

Regulations matter: their effects on actors of the non-industrial timber value chain in the Southern Highlands of Tanzania

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HIGHLIGHTS

- The government is the sole regulator of the timber value chain. However, regulations are implemented differently at the sub-national level.
- All value chain actors operate under the same regulatory framework despite their many differences.
- Some regulations are perceived cumbersome by the value chain actors.
- Although regulations affect all actors of the value chain, tree growers are the most-affected category.
- Government revenue is lost due to some strategies adopted by the chain actors to maximize their incomes.

SUMMARY

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. Access and distribution of the benefits are affected by governance, which is an important aspect in this regard. This paper focuses on state regulations, which in the context of Africa and Tanzania in particular, have received scant attention in the value chain studies. The paper seeks to respond to three main questions: i) How is the timber value chain regulated? (ii) What strategies do the value chain actors use to gain access to benefits? And iii) how do regulations affect the incomes of the chain actors? Data for the study were collected from Njombe District through documentary analysis, focus group discussions, observations and in-depth interviews with key informants. The study findings show that while the government is the sole regulator of the chain, regulations are implemented differently at the sub-national level. Industrial and non-industrial private forestry are placed 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. Despite strict regulations and many taxes paid, the actors adopt different strategies such as using locally available materials and capitalizing on social networks in maximizing their incomes from the timber business. The regulations affect incomes of all actors, however, tree growers are the most-affected category. This is because tree growers possess limited capital to engage in high value chain activities and strict regulations aggravate the situation. The paper concludes that the contribution of non-industrial private forestry to poverty alleviation is stifled by cumbersome district and state regulations that limit actors' access to profitable markets.

Keywords: governance, access, benefits, value chain, forestry

Les règles sont importantes: leurs effets sur les acteurs de la chaîne de valeur non-industrielle du bois dans les Terres hautes du sud en Tanzanie

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Au cours de ces dernières années, la foresterie privée non-industrielle (NIPF) pour la production du bois a gagné une importance économique dans les Terres hautes du sud de la Tanzanie. L'accès aux bénéfices accumulés par la NIPF présente une opportunité pour le soulagement de la pauvreté. Cet accès aux bénéfices et leur distribution est cependant affecté par la gestion, un aspect important à cet égard. Ce papier se concentre sur les réglementations d'état, lesquelles, dans le contexte de l'Afrique, et de la Tanzanie en particulier, ont été l'objet de peu d'attention dans les études des chaînes de valeur. Le papier cherche à répondre à trois questions principales: (i) comment la chaîne de valeurs est-elle réglementée? (ii) Quelles stratégies les acteurs de la chaîne de valeur utilisent-ils pour gagner accès aux bénéfices? et, (iii) comment les réglementations affectent-elles les revenus des acteurs de la chaîne? Les données de cette étude ont été recueillies dans le district du Njombe à l'aide d'une analyse documentaire, de discussions de groupes focus, d'observations et d'interviews poussées auprès d'informateurs-clé. Les résultats de l'étude indiquent que bien que le gouvernement soit le seul moniteur de la chaîne, les réglementations sont appliquées différemment au niveau sous-national. Les foresteries privées industrielle et non-industrielle sont placées dans le même cadre de réglementations, en dépit de leurs différences. Cela a partiellement résulté en des coûts de transaction élevés, inabordables pour la majorité des acteurs de la chaîne de valeur de la NIPF. Malgré des réglementations strictes et bien des impôts payés, les acteurs adoptent des stratégies différentes, telles que l'utilisation

de matériaux disponibles localement et une capitalisation sur les réseaux sociaux pour maximiser leurs revenus provenant du commerce du bois. Les réglementations affectent les revenus de tous les acteurs, toutefois, les cultivateurs d'arbres sont la catégorie la plus affectée. Ceci est dû au fait que ces cultivateurs ne possèdent qu'un capital limité pour se lancer dans des activités dans les chaînes de valeur élevées, et que des réglementations strictes aggravent la situation. Le papier conclut que la contribution de la foresterie privée non-industrielle au soulagement de la pauvreté est étouffée par des réglementations de district et d'état lourdes, limitant l'accès des acteurs aux marchés profitables.

La normativa importa: sus efectos en los actores de la cadena de valor de la madera no industrial en las tierras altas del sur de Tanzania

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En los últimos años, la silvicultura privada de carácter no industrial (SPNI) para la producción de madera ha ganado importancia económica en las tierras altas del sur de Tanzania. El acceso a los beneficios adquiridos por la SPNI representa una oportunidad para la mitigación de la pobreza. El acceso y la distribución de los beneficios se ven afectados por la gobernanza, que es un aspecto importante al respecto. Este artículo se centra en la normativa estatal, que en el contexto de África y de Tanzania en particular, apenas ha recibido atención en los estudios sobre la cadena de valor. El artículo trata de responder a tres preguntas principales: i) ¿cómo se regula la cadena de valor de la madera?; ii) ¿qué estrategias utilizan los actores de la cadena de valor para acceder a los beneficios?; y iii) ¿cómo afecta la normativa a los ingresos de los actores de la cadena? Los datos para el estudio se recolectaron en el distrito de Njombe mediante el análisis de documentos, discusiones de grupos focales, observaciones y entrevistas en profundidad con informantes clave. Los hallazgos del estudio muestran que, aunque el gobierno es el único regulador de la cadena, la normativa se aplica de forma diferente a nivel subnacional. La silvicultura privada industrial y la no industrial están sometidas al mismo marco normativo a pesar de sus numerosas diferencias. Esto ha provocado, en parte, unos elevados costos de transacción, inasequibles para la mayoría de los actores de la cadena de valor de la SPNI. A pesar de la estricta normativa y los numerosos impuestos que se pagan, los actores adoptan estrategias diferentes, como el uso de materiales disponibles localmente y la capitalización de las redes sociales para maximizar sus ingresos del comercio de la madera. La normativa afecta a los ingresos de todos los actores, pero los silvicultores son la categoría más afectada. Esto se debe a que los silvicultores poseen un capital limitado, por lo que no pueden participar en actividades de la cadena de alto valor, y la estricta normativa agrava la situación. El artículo concluye que la contribución de la silvicultura privada no industrial a la mitigación de la pobreza se ve ahogada por la engorrosa normativa estatal y de los distritos, que limita el acceso de los actores a los mercados rentables.

INTRODUCTION

Non-industrial private forestry (NIPF) is characterized by individual ownership of forest plantations, such as small individual farmers or urban-based investors. Unlike NIPF, industrial plantations are owned by governments and corporations. On the other hand, 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 Roshtko 2015). Yet NIPF supports the livelihoods of many people (Byron 2001, Cerutti and Lescuyer 2011, Pulhin and Ramirez 2016).

Many African countries, including Tanzania, have experienced an upsurge of NIPF plantations at least in the past decade (Carle *et al.* 2002). As in other value chains¹, the benefits accrued from this upsurge depend on the governance of the value chain² (Kaplinsky 2000). However, literature on governance of the NIPF value chain in Tanzania and Africa in general is scarce (Pedersen 2017). Thus, this paper introduces

NIPF value chain analysis in the African literature by analysing 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 focuses on the regulatory framework governing the chain.

In Tanzania, studies on the timber value chain have largely focused on either public plantations or natural forestry (e.g. Well and Wall 2005, Kapinga 2010, Lukumbuza and Sianga 2017). Other studies such as Ngaga (2011) and Mwamakimbula (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, a study by PFP (2016) paid much attention on technical aspects of forest products from both private and public plantations. Little attention on the governance of the NIPF value chain and specifically on how the actors of the chain interact with the regulatory framework is a common feature across all these studies.

¹ "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).

² "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 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, increasing demand for timber for construction, and a growing middle class/upper class with money to invest in the NIPFs (Ngaga 2011). Access to benefits accrued from NIPFs by all the actors of the chain presents the potential opportunity for poverty alleviation. However, 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 scant literature on the NIPF value chain in Tanzania and Africa in general, something can be learnt on the NIPF from some Asian literature. According to this literature, NIPF provides a range of benefits to rural communities; these include 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). However, despite these benefits, the contribution of NIPF to poverty alleviation is influenced by a host of other factors, 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 or cumbersome multiple regulations can negatively influence the contribution of NIPF to poverty alleviation and to the flourishing of the industry. According to Maryudi *et al.* (2015), timber regulations can increase transaction costs at the farm and processing levels well beyond the financial capacity of an individual smallholder farmer or producer. Similarly, as Meija *et al.* (2015) report, regulatory requirements can and have become economic and institutional barriers that limit access and exclude smallholders from the timber markets. A study by Pulhin *et al.* (2016) on the hurdles posed by regulations and informal practices in the community-based timber enterprise and smallholder forestry in the Philippines 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 respond to three main questions: i) How is the timber value chain regulated? (ii) What strategies do the actors use to gain 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: firstly bridging the knowledge gap on NIPF in Africa and Tanzania in particular; secondly, adding knowledge to literature on value chain governance; and finally, adding knowledge 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 in this paper.

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, which is sawn timber, reaches consumers via multi-level marketing channels. The institutional environment influences activities of the chain because it determines the roles and interaction of actors in the chain (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 nodes³ are affected equally by the regulations. It is worth noting that although regulations determine who gains and who loses; their effects are mediated by a host of factors, which Ribot and Peluso (2003) refer to as mechanisms of access. Thus, "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 2003:156). In this definition, "access" connotes a bundle of powers that is broader than the bundle of rights conferred by codes and customs. 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 2003:159). Accordingly, Ribot and Peluso (2003) identify eight mechanisms influencing access, namely technology, capital, market, knowledge, authority, labour, and labour opportunities, social identities and social relations.

This paper is inspired by access theory to explore 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). Thus, the paper proceeds by describing the methodology and presents results and discussions under four subheadings: actors, regulations, strategies, and outcomes or effects. Lastly, the paper draws conclusions and offer recommendations on how to reduce the negative effects imposed by the regulations.

METHODOLOGY

Study area

The Southern Highlands of Tanzania encompass five regions, namely, Iringa, Mbeya, Rukwa, Ruvuma and Njombe. NIPFs are found in all the regions of the Southern Highlands, however, the majority are found in Njombe, where in recent years, NIPF has gained economic importance as a livelihood strategy (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

³ A node is defined as sites where goods or information are exchanged (Tobin *et al.* 2016).

selected because it has the highest number of NIPFs as compared to the NIPFs in other districts of Njombe Region (PFP 2016). 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 with timber production occupying more than 50 percent of the total land in the area (FDT 2015). Due to the importance of these villages in timber production, a big market for sawn timber has been established 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 other towns and cities outside the District, such as Morogoro, Dodoma, and Dar es Salaam.

Research design and data collection

The study adopted a cross-sectional design and different methods to collect qualitative data. First, various documents, including the National Forest Policy of 1998 and the Forest Act of 2002 were reviewed. This exercise helped the researchers to familiarise themselves with the regulations governing the timber value chain. Later, these regulations were assessed against their implementation and the manner in which they affect the incomes of the value chain actors. Secondly, key informant interviews and focus group discussions were carried out. The key informants were purposively selected based on the knowledge of the subject of the study. These included Forest Officers, business and market facilitators from Forest Development Trust (FDT), Village Executive Officers from the three selected villages, the Zonal Manager for Tanzania Forest Services and leaders of the Matembwe Tree Growers' Association (TGA).

Furthermore, focus group discussions (FGDs) were conducted in order to gain understanding of the experiences on the study topic at group cum community level rather than at individual level. Besides, interaction is the unique feature of the method and that group interaction assists participants to explore and clarify their points of view (Suter 2000). However, to gain full advantage of group interaction requires good moderation of less strict structured discussion (involving people with similar backgrounds or experience) without which some individuals are likely to impose their own opinions over those of the others. In order to avoid the pitfalls of the method, homogeneity was considered in selecting the FGD participants and an experienced researcher moderated the FGDs.

A total of nine (9) focus group discussions involving three main actors of the timber value chain (namely, tree growers, sawmillers and timber traders) were conducted in Matiganjola,

Nyombo and Matembwe villages (Fig. 1). In each village, the first FGD involved tree growers, the second involved sawmillers, and the third involved timber traders. Members of FGDs were selected based on their extensive experience on a particular node. In each FGD, efforts were made to include all categories of actors. Thus, FGDs for tree growers 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 used the same sawmills (i.e., dingdongs), all sawmillers reported in the village were recruited into FGDs. On average, seven participants were involved in the FGDs.

Issues covered during 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 from 45 to 90 minutes. Lastly, observations were also made at the roadblocks established for the inspection of forest products and the collection of tax at different checkpoints along the road. The analysis of the data involved transcribing all interviews into text. This process resulted in the labelling of sentences and paragraphs. The labels communicated explicit meanings 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.

RESULTS

Actors in the NIPFs in the Southern Highlands of Tanzania

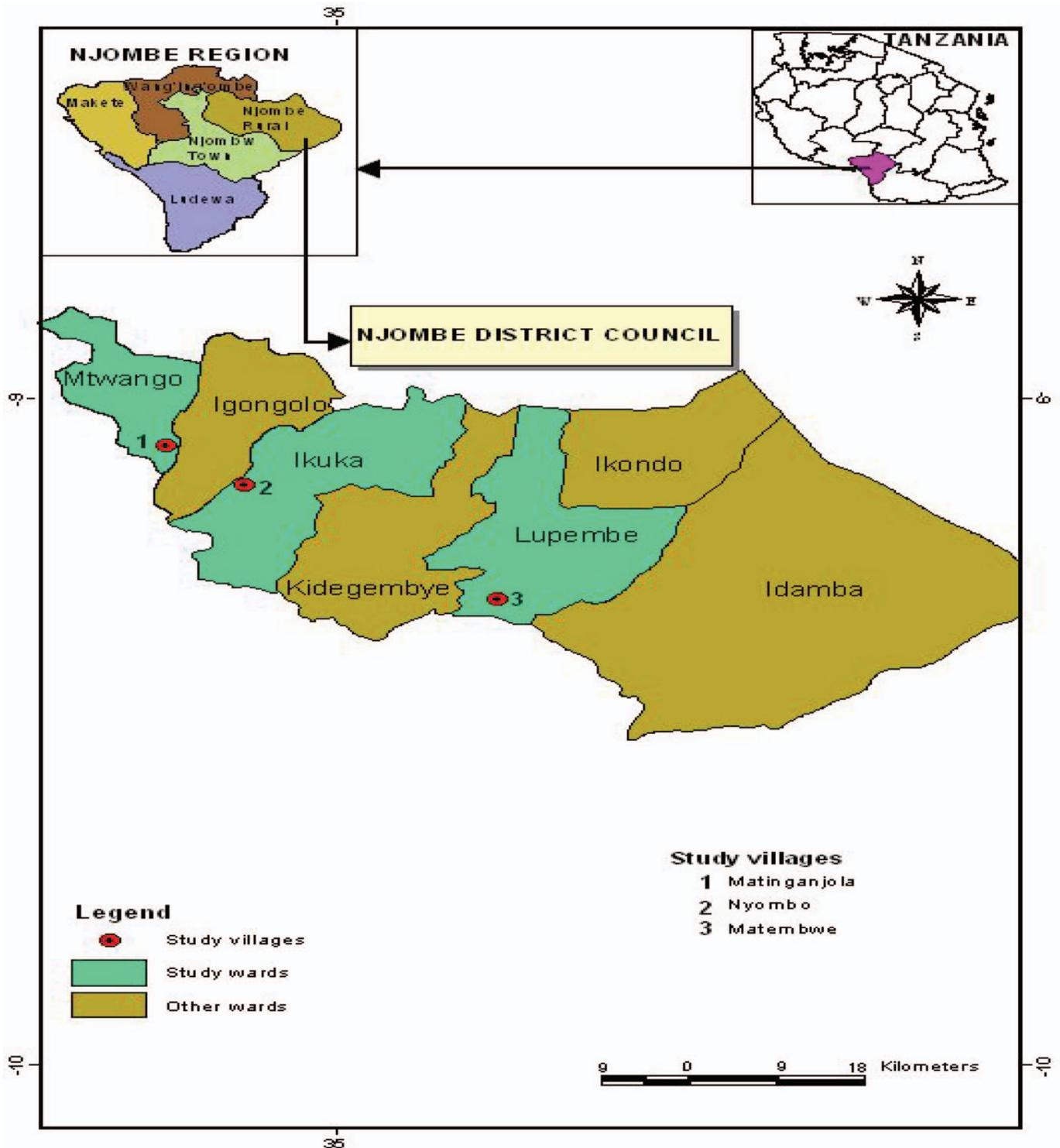
The value chain of NIPFs in the Southern Highlands of Tanzania comprises many actors (Mwamakimbula 2016, PFP 2016). However, in this paper, five main actors (notably, nursery operators, tree growers, transporters, sawmillers and timber traders) are analysed in detail to provide a good picture of how actors interact with the regulatory framework.

Nursery operators

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 in 2017, the price of one seedling was 150 TZS (0.1 USD)⁴, and on average growers used 470 seedlings per acre.

⁴ 1 USD is equivalent to 1500 TZS

FIGURE 1 A map of study areas



Tree growers

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*. In terms of land ownership, on average, tree growers tend to have larger landholdings than non-tree growers. For example, the FDT registration survey (2015) shows that 11 percent of tree growers own more than 20 acres of land, 56 percent own between 5–20 acres of land and 33 percent own less than 5 acres of

land. The median size of land in the Southern Highland is about 6 acres. In terms of land use, tree growers dedicate about 42 percent of their land to forestry and this figure rises to more than 50 percent in Njombe and Mufindi Districts. In Njombe District, the average size of pine woodlot is 6 acres. 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 they are present they are fewer than the number of tree growers in a village. Therefore, in most cases tree growers work individually. There is varied access to the market across tree growers. However, some of them sell sawn timber while others sell premature trees termed *miti ya kufuga*.

Sawmillers

The main role of sawmillers is to process timber, and majority of them own locally fabricated mobile machines referred to as dingdongs. Workers who operate dingdong saws move from one place to another depending on the location or existence of trees. Due to the transitory nature of the work force, majority of operations do not employ women. 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 (sawmillers) buy standing trees from which they get timber for selling to traders who, in turn, deliver the timber to local or regional markets. Therefore, in addition to offering sawmilling services, some sawmillers are engaged in timber trading.

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 saw milling points in the field to the selling points or to the secondary loading points. Sometimes these trucks are not serviced and lack legal documents such as insurance; thus, they cannot transport timber to distant markets for fear of being implicated with traffic offences, which might attract penalties. The second category of transporters is those who use trucks that are regularly serviced and have the required documents that allow them to transport timber from village markets or areas with good roads and to regional markets. These trucks pass through various check-points, notably the TFS checkpoints where cess is collected, and the weigh bridges where the weight of the cargo is measured. 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, in 2017 when this study was conducted the cost for transporting timber from Njombe to Dar es Salaam, a distance of 714 km, was about 2.5 million TAS (1 667 USD) per trip.

Timber traders

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. 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 it 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 involves those based in the regional centres who buy timber from either the village markets or district centres. In most cases, this type of traders sells the timber to the final consumers in the regional centres and can therefore be regarded as retailers.

The last category of timber traders is those who export timber outside the country. Although some individuals are involved, companies are the main players in the export of timber. It is worth noting that, although the identified 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., tree growing, processing, and marketing). However, in this study, the criterion used to classify them under a particular category was their main activity in the NIPF value chain. Figure 2 shows the main actors in the non-industrial timber value chain in the Southern Highlands of Tanzania.

Regulatory framework

The Forest Policy of Tanzania (URT 1998) and Forest Act No. 14 of 2002 CAP 323 (URT 2002) are the two main documents governing the timber business and its value chain in Tanzania. The Forest Regulations of 2004 help in operationalizing the Forest Act. A review of the policy showed that the Government of the United Republic 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 the Government commitment to the promotion of private forestry plantations include 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 focuses more on large-scale plantations. Despite their many differences the two types of plantations are placed under the same regulatory framework. This has partly resulted in high transaction costs, which are unaffordable to the majority of actors in the NIPF value chain. On the other hand, it is important to note that the Forest Policy of 1998 is under review,

FIGURE 2 Actors in the NIPF value chain and their interaction with regulation

Main Processes						
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, <i>Pinus patula</i>) 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 the weigh bridge is 47 tons.	Transit pass. Pay taxes	Business license. Pay taxes.

which provides an opportunity of addressing the weaknesses of the current policy, however there has never been any new Forest Policy despite that the review was made more than 10 years back at the time of the study.

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 the implementation of the policy, namely Forestry and Beekeeping Division under the Ministry of Natural Resources and Tourism, the President's Office through the Regional Administration and Local Governments (PORALG), and the Tanzania Forestry Service Agency (TFS). The Forestry and Beekeeping Division is mainly concerned with policy development, law enforcement, monitoring, and evaluation of the implementation of sectoral policy. The other organs, PORALG 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 the enforcement of forest legislation related to logging, processing and marketing of forestry products. In addition, the Tanzania Revenue Authority (TRA) collects various taxes, such as value added tax (VAT). Generally, the government regulations intend to set conditions of facilitating

smooth operations of the various activities for the benefit of actors and the government itself. However, the implementation of some regulations is accompanied by unintended effects to the chain actors including the government.

Regulations at the harvesting node

Section 5 (1) of the Forest Regulations sets the minimum girth of which trees may be harvested, however, this regulation is not enforced. This enables tree growers to harvest their trees at any time they want to do so. The government would wish to control tree harvesting by imposing strict regulations, however, the 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 the government's capacity for providing them. It therefore seems easier to control marketing, because it involves transportation where government officials can be placed at strategic points.

During FGDs, tree growers reported to have not been bothered by government officials, even when they harvest premature trees. However, they acknowledged having received advice and directives from non-governmental organizations (NGOs) and from government officials on the recommended harvesting age of their trees, which is at least 15 years since planting. Interviews with Forest Officers revealed that premature harvesting, which was attributed to the rotation age of the

pinus (*Pinus patula*), which is between 18 and 25 years, has been a big challenge in the study area. 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 Government officials 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) and also fetching lower prices. 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 of trees, the Forest Officers reported that, the regulation demands harvesting of trees be done after 15 years at the minimum; however, it is difficult to implement this regulation as observed by one of the officers,

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, which include 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.

This statement implies that it would have been easier 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 fertilizers.

Responding to the accusation of harvesting premature trees, tree growers reported that almost everybody is aware of the advantages of harvesting pines at 15 years. However, they face major challenges that override their desire to wait. These include wildfire and lack of alternatives to meet various household requirements. All members of FGDs from the three villages of Matiganjola, Nyombo and Matembwe unanimously agreed that wildfire is causing big losses. Explaining more about these losses, a tree grower and a member of FGD from Nyombo village said,

“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.”

This statement implies that wildfire is a serious challenge in the tree-planting business in the Southern Highlands of

Tanzania. There are different narratives regarding incidences of wildfire. Some people say fire is caused by reckless small-holder farmers who use it during land preparation for crop production. 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 say, fire is caused by sawyers (working as casual labourers), when the fire accidentally escapes during cooking.

Regarding lack of alternatives in meeting household requirements, the views of FGDs members were in line with the views of Forest Officers. FGD members also acknowledged to have heard about Government interventions of supporting bee keeping activities and admitted that it is an additional income activity. However, it may not reduce incidences of wild fire. This implies that premature harvesting may persist because bee keeping addresses lack of alternative of other income generating activities but it does not reduce the risk of wild fire. Thus, regardless of the narratives about forest fires, overcoming the challenge is paramount because it negatively affects tree growers in the Southern highlands of Tanzania.

Regulations at the processing node

At the processing node regulations are not strictly enforced. For instance, section 53. (1) of the Forest Regulations states, “Any person intending to operate a sawmill, chipboard mill, pulpwood mill, wood preservative treatment plant and any other similar installation of a similar nature must apply for and obtain a licence under these Regulations.” However, none of the sawmillers reported to have registered his sawmill particularly ding dongs. Furthermore, the study found that sawmills, which produce plenty of saw dust such as dingdongs are not permitted. According to District Forest Officers, currently many sawmillers use dingdongs; however, legislation of banning them is forthcoming. Certainly, if the regulation is strictly enforced, it would have a negative impact on the incomes of many actors, especially smallholder tree growers and small-scale sawmillers. This is because ding dongs allow tree growers, albeit few, to sell sawn timber as an alternative to the selling of standing trees to larger-scale operators.

Regulation at the marketing node

Selling forest products beyond the village involves having documents which are not easily accessible by smallholder farmers. Section 13 (1) of the Forest Regulations states, “No forest produce such as trees, timber, logs, poles, charcoal, firewood, gums, fibres, flosses and the like shall be removed from any forest area or woodlots under the control of the Forestry and Beekeeping Division, a local government or urban authority or private owner, or from any other location unless a Transit Pass in the form set out in the Fourth Schedule to these Regulations has been obtained.” This regulation is strictly enforced and actors of the chain who violate it are severely punished including confiscation of their entire cargo.

Furthermore, the study shows that before anyone opens a yard for selling timber, he/she must pay a registration fee amounting to 261,000 Tanzanian shillings (TZS), which is equivalent to USD 174 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 7,500/= TZS (USD 5) for a truck of not more than seven tons; and 15,400/= TZS (USD 10.27) 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 percent 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 by tree growers because they do not provide electronic receipts to their buyers (timber traders). As it will be shown later, tree growers do not issue electronic receipt because they cannot afford electronic fiscal device (EFD) and many years may pass before the grower can sell trees. 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 for the production of electronic receipt from timber traders. To avoid delays, timber traders settle this by entering into informal agreements with TRA officials, which may result in corrupt practices.

Apart from the VAT collected by TRA, District Councils also collect cess, which differs from one District Council to another. For instance, at the time of this study, Njombe District Council was charging 200/= TZS (USD 0.13) for a piece of sawn timber regardless of its size, while Njombe Town Council was charging 100/=TZS (USD 0.07) per piece of sawn timber. The difference in cess between the two district councils results in higher transaction costs for timber collected from Njombe DC than for the timber from Njombe TC. In turn, this reduces profitability among the actors, especially tree growers.

Regulations for transportation

Another regulation is to do with 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 the required number of pieces of timber drops during the rainy season because of two reasons. First, the timbers absorb water and gain more weight. Second, the roads to the timber sourcing points become almost impassable, and the trucks can only afford to carry fewer timbers (between 3,000 and 3,300 pieces). These findings underscore the importance of using a railway for cargo transportation that would enable actors to enjoy economies of scale and hence increase competitiveness of the sector. Another regulation relates to 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 and hence aggravates the negative effects

of regulations on the actors of the chain. To ensure that the government can monitor and enforce compliance, there are many roadblocks where officials ensure that all transported timber complies with the regulations.

Strategies used by actors to benefit from timber

Nursery operators

Most nursery operators mainly use locally available materials to maximize their income. They raise seedlings of *Pinus patula* with local seeds and use locally available soil and cardboard boxes instead of polythene bags. Furthermore, in order to benefit from cheap and reliable source of water, most of the nurseries are located close to the rivers or springs.

Tree growers

Actors adopt different strategies of ensuring that they continue to benefit from the tree/timber business. Tree growers capitalize on the use of social relations or social networks to earn more income from selling of 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 individuals are 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 the study villages, the central mechanism of maintaining a positive social relationship is trust, which is a norm enforced through sanctions.⁵

Another strategy used 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. In addition, 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).

Also, some tree growers chose to sell sawn timber instead of standing trees. The 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 in the literature, knowledge of the rules and regulations governing the sale of timber was an asset in selling 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 cited as a reason forcing some tree growers to sell standing trees. Interviews with one of the Forest Officers revealed that growers are supposed to pay the value added tax of 18 percent when they sell sawn timber. The Officer reported further that selling sawn timber to profitable markets

⁵ 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 was termed as source of livelihood insecurity.

requires some knowledge of the regulations governing the business and awareness of the documents required. The failure of adhering to the regulations involves a penalty and therefore a loss to the person involved.

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. Sawmillers related how they charge a high price for tree growers who seek to lease their sawmill for the processing of standing timber, as a way of ensuring continued access to cheap timber and maintaining the existing power relations.

Some sawmillers also act independent of timber traders by buying standing trees and processing them, only to sell them to timber traders. In this regard, the 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 customers to hire them. Another strategy of maximizing income was avoidance of paying the licensing (registration) fee, and which is made possible because of lack of law enforcement on the part of the responsible authority. In addition, because sawmillers are not authorized timber traders, they do not transport their products to distant markets where they can be spotted by the regulators. Instead, they sell their products to timber traders who have the required paperwork.

Timber traders

FGDs revealed that timber traders use various strategies of maximizing profits. For example, timber traders in Njombe DC avoid paying cess at any gate in the District Council even when timber has been collected from within 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 (USD 0.13), whereas in Njombe Town Council it is charged 100 TZS (USD 0.07). Therefore, a truck of 48 tons carrying between 3500 and 3700 pieces of timber is supposed to pay at least 700,000 TZS (USD 467) for cess in Njombe DC and only 350,000 TZS (USD 233) in Njombe TC. Therefore, avoiding paying cess at any of the gates in Njombe DC, a trader saves 350,000 TZS (USD 233) per truck.

In explaining why Njombe District Council charges higher cess per piece of timber compared to Njombe TC, a key informant from Njombe DC said, each council has full authority of charging any amount it wants. However, further probing revealed that the decision of charging higher rates by Njombe TC was attributed to the separation of the two councils (Njombe DC and Njombe TC), after which Njombe DC raised

cess on timber to enable it meet the requirements of the Local Government Act. The Act demands District Council to be self-sufficient by 80 percent in revenues, short of which a council has to merge with another District Council. The difference in cess between the two councils affects actors in Njombe DC, because all the costs incurred by traders are eventually included in the bargain of the price for trees between tree growers and timber traders. 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 loses significant amount of revenues because of timber traders evasion of payment of cess at the council's gates. This also affects developments of the wards from which the timber is collected, because certain percentages of revenue from timber are supposed to be allocated for funding developments activities such as provision of social services in the respective wards.

Effects of regulations on incomes of chain actors

Actors of the timber value chain cited different ways in which regulations affect their income. During FGDs, most of the tree growers reported not to have been 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.)”

In addition, tree growers reported to have been paid less by timber traders who buy their standing trees because of the many taxes. The demand for electronic receipt by TRA officials was also perceived as an impediment restricting tree growers from selling their trees.

“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 (533 USD) 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 the 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. In this regard, FGDs in the three villages revealed that any tree grower intending to transport timber to the regional markets as well as 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 must accompany each load of the 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 for 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 instalments 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 the 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.

These regulations did not seem to have any effect on the income of small sawmillers, however, the regulations seemed to have different effects on the incomes of medium sawmillers (those owning stationary sawmills). The small sawmillers' positive perceptions toward regulations could be explained by the statement of a TFS official who reported that the regulation requiring owners of sawmills to have a license was yet 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,” the owner of a stationary sawmill explained.

Interviews with timber traders revealed the manner in which timber traders are affected by the regulations. The difference in cess between Njombe District Council and Njombe Town Council negatively affects the incomes of traders who buy timber from Njombe DC. This is 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 in their negotiations of the price of standing trees. And, as discussed in the previous section, Njombe DC loses revenue because of strategies adopted by timber traders. Furthermore, the regulations were reported to affect traders' incomes because of the existence of police checks, weigh bridges and banning of transportation of timber at night, which negatively affect the timely delivery of timber to various markets as reflected 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 trader from Nyombo, sorrowfully explained the effects of these regulations.

DISCUSSION

The paper examined the manner in which the timber value chain is regulated and the consequence of these regulations on the incomes of the actors in the timber value chain in the Southern Highlands of Tanzania. In general, actors of the timber value chain are involved in different activities that earn them income. Although the presence of sawmillers in the forestry value chain is regarded by other scholars (e.g., Gosh and Sinha 2018) as an indication of a developed timber market, which motivates farmers to engage in tree growing (Versteeg *et al.* 2017), most actors of the value chain sell timber products in domestic markets (village, districts and regional markets) with the export market being dominated by companies. Limited involvement of individuals in timber export could be influenced by factors such as limited financial resources, inadequate market information (Karakaya and Harcar 1999), ability in investing in modern processing facilities (Held *et al.* 2017) and strict export regulations coupled with low knowledge of both domestic and international regulations governing the timber business (Hagen and Alvarez 2011).

Regarding the governance of the chain, there are various regulations on harvesting, processing and marketing of forest products. However, lack of enforcement of these regulations, allow people to get away without consequences. Law enforcement authorities face a moral dilemma caused by government's limited or negligible investment in the sector. Similar findings have been reported in other places; for example, a study by Rana and Chhatre (2016) reports that, stringent regulations in Northern India are not applied at the harvesting node in smallholder forest production. Similarly, Bertomeu (2008) reports that in Philippines farmers are required to pay harvesting fees. Furthermore, Maryudi *et al.* (2015) show that in Philippines strict regulations are placed at the marketing node. Generally, although the Government of Tanzania would wish to enforce the regulations at the harvesting and processing nodes, doing so would pose enormous challenge given that NIPFs are scattered almost everywhere in the Southern Highlands. Thus, the control of harvesting and processing nodes would require a lot of resources beyond the government capacity. In contrast, it seems easier to control marketing because it involves transportation and therefore one would face government officials placed at strategic points for collecting cess.

In terms of strategies, actors used varied strategies to maximize their income. Despite that actors achieve the intended goal of maximizing income, some of the strategies used compromise the improvement of NIPF. This is more so with the nursery operators who use local seeds because of high cost required of buying genetically improved seeds (Mwaseba *et al.* 2020). While traders and sawmillers gained more income through access to financial capital, technology and authority, tree growers used social relations as their main strategy. The use of social relations to access markets has been reported in developed and developing countries (Ribot 1998, Luiz *et al.* 2019, Scott and Richardson 2021). As Granovetter (2005) concludes, 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. To a large extent, the study shows the limited role of property and reveals the importance of extra-legal structures in shaping access to benefits accrued from timber business (Ribot 1998).

Certainly, regulations affect all actors of the timber value chain. Nevertheless, tree growers are mostly affected than other actors. Although there are households level factors, making tree growers get marginal benefits from growing trees, national scale factors particularly forest regulations aggravate the situation. As reported elsewhere (see Foundjem-Tita *et al.* 2013, Mejia *et al.* 2015) too much control placed at the marketing node act as disincentive for tree growers and thus encourages them to sell standing trees instead of sawn timber which would earn them more income. On the other hand, some regulations, which are intermittently implemented such as the demand of electronic receipt by TRA, are usually used by the traders as a tool of bargaining for lower prices when they approach tree growers for buying their trees (i.e. even though some traders do not pay anything for not having EFD receipt from farmers, some traders refer to them to imply the magnitudes of the transaction cost). In Lao, intermittent implementation of forest policy has been associated with negative effects on forest investment including lowering incomes of tree growers (Smith *et al.* 2021). On the other hand, smarter regulations are associated with motivating smallholders' investment in forestry and increase financial returns to the Government and to the private sector (Smith *et al.* 2021).

CONCLUSION

This paper explored the manner in which the timber value chain is regulated and the consequence of these 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 to the actors' ability to earn more income. Due to the differences in access mechanisms among actors, some of them, tree growers, are most greatly affected by the regulations. Furthermore, the differences among district councils in implementing the regulations aggravate the situation. The 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. This reveals the importance of extra-legal structures in shaping access to benefits accrued from NIPFs. Generally, to gain more income actors have adopted both legal and illegal strategies of overcoming the challenges imposed by the regulations. The illegal strategies reduce revenue of the council and, as a result, negatively impact the wards' development. The findings revealed further

that illegal strategies are used more by those with more ability of benefiting from the value chain activities (in this case, timber traders) than those with less ability, the tree growers.

RECOMMENDATIONS

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. 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, which are charged on timber, because differences in the taxes charged compromise business competitiveness in the sector. 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 (Hoffmann and Bernhard 2007). Also, through associations, they (tree growers) can lobby for regulations that are relevant to their context.

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