Chapter 8

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

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Introduction

For many years, investing in the 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 cash crop production (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 (referred to as non-industrial private forestry in this paper) is gaining economic importance in different parts of Africa (Arvola *et al.*, 2019). In Tanzania, this timber production is largely occurring in the Southern highlands. In fact, some studies (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, including Tanzania. 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 to a large extent on the supply from non-industrial private forestry, implying that there is a huge potential for smallholder tree growers to expand their woodlots and hence improve their household 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) emphasise 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 & Ewert, 2009). Thus, there is a need for understanding smallholders' upgrading activities 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). 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 received little scholarly attention because studies have focused mainly on the nature of relationships between firms and upgrading (Neilson & Pritchard, 2009). Secondly, manufacturing industries have been given much attention compared to agricultural commodities (Hamilton-Hart & Sringer, 2016). Thirdly, the mature and standardised global value chains are privileged over young (i.e. predominated by spot market) domestic value chains (Mishra & Dey, 2018). To bridge the gaps, this paper examines the upgrading

trajectories of domestic young value chain of the non-industrial private forestry (NIPF)[22] in the Southern highlands of Tanzania.

While trees planting for household consumption in East Africa dates to the colonial period, NIPF on a significant scale is a new phenomenon in sub- Saharan Africa. The newness of the term lies on the increased emphasis of growing trees for the market (Pedersen, 2017). Although some studies (see for example, Ngaga, 2011; PFP, 2016; Mwamakimbullah, 2016) have been conducted regarding the NIPF, these are based on consultancy work and thus do not provide theoretical insights of the observed upgrading processes. The paper aims at answering three main questions 1) What types of upgrading are happening in NIPF in the Southern highlands of Tanzania? (2) To what extent could upgrading in the NIPF be explained by the GVC upgrading concept? And (3) what are the drivers of upgrading processes? The paper argues that the institutional context and other non-state actors (development agencies and grower organisations) 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 with various actors in the NIPF value chain to show how various institutions influence upgrading trajectories in NIPF. This chapter uses quantitative data to support the arguments raised.

It is important to investigate how the institutional context influences upgrading potentials because it helps developing policy recommendations for enhancing socioeconomic 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. The methodology is followed by the results and discussion section, which begins by highlighting the context of NIPF before various cases of upgrading are presented. 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.

[22] 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 al., 2005).

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 analysing 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 & 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, organisation 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 summarised into three main categories. The first category involves improvement in the process, product, and volume (in the same node)[23]. The second category includes change and/or adds functions up or down stream involving several nodes[24]. 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

[23] 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.
[24] 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.

(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 & 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. Analysing the export of grape production in Northeast Brazil, Selwyn (ibid) concludes that although exporters might be well informed about what the market requires, state agencies and farmer organisations 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) showed that state-led interventions in South India not only contributed to upgrading but also lead to the bifurcation of smallholders into high -margin markets.

Methodology

This 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.

Research Design and Data Collection

The study adopted 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 (Ivankova et al., 2006; Saunders et al., 2016).

[GRAPHIC #3: A map showing study villages]

Data Collection

Qualitative data were collected through key informant interviews, focus group discussions, and observation. 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 focus group discussions were carried out three for tree growers, three for timber traders, and three for saw millers. The participants were from three villages namely, 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 categorised 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 categorised. On average, each focus group discussion involved seven participants, and the time taken ranged from 45 to 90 minutes. Issues covered included prices for standing trees and sawn timber; strategies adopted to gain more income from the timber business, the type of people or organisations supporting them, and challenges faced for each strategy.

Observation was used to complement findings from key informant interviews and 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.

Data Analysis

Qualitative data were analysed by transcribing all interviews. 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 & 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.

Results and Discussion

Timber Rush in Southern Highland of Tanzania

Timber production in 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 the state and by 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 programs. During the early 2000s, the demand for soft wood started to exceed the supply from the plantation. A continued high economic growth in the GDP increased national demand for timber fuelled by a building boom in Dar es Salaam. Concurrently, the supply during this period was challenged by mismanagement of state-owned plantations and more effective environmental protection of natural forest (Wells & Wall, 2005; Ngaga, 2011; Forest Development Trust, 2017). In response to this deficit supply, private timber traders identified large untapped potential softwood growing on the village land in Southern

Highlands. 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 programs and NGOs led by the Danida supported 'Hifadhi ya Mazingira'[25] (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, 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 them to planks insitu. This localization of chain sawmills represent a major shift, because until then timber processing was dominated by permanent large scale sawmills located adjacent to the plantations. According to focus group interviews, the first mobile sawmills (locally known as Ding Dong in Tanzania) started operating in 2005 and the number increased to 1000 five years later (PFP, 2016).

Timber Rush in Southern Highlands of Tanzania
Picture by Esbern Friis-Hansen

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. The Timber Rush took place over a decade (2007-2016). This was characterised 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. 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 TZS10,000 in 2015 to TZS 6,500 in 2019. Upstream trade

[25] Literally meaning 'Protect the Environment'.

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 by 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.

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 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. Except for 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

organised 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[26] 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 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 saw millers 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 different markets (village, district, regional and external markets) who deliver timber to consumers.

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, most 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

[26] Majority of the middlemen are also sawmillers

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 further showed 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 only became readily available in the past two to three years. Furthermore, the seedlings from improved seeds are expensive for the 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. Analysing 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[27]. 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 costs 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 utilised 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 constructing firebreaks would help to overcome the challenge, however, the extract above shows that firebreaks of 8 meters,

[27] 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.

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 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 hinge on the assumption that scientific forestry is useful irrespective of the context (see 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 to 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.

Apart from the government, other actors including donor funded programs 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 programs 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 FWITC of extension services were provided by NGO[28] and only one percent (1%) of tree growers indicated to have been contacted by government extensionists (PFP, 2018).

Despite the government and donors' initiatives, process upgrading has not resulted into any meaningful improvement of incomes among tree growers. For instance, although tree growers in Iyoka village reported to have been paid by buyers about TZZS 7000 per tree for a well-managed woodlot of eight years, compared to TZS 4000 for locally managed woodlot at the same age. However, in the latter 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 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 utilised the opportunity. The text in Box 1 provides detail about the company.

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 realised 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

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

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 premature trees. They indicated that the lack of quality standards results into flooding the domestic market with juvenile timber which in turn have negative consequences

particularly in the construction industry, which 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 standard 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's 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).

Newly sawn planks drying in the sun
Picture by Esbern Friis-Hansen

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 export of timber. While the government perceives 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 (see 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 to hire a sawmill, hire labourers who perform various activities - carry the sawmill to the field[29], 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.

In addition, selling sawn timber requires someone to wait for customers and in some cases 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 detail 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, dingdongs 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 for smallholder tree growers.

[29] 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 taxbega depends on the distance; however, the findings revealed that, the average cost for taxbega is about 150,000 TAS.

Table 8.1: product sold and modality of selling

What did you sell	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

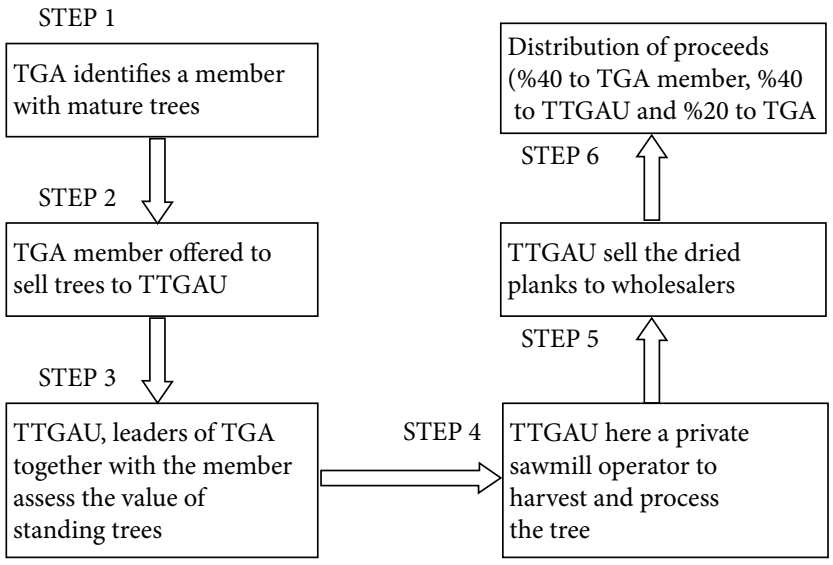
In addition, functional upgrading is facilitated by tree grower organisations and their apex body. In Iboya village, the primary tree grower association (TGA) identifies who among its members have mature trees that are ready to be harvested. The TGA members are then granted permission of selling their 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 surplus 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. Figure 1 presents details of this 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 analysed 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 that 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. Interview 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.

Figure 8.1: The TTGAU business model



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) mobilised resources[30] to build a timber market where growers are given

[30] 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).

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 the 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 improved the profit margin.

Additionally, availability of the timber market in Matembwe has 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 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 organisation 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 8.2: 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 improve seedlings, construction of fire break, proper thinning and pruning	PFP, FDT, the government of Tanzania, FWITC and MADEBE company

Upgrading	Strategies	Institutions driving upgrading
	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*

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 programs, and grower organisations are the main driver 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 findings revealed further 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 programs 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 showed 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.

Limitation of the Study and Acknowledgement

The study relied heavily on qualitative methods; thus, the findings cannot be generalised in the districts in which data were collected. However, quantitative findings can be generalised to the six councils because the villages and respondents were randomly selected.

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