

Research Article

Profitability Analysis of Tree Growing in the Southern Highlands of Tanzania

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Received 7 July 2020; Revised 10 November 2020; Accepted 21 December 2020; Published 13 January 2021

Academic Editor: Anna Żróbek-Sokolnik

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This study aimed at determining the extent to which the smallholder tree growers benefit from tree growing activities. It strove to accomplish the following: (i) analyse costs and benefits associated with tree growing activities; (ii) determine profitability indices; and (iii) assess economic status of respondents in the study area. Stratified random sampling technique was used to draw respondents. Mixed research methods for data collection were employed: household survey using semistructured questionnaire, key informants' interviews, focus group discussions, and researcher's direct observation. Data were analysed using Statistical Package for Social Sciences (SPSS) and Microsoft Excel computer programmes. Profitability was analysed by gross profit margin (GPM) and return on investment (ROI). Findings suggested that tree growing activities are profitable with GPM of 21% and ROI of 26%. ANOVA results showed no statistical difference within study districts between tree growers and non-tree growers. The possible explanation of this situation could be that tree growers have not invested much the benefits they get from tree growing into asset endowment. ANOVA results on household income revealed a similar pattern except in Njombe DC where there was a statistical significant difference in household income between tree growers and non-tree growers ($F(1, 64) = 5.989, P = 0.017$). The effect size of the difference is medium ($\eta^2 = 0.08$). It is concluded that tree growing activities in the Southern Highlands of Tanzania are economically profitable.

1. Introduction

1.1. Profit and Profitability Concepts. Profit is the excess of revenue/income above the costs/expenses incurred in the process of producing the revenue/income [1]. Profit is an absolute measure of the positive gain from an investment or business operation after subtracting all expenses. Profit usually acts as the entrepreneur's reward for his/her investment. As a matter of fact, profit is the main motivator of an entrepreneur for doing business. Profit is also used as an index for performance measuring of a business [2]. Profits can be expressed as either accounting profits or economic profits, and they are the main goal of a business venture [3]. Profitability, on the contrary, is the size of the profit relative to the size of the business. Profitability measures how efficient the business is in using its resources (capital and employees) to produce profit [4]. Unlike profit, profitability

involves the capacity to make benefits from all the business operations of an organization, firm, or company [5]. Profitability is a relative measure of the success or failure of a business. Sometimes, the terms "profit" and "profitability" are used interchangeably, but in real sense, there is a difference between the two. Profit is an absolute term, whereas the profitability is a relative concept. However, they are closely related and mutually interdependent, having distinct roles in business. Evans [6] noted that it is possible for a business to generate profit but not profitable. So, profit is a necessary but insufficient criterion for a business to be profitable. Profitability portrays the efficiency of the management in converting the firm's resources into profits [5]. Thus, firms are likely to gain a lot of benefits related to increased profitability [4]. One important precondition for any long-term survival and success of a firm is profitability. It is profitability that attracts investors, and the business is

likely to survive for a long period of time [7]. Many firms strive to improve their profitability, and they do spend countless hours on meetings trying to come up with a way of reducing operating costs as well as on how to increase their sales [8].

Gross profit margin (gross margin) and return on investment (ROI) were the methods used in the determination of profitability of tree growing in the Southern Highlands of Tanzania. Gross profit margin (gross margin) is the ratio of gross profit (sales revenue minus its cost of goods sold) to sales revenue. It is the percentage by which gross profits exceed production costs. Gross margins reveal how much a company earns taking into consideration the costs that it incurs for producing its products or services. Gross margin is a good indication of how profitable a company is at the most fundamental level and how efficiently a company uses its resources, materials, and labour. It is usually expressed as a percentage and indicates the profitability of a business before overhead costs; it is a measure of how well a company controls its costs. Gross margin measures a company's manufacturing and distribution efficiency during the production process. The higher the percentage is, the more the company retains on each dollar of sales to serve its other costs and obligations and the better the company is thought to control costs. Investors use the gross profit margin to compare companies with similar revenue and also in different industries to determine what are the most profitable. A company that boasts a higher gross margin than its competitors with the same level of revenue is said to be more efficient [9]. Gross profit margin is computed as follows:

$$\text{GPM} = \frac{\text{gross profit}}{\text{revenue}} \quad (1)$$

Return on investment (ROI) is one of the most popular performance measurement and evaluation metrics used in business analysis. Decades ago, ROI was conceived as a financial term and defined as a concept based on a rigorous and quantifiable analysis of financial returns and costs. At present, ROI has been widely recognized and accepted in business and financial management in the private and public sectors. Wide proliferation of the ROI method, though, has led to the situation today where ROI is often experienced as a nonrigorous, amorphous bundle of mixed approaches, prone to the risks of inaccuracy and biased judgment [9]. Computation of ROI is done as follows:

$$\text{ROI} = \frac{\text{gain from investment} - \text{cost of investment}}{\text{cost of investment}} \quad (2)$$

1.2. Plantation Forestry in Tanzania. Tree plantations in Tanzania, like in other tropical countries, had gone through phases of increasing in the 1960s, declining in between 1970 and 1990, and increasing again in the late 1990s [10, 11]. For example, tree planting promotions by donor funded projects have been focusing on environmental aspects such as carbon trading [12–14]. On the contrary, industrial plantation programmes for long time have been undertaken by the government and big companies [15–18]. Current statistics

indicate that the total area of nonindustrial private forests (NIPFs) is estimated at 419,500 hectares [19], but Ngaga [20] estimate at 120,000 ha–140,000 ha is only found in the Southern Highlands of Tanzania. According to [21], the plantation area of the Southern Highlands as a whole was 207,000 ha (Table 1).

In the Southern Highlands of Tanzania, industrial plantations have been undertaken by Sao Hill (public) and big commercial private companies such as Green Resources Ltd., TANWAT Ltd., Mufindi Paper Mills Ltd., and New Forests Co. Ltd. [22]. The estimates apparently show that the forest area under NIPF surpasses the total area under both public and industrial forests by more than threefold. According to the URT [23], there are 16 government plantations which are presented in Table 2. The geographical distribution of the plantations is shown in Figure 1.

Recent reports and government project documents indicate a reduction in government-managed plantations, particularly in the supply of mature pine round wood logs [24]. For example, a study conducted by the Private Forestry Programme [25] in Tanzania reported a 30% (total 540,300 m³) reduction in government allocations from 2014/15 to 2015/16 harvesting season with an increase in the number of beneficiaries for allocations from 832 to 964, respectively. Additionally, MNRT [26] reported a sharp increase in the demand of wood products such as timber and poles for construction, electricity, and communication in the local and international markets, especially exports to the Middle East, Kenya, Burundi, and neighboring countries [26]. According to PFP [25], sawn soft timber exports increased from 511 m³ in 2001 to 310,600 m³ in 2007. The report also indicated a growing sawn timber import, especially from Mozambique and Malawi [26]. This decrease in the volume from the government plantations, increased soft timber exports, and increased importation of sawn timber have attracted other actors to involve in tree plantation “nonindustrial private forestry” to take an advantage of the existing timber market.

1.3. Nonindustrial Private Forestry Trends. Nonindustrial private forestry (NIPF) is defined as “forest land that is privately owned by individuals or corporations other than the forest industry and where management may include objectives other than timber production” [27]. According to Harrison et al. [28], nonindustrial private forests are essentially owned by individual farmers, local business people, or urban-based investors. Unlike industrial plantations, nonindustrial private forest owners do not operate wood-processing plants. Private forestry, particularly nonindustrial private forest (NIPF) growers, is becoming more important in Tanzania. As opposed to the pre-1990 policies and socioeconomic environment, forestry is no longer considered as a means for ensuring supplies for the domestic market and for conservation alone; increasingly, it is also purely a business by tree growers [29, 30]. The importance of private-sector actors is all the more important because the country faces an acute shortage of timber in the near future; Ngaga [20] projected acute shortage starting from 2017 if

TABLE 1: List of forest plantations in Southern Highlands, Tanzania.

Region name	Regional total area (ha)	Plantations (ha)
Njombe	2,343,413	89,843
Iringa	3,562,373	85,919
Mbeya	6,101,284	24,094
Morogoro	3,200,743	4,205
Dodoma	573,507	1,411
Ruvuma	3,216,429	1,374
Katavi	429,668	52
Singida	755,434	12
Rukwa	266,072	6
Lindi	57,687	0
Tabora	121,572	0
Grand total	20,718,182	206,916

TABLE 2: List of government-owned forest plantations in Tanzania.

No.	Name of the plantation	Location/region	Area (000 ha)	% of total industrial plantations
1	Sao Hill	Iringa	41,604	50.11
2	Meru/USA	Arusha	5,710	6.9
3	North Kilimanjaro	Kilimanjaro	6,200	7.5
4	West Kilimanjaro	Kilimanjaro	6,019	7.3
5	Buhindi	Mwanza	3,210	3.9
6	Kiwira	Mbeya	2,637	3.9
7	Rondo	Lindi	2,599	3.2
8	Kawetire	Mbeya	1,956	3.1
9	Rubya	Mwanza	1,906	2.4
10	Shume/Magamba	Tanga	3,804	4.6
11	Longuza	Tanga	2,450	3.0
12	Ukaguru	Morogoro	1,700	2.0
13	Mtibwa	Morogoro	1,410	1.7
14	Matogoro	Songea	868	1.0
15	Ruvu-wood fuel	Coast	633	0.8
16	Rubare	Kagera	285	0.03
	Total		82,991	100.00

harvesting and processing in government plantations go unregulated. If unmet, this demand will mean either increased reliance on imports or logging in reserved forests. However, it is encouraging to see a self-propelling private-sector immergence in forestry, where small-scale tree growers NIPF is contributing significantly [31].

Previous studies underestimated the contribution of small- and medium-scale tree growers, but the recent remote sensing study completed by [32] highlighted their growth as a segment and importance as a source of supply in terms of hectares planted. It is estimated that, in 2016, about 174,000 hectares were owned by small- and medium-scale tree growers, 54% of the total, with the balance consisting of 100,000 hectares of Tanzania Forest Services (TFS) plantations (31%) and 51,000 hectares of large private plantations (15%), owned by five major actors (Green Resources Ltd., TANWAT Ltd., Kilombero Valley Teak Co. Ltd., Mufindi Paper Mills Ltd., and New Forests Co. Ltd). According to [26], NIPFs are currently supplying estimated 250 000 m³ of round wood in the Southern Highlands area of Tanzania. A few of these individuals own up to some hundred hectares, but most of them are having fairly small woodlots (varying from a few tens of hectares to individual tree groups). A

study conducted by Singunda [33] in Mufindi district revealed that the average land area per household across the surveyed area was 6.8 ha out of which the average land planted with woodlots in the surveyed area was about 2.6 ha. Most of these NIPFs are planted with mainly pines and eucalyptus species and other insignificant species such as cypress, wattle, and grevillea [34]. Tree growing in the study area is of monoculture type.

As a matter of principle, planted forests should not replace natural forests nor should they adversely affect the livelihoods of forest-dependent or indigenous people. The roles of planted forests should rather complement those of natural and seminatural forests, and competitive effects should be minimized [35]. These are the issues that comply with Sustainable Development Agenda 2030 of the UN [36]. Payn et al. [35] also reported that while total forest area decreased from 4.28 billion hectares to 3.99 billion hectares from 1990 to 2015, with global forest cover percent dropping from 31.85% to 30.85%, the area of planted forests increased from 167.5 to 277.9 million hectares or 4.06% to 6.95% of total forest area. Increase was most rapid in the temperate zone and regionally in East Asia, followed by Europe, North America, and Southern Asia. Documented experiences on different issues

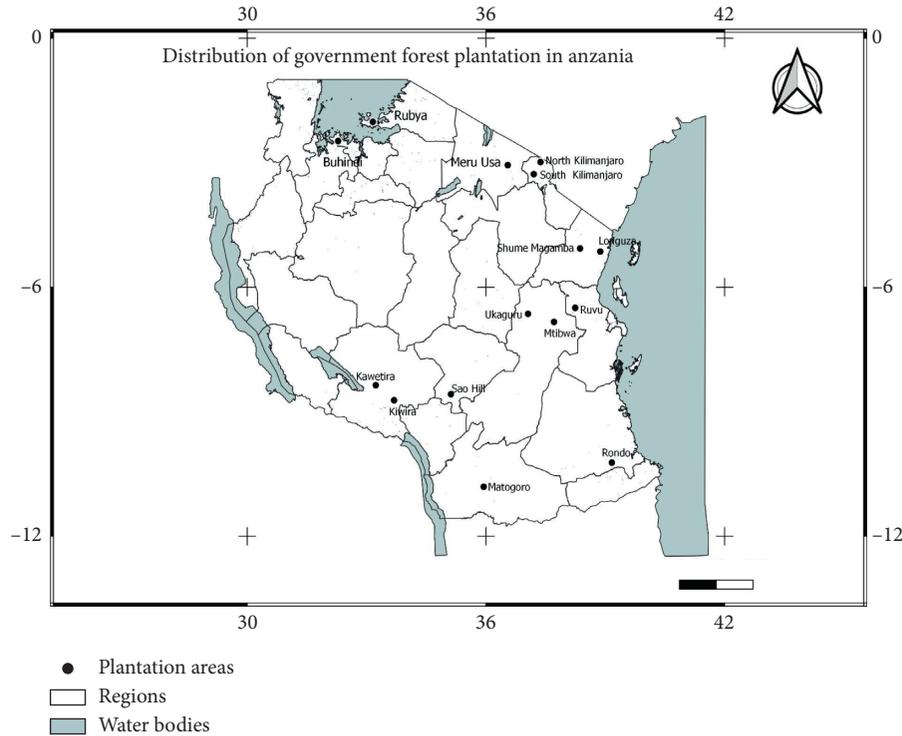


FIGURE 1: Distribution of government forests in Tanzania (source: [20]).

related to NIPF in Tanzania are either rare, scanty, or none existing, and this seems to be the case for other countries in Africa [20, 30]. There is sufficient documentation of community participation in forest management for Tanzania and other countries both in Africa and Asia which pay attention more to natural forests as opposed to planted forests. It appears that planting efforts are increasing overtime. Fortunately, there are, at present, limited problems from disease and pests in the forests of the Southern Highlands. However, the limited genetic diversity and quality of plantations in Tanzania mean that the country is extremely susceptible to diseases and pests arriving from other parts of the continent. Around one in five farmers claimed to have suffered woodlot damage due to diseases, most of which are concentrated geographic incidences [34]. A study by Mbeyale and Lusambo [37] revealed that NIPFs in the Southern Highlands of Tanzania have some negative effects on food security and local hydrology natural forests (invasiveness).

Singunda [33] envisaged that the current efforts by tree growers under NIPF will make a notable contribution to the current wood and timber market. NIPF contributions to the household economy, livelihood, and land use dynamics involved in its development should not be ignored by all standards. It is therefore the aim of this study to investigate the profitability of tree growing in the Southern Highlands of Tanzania.

1.4. Timber Trading in Tanzania. The commercial forestry sector in Tanzania is in a period of transition as the supply base moves away from the large private and government

plantations towards small- and medium-scale tree growers [22]. Nonindustrial private forestry differs in many ways from industrial forestry as such research relating to industrial forestry cannot be transferred to small-scale forestry [28]. Incentives to encourage industrial forestry through public and big companies' plantations have limited application to nonindustrial private forestry [15], making the study of profitability of nonindustrial private forestry important. Studies on timber marketing have been conducted on public plantations with limited academic-based studies on nonindustrial private forestry and, in particular, the small-scale tree growers [25, 26].

For long time, timber trade was undertaken by big public and private companies. In Tanzania, Sao Hill Industries is the largest sawn timber producer and has its own network of timber merchants in Dar es Salaam, Morogoro, and Dodoma [25]. The producer also sells directly to major end users, constructors, and factories. Different from industrial forestry, Ledger [17] pointed out that nonindustrial private forestry is faced by lack of access reasonable markets. The sector is highly dependent on travelling traders, who generally offer low prices that tree growers are forced to accept. Studies have indicated that tree growers sell standing trees to either middlemen or traders; very few farmers manage to sell processed timber or transport timber to district centres and big cities [25, 32]. However, FDT report indicates that sawn timber value chain will remain the key value chain for nonindustrial private forestry undertaken by small tree growers in the Southern Highlands that can provide significant gains in efficiency and quality if the enabling conditions for better processing can be met. A study

conducted in the Philippines also found all tree growers interviewed sold standing trees to small-scale saw millers, whereas the findings from the small-scale saw millers interviewed mentioned to buy the standing trees directly from tree growers plantation as well as get the logs from the tree growers and middlemen [15]. This indicates that some tree growers also sell sawn timber; hence, profitability analysis is very important for generating information that can be useful to farmers in making informed marketing decisions as well as investments in better processing options. With regard to selling sawn timber, a study on timber market dynamics in Tanzania [26] found that the forest processing industry in the Southern Highlands of Tanzania is dominated by sawmilling and that over 70% are mobile micromills (dingdongs) and 25% small-size and 5% medium-size mills. The mobile micromills are the homes of the small-scale tree growers since they can be moved into the tree plantations which, in most cases, are inaccessible, making transportation to the stationary sawmills impossible. The study further indicated that the production is barely profitable with a need for intervention in other stages in the chain to make the production more profitable. This also signifies a research on the profitability of tree growing to come up with suggestions for possible interventions in the timber value chain.

1.5. Objectives of the Study. The overarching objective of the study was to determine whether smallholder tree growing in the Southern Highlands of Tanzania is a profitable undertaking. Specifically, the study strove to accomplish the following: (i) analyse costs and benefits associated with tree growing activities; (ii) determine profitability indices; and (iii) assess economic status of respondents in the study area.

2. Methodology

The study was conducted in Mufindi, Kilolo, Makete, Wanging'ombe, Njombe DC, and Njombe town districts, Tanzania. The design of the study was a descriptive and analytic cross-sectional survey. The sample design for the present study strove to have a study sample which is sufficient and representative of the target population. The target populations for this study were households in the study districts who are involved in tree growing activities and those who are not involved in tree growing. In the context of this study, the term "tree growing" refers to a long-term investment of tree planting. It involves raising trees from seeds or seedlings through a number of silvicultural practices: land preparations, planting, weeding, pruning, and thinning before they are eventually harvested and sold/utilised. The sampling frame was the updated list of all the households in the respective villages. All chairpersons and executive officers in the selected study sites were asked to update lists of households in their respective areas by excluding households which no longer existed and/or adding those ones which were missing in their lists. Stratified random sampling design was used in the present

study. A total of 400 respondent households were involved in this study. Data were collected using a number of techniques: household questionnaire survey, focus group discussion, key informant interview, and researcher's direct observation. Questionnaires were both pretested and pilot-tested before actual data collection. Data analysis was carried out using SPSS and Excel statistical computer programmes. Marginal profit analysis and analysis of return on investment were carried out. After running descriptive statistics, it was noted that, in certain cost components, there was small valid sample size which was not statistically acceptable. In view of this, such cost items were excluded in the final analysis.

3. Results and Discussion

3.1. Costs and Benefits Associated with Tree Growing Activities.

It was found that most of the grown tree species are pines and eucalyptus. Growing of eucalyptus is more pronounced in Kilolo district compared to other districts, while pines dominate in Wanging'ombe district (Figure 2). Thus, most of the investors in the study areas prefer growing pines than other species. This could be justified by the demand and selling prices of pines as opposed to other species of trees [25]. Purchase of land constitutes a large proportion of costs for tree growing. It was revealed that land is relatively more expensive in Mufindi district and lowest in Wanging'ombe district (Figure 3). Smallholder tree growers incur sizeable benefits (revenue) from tree growing activities.

Tree growing was found to be the main activity in the study area. From the findings, tree growers interacted with seedling producers and middlemen. Interaction of tree growers and seedling producers was through contracting the seedling producers. The contracts were informal based on trust, and all operation costs were covered by the tree growers with some additional cash to cater for labour and time used in undertaking seedling production. Findings from the key informant interview indicated that it was relatively cheaper to produce own seedlings than purchasing due to limited income. Furthermore, own seedling production was used as an alternative source of income from selling of the remained seedlings. Nevertheless, in the study area, tree growers have diversified sources of seeds and consequently experience varying costs and revenue. The results for the costs associated with tree growing activities are presented in Table 3. Results on revenue accrued from tree growing are presented in Table 4.

Figure 2 indicates costs of purchasing land in the study district; findings revealed that the costs at Mufindi were the highest and Wanging'ombe were the lowest. The high costs at Mufindi might be attributable to the presence of plantations such as Sao Hills and Green Resources which have increased the demand for land. Furthermore, people around Sao Hill learned from Sao Hill plantation the benefits of tree growing and thus have a long culture of tree planting. Other initiatives that promoted tree growing, for example, PFP in the Southern Highlands, started at Mufindi, and thus, people exhausted the land before the initiatives spread to other

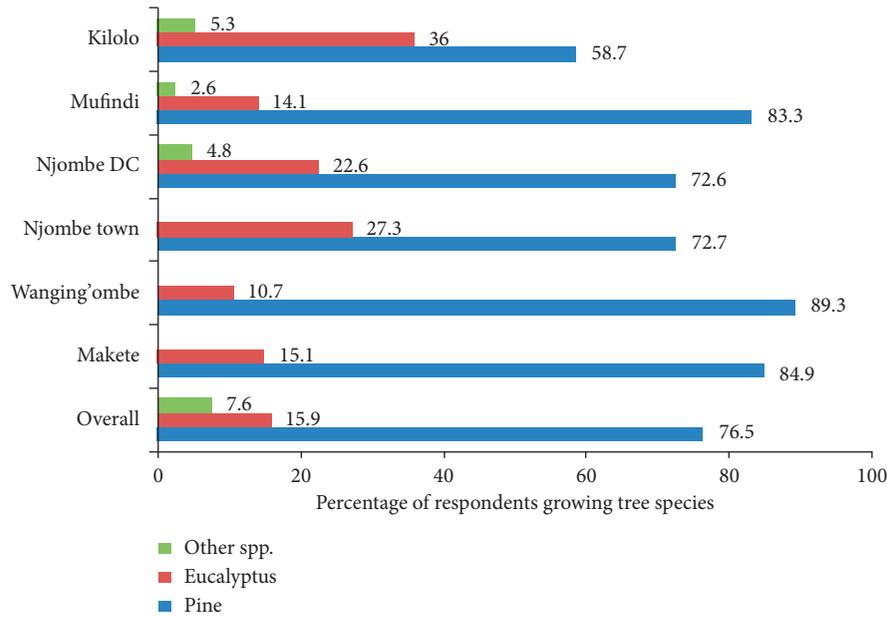


FIGURE 2: Tree species grown in the study districts (source: own field data).

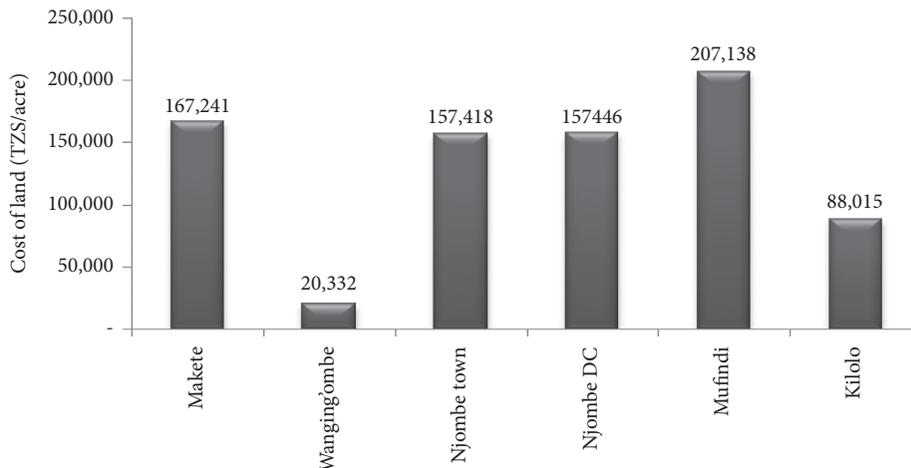


FIGURE 3: Cost of land in the study districts (source: own field data).

areas. Furthermore, the pace of tree planting at Wanging'ombe is slow, and thus, arguably, demand for land is lower than other areas.

Table 3 indicates costs associated with tree growing in the study districts. While purchasing of land is the most expensive as an investor is obliged to pay, on average, TZS 147,515 one acre, seedlings and nursery preparations cost relatively less. This could be explained by the recent trend where people from both rural and urban areas are rushing to the Southern Highlands to purchase land and establish tree plots leading to an increased demand for land. Other costs are relatively affordable to tree growers after purchasing of land. During the dry season (September–November), there is frequent occurrence of bush fires which threatens the investment in tree growing. Consequently, investors are forced to pay for fire protection (Table 3) which increases the costs of investment.

Table 4 presents revenue accrued from tree growing; it has been revealed that respondents indicated to gain more by selling woodlots than selling individual trees. The reasons advanced by the tree growers are that it is profitable to sell woodlots which will be paid as a whole regardless of smaller trees as opposed to selling individual tree; buyers in the later case will examine all the trees and pay relatively less for small and immature trees.

3.2. Profitability of Tree Growing Activities. Gross profit margin (gross margin) and return on investment (ROI) were used in the determination of profitability of tree growing in the Southern Highlands of Tanzania. Table 5 presents profitability indices. According to the study findings, overall, tree growing in the study area is profitable (GPM = 21% and ROI = 26%). When analysis was

TABLE 3: Costs associated with tree growing.

S/no.	Cost activity	Cost (TZS/acre)	Valid sample (n)
1	Digging of holes	9,135	270
2	Nursery preparation	5,405	58
3	Purchase of pots	6,311	34
4	Purchase of land	147,515	134
5	Cost of seeds	11,743	237
6	Fire protection	16,366	128
7	Land clearing	13,149	211
8	Nursery management	16,061	62
9	Planting	7,896	247
10	Seedling transportation	5,738	242

TABLE 4: Revenue accrued from tree growing.

S/no.	Source of revenue	Revenue (TZS/acre)	Valid sample (n)
1	Selling of individual trees	272,018	53
2	Selling of woodlots	347,478	87

TABLE 5: Statistics of profitability in various study sites.

District	Cost per acre	Revenue per acre	GPM (%)	ROI (%)
Overall	104,919	132,635	21	26
Makete	98,095	172,242	43	76
Wanging'ombe	52,336	137,211	62	162
Njombe town	106,757	91,852	16	14
Njombe DC	117,951	107,835	9	9
Mufindi	122,181	99,610	23	18
Kilolo	94,040	220,175	57	134

segregated by districts, it was revealed that tree growing is more profitable in Wanging'ombe district followed by Kilolo district and then Makete district. In Njombe town, Njombe DC, and Mufindi, it was revealed that tree growing activities are not profitable (evidenced by negative values of profitability indices). Arguably, Wanging'ombe revealed highest profitability because it has lowest cost of land (Figure 2). A study conducted by Kallio [38] revealed that trees were mainly planted for economic reasons and were harvested when cash was needed. Long rotation lengths, lack of capital, low wood prices, and poor access to production inputs or markets were found to be the main constraints to current and future smallholder tree planting. The reported ROI values in this study are similar to those reported by Botchkarev and Andru [9] in which the value was as high as 450%.

3.3. Economic Status of Respondents in the Study Area.

The concept of family economics has become important around the world. It has been realized that community-based family economics can play a fundamental role in poverty alleviation. Measuring of family economic status is an important step in developing family economic strategies to achieve poverty reduction. Economic status represents the economic capacity of families to meet their material and nonmaterial needs. Income and ownership of

physical assets are means that can be used to acquire suitable economic status of families [39]. In the present study, economic status of respondents was measured by both household income and asset values of respondents. The gist here was to explore whether tree growers have improved their economic status. Results on asset value and household income are presented in Figures 4 and 5, respectively. When segregated by study districts, it was revealed that the value of household assets is highest in Njombe DC (TZS 53,682,231) and lowest in Wang'ing'ome (TZS 12,834,979). Household annual income accrued from other sources than tree growing is highest in Makete (TZS 2,730,468) and lowest in Kilolo (TZS 1,467,230). Further analysis was carried out to establish whether there exists a statistical difference between tree growers and non-tree growers in the study area. ANOVA results (Table 6) showed no statistical difference within study districts between tree growers and non-tree growers with regard to asset ownership. The possible explanation of this situation could be that tree growers have not invested much the benefits they get from tree growing into asset endowment. ANOVA results on household income revealed a similar pattern except in Njombe DC, where there was statistically significant difference in household income between tree growers and non-tree growers ($F(1, 64) = 5.989$, $P = 0.017$). The effect size of the difference is medium ($\text{Eta} = 0.08$).

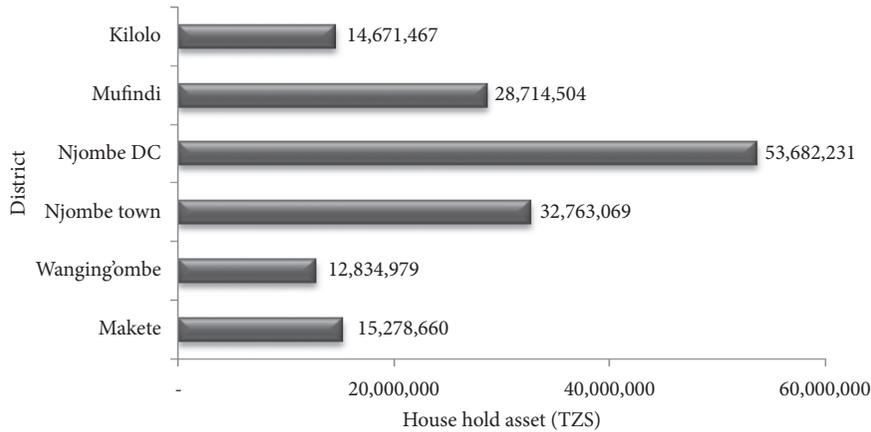


FIGURE 4: Results on household assets (source: own field data).

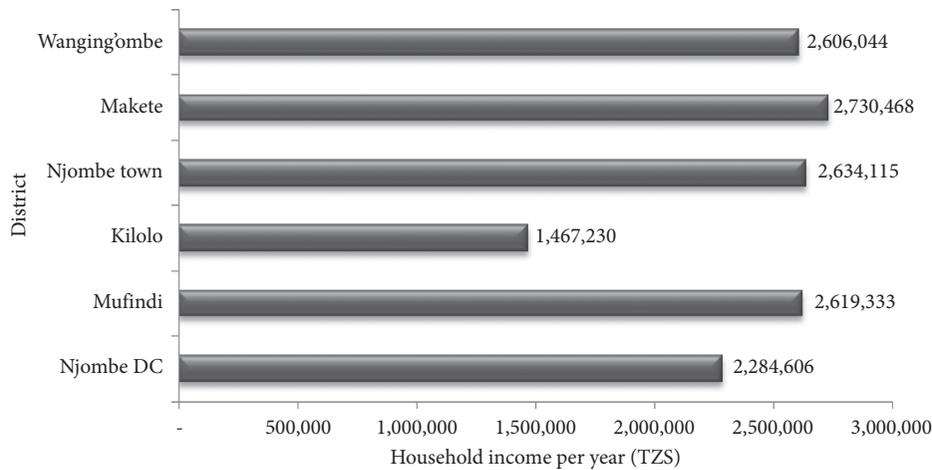


FIGURE 5: Household income from non-tree farming activities (source: own field data).

TABLE 6: ANOVA results on comparison between tree growers and non-tree growers.

District	Household income		Household assets	
	P value	Remarks	P value	Remarks
Makete	0.438	Ns	0.795	Ns
Wanging'ombe	0.689	Ns	0.202	Ns
Njombe town	0.525	Ns	0.551	Ns
Njombe DC	0.017	*	0.779	Ns
Mufindi	0.501	Ns	0.442	Ns
Kilolo	0.598	Ns	0.509	Ns
Overall	0.697	Ns	0.373	Ns

* Statistically significant at $P < 0.05$.

4. Conclusions

The study concludes that overall, tree growing in the study area is fairly profitable and that the smallholder tree growers have a potential to benefit more. When segregated by study districts, however, it was found that tree growing was not profitable in some of the districts. The profitability of tree growing was fairly high in Wanging'ombe and Kilolo

districts. There are no differences in household asset values between tree growers and non-tree growers. The household income is also generally not statistically different with the exception of Njombe DC.

Furthermore, rigorous literature review (e.g., [37]) revealed that nonindustrial private forests (NIPFs) in Tanzania have received little attention by both policy makers and researchers. As a result, there is scanty information regarding its implication to livelihoods. In the Southern Highlands, tree growers seem to intensify tree planting efforts. In general, tree planting is perceived highly positive by most of the households as the most dependable financial security. Most villagers have a very positive image with tree planting more than seasonal crop that used to be the most dependable source of income. There are several actual benefits that households involved in tree planting get, which include ability to build descent houses, purchase of transport means such as motor vehicles and motorcycles, and ability to pay educational fees. This has resulted into everybody looking forward to planting trees everywhere at any spot available for putting a tree. The end results have been food insecurity. There is also encroachment into different vegetation types, and the most affected include the miombo

woodland, the grasslands, and wetlands close to water sources. *Eucalyptus* spp. has been identified to colonize most of the farm land when left unattended. The impact is also visible on water sources to the extent that most of the wetlands are drying up; rivers which were permanent are now either seasonal or have stopped flowing.

5. Recommendations

Deliberate efforts need to be made to improve profitability in the study area. According to the yardstick used in this study, efforts should be directed at reducing production costs and improving revenues from tree growing. By implication, costs of inputs of production should be reduced using various strategies, e.g., provision of subsidies. On the contrary, tree growers should have reliable and efficient markets. They should also easily access the financial support from various institutions. Furthermore, efforts should be made by relevant government organs to regulate tree growing activities in the study area so as to avoid the possible negative ramifications of this hitherto important economic activity.

Data Availability

The data that support the findings of this study are available from the corresponding author (L.L) upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

The authors are exceedingly grateful to Timber Rush Project Management for the financial support that made this study successful. Special thanks are due to the Sokoine University of Agriculture for granting them time for project activities whenever they requested. The authors are also grateful to district and village officials for their full support they rendered them during fieldwork for this study.

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