy recommendations for enhancing socio-economic outcomes of smallholder tree growers. The next section provides the analytical framework of the paper. This is followed by the description of the relationship between institutional context and upgrading, followed by a presentation of the methodology used. In turn, the paper presents and discusses the results. Next is the conclusions and recommendations section, followed by a reflection on the limitation of the study. The acknowledgement section is presented at the end.

4.3 Analytical Framework

According to Humphrey and Schmitz (2002), upgrading is concerned with making a product more efficient in increasing value adding activities by making products that are more sophisticated and taking on more sophisticated processes. This definition implies that actors must invest in learning in order to acquire technological and market capabilities that would enable them to move into higher-value activities. Humphrey and Schmitz (2002) propose four types of upgrading which are product upgrading, functional upgrading, process upgrading, and inter-sectoral upgrading. Although Fold and Larsen (2011) regard these types of upgrading as a standard way of conceptualizing upgrading in GVC analysis, they (the types) are mainly applied in analyzing upgrading in the industrial context (Kilelu *et al.,* 2017). Accordingly, Ponte and Ewert (2009) point out difficulties in working with Humphrey and Schmitz's typology in agri-value chains by showing that it is difficult to distinguish product and process upgrading because sometimes new processes generate new products (Ponte and Ewert, 2009). They suggest that Humphrey and Schmitz' classification of upgrading should be used in a more critical manner.

Building on Humphrey and Schmitz's notion of upgrading, Riisgaard *et al.* (2010) broaden the concept to make it more applicable to policy interventions. They define upgrading as something that happens to a specific actor (an economic group, organization or an individual) inside the chain which directly improves the performance or position of the actor, thereby increasing rewards and/or reducing the exposure to risk (Riisgard *et al.*, 2010). Consequently, Riisgard *et al*. (2010) propose seven types of upgrading summarized into three main categories. The first category involves improvement in the process, product, and volume (in the same node)[13]. The second category includes change

[13]Process upgrading entails improving efficiency or reducing negative externalities, product upgrading – making better products with increased unit value and volume upgrading means increasing the amount or number of products sold through an increase in yield or planted area.

and/or adds functions up or down stream involving several nodes[14]. The last category is improvement in the value chain coordination that includes vertical contractualization involving the agreement of two actors of different nodes, and horizontal contractualization that describes an agreement of cooperation among same actors within the same node (Riisgaard *et al.*, 2010). In this framework, upgrading strategies interact. This implies that one type of upgrading may result into a new type of upgrading or may produce positive effects to the existing strategies. Moreover, their framework points out the effects, which can be initiated by the institutional framework, thus, the framework is appropriate to the current paper.

Regarding the role of institutional framework in upgrading, literature suggests that in the context of developing countries, the state is the main actor that influences the institutional environment in which value chains are embedded. The state influences upgrading by playing five major roles – facilitator, regulator, producer, buyer, and distributor (Horner, 2017; Mayer and Phillips, 2017). According to Porter (1998), the role of the state in supporting upgrading is through investing in skills development and technologies, which are fundamental inputs for upgrading. As Selwyn (2008) argues, the role of the state in upgrading could be complemented through public sector support and by public-private partnership. Analyzing the export of grape production in North East Brazil, Selwyn (ibid) concludes that although exporters might be well informed about what the market requires, state agencies and farmer organizations set basic conditions for exporting. Similarly, Neilson and Pritchard (2009) found that the presence and strength of the institutional thick web of industry and public sector networks in South India played a greater role for producers to stay in the global competition. On a critical note, Larsen (2016) shows that

[14]Functional upgrading happens when the producer acquires new functions upstream or downstream of the chain while functional downgrading occurs when the producer moves one node down the chain.

state-led interventions in South India not only contributed to upgrading but also led to the bifurcation of smallholders into high -margin markets.

4.4 Methodology

4.4.1 Study area

The study was conducted in Njombe and Iringa regions. These regions represent the major tree growing areas in the Southern Highlands of Tanzania. In Njombe region, data were collected from Njombe District Council, Njombe Town Council, Wanging'ombe and Makete District Councils. In Iringa region data were collected from Mufindi and Kilolo District Councils.

4.4.2 Research design and data collection

The study adopted the mixed methods approach, which allows a combination of both quantitative and qualitative methods (Saunders *et al.,* 2016). The approach offers a more robust analysis and a better description of the situation because qualitative and quantitative methods complement each other (Saunders *et al*., 2016).

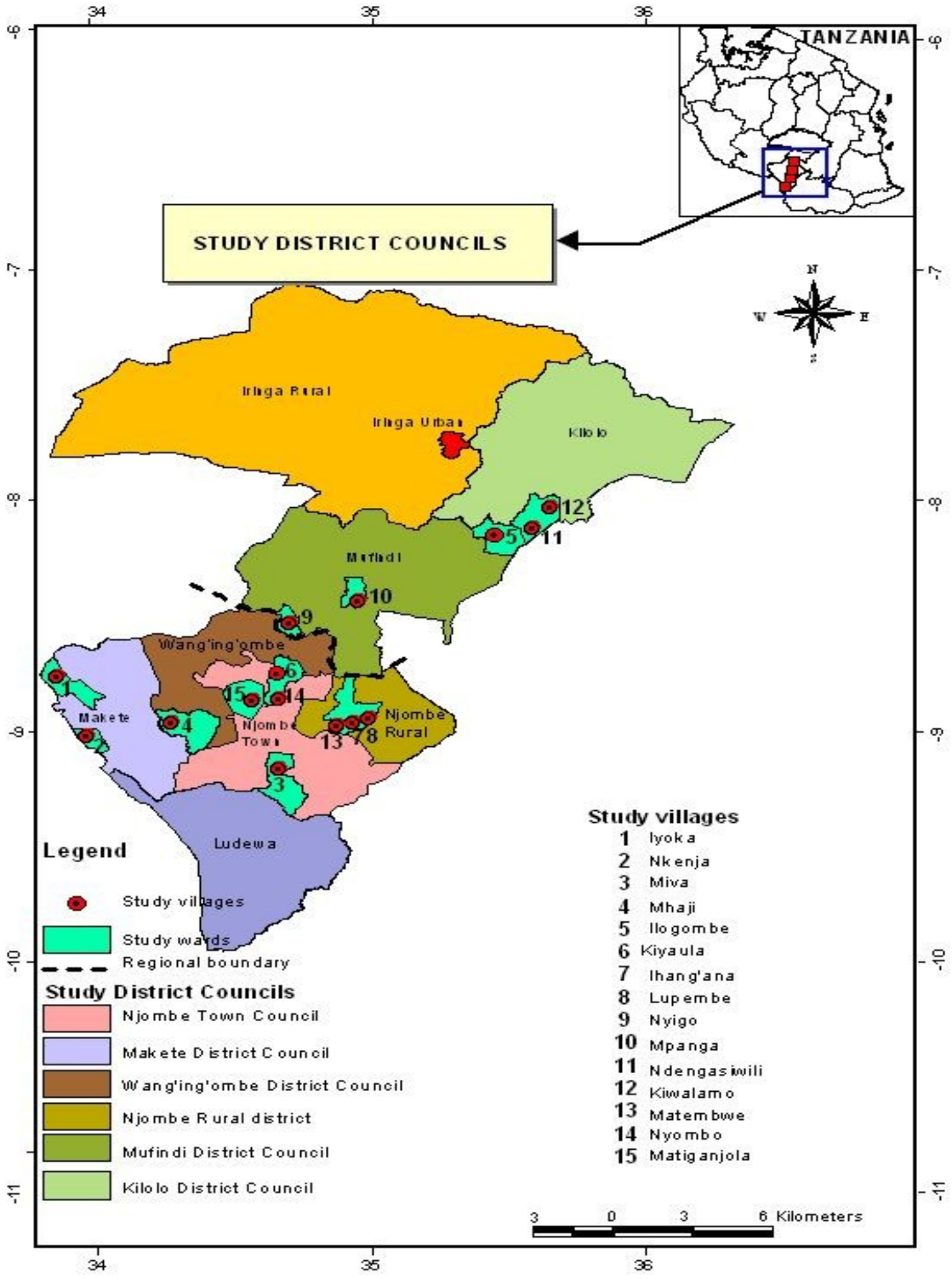


Figure 4.1: A map showing study districts and villages

4.4.3 Data collection

Qualitative data were collected through key informant interviews, focus group discussions, and observations. Key informants interviewed represented various actors along the NIPF value chain. They included six District Forest Offers (DFOs), three leaders of Tree Grower Associations (TGAs), two leaders of the Union of Tanzania Tree Grower Associations (TTGAU), and the Secretary of Njombe Timber Traders' Association (UWAMBANJO). Others are Manager of Forestry and Wood Industries Training Centre (FWITC), three staff of Tanzania Forest Service (TFS), two nursery operators, the Director of Make Forest Develop Best (MADEBE) company and Manager of Matembwe Village Timber Market, staff of Forestry Development Trust (FDT) and staff of Private Forestry Program (PFP).

Nine FGDs were carried out three for tree growers, three for timber traders, and three for saw millers. The participants were from three villages of Nyombo, Matiganjola and Matembwe in Njombe District. For growers and timber traders, the participants were in three categories (i.e. growers with small, medium, and large woodlots) and small, medium, and large traders. Timber traders were categorized based on their level of capital. Snowballing method was used to get saw millers. These were very few in the study villages and all used dingdong sawmill to process trees; thus, they were not categorized. The number of participants in each FGD ranged between 7 and 15 and the time taken ranged was between 45 and 90 minutes. Issues covered included prices for standing trees and sawn timber; strategies adopted to gain more income from timber business, the type of people or organizations supporting them, and challenges faced for each strategy.

Observation was used to complement findings from key informant interviewsand focus group discussions. The observed aspects were the effects of fire on woodlots, land use changes (i.e. what is planted after harvesting woodlot or crops), the manner in which woodlots were established and managed including the adoption of silviculture practices. All the issues observed were noted down in the researcher's notebook.

In addition, the study collected quantitative data from a household survey jointly carried out by the Timber Rush Program. The household survey used a stratified random sample frame that ensures proportional and representative participation from 2 regions, 6 districts, and 12 villages.

4.4.4 Data analysis

Qualitative data were analysed by transcribing all interviews into a text. The analysis involved reading the text several times, a process that resulted in labelling of sentences and paragraphs. The labels communicated explicit meaning of the respective sentences and paragraphs. Similar labels were grouped together to form themes and subthemes (Braun and Clarke, 2006) that represented meaning related to the research questions. Quantitative data were analysed using SPSS software and the findings were presented in descriptive form.

4.5 Results and Discussion

4.5.1 Context: timber rush in the Southern Highlands of Tanzania

Timber production in the Southern Highlands of Tanzania can be traced back to early colonial period when the first plantations in the area, Kawetire and Sao Hill, were established in 1937 and 1939 respectively (Ngaga, 2011). Until the mid-2000s, the supply of timber for construction and industry was dominated by state and privately owned

plantations (Hurst, 2004; Kangalawe, 2018), with smallholder farmers playing a minor role (Pedersen, 2017). This situation has dramatically changed over the past 15 years, during which NIPF operated by small scale farmers and medium scale domestic investors surpassed the plantations in terms of forest cover and became the most important future suppliers of soft wood (Lasasi *et al.*, 2020).

This change has largely been driven by market forces, with limited influence and support from government policies, state agencies, and donor programmes (Friis-Hansen *et al.*, forthcoming). During the early 2000s, the demand for soft wood started to exceed the supply from the plantation sector. On the one hand, a continued high economic growth in the GDP increased national demand for timber fuelled by a building boom in Dar es Salaam. On the other hand, the supply during this period was challenged by mismanagement of state-owned plantations and more effective environmental protection of natural forest (Wells and Wall, 2005; Ngaga, 2011).

In response to this deficit supply, private timber traders identified large untapped potential softwood growing on the village land in Southern Highlands (Friis-Hansen *et al.*, forthcoming). These pine trees were planted by small scale farmers on private and communal village land during the 1990s to conserve the environment and water sources (Aalbaek, 2001). This development was strongly supported by donor programmes and NGOs led by the Danida supported 'Hifadhi ya Mazingira'[15] (HIMA) that started in Iringa District in 1990 and scaled up to Njombe and Makete Districts in 1992 and later to Mufindi and Ludewa Districts in 1998 (MFAD, 2007; FGDs interviews November, 2019). Timber traders accessed this potential supply of softwood by introducing mobile chain saw milling, which allowed traders to buy standing trees from farmers and process

[15]Literally meaning 'Protect the Environment.

them to planks in situ (Friis-Hansen *et al*, forthcoming). This localization of chain sawmills represent a major shift, because until then timber processing was dominated by permanent large scale saw mills located adjacent to the plantations. According to focus group discussions, the first mobile sawmills (locally known as Ding Dong in Tanzania) started operating in 2005 and their number has increased to 1000 five years later (PFP, 2016).

The combination of relative high prices for timber and the new field-level effective market demand for trees spurred what is known as a Timber Rush (Friis-Hansen *et al*, forthcoming). The Timber Rush took place over a decade (2007-2016). This was characterized by many producers scrambling for access to village land in the Southern Highlands for planting pine trees. More than 100 000 resident farmers and up to 5000 urban-based domestic investors were involved in the Timber Rush that resulted in the expansion of forest cover of pine on village land from a few thousand hectares to 325 000 hectares during this decade (Friis-Hansen *et al*., forthcoming). Another effect of timber rush was a rapid increase in prices of land, as this resource increasingly became scarce (Lusasi *et al.,* 2020).

Timber Rush came to a halt in 2016, as a result of government tightening of its fiscal policy resulting in a collapse of the building boom across the country. Accordingly, retail prices for timber dropped by more than 50 percent from 2016-2019 because of a dramatic fall in demand. This dramatic fall of retail prices had repercussions throughout the timber value chain. The results of TR household survey show that the average prices per tree paid to farmers by timber traders fell from the average of 10 000 TZS in 2015 to 6500 TZS in 2019. Upstream trade of timber between farmers and district trading hub is reported to have become less profitable (personal communication with the chairman of

TTGAU in 2019). Although the price for standing trees seems to drop for about 50 percent, the price of processed tree in the regional markets has been comparatively stable.

The economic viability of growing trees has declined since a shift in economic policy caused by the collapse of building industry in 2016. based on qualitative interviews and observations indicators for this shift after 2016, include (i) a sharp fall in investments in the establishment of new NIPF plantations, (ii) an increase in the number of established NIPF plantations put up for sale, and (iii) a sharp fall in the sale of pine seedlings by nurseries. Others include (iv) a tendency of some owners of newly established NIPF plantations of uprooting young pine trees located on relative flat land on top of ridges and replacing them with avocado, (v) an emerging tendency of establishing avocado plantations on newly cleared land and (vi) a tendency of planting eucalyptus instead of pine. A new dynamic in the value chain is the establishment of several veneer factories in Mufindi District. These new factories offer to buy eucalyptus trees of all ages from tree growers. While this is offering new market opportunities to NIPF growers, Forest Extension Officers see it as a threat since it also creates a temptation for tree growers of selling their eucalyptus trees while still immature. We argue that their perception about the rotational period of eucalyptus that lead them regard veneer factories as buying immature trees perhaps is influenced by the past uses when poles was the only main product from eucalyptus.

4.5.2 Generic value chain of timber from NIPF

Many actors are involved either directly or indirectly in the timber value chain. In this paper, only the main actors of the chain are discussed in order to shed light on how the timber value chain operates. Nursery operators can be regarded as the first category of actors. In the Southern Highlands of Tanzania, majority of nursery operators own small

tree nurseries of less than one acre. Although some medium tree nurseries (with the size of one acre and above) can also be found, they are operated by institutions such as TGAs, District and Village Councils, churches and NGOs. With the exception of NGOs that donate seedling free of charge, other nursery operators produce seedlings mainly for their own use and for selling to other people.

The second category of actors is the tree growers more than 70 percent of who grow *Pinus patula* (PFP, 2016). Some tree growers are organized into Tree Grower Associations (TGAs) while others work independently. Tree growers supply timber and access the market in various ways. Some sell standing trees to middlemen[16] who go around in the villages looking for trees for buying while others process trees and sell sawn timber. There are two main ways through which growers sell standing tress. Some sell the whole compartment (woodlot) and others sell individual trees (selective harvesting).

Other actors in the NIPF value chain are saw millers, whose main role is processing of the logs, and they sometimes buy standing trees from growers. The processed logs are sold to timber traders who in most cases are whole buyers. As will be discussed in the next sections, more than 80 percent of sawmillers use dingdong sawmills. Another category of actors includes timber traders; these buy sawn timber from the saw millers or from the growers who decide to process their trees. There are different categories of timber traders who supply timber to different markets. Some sell their timber at the village timber markets, some transport and supply timber to district hubs; others supply timber to regional markets, and a few traders export timber to neighbouring countries such as Kenya. In all cases, ` transportation is provided either by private entrepreneurs or timber traders who own trucks. All categories of traders sell timber to retailers located at

[16] Majority of the middlemen are also sawmillers

different markets (village, district, regional and external markets) and who deliver timber to consumers.

4.5.3 Upgrading strategies in NIPF value chain

Case 1: Process upgrading

Various institutions promoting process upgrading were found in the study area. The government promotes process upgrading through government extension agents and through the Forestry and Wood Industry Training Centre (FWITC). The Extension agents promoted both pre-planting and husbandry management. Tree growers are advised to clear land before planting and to plant seedlings of improved seeds. During key informant interviews, DFOs explained that clearing promotes health growth of trees by providing better access to water, nutrients, and sunlight. The findings of interviews with tree growers showed that only tree growers with capital could afford clearing the land before planting. However, the majority of tree growers clear the land not for planting trees but for planting food crops such as maize. This is particularly for tree growers who plant trees in flat land. In places where trees are planted on steep slopes, almost no one clears the land before planting, as this is perceived by farmers, and rightly so, as causing soil erosion.

The findings showed further that, although extension agents promote planting seedlings of improved seeds, however, such seeds were not readily available when the rush of planting trees was at its peak. The improved pine trees varieties became readily available in the past two to three years. Furthermore, the seedlings from improved seeds are expensive to majority of tree growers. Accordingly, majority of pine trees planted are local varieties of pine and the results of survey show that in other places such as Makete 51 percent of tree growers rely on regrowth commonly referred to as "*maotea*" for

establishing woodlots. Analyzing the costs of establishing woodlots by relying on improved pine seed varieties, members of FGDs indicated that one acre requires an average of 470 seedlings and the price for one seedling is about 150 TAS, which translates into 70 500TAS per acre excluding the cost of transportation.

Regarding husbandry management, extension agents promote process upgrading by advising tree growers to remove weak seedlings from their woodlots, construct recommended firebreaks and to adopt appropriate pruning and thinning. As with land clearing, tree growers indicated that weeding is done for removing weeds from planted food crops[17]. For the firebreaks, forest extension agents recommend firebreaks of 8 meters wide. However, DFOs reported that most of smallholder tree growers do not follow their recommendations because of high cost involved. However, tree growers in Matembwe village reported not to have constructed the recommended firebreaks because of the big amount of space it takes. Such space could be utilized for planting trees. The following statement from a tree grower confirmed this observation;

> *Some of us have only one or two acres of woodlots, imagine constructing a firebreak of 8 meters around such a small woodlot, it is a wastage of land which I could plant more trees (A tree grower in Matembwe commented)*

About 42 percent of tree growers have experienced wildfire in their woodlots and that, constructing firebreaks would help to overcome the challenge, however, the extract above shows that firebreaks of 8 meters, which are promoted by forest extension agents, are not compatible with smaller sized woodlots, which constitute more than 50 percent of woodlots in the Southern Highlands of Tanzania. Furthermore, as it has been argued, the

[17] In the Southern Highlands of Tanzania, tree growers mix trees with food crops such as maize. This is done consecutively up to three years before trees develop a canopy that can inhibit the growth of maize.

recommendations of 8 meters may be promoted not because it is beneficial to tree growers but because they align with professional norms and beliefs of foresters and which hinged on the assumption that scientific forestry is useful irrespective of the context (Mwaseba *et al.,* 2020; Sungusia *et al*., 2020).

Also, forest extension agents promote process upgrading by emphasizing proper pruning and thinning techniques. Proper pruning entails the use of recommended tools such as pruning saws and clippers or secateurs. Akin to the study findings of Arvola *et al.* (2019), those who did not use the recommended pruning tools had woodlots with visible damages caused by poor pruning. On the other hand, proper thinning entails the balance of trees removed and the trees that remain. Improper thinning results into poor quality wood (i.e. woodlot with trees of smaller diameter or woodlot with trees of heavy branches and knots). Also, the pruned branches are left on the ground under the trees and not removed as practiced in plantations.

The Forestry and Wood Industry Training Centre (FWITC) also promote process upgrading. The FWITC is in Mufindi District. This was established by the bilateral programme between the Governments of Tanzania and Finland known as Private Forestry Program (PFP). The main goal is to produce competent and skilled labour for the development of the sector. The manager of the centre indicated that the centre has offered 18 short courses numbering about 200 graduates. Furthermore, apart from in-house training, the centre offered short courses on thinning and harvesting to members of TGAs in Kifanya and Iboya villages in Njombe District. As Fromm (2007) maintains, upgrading entails investments in people, know-how, processes, equipment, and favourable work conditions (Fromm, 2007).

Besides the government, other actors including donor funded programmes and private companies are also attempting to promote process upgrading. The Private Forest Program (PFP), a bilateral programme between the Governments of Tanzania and Finland and Forest Development Trust (FDT) are the two major donor funded programmes that promote pre-planting and husbandry management practices. These complement the work of the government forest extension agents who are few, making FPF and FDT as their major providers of forest extension services in the area. These findings are consistent with the findings of the scoping study of extension services in the Southern highland which indicated that 85% of extension services were provided by NGO[18] and only one percent (1%) of tree growers indicated to have been contacted by government extension staff (PFP, 2018).

Despite the government and donors' initiatives, process upgrading has not resulted into any meaningful improvement of incomes among tree growers. For instance, tree growers in Iyoka village reported to have been paid by buyers about 7000 TZS (equivalent to 4.5 USD) per tree for a well-managed woodlot of eight years compared to 4000 TZS (equivalent to 2. 6 USD) for locally managed woodlot at the same age. However, in the former case, practices such as clearing of land before planting, the use of improved seeds, weeding, firebreak construction, pruning, and thinning come with costs, which are, in most cases not recovered. This argument is supported by Mwaseba *et al.* (2020) who reported the existence of high cost of inputs particularly of genetically improved tree seeds in the area. Furthermore, Lusambo *et al.* (2021) did not find any statistical significance difference in profit margin between tree growers who adopted recommended process upgrading and those who did otherwise. Nevertheless, emphasis on pre-planting and husbandry management could be associated with an increase of awareness of

[18] Also, in this study donor funded programmes such as PFP were perceived as NGO by the tree growers.

management practices among tree growers in the southern Highlands of Tanzania. This is demonstrated through the demand of tree management services among some tree growers whereby private companies such as Make Forest Grow Best (MADEBE) has utilized the opportunity. The text in Box 1 provides detail about the company.

Box 4.1: The case of MADEBE company

MADEBE is a local company in Njombe District. Its establishment is associated with the training on how to establish and manage commercial forestry plantation offered by FDT. The Chief Executive Officer (CEO) and founder of the company gave an account of how the training he received enabled him to acquire knowledge and skills to manage forestry in a professional and commercial manner and enabled him to establish his own woodlots. Later, he realized that most of tree growers, both smallholders and town-based investors, do not follow recommended silvicultural practices in establishing woodlots. Thus, he decided to form a company of helping people establish woodlots by following recommended practices. Although the company aims at offering services to all kinds of growers, most of the customers are the town-based investors. Currently, MADEBE has signed an agreement with more than 100 tree growers to manage their woodlots and protect them from fire hazards. The CEO associated this "good" number of customers with how he manages tree plantations. He revealed further that there is a difference between tree plantations managed by his company and those managed by smallholder tree growers.

Generally, MADEBE is actively involved in managing its tree plantations and those owned by town-based investors. Interviews held with two urban-based investors whose tree plantations are managed by MADEBE indicated uncertainty of recovering their management costs. As one urban-based investor pointed out…."*Although my plantation is well managed, given the current price of trees, I'm not sure whether I will be able to recover the cost of management" (*Interview with urban-based investor, November 2019). This statement confirms further that the cost of managing tree plantations through adoption of recommended silviculture practices (i.e. process upgrading) are so high that the price received for the standing trees may not offset management costs. We therefore maintain that although the CEO of MADEBE claimed to manage tree plantations commercially, there is no guarantee that clients will get higher returns as opposed to the returns they would have gotten from tree growers who have not adopted the promoted silviculture practices.

Case 2: Product upgrading

Setting standards in a spot-market type of value chain is a new feature geared towards improving the quality of sawn timber from the NIPF. Since the start of the rush for planting trees, there have been no quality standards for timber entering domestic market. This could be associated with the lack of a lead firm that is sufficiently large to initiate and enforce the standards, lack of regulation on timber standard, and lack of explicit demand for quality timber by the consumers. Recently, the need for quality standards has emerged through informal relationships where timber traders are required by buyers (retailers) to supply timber without scars, non-bending and with proper dimensions. However, these standards are not enforced by laws and their implementation varies from place to place and from one retailer to another.

Interviews with key informants (DFOs and TFS officers) revealed that quality standards are highly needed because of current practices where smallholder tree growers harvest pre-mature trees. They indicated that lack of quality standards results into flooding the domestic market with juvenile timber with negative consequences particularly in the construction industry, who is a major consumer of timber from NIPF. In response, the National Bureau of Standards (TBS), Tanzania Forest Services (TFS), and the bilateral programme between the governments of Tanzania and Finland known as Private Forestry Program (PFP) have launched a standards setting process to improve the quality of timber from NIPF.

The envisaged quality standards include i) setting higher prices for wood from mature trees (minimum 15 years), higher prices for planks sawn with improved stationery sawmill compared with a Ding Dong mobile sawmill, iii) quality standards for drying, and iv) quality standards for treatment of wood planks. Although the standards are not yet

operational, there are all signs that they would be effectively implemented. This is reflected in the government commitment to export sawn timber and other wood products. The following statement from a key informant underscores the government commitment in implementing quality standards.

> *"Through the support of the government of Finland, the TBS in collaboration with TFS is setting quality standards that will allow export of wood products from Tanzania"* (Interview with TFS officer in November, 2019).

Although the process of setting standards is underway, the push is not from the retailers or consumers but the government and development partners. Standards are geared toward overcoming the perceived challenge of flooding the market with juvenile timber by harvesting premature trees. In addition, as indicated in the statement of the TFS Officer, another motive is to gain foreign currency from exportation of timber. While the government perceive harvesting premature tree as a problem, smallholder tree growers see it as an opportunity of solving their pressing needs. Besides, it is not clear how the standards will benefit the smallholder tree growers. We therefore support the conclusion of other studies such as Schou (2019) that, the overall concern is related to the quality of product and its effect on the market. Tree growers are not given much emphasis even though tree-growing activities are often promoted as a way of alleviating poverty. We further argue that, harvesting putting tree growers at the centre and thinking beyond product upgrading require consideration on sustainability, efficiency, and equity issues. In terms of sustainability, premature trees would have taken less from the soil as compared to mature trees. In terms of economic efficiency, by harvesting trees at eight years, tree growers could get more returns as the land might be put into other uses that are economically beneficial than waiting for 15 years. These arguments resonate well with

the definition of upgrading given by Hamilton-Hart and Stringer (2016) who observe that upgrading has two broad meanings – extracting greater value at a particular point in a value chain and increasing the efficiency and sustainability of resource use. In terms of equity, it is rational to allow a tree grower to harvest their trees at any time if there is a market for the product.

Case 3: Functional upgrading

Functional upgrading is achieved using locally fabricated sawmills (dingdongs). Interviews with saw millers and findings from TR household survey show that dingdong sawmills are the most widely used technology whereby about 90 percent of logs from NIPF in Njombe and Iringa regions are processed using dingdong sawmills. Saw millers reported to have preferred dingdong sawmills because they are affordable as compared to other types of sawmills. The findings of the study show that dingdong sawmills have allowed 20 percent of growers to have their wood processed before sale while those who do not process trees (80%) sell standing trees (Table 3). There are different ways of selling standing trees. Results in Table 3 show that about 61 percent sell the entire plot while 39.3 percent sell per tree. Although selling sawn timber generates more income compared to selling standing trees, this is not an easy option for most of the tree growers. In-depth interviews with leaders of TGAs showed that the shift from selling standing trees to selling sawn timber is the function of capital and ability to find customers for the sawn timber. Financial capital is required in order to hire a sawmill, hire labourers who perform various activities - carry the sawmill to the field[19], fell trees, process or saw trees, collect logs, and carry sawn timber from remote areas to the passable roads where trucks or tractors can reach.

[19] Some woodlots are located on steep slope areas where cars and motorcycle cannot reach. Thus, a sawmill is carried by four people commonly called ‘taxbega’. The cost for taxbegas depends on the distance; however, the findings revealed that, the average cost for taxbega is about 150000 TAS (Equivalent in USD).

In addition, selling sawn timber requires someone to wait for customers and in cases of delay of getting customers; the quality of timber may deteriorate due to poor storage facilities. This presents a risk on the part of growers who find it easy to deal with customers who buy standing trees. Nevertheless, the issue of capital and ability to find customers apply more to resident tree growers and may not matter to an emerging group of non-resident domestic investors. The latter group seem to have enough capital to hire labourers to process and sell planks (for more details see Lusasi *et al.,* 2019). However, this group of NIPF growers have not yet started marketing their trees on a major scale.

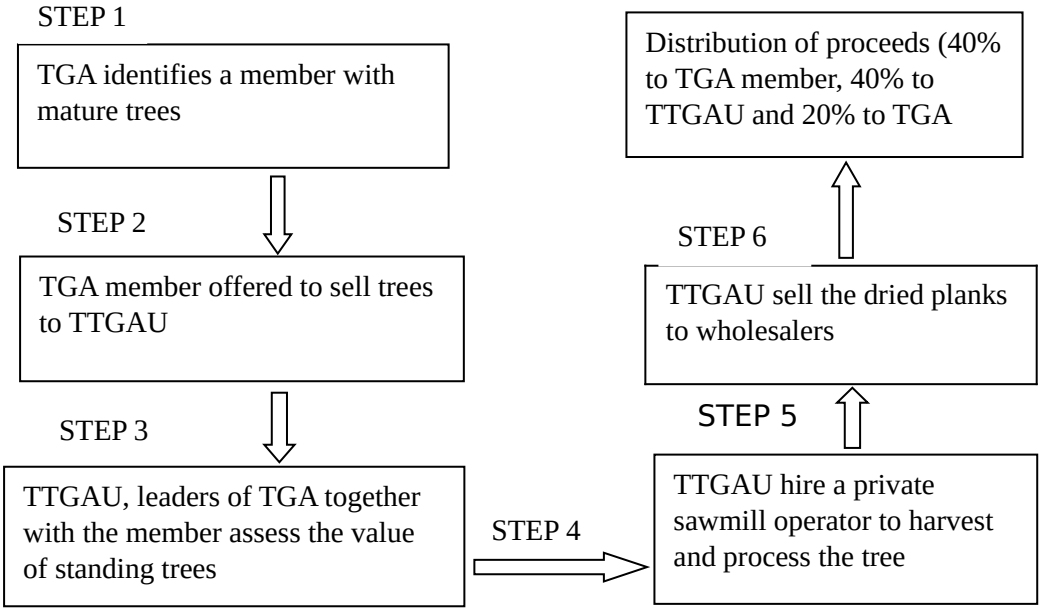
Notwithstanding the role of dingdong sawmills in facilitating functional upgrading, saw millers were worried that the government intends to ban the use of dingdongs on ground of having low recovery rate, which results in poor quality of timber with large volumes of low or poor value residues. It is, however, argued that due to their mobility, ding dong can be used to process trees located in steep slopes. Therefore, banning their use implies that tree growers or sawyers will be required to transport logs from remote areas with steep slopes to the road then from the road to the stationery sawmill. This may increase the cost hence reduce the price of trees or woodlots. In other words, the ban on dingdongs could mean a loss to tree growers/saw millers, as transport costs would be higher than the value of the higher recovery rate. Moreover, some areas may no longer be viable for tree planting as transport costs increase. Furthermore, even though stationery sawmills have higher recovery rates, they are not easily accessible by smallholder tree growers and improvement in recovery rate is therefore unlikely to translate into higher returns to smallholder tree growers.

Table 4.1: Product sold and modality of selling

Product sold	Frequency	Percent
Standing trees	148	80.0
Sawn wood	37	20.0
Total	**185**	**100.0**
Modality of selling standing trees		
Per plot	85	60.7
Per tree	55	39.3
Total	**140**	**100.0**

Source:TR Household Survey 2019

In addition, functional upgrading is facilitated by tree grower organizations and their apex body. In Iboya village, the primary tree grower association (TGA) identifies who among its members have mature trees that are ready to be harvested. The TGA members are then granted permission of selling their trees to the apex body of tree growers referred to as Tanzania Tree Grower Association Union (TTGAU) as an alternative to selling the trees to private traders. The advantage of selling trees through the TTGAU is that members fetch a higher income compared with members who sell trees to private traders. Interviews with key informants revealed that TGA members are paid the value of the standing trees at the time of the sale. The additional amount is paid after processing and selling of planks. According to key informants, TTGAU does not own its own mobile sawmill and chainsaw and must rent from private operators. Therefore, the surplus from processing the trees is reduced. Figure4.1 presents details of this model.



Figures 4.2: The TTGAU business model

The first step after the TGA member agrees to sell his or her trees to TTGAU is the assessment of the value of the standing trees in the field by leaders of the primary TGA and a member. Then, the TTGAU hire a private mobile sawmill operator to harvest and process the trees. The TTGAU sell the dried planks to wholesalers at the district hub. The proceeds from the sales of the wood planks are distributed using the following formula: 40percent to TGA member, 40percent to TTGAU, and 20percent to the primary TGA.

In 2019, TTGAU piloted this model of value chain upgrading in Iboya village in Njombe Region and plan to expand it to other villages. Precisely how economically attractive this model is for TGA members is yet to be analyzed in detail. However, key informants insisted that the model is economically viable and that, TGA members are paid an extra premium above the value of the standing trees by selling through TTGAU. The size of the premium is assessed to be less than that of the price of standing trees. Another reported benefit of this model was adopting government recommendation of selling by volume

which provides a slightly higher income compared to selling by trees or per sawn timber. Apart from enabling TGA, members get a higher share of the revenue in the value chain; the model provides crucial and highly needed income for TTGAU and the primary TGAs. After initially been fully dependent on external support donor, income obtained from involvement in processing and sales of timber on behalf of members is an important strategy of becoming economically self-sufficient and independent. Interviews with tree growers who sold trees through this model indicated that only TGA members with mature trees of at least 15 years could sell their trees through TTGAU. This was cited as a challenge because most of the tree growers sell their trees at the age of eight to ten years.

Case 4: Horizontal upgrading through Tree Grower Associations (TGAs)

The study shows that tree grower associations (TGAs) have reduced transaction costs through improved coordination and achieving economies of scale. The TGA in Matembwe village (UWAMIMA) mobilized resources[20] to build a timber market where growers are given a space to store their sawn timber while waiting for customers. Non-members pay for the space whereas members of the association store their timber free of charge. In addition, apart from paying for the space, there was a development of a proposal of charging each piece of sawn timber entering the market. Interviews with the market project manager revealed that timber which belongs to members of the association will be exempted from this payment. More importantly, the market has enabled members of the association and non-members to get in direct contact with buyers without going through the middlemen hence, improving the profit margin.

[20]Financial and physical resources were mobilized from donors (notably, the government of Finland), Njombe DC, TGA (particularly, UWAMIMA), Matembwe Village Company (MVC) and village government (interview with leaders of UWAMIMA).

Additionally, availability of timber market in Matembwe have reduced the distance of transporting timber from more than 60 KM to about 10 KM to the district hub. Long distance reduced the profit margin due to transportation cost. Similarly, the market has enabled easy access to market information. Before the construction of the market, growers had either to travel to the district hub or use mobile phone to call middlemen in order to get the up-to-date price of timber. Currently, the price for different sizes of timber is displayed at the market. Moreover, the reduction of cost has been achieved by making Matembwe market a one stop centre where timber traders could get the required documents of timber trading such as transit pass (TP) and TRA tax clearance from one place. Before the establishment of the market, traders had to travel to Njombe town to obtain the documents.

Generally, the TGA in Matembwe has become a strong organization with a positive influence on the livelihoods not only of its members but, also of non-members and the community at large. The community and villagers benefit from the provision of various services to traders who come to the market to buy timber. In addition, there has been regular rehabilitation of the road to the market that has helped easy transportation of timber and other goods and services. Table 4 provides a summary of types of upgrading and institutions that drive them.

Table 4.2: Upgrading strategies in NIPF value chain

Upgrading	Strategies	Institutions driving upgrading
Process and product upgrading	Adoption of silviculture practices which include clearing land before planting, use of improved seedlings, construction of fire break, proper thinning and pruning	PFP, FDT, the government of Tanzania, FWITC and MADEBE company
	Setting standards	PFP and the government of Tanzania through its agencies, TBS and TFS
Functional upgrading	Selling sawn timber instead of standing trees	TGAs and TTGAU
Improvement in chain coordination	Horizontal contractualization	TGA, The government of Finland, and the government of Tanzania (through the village and district councils).

Source: Interpretation of findings of the four cases of upgrading in NIPF value chain

4.6 Conclusion and Recommendations

Our case studies present four types of upgrading found in the NIPF value chains. The study found that in the absence of a lead firm, an institutional framework comprising state agencies, donor funded programmes, and grower organizations are the main drivers behind the attempts of upgrading the NIPF value chain. However, although four types of upgrading were promoted, only functional upgrading has so far resulted into meaningful improvement in income among tree growers. The number of tree growers benefiting from functional upgrading is negatively affected by limited access to financial capital and the ability of finding customers for sawn timber. Facilitating access to credit and reliable

market for sawn timber can increase the number of tree growers engaged in functional upgrading.

The study further show that, other upgrading strategies have the potential of improving growers' income, however, high cost of adopting the strategies and low price of trees received by the tree growers make the strategies less profitable. In this regard, the government and development partners through donor funded programmes should facilitate the adoption of cost reducing strategies such as facilitating the formation or strengthening of tree growers' associations. By working in groups, tree growers could also improve their bargaining power when selling their trees.

The study also found that setting quality standards in NIPF as a measure of promoting product upgrading is driven by the government's ambition to export timber and reduce negative consequences in the construction industry that uses juvenile timber. It is vital to be aware that presently selling what is termed premature trees is helping tree growers to solve their pressing needs such as paying for school fees and health bills. Any measure that prevents tree growers from selling their trees at any time would result to negative consequences among tree growers in terms of access to health and education for their children. Thus, before ratifying the envisaged quality standards it is important to conduct an in-depth analysis on how standards would affect tree growers and take measures to mitigate negative consequences among tree growers.

Finally, the findings show that in the past two to three years, the price of standing trees at the village level have dropped to about 50 percent while the price of sawn timber in distant markets remained constant. We learn from this scenario that upgrading alone does not guarantee higher income to tree growers other factors are also involved.

Consequently, interventions for improving income of tree growers should consider other factors beyond upgrading and these include internal governance of the chain and invisible cost incurred by buyers of standing trees and sawn timber. There is therefore a need for further research on investigating the factors behind the mismatch between the price of timber at the village and regional markets.

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CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Major Results and Conclusions

This chapter presents a synthesis of the findings of the study on institutions, governance, and upgrading in non-industrial private forestry (NIPF) value chain in the Southern Highlands of Tanzania. Then, it draws conclusions and provides recommendations based on the synthesis and the study findings. The overall objective of this study was to analyze the role of institutions and governance in non-industrial private forestry value chain in the Southern Highlands of Tanzania. Specifically, the study intended to i) Analyze the role of state regulations in governing timber value chain ii) Examine the role of informal institutions in timber value chain iii) Analyze the types of upgrading in the NIPF value chain and institutions driving them.

In order to provide a holistic understanding of the role of institutions and governance in NIPF value chain, the findings are organized in three chapters that complement each other. These chapters respond to the three specific objectives, which the thesis sought to address. Together, the chapters provide a holistic understanding of the role of institutions in timber value chain in the Southern Highlands of Tanzania. This is achieved by applying North's definition of institutions, which is considered broad enough to capture all the types of institutions (Boliari, 2007; Faundez, 2016). Thus, Chapter two focuses on the role of state regulations. Chapter three delves into informal institutions tracing the role of trust in NIPF value chain. Chapter four examines the types of upgrading in NIPF and institutions behind them.

5.1.1 Effects of regulations on actors of the non-industrial timber value chain in the Southern Highlands of Tanzania

Chapter three investigates the role of state regulations in governing the timber value chain and sheds light on how the regulations shape the distribution of benefits across the chain. The chapter shows that lack of distinction between industrial and non-industrial private forestry has resulted in placing them under the same regulatory framework despite their many differences. This has partly resulted in high transaction costs, which are unaffordable by the majority of actors in the NIPF value chain. The chapter shows further that the impact of placing the actors under the same regulatory framework is not uniformly distributed among the actors. In this regard, tree growers are the people most affected. The theory of access is used to explicate how this happens. It shows that differences in access mechanism among actors of the value chain are associated with the differences in the income gained. Moreover, the chapter engages with the issue of agency by showing how actors adopt various strategies to enable them maintain their positions in the chain.

Concluding remarks

"Although their mission papers and statements suggest most national government policies in Cameroon address tree planting, actual legislation designed to follow up the policies mostly contradicts the poverty reduction goals" (Foundjem-Tita *et al*., 2013).

The above quote made in reference to Cameroon resonates with the findings of this study regarding NIPF in Tanzania. I argue that, the contribution of NIPF in alleviating income poverty among actors of the NIPF value chain, particularly tree growers is constrained by state regulations that govern the chain. Although, the National Forest Policy in its various statements promises to provide an enabling environment and regulatory framework for

the involvement of the private sector in the forestry industry, this has not been realized by small-scale tree growers in the Southern Highlands of Tanzania, as these regulations do not encourage them to go beyond the production node. Tree growers cannot afford the many taxes and documents demanded by the regulations in order to sell timber in the regional markets. As a result, they (small-scale tree growers) access the market by selling standing trees, which make them generate low income. Strict regulations also affect other actors of the value chain albeit to a lesser extent. In order to circumvent the regulations, these actors adopt mechanisms that not only put tree growers at the disadvantage but also cause losses of government revenues. The question is, how could this situation be fixed? Answers could be obtained through asking the right questions at the beginning of designing a policy or regulations (Greeley, 2000). Questions such as how to formulate pro-poor regulation without necessarily undermining government revenue catalyse institutional thinking in terms of their effect and put poor actors of the value chain at the centre of the development process (Sjouquist, 2001).

5.1.2 Roles of trust in timber value chain in the Southern Highlands of Tanzania

Chapter two focuses more on formal institutions, and chapter three, which uses trust as a case, contributes to a broader understanding of the role of institutions in the value chains by analyzing the role of informal institutions. The chapter emphasizes the importance of informal institutions in value chain governance by showing how trust plays both integrative and exclusionary role in the timber value chains. This leads to the argument that conceptualizing trust as something inherently good undermines its dark side. This has an important implication in the manner in which trust is promoted among actors of the value chains. However, this does not imply that trust is not important rather it underscores the importance of promoting trust by considering both the advantages and challenges.

Concluding remarks

The role of institutions in the value chains was also examined focusing on informal institutions. Special attention was given to the role of trust which is one type of informal institutions widely promoted because it is considered as a vital social resource in facilitating cooperation between actors in the value chains (Villena *et al.*, 2011; Dirks and Ferrin, 2001 cited by Skinner *et al*., 2014). Most studies conceptualize trust as something inherently good which must be promoted without thinking about its dark side (Villena *et al.*, 2011). However, empirical evidence from this study shows that, trust plays a complex role, which cannot be understood by analyzing its bright side only. This thesis therefore argues for a new way of conceptualizing and promoting trust that also considers its dark side. There are three reasons; first, trust can also result in unintended negative effects on a party involved in a relationship. Certainly, considering only the bright side is ignoring the negative effects of trust. Secondly, by paying attention to the bright and dark sides of trust I advance our understanding of the complex informal relationship between actors of the value chain, which has not been sufficiently understood (Skinner *et al*., 2014). Thirdly, by considering the dark side of trust, those promoting trust can incorporate strategies of mitigating its negative consequences or delaying its occurrence (Villena *et al.*, 2011).

5.1.3 Upgrading trajectories in non-industrial private forestry in the Southern Highlands of Tanzania

Chapter four examines the role of concrete organizations in value chains thus solidifies understanding of the role of institutions. Thus, the chapter demonstrates how upgrading, driven by the state, farmer organization, and other non-state actors, can still occur in the absence of a lead firm. The chapter shows however that, some of the promoted upgrading strategies are not beneficial to tree growers but rather they are aligned with the values of professional forestry. The chapter shows that some of the upgrading strategies are not

well suited to the circumstances of smallholder tree growers in the Southern Highlands of Tanzania. The chapter reveals how other upgrading strategies are not beneficial because the price of trees received by tree growers is low and does not reflect the cost involved in adopting the strategies.

Concluding remarks

Douglass North's definition of institutions also includes concrete organizations as the third category of institutions (North, 1990). Therefore, to gain a holistic understanding of the role of institutions, chapter four examined the role of the state and non-state actors in the upgrading of NIPF value chain. Drawing from the notion of Riisgard and colleagues on upgrading, the chapter shows that four types of upgrading are occurring in the NIPF of the Southern Highlands of Tanzania. It is concluded that in the absence of a lead firm institutional framework comprising the state, development partners through donor funded programmes and farmer organizations can drive upgrading (Larsen, 2016). Following the notion of Riisgard and colleagues on upgrading, it can also be concluded that although the four types of upgrading are promoted, only functional upgrading has increased the rewards in terms of income gained. Other types of upgrading have not resulted in the improvement of income because of two main reasons. First, they are costly, and that the price of standing trees received by tree growers does not offset the cost of adopting the upgrading strategies. This shows the importance of good markets for upgrading to become beneficial. Secondly, silviculture practices such as construction of firebreak of eight meters as recommended by forest extension agents have not been adopted. In line with the notion of Riisgard and colleagues on upgrading, the construction of firebreak would reduce the risk of wildfires. However, the promoted firebreak of eight meters wide is not compatible with the context of smallholder tree growers who have smaller woodlots

of one or less of an acre. This raises questions as to the practices promoted by forestry extension agents. In this regard, Sungusia *et al*. (2020) argue that, because of professional foresters' habitus acquired through forestry training, technical practices are taken for granted. Mwaseba *et al*. (2020) support this view by showing that because of the existing power relations among actors, greater importance is accorded to professional and expert knowledge than it is accorded to local knowledge. As a result, forest management practices that are relevant to the local context are advocated (see Hansen and Lund, 2017).

5.2 Theoretical Reflections

Two theoretical streams were used to understand the role of institutions and governance in the value chain of timber. Drawing from North's definition of institutions, the thesis shows that both formal and informal institutions were important in shaping the benefits accrued to the actors of the timber value chain. It shows that some regulations designed to govern the timber business have become obstacles to actors against gaining more income. On the other hand, formal institutions in terms of concrete organizations - district councils, tree grower organizations, and development partners through donor-funded programmes present opportunities by attempting to upgrade the value chain of NIPF. The thesis shows further that trust, which is one type of informal institutions, plays a conflicting role of integrating actors in the value chain but also in some cases of excluding them from gaining access to the markets. By examining the role of trust, the thesis contributes to the value chain theory particularly on its informal institutional dimension where little attention has been paid. In this respect, the thesis calls for a new conceptualization of trust by focusing on both the bright and dark sides. Generally, the institutional framework of the value chain theory helped to illuminate the role played by

the external and internal environment and in turn the manner in which actors of the value chain respond to the opportunities and constraints generated by this environment.

The governance dimension of the global value chain theory helped to identify various relationships between the value chain actors. Thus, through this dimension, it was possible to analyze the manner in which different actors are linked to the market and power was exercised in those linkages. However, by using the two analytical dimensions of the global value chain theory, it was not possible to explain adequately why some of the actors of the value chain had more access to the benefits than is the case with others despite that all were operating under similar institutional framework. In this regard, the theory of access was very useful in explaining this phenomenon. According to the theory of access, differences in the access to processing technology, capital (both financial and social), and market were important mechanisms behind the differences in the access to benefits. Therefore, the thesis contributes knowledge to the governance dimension of the global value chain theory by locating the sources of power possessed by actors of the value chain. This is achieved by complementing the governance dimension of the global value chain theory with the theory of access.

5.3 Recommendations

5.3.1 Effects of regulations on actors of the non-industrial timber value chain in the Southern Highlands of Tanzania

The main goal of chapter two was to analyze the effects of regulations on actors of the non-industrial timber value chain in the Southern Highlands of Tanzania. The study findings show that all actors of the value chain operate under the same regulatory framework regardless of their differences. Lack of distinction has partly resulted in high transaction costs, which most actors in the NIPF value chain cannot afford. Therefore, it

is recommended that the government, through the Ministry of Natural Resources and Tourism (MNRT) should review the regulations governing the timber value chain in order for NIPFs to contribute significantly and sustainably to the income of actors. Specifically, barriers that limit tree growers and other actors from gaining access to the market should be minimized or completely removed. In addition, district councils should harmonize taxes that are charged on timber, because differences in the taxes charged compromise business competitiveness in the sector. Because tree growers were the most affected actors in the chain, the formation and/or strengthening of their associations for timber marketing would help them participate in the nodes with higher returns. In addition, through associations they can lobby for regulations that are relevant in their context.

5.3.2 Role of trust in timber value chain in the Southern Highlands of Tanzania

The aim of chapter three was to analyze the role of trust in timber value chain in the Southern Highlands of Tanzania. The study findings show that absence of trust negatively affected tree growers because it was associated with opportunistic behaviour of intermediaries who buy trees from tree growers. In the nodes where some trust was found, the trust played both integrative and exclusive roles. The integrative role of trust was negatively affected by power asymmetry among actors of the value chain. This suggests that addressing power relationship can be an entry point for improving trust in the value chains. Power can be dissolved among actors of the value chain through facilitating access to resources including information, credit, reliable market, and long-term collaboration. Therefore, as a way of promoting trust and enhancing integration in the value chains, the government, development partners, and grower organizations could facilitate access to these resources. In addition, because trust may be associated with negative consequences, it is also important to pay attention to its dark side in order to mitigate unintended consequences.

5.3.3 Upgrading trajectories in non-industrial private forestry in the Southern Highlands of Tanzania

The aim of chapter four was to analyse upgrading strategies in NIPF value chain and institutions driving them. The study identified four types of upgrading including process, product, functional and horizontal upgrading. The institutional framework comprising the state, development partners through donor and grower organizations were the main drivers behind the attempts of upgrading in NIPF. Nonetheless, only functional upgrading was found to improve the income of tree growers. Besides, the number of tree growers benefiting from functional upgrading was negatively affected by limited access to financial capital and the ability of finding customers for sawn timber. It is therefore recommended that, grower organizations, development partners, and the government through the district councils should facilitate access to credit and reliable market for sawn timber in order to increase the number of tree growers engaged in functional upgrading and alleviate poverty in rural areas through NIPF.

In addition, the study found that setting quality standards as a measure of promoting product upgrading was driven by the government's ambition of exporting timber and reducing negative consequences in the construction industry. It is important to be aware that presently the selling of what is termed premature trees is helping tree growers solve their pressing needs such as paying for school fees and health bills. Any measure that prevents tree growers from selling their trees any time they wish to do so, will be associated with negative consequences on access to health and education for their children. In addition, preventing tree growers from selling premature trees may tempt them to sell the entire compartment of woodlot including their land, which, in a long run, could lead to land scarcity. Therefore, the study recommends that before ratifying the envisaged quality standards, the government and development actors should conduct an

in-depth analysis on how the standards would affect the tree growers' well-being and take necessary measures to reduce the negative consequences.

Finally, the study findings showed that in the past two to three years, the price of standing trees at the village level dropped to about 50 percent while the price of sawn timber in distant markets remained almost the same. This scenario implies that upgrading alone does not guarantee higher income to tree growers as other factors are at play. Consequently, interventions for poverty alleviation among tree growers should consider other factors besides upgrading. Such factors could be associated with internal governance of the chain and unpredictable cost incurred by timber traders.

5.4 Areas for Further Research

This study has exposed four research areas as follows

First, the findings of the study show that in the past two to three years, the price of standing trees at the village level dropped by about 50 percent while the price of sawn timber in distant markets remained constant. This study did not analyse this, therefore, future research could investigate the factors behind this discrepancy of the price of timber at the village and regional markets.

Secondly, in this study the value chain of one product, sawn timber, was studied. Future studies could consider additional products and their uses (e.g. furniture making and packaging) because different strands of the value chain (according to end use) may have different governance and institutional characteristics that affect the chain all the way to farmers.

Thirdly, to gain a deep understanding of the effects of regulations on the incomes of value chain actors, the study heavily relied on qualitative methods. Therefore, future research could use research methods that can quantify the effects of regulations of various actors of the NIPF value chain.

Fourth, in pursuit of gaining a deeper understanding, this study also analyzed the role of informal institutions. However, special attention was paid to trust because it is one type of informal institution promoted in the value chains. However, this does not mean that other informal institutions are not important. Therefore, future research could analyze the role played by cultural norms and beliefs because they can also influence the performance of the value chain of NIPF. It is important to analyze these informal rules especially in the context of Africa, Tanzania in particular, because some cultural norms and beliefs restrict some social groups such as women and youths from accessing certain resources.

5.5 References

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APPENDICES

Appendix 1: Semi Structured Interview Guide for Tree Growers

Introduction

Good evening/morning. My name is Respikius Martin, a PhD student registered at Sokoine University of Agriculture in Morogoro Tanzania and University of Copenhagen in Denmark. As part of the requirements of PhD studies, I am conducting research on timber value chain. This research is conducted under the project entitled the Timber Rush: Private Forestry in Village Land implemented in the Southern Highlands of Tanzania. To achieve my research objective, I would like to ask for your consent to be interviewed as one of the actor in the value chain of timber. I would like to assure you that your name will not be mentioned anywhere while processing the information you will share with me. The interview will take between 40 – 60 minutes. I thank you in advance for in advance for your cooperation and agreeing to participate in my research.

Date of interview _____

Name of the respondent_____

Village_____

Mobile number_____

A: Socio-demographic Characteristics

i. Sex _____
ii. Education _____
iii. Marital status_____
iv. Age_____

B: Land Ownership

Land information: This will be used as a criterion for categorizing tree growers into small, medium or large tree grower)

Think about land you own/rent

B1. I would like to know whether you own/rent some plots of land

(**Probe** for number of plots, number of plots planted with trees, number of plots plated with other crops and their sizes as indicated in the table below.

Plots planted with Trees		**Plots planted with other crops**		
Plot no	Size in acres	Plot no	Type of crop planted	Size in acres
1		1		
2		2		
3		3		
4		4		
5		5		
Total		**Total**		

B2. What are your livelihood activities?

B3. Of all the livelihood activities your mentioned, what are the three most important activities (arrange them according to their importance. (Probe for the extent of contribution, reasons why this is the main contributor, the challenges faced by this enterprise)

C: Experience with tree growing and governance of the value chain

After discussing issues related to land, I would like now to focus more on tree growing

C1. What are the activities related to timber value chain are you engaged in?

C2. What are the regulations you need to follow in each of the activities?

C3. How do the regulations affect your activities?

C4. How do the regulations affect your income from the activities?

C5. What strategies do you use to get more income from activities you are engaged in?

D: Linkages in timber value chain

D1. Have you ever received any income from trees? YES/NO

D2.Recall the last time you received income from trees, how did you sell your trees (**Probe** for mode used to sell trees)

Sn	Probe for the following mode	Probe for reasons for opting the mode of selling
I	Selling land and pre-mature trees	
Ii	Selling pre-mature trees only (miti ya kufuga)	
Iii	Selling mature trees for harvesting	
Iv	Selling sawn timber	
V	Selling sawn timber through association	

D3. To whom did you sell trees/sawn timber/land with pre-mature trees/pre-mature trees only?

D4. How did you identify the buyer? _____

D5. How many times did you sell to the same person? _____

D6. Are you still in touch/having any sort of relationships with the buyer? YES/NO

D7.What are the advantages of selling to that person?

D8.What are the challenges encountered?

E. Trust

Issues to be covered include the following:

Length of trading relationship (short or long term?); Ordering procedure (presence of bidding or absence of, price agreed before or after order is commissioned); Contractual relationship (presence of written order or absence of written order);Inspection (inspection conducted upon delivery/ inspection not conducted); Degree of dependence (supplier has many or few customers); Technical assistance (technical assistance to supply quality

product provided or not provided, if provided, is it free or charged); Communication (formal or informal); Price determination (adversarial or non-adversarial); Credit (extended or not extended);Payment (on time according to agreement or delayed); advantages of trust; challenges or disadvantages of trust.

F: Upgrading

Issues to be covered

F1**.** Aspect of upgrading (process, product, quality, functions, coordination (vertical and horizontal)

F2. Which aspect(s) of upgrading are tree growers involved in?

F3. How are they involved?

F4. Do tree growers initiate the upgrading or someone else does?

F5. Who support or promote the upgrading (probe for the aspect promoted and how is promoted)?

F6. What is the perception of tree growers regarding the upgrading (probe whether the aspect is perceived positively or negatively, probe whether the aspect promoted has increased the income of tree growers, the challenge of adopting the upgrading promoted)?

Appendix 2: Interview Guide for Sawmillers

Introduction

Good evening/morning. My name is Respikius Martin, a PhD student registered at Sokoine University of Agriculture in Morogoro Tanzania and University of Copenhagen in Denmark. As part of the requirements of PhD studies, I am conducting research on timber value chain. This research is conducted under the project entitled the Timber Rush: Private Forestry in Village Land implemented in the Southern Highlands of Tanzania. To achieve my research objective, I would like to ask for your consent to be interviewed as one of the actor in the value chain of timber. I would like to assure you that your name will not be mentioned anywhere while processing the information you will share with me. The interview will take between 40 – 60 minutes. I thank you in advance for in advance for your cooperation and agreeing to participate in my research.

Date of interview _____

Name of the respondent_____

Village_____

Mobile number_____

A: Socio-demographic Characteristics

i. Sex _____
ii. Education _____
iii. Marital status_____
iv. Age_____

B: Land Ownership

Land information: This will be used as a criterion for categorizing tree growers into small, medium or large tree grower)

Think about land you own/rent

B1. I would like to know whether you own/rent some plots of land

(**Probe** for number of plots, number of plots planted with trees, number of plots plated with other crops and their sizes as indicated in the table below.

Plots planted with Trees		**Plots planted with other crops**		
Plot no	Size in acres	Plot no	Type of crop planted	Size in acres
1		1		
2		2		
3		3		
4		4		
5		5		
Total		**Total**		

B2. What are your livelihood activities?

B3. Of all the livelihood activities your mentioned, what are the three most important activities (arrange them according to their importance. (Probe for the extent of contribution, reasons why this is the main contributor, the challenges faced by this enterprise)

C: Experience of Sawmilling and Governance of the Chain

After discussing issues related to land, I would like now to know more about sawmilling activities

C1**.** To start with, I would like to know when did you start sawmilling business?

C2**.** Do you own or rent a sawmill?

C3. If you own a sawmill, when did you buy it? (Probe for reasons of buying a sawmill, number of sawmill owned, the type, its capacity and how it is used)

C4. What are the activities related to timber value chain are you engaged in? (probe if the sawmiller is involved in other activities apart from sawmilling)

C5. What are the regulations you need to follow in each of the activities?

C6. How do the regulations affect your activities?

C7. How do the regulations affect your income from the activities?

C8. What strategies do you use to get more income from activities you are engaged in?

D: Linkages in Timber Value Chain

D1. Have you ever received any income from trees? YES/NO

D2.If YES, recall the last time you received income from trees, how did you sell your trees (**Probe** for mode used to sell trees)

Sn	Probe for the following mode	Probe for reasons for opting the mode of selling
I	Selling land and pre-mature trees	
Ii	Selling pre-mature trees only (miti ya kufuga)	
Iii	Selling mature trees for harvesting	
Iv	Selling sawn timber	
V	Selling sawn timber through association	

D3. To whom did you sell trees/sawn timber/land with pre-mature trees/pre-mature trees only?

D4. How did you identify the buyer? _____

D5. How many times did you sell to the same person? _____

D6. Are you still in touch/having any sort of relationships with the buyer? YES/NO

D7. What are the advantages of selling to that person?

D8. What are the challenges encountered?

E. Trust

Issues to be covered include the following:

Length of trading relationship (short or long term?); Ordering procedure (presence of bidding or absence of, price agreed before or after order is commissioned); Contractual relationship (presence of written order or absence of written order); Inspection (inspection conducted upon delivery/ inspection not conducted); Degree of dependence (supplier has many or few customers); Technical assistance (technical assistance to supply quality product provided or not provided, if provided, is it free or charged); Communication (formal or informal); Price determination (adversarial or non-adversarial); Credit (extended or not extended); Payment (on time according to agreement or delayed); advantages of trust; challenges or disadvantages of trust

Appendix 3: Semi Structured Interview Guide for Timber Traders

Introduction

Good evening/morning. My name is Respikius Martin, a PhD student registered at Sokoine University of Agriculture in Morogoro Tanzania and University of Copenhagen in Denmark. As part of the requirements of PhD studies, I am conducting research on timber value chain. This research is conducted under the project entitled the Timber Rush: Private Forestry in Village Land implemented in the Southern Highlands of Tanzania. To achieve my research objective, I would like to ask for your consent to be interviewed as one of the actor in the value chain of timber. I would like to assure you that your name will not be mentioned anywhere while processing the information you will share with me. The interview will take between 40 – 60 minutes. I thank you in advance for in advance for your cooperation and agreeing to participate in my research.

Date of interview _____

Name of the respondent_____

Village_____

Mobile number_____

A: Socio-demographic characteristics

i. Sex _____
ii. Education _____
iii. Marital status_____
iv. Age_____

B: Land ownership

Land information: This will be used as a criterion for categorizing tree growers into small, medium or large tree grower)

Think about land you own/rent

B1. I would like to know whether you own/rent some plots of land

(**Probe** for number of plots, number of plots planted with trees, number of plots plated with other crops and their sizes as indicated in the table below.

Plots planted with Trees		**Plots planted with other crops**		
Plot no	Size in acres	Plot no	Type of crop planted	Size in acres
1		1		
2		2		
3		3		
4		4		
5		5		
Total		**Total**		

B2. What are your livelihood activities?

B3. Of all the livelihood activities your mentioned, what are the three most important activities (arrange them according to their importance. (Probe for the extent of contribution, reasons why this is the main contributor, the challenges faced by this enterprise)

C: Experience of timber trading and governance of the chain

After discussing issues related to land, I would like to know more about timber trading

C1. To start with, I would like to know when you started timber trading_____

C2.What motivated you to start timber trading?

C3. Do you operate/own a timber yard?

C4. If yes, how many timber yard do you operate or own? Where are they located?

C5. What were you doing before starting timber trading?

C6. What are the other activities along the value chain are you engaged in?

C7. What are the regulations you need to follow in timber business?

C8. How do the regulations affect your activities?

C9. How do the regulations affect your income obtained from the activities along the chain?

C10. What strategies do you use to get more income from activities you are engaged in?

D: Linkages

D1**.** Where, how and from who do you obtain timber? (**Probe** for different modes of getting timber and reasons for using the mode)

D2. Do you buy from the same person more than once?

D3. Do you have any sort of contract with the seller/your supplier?

D4. Do you offer any support to a person from whom you procure timber? (Probe for the kind of support provided -financial, technical etc.

D5. How do you ensure procurement of quality timber?

After discussing about how you get timber, I would like now to discuss about how you sell timber

D6. Where do you sell timber and to who are your customers? (**Probe** for the reasons for selling to that person)

D7. If timber is transported to distant regions, how much timber is transported? (**Probe** for frequency and amount)

D8. Do you sell to anybody or have permanent customers? (Probe for the reasons of the answer provided)

D9. Do you have any sort of contract/written agreement with your customer(s)? YES/NO

D10. What are the terms of payment when you deliver the cargo?

D11. Do you receive any kind of support from your customers? (**Probe** for kind of support provided eg. information related to demand of the market, credit, technical etc)

D12. What are the main challenges encountered in selling timber?

D13. How do you solve them?

E. Trust

Issues to be covered include the following:

Length of trading relationship (short or long term?); Ordering procedure (presence of bidding or absence of, price agreed before or after order is commissioned); Contractual relationship (presence of written order or absence of written order); Inspection (inspection conducted upon delivery/ inspection not conducted); Degree of dependence (supplier has many or few customers); Technical assistance (technical assistance to supply quality product provided or not provided, if provided, is it free or charged); Communication (formal or informal); Price determination (adversarial or non-adversarial); Credit (extended or not extended); Payment (on time according to agreement or delayed); advantages of trust; challenges or disadvantages of trust

Appendix 4: Semi Structured Interview Guide for Timber Retailers

Introduction

Good evening/morning. My name is Respikius Martin, a PhD student registered at Sokoine University of Agriculture in Morogoro Tanzania and University of Copenhagen in Denmark. As part of the requirements of PhD studies, I am conducting research on timber value chain. This research is conducted under the project entitled the Timber Rush: Private Forestry in Village Land implemented in the Southern Highlands of Tanzania. To achieve my research objective, I would like to ask for your consent to be interviewed as one of the actor in the value chain of timber. I would like to assure you that your name will not be mentioned anywhere while processing the information you will share with me. The interview will take between 40 – 60 minutes. I thank you in advance for in advance for your cooperation and agreeing to participate in my research.

Date of interview _____

Name of the respondent_____

Village_____

Mobile number_____

A: Socio-demographic characteristics

i. Sex _____
ii. Education _____
iii. Marital status_____
iv. Age_____

B: Land ownership

Land information: This will be used as a criterion for categorizing tree growers into small, medium or large tree grower)

Think about land you own/rent

B1. I would like to know whether you own/rent some plots of land

(**Probe** for number of plots, number of plots planted with trees, number of plots plated with other crops and their sizes as indicated in the table below.

Plots planted with Trees		**Plots planted with other crops**		
Plot no	Size in acres	Plot no	Type of crop planted	Size in acres
1		1		
2		2		
3		3		
4		4		
5		5		
Total		**Total**		

B2. What are your livelihood activities?

B3. Of all the livelihood activities your mentioned, what are the three most important activities (arrange them according to their importance. (**Probe** for the extent of contribution, reasons why this is the main contributor, the challenges faced by this enterprise)

C: Experience with timber retailing and governance of the chain

After discussing issues related to land, I would like to know more about timber business

C1. To start with, I would like to know when did you start timber business? _____

C2.What motivated you to start the business? (Probe for the reasons why timber retailing and not wholesaling)

C3. Do you operate/own a timber yard?

C4. If yes, how many timber yard do you operate or own? Where are they located?

C5. What were you doing before starting timber trading?

C6. What are the other activities along the value chain are you engaged in?

C7. What are the regulations you need to follow in timber business?

C8. How do the regulations affect your activities?

C9. How do the regulations affect your income obtained from the activities along the chain?

C10. What strategies do you use to get more income from activities you are engaged in?

D: Linkages

D1**.** Where, how and from who do you obtain timber? (**Probe** for different modes of getting timber and reasons for using the mode)

D2. Do you buy from the same person more than once? (If yes, probe for the frequency, amount bought, duration of business relationship and the reasons/advantage of long term/short term relationship with the supplier)

D3. Do you have any sort of contract with the seller/your supplier?

D4. What are the terms of payment when the cargo is delivered?

D5. Do you offer any support to a person from whom you procure timber? (**Probe** for the kind of support provided -financial, technical etc.)

After discussing about how you get timber, I would like now to discuss about how you sell timber

D6. Who are your customers?

D7. How do you ensure procurement of quality timber?

D8. Do you sell to anybody or have permanent customers? (Probe for the reasons of the answer provided)

D9. Do you have any sort of contract/written agreement with your customer(s)?

D10. What are the main challenges encountered in procurement and selling timber?

D11. How do you solve them?

E. Trust

Issues to be covered include the following:

Length of trading relationship (short or long term?); Ordering procedure (presence of bidding or absence of, price agreed before or after order is commissioned); Contractual relationship (presence of written order or absence of written order); Inspection (inspection conducted upon delivery/ inspection not conducted); Degree of dependence (supplier has many or few customers); Technical assistance (technical assistance to supply quality product provided or not provided, if provided, is it free or charged); Communication (formal or informal); Price determination (adversarial or non-adversarial); Credit (extended or not extended); Payment (on time according to agreement or delayed); advantages of trust; challenges or disadvantages of trust .

Appendix 5: Focus group discussion guide for tree growers

Date of FGD_____

Number of participants: Me_____ Ke_____ Total _____

Name of the village_____

Discussion Guide Questions

Part one: Role of the actor and regulations governing activities of the actor

1. Who are the actors of timber of value chain?
2. What role do they perform?
3. In which activities of the value chain are you mainly engaged in?
4. What are the main challenges that limit you from gaining more income from the activities?
5. What are the government regulations you are required to follow to perform your activities?
6. What are the advantages and or opportunities posed by these regulations?
7. What are the challenges or constraints imposed by these regulations?
8. How do you overcome the challenges posed by the regulations?
9. What strategies do you use to gain more income?
10. What is your suggestion regarding the government regulations?

Part two: Market linkages

1. In which form do you sell your trees?
2. Who is/are your customer(s)?
3. What are the benefits and challenges of selling trees/sawn timber to those customers?

Part three: Upgrading strategies

1. In which form do your sell your trees?
2. To whom do you sell your trees/sawn timber?
3. What are the challenges encountered in business relationship?
4. What are the strategies adopted to gain more income from trees?
5. Which strategy gives you more income than others and why?

Appendix 6: Focus Group Discussion Guide for Sawmillers

Date of FGD_____

Number of participants: Me_____ Ke_____ Total _____

Name of the village_____

Discussion Guide Questions

1. Who are the actors of timber of value chain?
2. What role do they perform?
3. In which activities of the value chain are you mainly engaged in?
4. What are the main challenges that limit you from gaining more income from the activities?
5. What are the government regulations you are required to follow to perform your activities?
6. What are the advantages and or opportunities posed by these regulations?
7. What are the challenges or constraints imposed by these regulations?
8. How do you overcome the challenges posed by the regulations?
9. What strategies do you use to gain more income?
10. What is your suggestion regarding the government regulations?
11. Who is/are your customer(s)?
12. What are the benefits and challenges of selling trees/sawn timber to those customers?

Appendix 7: Focus Group Discussion Guide for Timber traders

Date of FGD_____

Number of participants: Me_____ Ke_____ Total _____

Name of the village_____

Discussion Guide Questions

1. Who are the actors of timber of value chain?
2. What role do they perform?
3. In which activities of the value chain are you mainly engaged in?
4. What are the main challenges that limit you from gaining more income from the activities?
5. What are the government regulations you are required to follow to perform your activities?
6. What are the advantages and or opportunities posed by these regulations?
7. What are the challenges or constraints imposed by these regulations?
8. How do you overcome the challenges posed by the regulations?
9. What strategies do you use to gain more income?
10. What is your suggestion regarding the government regulations?
11. Who is/are your customer(s)?
12. What are the benefits and challenges of selling trees/sawn timber to those customers?

Appendix 8: Checklist for Key Informants (Forest Officers and Tanzania Forest Service Agency staff)

Date of interview_____

Name of the key informant _____ Se_____

Organization represented_____ Position_____

Checklist of Questions

1. Who are the actors of the timber value chain?
2. How do the actors of the timber value chain relate?
3. What is your role in the timber value chain?
4. What are the regulations governing various activities along the value chain of timber?
5. What are the constraints opportunities posed by the regulations?
6. What are the constraints imposed by the regulations?
7. What are the challenges of implementing/enforcing the regulations?
8. What are the other challenges related to your work in timber value chain?
9. How do you facilitate value chain upgrading?
10. What are the challenges in promoting value chain upgrading?

Appendix 9: Checklist for Key Informants (Leaders of tree grower associations)

Date of interview_____

Name of the key informant _____ Se_____

Organization represented_____ Position_____

Checklist of Questions

1. Who are the actors of the timber value chain?
2. How do the actors of the timber value chain relate?
3. When did your start your organization?
4. Is your organization registered?
5. Who initiated its formation?
6. What is the role of your organization in the value chain of timber?
7. What are the regulations governing activities along the value chain of timber?
8. What are the opportunities posed by the regulations?
9. What are the constraints imposed by the regulations?
10. How does your organization help growers to get more income from trees?
11. What are the challenges that limit your organization to perform its functions?
12. How do you deal with those challenges?
13. What can you say about the contribution of your organization in helping tree growers gain more income?

Appendix 10: Household Survey Questions

A: Socio-demographic Variables

1. Name of the respondent _____
2. Village_____
3. Ward _____
4. District _____
5. Region _____
6. Sex
7. Age (yeas)
8. Highest level of education
9. Main sources of household income

B: Tree Planting Cost

1. When did you last plant your woodlot? (year)_____
2. What was the size of the plot? (acres)_____
3. Please provide information on the costs related to the last planted woodlot

Item	Description	Quantity	Cost (TZS)
Sources of seedlings			
If used own raised seedlings	Seeds (specify units)		
	Nursery site preparation		
	Pots (specify units)		
	Nursery management (lumpsum)		
Other items			
Seedlings transportation			
Land clearing			
Digging holes			
Fertilizer (Kgs)			
Planting			
Fire protection until harvesting			
Harvesting (Year)	Hiring machinery for felling trees (e.g. chain saw)		
	Collection of logs		
	Hiring machinery for saw milling (eg. dingdong)		
……	Transportation to the roadside		

	Transportation to seasoning center		
	Transportation to the marketing center		

4. If you did not harvest the last planted woodlot, when did you last harvest? (year)
5. What was the size of plot harvested (acres)……?
6. Please provide with us information on the costs related to the last harvest

Harvesting	Hiring machinery for felling trees (e.g. chain saw)	
	Collection of logs	
	Hiring machinery for saw milling (eg. dingdong)	
	Transportation to the roadside	
	Transportation to seasoning center	
	Transportation to the marketing center	

C: Marketing of Products from Woodlots

1. On overage, how old was the last harvested woodlot? (years)
2. What is the recommended harvesting age? (years)
3. What did you sell? 1 = sawn wood 2 = Standing tree
4. If standing trees, what was the modality of selling? 1 = Per tree 2 = Per plot
5. If per tree, how many trees were sold? ……..
6. What was an average price per tree?.....
7. If sold per plot, what was an estimated size of the plot?.....estimated number of trees?.....price per plot……
8. How did you identify the person to whom you sold trees/sawn wood? (1 = Through a colleague 2 = through a middleman 3 = They just came asking 4 = Mobile sawmill operator 5 = Others, specify……)
9. Please provide information related to selling sawn wood

Size of sawn wood sold	**Price per sawn wood**	**Cess per sawn wood**

10. Have you ever sold young woodlots 1. Yes 2. No
11. If yes, what was the age of young woodlot sold? (years)…..
12. Why did you sell the woodlot at this age (1 = Paying school fees; 2 = Paying medical bills; 3 = House construction; 4 = Other (Specify……..)

D: Horizontal Upgrading

1. Are you a member of any tree grower organization? 1. Yes 2. No
2. If no, why……..
3. If yes, how do you benefit from it?.....
4. What activities do you conduct together as a group?.....
5. Does your group undertake any value addition activities? 1. Yes 2. No
6. If yes, mention them……
7. What are the challenges faced by your group…….

E: Wildfire

1. Have you ever experienced wildfires in your woodlot? 1. Yes 2. No
2. If yes, please provide the following information on wildfires

What is the major cause of fire?	How many acres have been burnt?	What is the total loss (TZS)?
1. Crop farming 2. Beekeeping 3. Land conflicts 4. Others (Specify) …….	……	…….

Appendix 11: Themes and Subthemes Emanated from Qualitative Data A*nalysis*

Sn	Themes	Subthemes
1	Effect of regulations	Positive effect
		Negative effects
2	Strategies for more income	Illegal strategies
		Legal strategies
3	Roles of trust	Advantages of trust
		Disadvantages of trust
4	Types of upgrading	Improvement of Process,
		Improvement of product
		Improvement of coordination
		Functions added
5	Strategies for promoting upgrading	
6	Perceptions on different strategies	Positive perception
		Negative perceptions
7	Types of linkages	
8	Institutions promoting upgrading	
9	Opinion on how to improve the value chain	
10	Relationship among actors of the value chain	
11	Constraints for upgrading	
12	Mechanisms underlying access to more income	The uses of capital
		Benefits of access to processing technology
		Social capital
		Knowledge of regulations

13 Miscellaneous