

AVAILABILITY OF FOREST PRODUCTS TO SUPPORT INDUSTRIES IN TANZANIA: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Primary forest based industries in the country play a major role in the conversion of forest products into various end uses. The current study was conducted to assess demand and supply of raw materials, the means of allocating raw materials, the challenges and opportunities of the availability and production of raw materials for forest industries. The study was conducted in Tanzania mainland covering seven zones and 23 forest plantations under TFS jurisdiction. Structured questionnaire were used for data collection. The data were then coded, compiled, and analysed using SPSS and Ms excel. The results indicate that primary wood based industries were either active (44%) or inactive (45%) with small proportions (11%) being dormant and their actual installed, annual wood demand and utilized capacities were 2,541,918 m³, 1,559,332 m³ and 554,752 m³ respectively. The finding revealed that the total annual wood allocated for all primary wood based industries increases yearly due to the growing market demand of wood for construction purpose or other development activities. The finding revealed further that the increasing demand of industrial round wood created a lot of challenges that affected day-to-day operations. Example of such challenges include political leaders banning harvesting of forest products. Finally, there is existing potential for government, individual, private or community for expanding areas for establishment of new forest plantations in order to increase supply of raw wood material for wood based industries.

Key word: Wood based industries, Forest industries, Availability of wood, Opportunities and Challenges

INTRODUCTION

Tanzania covers an area of about 945,000 km² out of which 888,600 km² (94%) is land. According to the recent National Forestry Resources Monitoring and Assessment (NAFORMA, 2015) report, the growing stock based on the vegetation cover types is categorized into woodlands (73.9%), forests (11.3%), cultivated lands (7.8%), bush lands (4.2%), grasslands (1.4%), water (0.3%) and others (1.0%) (MNRT, 2015). The total wood volume of Tanzania mainland is 3.3 billion m³, whereby 97% comes from trees of natural origin and only 3% comes from planted trees. The average wood volume is 37.9 m³/ha across all land cover types, varying from 1 m³/ha in open grasslands to 171 m³/ha in humid montane forests. The standing volume of wood per capita is 74.4m³ (NAFORMA 2015).

Forest products provide an income for small holder rural communities in the tropics, and contribute significantly to their well-being (Bryon and Arnold 1999, Reyes- Garcia *et al.*, 2015). Primary forest based industries in the country play a major role in conversion of forest products into various end uses. Many private companies and individuals have invested in the production facilities, which use raw materials from the forest resource in both the natural and plantation forests (Ngaga, 2011). The major conversion from forest based industries is focused on the production of sawn timber, poles, fibreboards, chipboards,

plywood, pulp and paper manufacturing. These industries play a significant contribution in the utilization of forest products in terms of value addition and employment creation. It is in this regard that in 2012, the Tanzania Government issued a Circular No .1 of Public Service Furniture that banned the importation of furniture, which is used in public offices with the aim of ensuring value for money and empowerment of forest industries in the country. Tanzania Forest Services Agency (TFS) is strategizing to enhance the contribution of forest sector to the Gross Domestic Product (GDP), increase export earnings and share of the total employment as stipulated in the Five Years Development Plan II (FYDP II) ending in 2019.

Despite the importance of forests in the country; high deforestation and forest degradation rates have been witnessed taking place in both reserved and unreserved forests. Forests in general lands have no properly defined management regime, they also have open access hence facing severe deforestation and forest degradation which results in dynamics of forest cover (Kajembe and Mwihomeke, 2001). According to a study by the National Carbon Monitoring Centre (NCCM, 2018); the annual rate of forest loss is estimated at 469,420 ha per year. NAFORMA report (URT, 2015) revealed that widespread deforestation and forest degradation results into multiplier negative impacts all the way to the forest based industries. The loss is contributed by, among other factors, the growing demand for land for agriculture, encroachment, uncontrolled wildfires and illegal harvesting (Ngaga, 2011). It was estimated that by 2017, there would be a significant drop in wood supply from government forest plantations and natural forests because of a decline in harvesting levels at Sao Hill Forest Plantation (Mwamakibullah, 2016).

The construction industry which includes residential and development projects consumes about 62% of the total 1.46 million m³ of sawn wood produced annually in Tanzania (Indufor, 2010). Despite the contribution of forest industries to the national economy growth via taxes and fees, and its crucial role of improving livelihoods of the local communities, there are still research gaps on the availability of forest products to support these industries and the associated challenges and opportunities. Also unreliable information on the increase in public and private forest plantations creates difficult in securing enough wood raw materials. This has, in turn, created uncertainty for long term investments (Ngaga, 2011). It is against this background that a study to determine the availability of forest products to support industries in Tanzania was carried out. Specifically, the study assessed the demand and supply of forest products to support industries, determined the means of allocating forest products to the existing primary wood industries, identified challenges on the availability of forest products in supporting industries, and assessed the opportunities for the production of forest products to support forest industries.

METHODOLOGY

Study Area

The study area involved (**Fig. 1**) seven TFS administrative zones (Southern Zone (SZ), Southern Highland Zone (SHZ), Northern Zone (NZ), Eastern Zone (EZ), Western Zone (WZ), Central Zone (CZ) and the Lake Zone (LZ)) and 23 forest plantations under TFS jurisdiction. Tanzania is located between Latitude 1° and 12° South and Longitude 29° and 41° East (URT, 2012). The total area of the country is 945,000 km² of which 881,000 km² are on the mainland and 2,000 km² are on the islands of Zanzibar (URT, 2007). The country shares borders with Kenya and Uganda to the Northern part, Rwanda, Burundi and the Democratic Republic of Congo to the Western part; Zambia, Malawi and Mozambique to the Southern part, and the Indian ocean to the Eastern part (URT, 2007).

TANZANIA FOREST SERVICES (TFS) AGENCY ADMINISTRATIVE ZONES

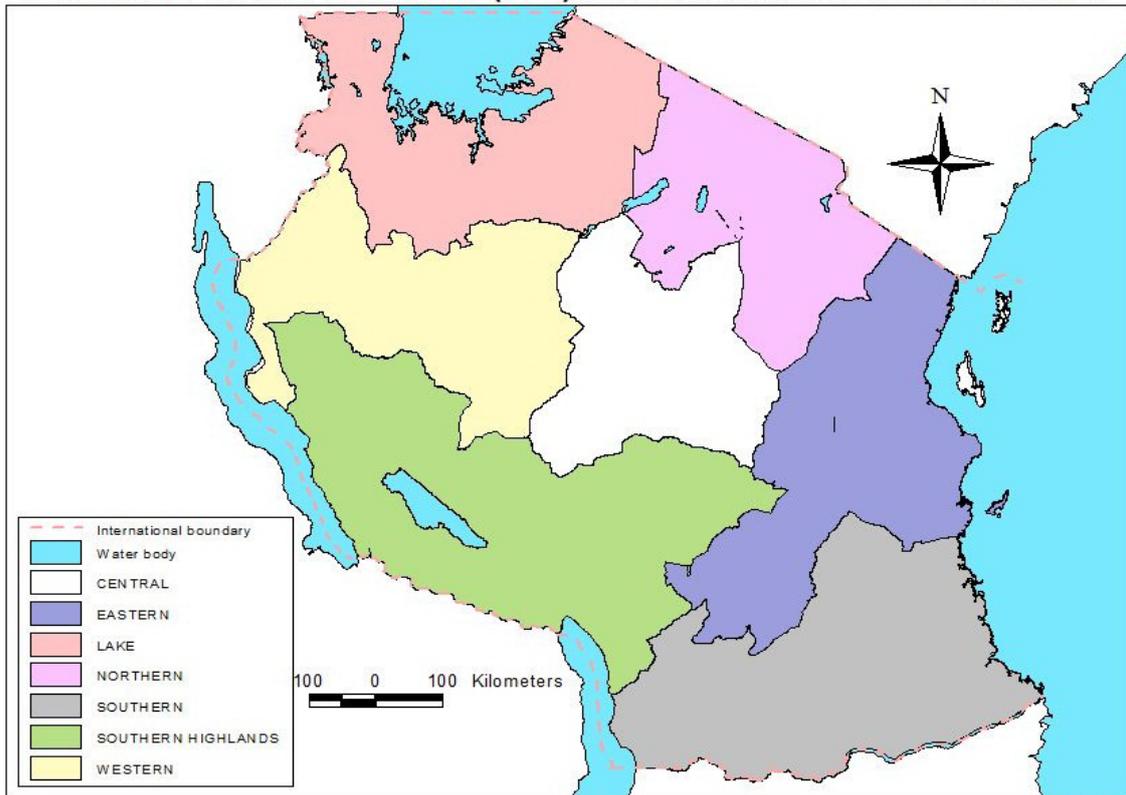


Figure 1: Location of the study area

Source: URT (2012)

Data Collection and Analysis

Primary data were collected via structured questionnaire that included closed and open ended questions. Secondary data were collected through desk work and review of TFS documents and other relevant documents. Participant observation was done where the researcher had the opportunity of comparing what the respondents reported against what were really observed in primary wood based industries. The information collected was coded and the data were compiled and analysed using Statistical Package for Social Sciences (SPSS) and Ms excel. For questionnaire data, descriptive statistics (such as frequencies and percentages) was used to summarize the data and correlation was used to compare the availability of forest products to support primary wood based industries.

RESULTS AND DISCUSSION

Demand and Supply of Forest Products to Support Forest Based Industries

The finding revealed that there are about 630 primary wood based industries in the country which include: 609 sawmills, 9 wood based panels industries, 9 pole treatment, 2 wattle extracts, and 1 sandalwood oil and spent dust (**Table 1**). Most of the surveyed primary wood based industries were either active (44%) or inactive (were not in operation during the survey time) (45%) with small proportions (11%) being dormant (were closed). In terms of size, majority of the primary wood based industries were categorized as small (75%) followed by medium and large in small proportions. There is a decreasing trend of primary wood based industries from small to large category, with small change of many of the small industries shifting from small to medium in the Southern Highlands Zone (SHZ). The survey revealed further that the total installed, annual wood demands and utilized capacities of all primary wood based industries were

4,321,893 m³, 2,542,614 m³ and 703,495 m³ respectively. However, on the basis of the active primary wood based industries the actual installed, annual wood demand and utilized capacities were 2,541,918 m³, 1,559,332 m³ and 554,752 m³ respectively.

From the survey, the actual annual hardwood and soft wood demands by active primary wood based industries were 487,722 m³ and 1,072,610 m³, respectively. The *Tectona grandis* and *Eucalyptus* spp account for 57% of the annual hardwood demanded by active primary wood based industries.

Table 1: Distribution of Forests industries in Tanzania

Industry type	Total	%	Distribution of forest industries in TFS Zones					
			NZ	SHZ	WZ	EZ	LZ	SZ
Sawmills	609	96.67	269	143	74	26	83	14
Wood based panels	9	1.43	3	5	0	1	0	0
Pole treatment	9	1.43	2	7	0	0	0	0
Wattle extracts	2	0.31	1	1	00	0	0	0
Sandalwood oil & Spent dust	1	0.16	1	0		0	0	0
Total	630	100	276	156	74	27	83	14

However, there is only 1,369,260 m³ (848,933 m³) from plantations and 520,327 m³ from Natural Forests for harvesting at a sustainable level per year from the central Government forest reserves (Natural Forests and Plantation) (TFS, 2018) (**Tables 2a and 2b**). The value from the plantations is slightly higher than the value reported by FAO (2014) of 1,034,765 m³ per year from Industrial round wood production plantation in Tanzania. The consumption exceeds the sustainable supply causing an annual wood deficit of 191,072 m³ to the primary wood based industries. Since the annual growth of the natural vegetation types is low compared to plantations, the deficit might be covered illegally from strictly “protected areas” for example the national parks, game reserves, and nature reserves or exceeding the permitted harvesting levels causing huge damage to natural forests.

Table 2a: List of Forest plantations with allowable cut volumes

No	Name of forest plantation	Allowable cut volume 2017/18	Harvested volume up to March, 2018	Allocated volume for harvesting 2018/2019
1	Buhindi	31,218.32	21,546.32	51,070.00
2	Sao Hill	651,475.00	403,905.00	610,000.00
3	Kiwira	28,500.00	18,894.30	25,500.00
4	Kawetire	15,414.00	6,056.62	11,086.00
5	Shume	37,509.90	23,127.00	31,489.00
6	West Kilimanjaro	20,000.00	13,335.35	30,619.00
7	North Kilimanjaro	33,000.00	25,740.29	30,000.00
8	Longuza	11,000.00	6,813.03	11,000.00
9	Mtibwa	10,000.00	9,014.10	10,469.00
10	Rubya	2,800.00	2,658.44	12,000.00
11	Meru	23,800.00	14,545.443	19,700.00
12	Rubare			6,000.00
Grand total		864,717.22	545,635.90 (63%)	848,933.00

Table 2b: List of production forest reserves and their annual allowable cut volumes

SN	Name of Forest reserve	Allowable cut volume (According to management plans)	Actual volume to be harvested (only 10%) for 2018/2018
1	Inyonga	343,255	34,326
2	Uvinza	27,091	2,709
3	Nyahua Mbuga	1,418,570	141,857
4	Ugalla North	1,319,106	131,911
5	Msaginia	22,848	2,285
6	North East Mpanda	209,007	20,901
7	Mlele Hills	173,504	17,350
8	Ugalla river	155,515	15,552
9	Mpanda line	116,882	11,688
10	Uyui Kigwa Rubaga	39,539	3,954
11	Rungwa river	161,495	16,150
12	Mitarure	25,457	2,546
13	Ndechela	1,574	158
14	Nyera Kipelele	14,364	144
15	Pindiuro	205,273	20,527
16	Mitundu Mbeya	296,644	29,664
17	Mbinga maji	39,245	3,925
18	Ngarama south	52,877	5,288
19	Muhuwesi	46,694	4,669
20	Rungo	2,429	243
21	Kitope	647	65
22	Matapwa	6,090	609
23	Matogoro B	10	0
24	Kipembawe	538,064	53,806
Total		5,216,181	520,327.00

Similar observations were made by Frontier-Tanzania, (2005), Malimbwi *et al.* (2005), Forestry and Beekeeping Division, (2005) who assessed different forests conditions in the country and revealed a lot of anthropogenic activities inside forest reserves including encroachment (for agriculture), illegal activities such as mining, pit-sawing, harvesting for building materials, firewood collection, and collection of medicinal plants. Therefore, there is a high potential for TFS, the private forestry sector, local authority, communities, and individual of using this opportunity of wood demand for the expansion of forest plantations and establishment of new forests in order to address these challenges.

Allocation of Forest Products to the Existing Primary Wood Based Industries

The survey revealed that the total annual wood allocated for all primary wood based industries in 2018/2019 was 848,933 m³ from plantations and 520,327 m³ from Natural Forests in the government plantation allocation trends since 1992 (**Fig. 2**). Furthermore, the finding revealed that the annual hardwood and soft wood demands in for the smooth running of active primary wood based industries were 487,722 m³ and 1,072,610 m³, respectively. The amount of soft wood allocated seems to be lower than the market demand, creating the opportunity for the importation of soft wood or expansion of softwood tree planting areas in forest plantations.

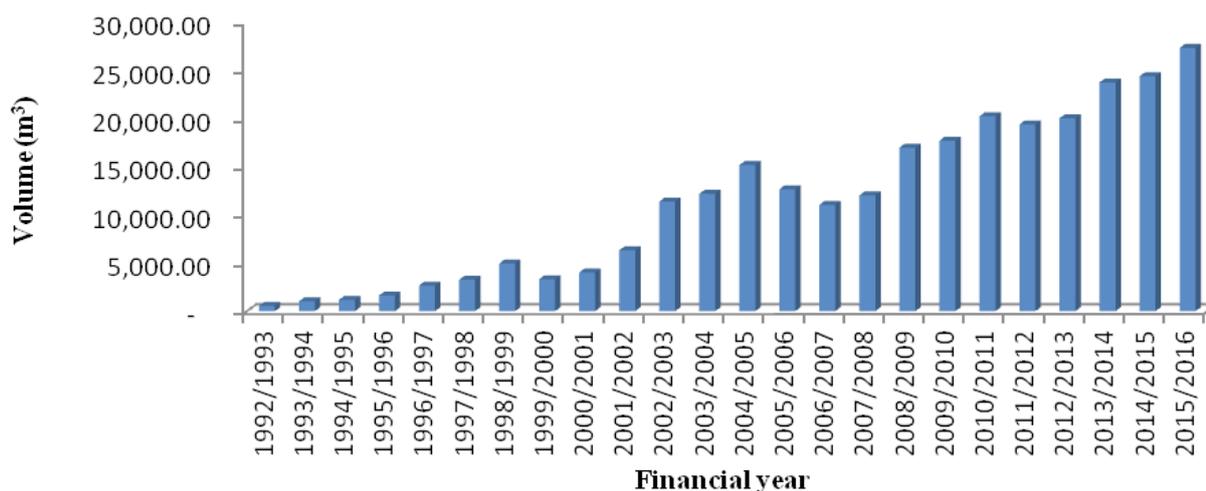


Figure 2: Available wood volume from Government plantations - trends From 1992/1993 - 2015/2016 financial years

The utilized capacity of primary wood based industries is lower than the annual wood demand by particular firms (**Table 3**).

Table 3: Wood product requirement from Plantation and Natural Forests

Activeness of the PWBI	Total volume per year (m³)		
	Installed capacity	Annual wood demands	Utilizing capacity (m³)
Active PWBI	2,541,918	1,559,332	554,752
Inactive PWBI	4,321,893	2,542,614	703,495

Figure 2 shows that, there was a gradual increase of allocated volume from government plantations due to the growing market demand of wood in Tanzania. For example in year 2001/2002, the allocated volume was almost double that of the previous year (2000/2001). At the same time from year 2007/2008 to 2014/2015, the volume was almost doubled. With this increasing market demand for wood and a decline in the harvesting levels at Sao Hill Forest Plantation and other government plantations due to underage, more than 50% of industrial round wood will be supplied by private plantations. Similar observations are reported by ICPF (2013) and Mwamakibullah (2016). Furthermore, Mwamakibullah (2016) predicts a significant drop in wood supply from government forest plantations and natural forests because of a decline in the harvesting levels at Sao Hill Forest Plantation by 2025 which is the major supplier of wood in the country, but who unfortunately has more than 50% of the planted area as underage.

Challenges on Availability of Forest Products to Support Forest Industries

National governments, civil society groups, the private sector and local communities have been looking for alternative ways of supplying industrial round wood. The increasing internal demand for raw material and for exportation had created a lot of challenges such as political influence in the forestry sector and that had affected some day-to-day operations, good examples include cases where some politicians ban the harvesting of forest products. Furthermore, some district councils use revenue collection agents a situation that lead to law violations as they do not adhere to legal requirements or procedures such as charging minimum fines. Poor compliance and weak law enforcement on the trade of forest products prompt over-exploitation and acceleration of forest degradation despite the presence of forest act that cuts across both Central and Local Government forests. The presence of parallel government structures in the management of forests at the Ministry of Natural Resources and Tourism (MNRT) and at the President's Office - Regional

Administration and Local Government (PO - RALG) increased the management challenges leading to a decrease in the availability of round wood in a sustainable manner at a district level. Due to this deficit of industrial round wood security staff/forest guard, stationed at checkpoints or inside the natural Forest Reserves and those engaged in patrols and evictions were put at risk situation during the discharge of their daily duties. Therefore, balancing the pressing needs of the present generation in primary wood industries and other uses with the needs of the future generations is a huge task and requires adequate political priority and resources.

Opportunities for Production of Forest Products in Supporting Forest Industries

Forest wood based industries growth closely depends on the synergies between raw materials from the forest, new knowledge/technology of processing and which have made major advances in technological wood product quality and human capital. Tanzania is implementing the second series of Five Year Development Plans for 2025 which aim at transforming Tanzania into a middle-income country by 2025 (URT, 2011). The effective supply of raw material from forests (both timber and none timber) will ensure business growth, employment creation, income generation and ultimate improvement of wellbeing in the urban and in the rural areas. These can be done through the expansion of tree planting areas in forest plantations and the establishment of bee reserves and apiaries in the zones, upgrading of forest reserves to the natural forest reserves, development of ecotourism sites, and the enhancement of in-situ conservation and rehabilitation of degraded areas. The expansion and the establishment of new forest plantations in different areas with favourable growing conditions would lead to the diversifying and an increase of the supply of raw material for wood based industries.

CONCLUSION AND RECOMMENDATIONS

Forest resources provide considerable social and economic potential, unique natural ecosystems rich in biological diversity and wildlife habitats. They also provide numerous goods and services both in the national economy and to the society at large. Therefore, in order to have a sustainable development of wood industries in the country, we must devote more effort on the commercial industrial plantations.

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