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Private forestry sector in Tanzania: status and potential

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Front and back cover photos (left to right): tree nursery in Turbo Kakamega, Kenya (credit: Dr. Joshua Kiplongei Cheboiwo); commercial tree planting in Cameroon, (credit: Dr. Marie Louise AVANA-Tientcheu); timber trading in Makambako Township, Tanzania (credit: Prof. Reuben Mwamakimbullah).

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Private forestry sector in Tanzania: status and potential

Prof. Reuben Mwamakimbullah

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Acronyms and Abbreviations

AFF	African Forest Forum
CBOs	Community Based Organizations
CCRO	Customary Certificate of Right of Occupancy
CEOs	Chief Executive Officers
CIT	Confederation of Industries in Tanzania
DFNRNR	Department of Forestry and Non-Renewable Resources
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organisation of the United Nations
FAOSTAT	FAO Statistical Database
FBD	Forest and Beekeeping Division
FDT	Forest Development Trust
FITI	Forest Industry Training Institute (FTI)
FTI	Forestry Training Institute
GRL	Green Resources Ltd
GRO	Granted Right of Occupancy
ILO	International Labour Organisation
JFM	Join Forest Management
JMAs	Joint Management Agreements
KCM	Kenya Commercial Bank
KVTC	Kilombero Valley Teak Company
LGA	Local Government Authority
LMDA	Logging and Miscellaneous Development Account
MANR	Ministry of Agriculture and Natural Resources - Zanzibar
MCDI	Mpingo Conservation Development Initiative
MITC	Ministry of Industries, Trade and Cooperatives
MJUMITA	Mitandao ya Jamii ya Usimamizi wa Misitu Tanzania
MNRT	Ministry of Natural Resources and Tourism
MPM	Mufindi Paper Mills
MTTCS	Makambako Timber Traders Cooperative Society
NAFORMA	National Forest Resources Monitoring and Assessment
NBS	National Bureau of Statistics
NFC	New Forest Company Ltd
NGOs	Non-Governmental Organizations
NMB	National Microfinance Bank
NOFIA	Northern Forest Industries Association
NTFPs	Non-timber Forest Products
PFM	Participatory Forest Management
PFP	Private Forest Programme
PMO-RALG	Prime Minister's Office-Regional Administration and Local Government
PPP	Public Private Partnership
REA	Rural Electrification Authority
SADC	Southern African Development Community
SAFIA-	Sao Hill Forest Industries Association

SHIVIMITA	Shirika la Viwanda vya Misitu Tanzania
Sida	Swedish International Development Cooperation Agency
SMEs	Small and Medium Enterprises
SUA	Sokoine University of Agriculture
SWOT	Strengths, Weaknesses, Opportunities and Threats
TAF	Tanzania Association of Foresters
TaFF	Tanzania Forest Fund
TAFORI	Tanzania Forest Research Institute
TANESCO	Tanzania Electric Supply Company Ltd
TANWAT	Tanganyika Wattle Company
TBS	Tanzania Bureau of Standards
TCCIA	Tanzania Chamber of Commerce, Industries and Agriculture
TFCG	Tanzania Forest Conservation Group
TFS	Tanzania Forest Service Agency
TGA	Tree Growers Association
TIC	Tanzania Investment Centre
TPSF	Tanzania Foundation for Private Sector Development
TRA	Tanzania Revenue Authority
TTSA	Tanzania Tree Seed Agency
TZS	Tanzania Shilling
UWAMBU	Umoja wa Wafanya Biashara ya Mbao Buhindi
VNRCs	Village Natural Resource Committees
VAT	Value Added Tax
WOCAN	Women Organizing for Change in Agriculture and Natural Resource Management
WWF	World Wide Fund for Nature
ZWBS	Zanzibar Woody Biomass Survey

Executive Summary

In many African countries, the private sector in forestry is almost non-existent as an organized entity that one can dialogue with. This is also true in Tanzania, the country this study reports on, and where the sector is at its infancy, and needs to be nurtured to become stronger and better organized for it to significantly contribute to the national economy. In this regard, it has to be organized and coordinated as an entity and the many diverse actors who largely operate informally have to be strengthened. This study was conducted with this in mind; that is to facilitate the development of an organized private sector in forestry in Tanzania.

The Government of Tanzania is the main regulator of activities in the forestry sector through its Ministry of Natural Resources and Tourism (MNRT), specifically through the Forestry and Beekeeping Division (FBD), and the Tanzania Forest Service Agency (TFS). The government sets the forest policy, rules and regulations to guide forestry practice in the country and ensures that these rules and regulations are enforced. The Forest Policy of Tanzania (URT, 1998) and the Forest Act Cap 323 [R.E.2002] (URT 2002) are the two prime documents for the facilitation and development of the forest industry in the country. In addition, a draft for the National Forest Programme II (NFP II, 2015 – 2024) which is an instrument to implement the National Forest Policy is in place. All three documents emphasize for the need to create an enabling environment for the development of private forestry sector. However, despite the government's political will, there are areas that need to be improved in order for the sector to flourish. Such areas include business incentives and harmonisation of fees and taxes charged to operators in forest product business, infrastructural development particularly the railway networks, and re-addressing bureaucracy associated with land acquisition process for forest establishment.

In terms of forest land ownership, villages own the largest portion (45.6%) of the total 48,090,700 ha under forests and woodlands forest categories in the country. The central government ranks second, occupying about 34.5% of the forest land. The remaining part of forest land is owned by local government, private companies, some institutions and individuals.

The forest sector in general and the private forest sector in particular, has been found to have significant potential to contribute to the national economy and social development in the country; specifically in terms of job creation and income generation. Sawmilling, timber and poles treatment, paper manufacture, tree nurseries, furniture making, transport and timber trading, imports and exports all open opportunities for employment and especially to the fast growing youth population. While the government has expressed political will to provide an enabling environment to facilitate the growth of the private sector, more is required of it to remove the remaining hurdles that constrain the pace of establishment and development of the private forestry sector. For example, putting in place mechanisms for formalisation of the informal part of the sector could significantly improve the growth and the contribution of the private forestry sector.

The private forest sector in Tanzania is comprised of private forest-based companies and individuals, traders of forest products, transporters, and federations of forest-based SMEs. In addition, there are several actors who supply inputs to the sector. Such inputs may include seeds and seedlings or any other planting material, fertilizers, fungicides, training, research/consultancy and extension services, food and drinks, fuel and oils, maintenance services, etc. Many times the contributions made by these actors in private forestry sector go unnoticed in sizing up the contribution of the sector to the national economy.

There have been commendable efforts to organize the forestry private sector in the country through institutions like TGAs, TAWOFE, SHIVIMITA (which include SAFIA, NOFIA and UWAMBU), and MTTCS. Formalised forest-based federations include Shirika la Viwanda vya Misitu Tanzania (SHIVIMITA) and Tanzania Wood Working Federation (TAWOFE). These federations are lobby bodies that safeguard the interest of their members. However, one would wish to see a stronger, united and more vibrant apex body for private forest sector which could speak and stand for the sector. It is therefore, recommended that an apex body be formed for example in name of the Tanzania Private Forestry Foundation (TPFF). This should go hand in hand with the formation of national product/business line associations as founding members.

In the forestry sector in Tanzania, the PPP arrangement which is supported by the Forest Policy (MNRT, 1998) and the Forest Act (MNRT, 2002) can be operationalised through PFM and concession arrangement. The PPP arrangement in PFM is implemented in a Joint Forest Management (JFM) which allows communities to sign joint forest management agreements with government and other forest owners, mainly local governments. Since its inauguration in the early 1990s, about 5,392,095 ha and 1052 villages have been put under the JFM arrangement. Despite acceptance of JFM across the country, it hasn't been very popular among some local communities. Such communities claim that they spend more than they benefit from JFM. Other JFM arrangements that could be tested although not provided in law are: JFM between Central Government and TGAs, JFM between village governments and TGAs or between community groups and TGAs, and out-grower arrangements between tree farmers or TGAs, and industry companies such as the one practiced by KVTC. These other more recent JFM arrangements appear more likely to improve social inclusion

Private sector forestry industry types operating in the country include sawmills, impregnation plants, paper mills, veneer factories, fibreboard and plywood production and two emerging wood briquette factories under construction in Kilombero District (BoraMoto) and at SaoHill Industries Ltd. The types of products include kraft paper, sawn timber, utility poles, seedlings, veneer, furniture, charcoal and bee products. Apart from KVTC and Saohill Industries sawmills whose sawmills use advanced technologies i.e. laser technology and hewsaw at KVTC and Saohill Industries Ltd, respectively, most of the other sawmills use inefficient and old technologies in processing wood and with small scale sawmills being particularly wasteful. A cluster initiative could be a worthy strategy to consider in order to enable forest-base SMEs to jointly build the required capacity and shift to new technologies.

With exceptional of a few large companies in Tanzania most forest-based SMEs produce and sell their products locally. Sawn timber and utility poles are the main timber products on the Tanzanian market. The major consumer of sawn timber is the construction industry, mainly the National Housing Corporation and other individuals or building contractors. 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). On the other hand, the major consumers of utility poles are TANESCO and REA. In 2010 and 2011, TANESCOs utility poles requirements ranged from 80,000 to 120,000 units (Ngaga, 2011) but currently the requirements have gone up to a range of between 100,000 and 165,000 poles per annum. REA's annual requirement has increased from 2,200 in 2010 to 172,000 in 2014. It is estimated that 55% and 50% of the TANESCO and REA poles' requirement are imported, respectively. The demand for utility poles is increasing and in order to supplement wooden poles, TANESCO is set to start production of concrete poles through PPP arrangement in 2016.

By 2017, a significant drop in wood supply from government forest plantations and natural forests is predicted because of a decline in harvesting levels at SaoHill Forest Plantation; the largest forest plantation and major supplier of wood in the country. About 50% of the growing stock at this plantation is currently underage and therefore not ready for harvesting. Given this scenario, it is envisaged that by 2025 about 70% of the supply of industrial round wood will come from private plantations; therefore, it is necessary to make plans for this to happen. There is also need to address challenges facing the private forestry sector and put in place an incentive scheme that will allow sector grow smoothly and swiftly to enable it take up this task.

The private sector plays a crucial role in improving local communities' livelihoods and the national economy. For example, GRL facilitates socio-economic development and poverty alleviation in rural areas through provision of employment, infrastructure development, schools, health and other community development. KVTC supports an out-grower scheme in which households with land banks are advised to convert from one to 50 ha of their existing farm land to teak forestry. The company provides inputs such seeds, fertilisers, technical support in managing the forests, and KVTC has a purchase agreement for the crop. The objective of such programs is to facilitate local farmers to transit from subsistence farming to market-focused production.

Other contributions of the private forest sector are in the form of taxes and fees to the national economy. Such taxes include i) corporation tax which is 30% of the profit (Section 4 of the income Tax Act (2004)), ii) Value Added Tax. It should be noted that sawlogs, pulp and timber are not among goods that are VAT exempted; all taxable goods and services are charged VAT at standard rate of 18% of the value goods supplied (VAT Act 1997), iii) LGAs collect produce cess of 5% and fees for business licenses which is a minimum of 100,000 Tsh equivalent to about 45 USD, iv) Royalty fees as categorised by species classes (Forest Act, 2002), v) a levy of 2% of any royalty payable under the Forest Act, vi) Annual factory registration fee, vii) Logging

Miscellaneous Account (LMDA) fee, etc. All these taxes and fees go to boost the national economy. Given this valuable role which is played by the private forest sector in employment creation, improvement of livelihood of the local communities and boosting national economy; the government should strive to support its development.

Gender inequalities were observed in the forest sector where men are more favoured by customary law than women. Although women have fairly good access to important resources that would allow one to fully participate in forestry activities, control of the resources rests on hands of men. Only when such cultural barriers are removed, one could not see full participation of women in forestry activities. While land tenure, ownership and control of land, and mandates on revenues collected from sales of forest produce culturally favour men, they are essentially are discouraging women to take active participation in forestry activities. On the other hand, youths also find it difficult to participate in forestry activities that could improve their employment and income situation, largely because they are in most cases uninformed of opportunities in the forest sector and also in short of capital and skills. There is need therefore to empower women and youths in forestry activities. Women and youth are involved in forestry activities such as establishment of woodlots and tree nurseries. On top of woodlot and nursery establishment, young men are also involved in activities like furniture making and trading, harvesting of forest produce, sawmilling, and timber trade.

Tropical forest in the Lake Manyara National Park, Nothern Tanzania (Photo: Wikipedia Commons)

1.0 INTRODUCTION AND OBJECTIVES OF THE STUDY

1.1 INTRODUCTION

A countrywide project, namely the National Forest Resources Monitoring and Assessment (NAFORMA), was implemented in Tanzania mainland over a period of five years (2009- 2014). The NAFORMA findings (MNRT, 2015) gave valuable updates of forest resources in Tanzania mainland. The report details the type of vegetations available, coverage and growing stock of each vegetation type, forests in different land uses, forest ownership, tree species and sizes. The NAFORMA findings are a supplement to another key report by Indufor and the Ministry of Natural Resources and Tourism (MNRT) (2011). The Indufor report investigated timber market dynamics in Tanzania. On other hand, the Zanzibar Woody Biomass Survey (ZWBS) conducted between 2012 -2013 by Indufor and the Zanzibar Ministry of Agriculture and Natural Resources (MANR) highlighted forest resource base in the Islands. The reports complementarily describe the forest resource base in Tanzania mainland and Tanzania-Island.

1.2 BACKGROUND AND OBJECTIVES OF THE STUDY

Generally, in many African countries, the private sector in forestry is almost non-existent as an organized entity that one can dialogue with. This is true also in Tanzania where the sector is at its infancy stage and needs to be nurtured in order to grow into a stronger sector that could significantly contribute to the national economy. It has to be organized and developed from the many diverse actors who largely operate informally in order to better coordinate their role in forestry development. At the heart of private sector development in forest products industry are diversified groups of individuals including young men and women and marginalized/disadvantaged/vulnerable groups. Facilitating the development of the industry demands the identification and understanding of the interactions between the different groups of people and the forest resources as well as their differing needs, privileges, contributions, challenges and priorities. However, gender disaggregated information about the categories and activities of users of forest resources in rural communities and their contributions to the local economy are seldom available. The private sector development has a particularly strong role to play in poverty alleviation, and could have significant impact on women and other marginalised groups. Gender disaggregated data and analysis is therefore crucial to helping fill this information gap.

This consultancy assignment was undertaken to unveil key actors in both primary and secondary forestry production in Tanzania. The main objective was to get a set of strategies on how to strengthen and or develop all-inclusive actors into an organized and cohesive sector that can articulate its issues, be heard, and attract attention and resources for its development and growth.

1.2.1 Purpose of the work

The purpose of this study is to facilitate the development of an organized private sector in forestry, and including the identification and promotion of promising public private partnership (PPP) models/approaches for an all-inclusive forest compatible sustainable livelihoods development, including gender considerations in Tanzania.

1.2.2 Specific tasks

i. Map out the key actors and identify the gender groups' representation in primary forest production and secondary forest production (wood processing, marketing and trade) including SMEs based on all forest types in the country;
ii. For actors in primary forest production, collect information on tree species raised/managed (their productivity and use) and distributed by area, age classes, and volume (total and merchantable), as well as plans for sustainable supply;
iii. For actors in secondary forest production, collect information on industry type, installed capacity, products lines/types, capacity utilization, production volumes (in the last five years) and raw material types and sources;
iv. For both actors in primary and secondary forest production sector:
    a) evaluate employment opportunities, policies, regulations and other factors facilitating and/or constraining the development of forest products industry, including undertaking a SWOT analysis;
    b) assess and identify the gender specific inequalities;
    c) assess and identify the factors inhibiting and or promoting the full and equal participation of marginalised groups;
    d) Assess and analyse gender based control and access to required assets/resources including the specific opportunities, challenges and privileges of involvement and participation in the sector;
    e) Evaluate marketing and trade (domestic and international) in their products including volumes, production costs, revenues and prices of products traded in the last five years.
v. Evaluate the relationship/linkages among actors in primary forest production on one hand and the relationship/linkages among actors in secondary forest production on the other hand and how this can be organized to contribute to the growth of a well-organized formal private sector in forestry;
vi. Evaluate the scope, within the country, for public private partnership in forestry including existing promising models/approaches that can enhance social inclusion, gender equitable practices and forest compatible sustainable livelihoods development in the different forest types and propose recommendations on way the forward;

vii. Provide past trends on production, trade and consumption on timber and non-timber products in the country in the last five years. Also provide forecasts of future production, trade and consumption of the same; and
viii. Assess the contribution of these private forestry sector activities to local livelihoods and national economy.

1.2.3 Expected deliverables

At the end of the consultancy period, the following are the expected deliverables:
i. A technical report of about 40 pages long, excluding references;
ii. A policy brief, a fact sheet and a journal article, all to be finalised in collaboration with the relevant staff at the AFF Secretariat who will get involved in this assignment.

1.3 METHODOLOGY

Gathering of information essential to addressing issues for this assignment was achieved using different approaches:
Tasks (i) and (ii) - These were done through review of published and unpublished literature and personal experience.
Tasks (iii) and (iv) - A field survey was conducted. Among institutions visited include Saohill Industries Ltd, Tanganyika Wattle Company (TANWAT), Kilombero Valley Teak Company (KVTC), Mufindi Paper Mills Ltd (MPM), members of the SaoHill Forest Industries Association (SAFIA) and Northern Forest Industry Association (NOFIA), Tanzania Wood Working Federation (TAWOFE). Others were carpentry workshops, Tanzania Revenue Authority, Tanzania Forest Service Agency (TFS), Tree Growers Association (TGA) in Mafinga, Mufindi District Council, wood workshops, Makambako Timber Trader Cooperative Society (MTTCS), to mention a few.
Task (v) – Literature search as well as consultation with various stakeholders was conducted. Of those consulted included members of SAFIA, TAWOFE and individual forest industry managers and senior officials from well advanced private forestry sector associations like the Forestry South Africa and South African Wood Preservers Association of South Africa. The Ministry of Agriculture, Forestry and Fisheries of South Africa was also contacted.
Task (vi) - Review of relevant policies and provisions within the legal public private partnership (PPP) framework in the country. Review of forest related PPP projects.
Task (vii) – A field survey was conducted to collect data to augment those collected in tasks (iii) and (iv) above. The institutions visited included TFS, Tanzania Revenue Authority, the National Bureau of Statistics (NBS), Mufindi District Council and some individual companies.
Task (viii) Literature search was conducted and consultation with various stakeholders was done including managers of some private companies.

Note: A full list of names of people contacted and their institution are provided in annex 1.

2.0 RESULTS OF THE STUDY

This section summarises key findings in respect to each task stipulated above. Where necessary, tables, figures and photos are used to give a snapshot of issues.

2.1 KEY ACTORS AND THEIR ROLES IN THE PRIMARY AND SECONDARY FOREST PRODUCTION

2.1.1 Key actors and their roles in the primary forest production

In Tanzania there are various actors who are engaged in primary forest production, some are engaged directly while others are indirectly involved (Maryudi, 2011). Key actors in primary forest production in Tanzania are categorized as follows:

2.1.1.1 The government as a regulator

The Government of Tanzania is the main regulator of activities in this sector through its Ministry of Natural Resources and Tourism (MNRT), specifically through the Forestry and Beekeeping Division (FBD), and the Tanzania Forest Service Agency (TFS); and also the Prime Minister's Office through Regional Administration and Local Governments (PMORALG). The government sets the forest policy, rules and regulations to guide forestry practice in the country and ensures that these rules and regulations are enforced. The National Forest Programme and the National Research Master Plan are also tools developed under the Government's directives (section 4.4.6 of the Tanzania Forest Policy, 1998). Furthermore, the government is also responsible to develop infrastructure and create an enabling environment for the development of the private sector (URT, 1998, *see Box 1*). The enabling environment in discussion may include provision of information, technical and advisory services such as extension, and where possible, provide capital through Tanzania Forest Fund (TaFF) (URT, 2002).

Box 1
Policy statement (38): An enabling environment and regulatory framework for the private sector involvement in forestry will be created through secured raw material procurement, training, research, and transfer of technology. Incentives and credit facilities for investments will be promoted and joint ventures will be encouraged.

Source: MNRT (1998)

In addition, the government and her organs i.e. FBD, TFS, TaFF and Local Government Authorities (LGAs) are among key employers in the sector.

2.1.1.2 Owners of the forests

This category embraces the central government through TFS, LGAs, village councils, private companies and individuals, religious organizations, schools, and tree growers associations or groups.

The NAFORMA report (Fig. 1) shows ownership of the forest resources in Tanzania Mainland. The report shows that out of a total of 48,090,700 ha which is the total area under forests and woodlands in the country, village forest lands occupy 45.6%. This means that village councils are the lead actors whose interests must be taken on board whenever planning for forest development is done.

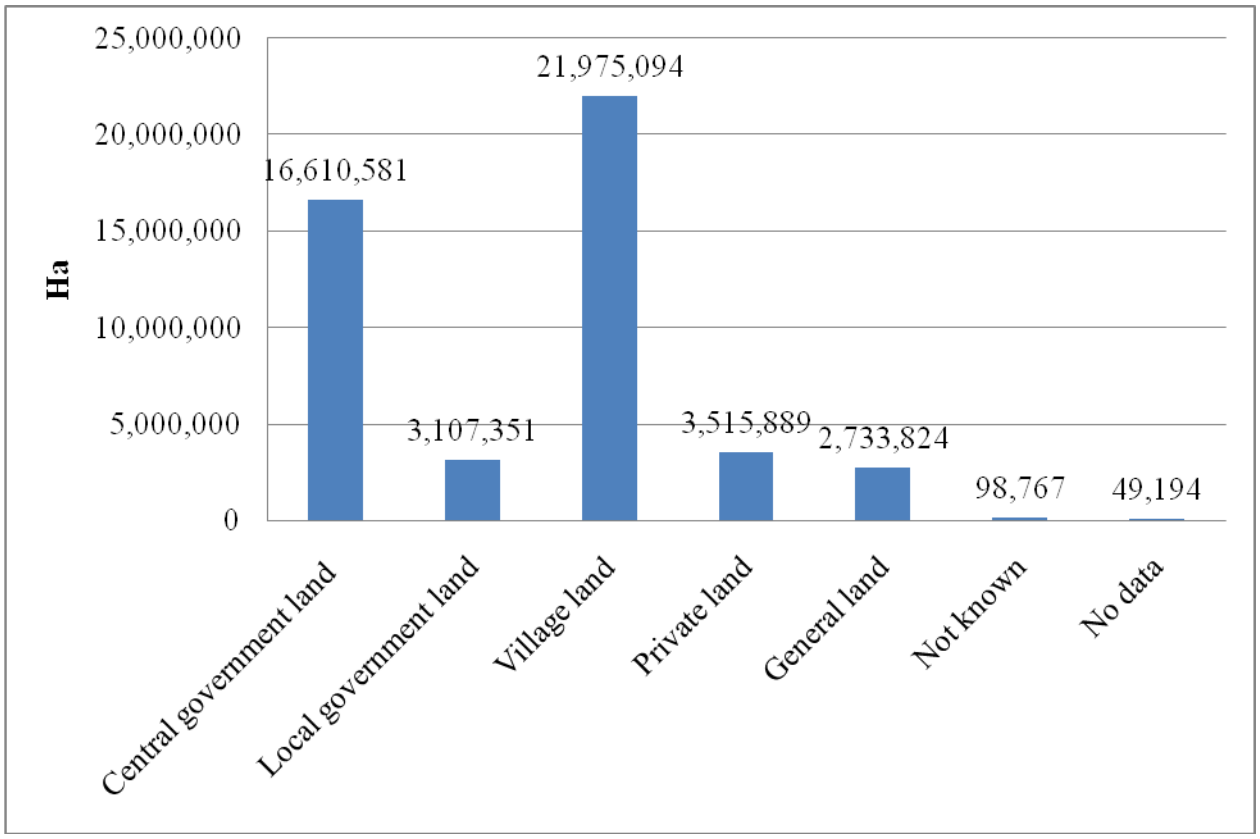

Figure 1: Distribution of forest and woodland per ownership classes
Source: MNRT (2015)

It is within the villages where most women and youths live. It is fascinating to note that the dual looks at planting forests as an opening window of opportunities. For example, a study by Singunda (2009) found that 14.1 and 21.1% of owners of woodlots in Mufindi District were women and youths, respectively. Supporting woodlots development through provision of extension services, loan facilities, markets, etc indirectly will be solving problems facing women and youths in terms of land and forest tenure, incomes and other livelihood supporting means and employment.

2.1.1.3 Forest users or user groups

Forest users are nonhomogeneous group interested in forest produce as a source of livelihood. This is a large group in the country and may include charcoal makers, beekeepers, illegal loggers, pit sawyers, hunters, herbalists, traders, and collectors of: firewood, building materials, forest foods and fruits, seeds, forest soils and gravel, etc (TFCG 2006; MNRT, 2015). The majority of the so called marginalized/ vulnerable/ disadvantaged groups which mainly include youth, widow women, old women and men, poor people and orphans who are struggling to meet their basic needs (Impact, 2012) are found in this group.

For example, a study by TFCG (2006) indicated that young men in villages adjacent to the Nguru Forest Reserve are employed as carriers of illegally harvested timber using bicycles for a pay of 4US$ per load. Also, they derive their income from collection of poles, walking sticks and handles for hoes within the forest reserve. The poles are traded locally at a price range of 0.04-0.16 US$. Local community adjacent to the forest reserve also collect sambu oil seeds from *Allanblachia stulimanii* and the wild black pepper (piper capansi) for income generation and own consumption. Women living in villages adjacent to the forest often collect fuel wood in the forest reserves. This is one of the many examples of forest users such groups have to be included in planning forestry interventions. Further, not all users in this group use forest resources sustainably. Consequently, strategies have to be developed to address the interests of user groups while at the same time discouraging acts like illegal logging, use of fire during hunting, and unsustainable harvesting of non-timber forest products, etc.

2.1.1.4 Inputs and service suppliers

These are suppliers of the required inputs to the primary forest production process. The inputs could be in form of seeds and seedlings or any other planting materials, fertilizers, fungicides, training, research/consultancy and extension services, food and drinks, fuel and oils, maintenance services, etc. The Tanzania Tree Seeds Agency (TTSA), for example, is the official supplier of tree seeds to the operators in the primary forest production. However, forest plantations, individuals (Fig.2), TGAs, LGAs, private forest companies such as Green Resources Ltd (GRL- Fig. 3), KVTC, TANWAT, MPM; local Non-Governmental Organisations (NGOs) such as Forest Development Trust (FDT), etc have been in the forefront as suppliers of seedlings. Table 1 shows leading producers of seedlings in visited Mufindi District, Iringa Region.

Figure 2: Women attending their nurseries in Mafinga town in Mufindi District

Figure 3: Makungu Seedlings and Clonal central nursery owned by Green Resources Ltd- Mufindi District. Source: Field photo (2015)

Table1: Major producers of seedlings Mufindi District in Iringa region

SN	Name of the producer	Number of seedlings	Status
1	SaoHill forest plantation	10,000,000	Public
2	Green Resources Ltd	5,000,000	Private company
3	TANWAT	30,022,500	Private company
4	MPM	2,000,000	Private company
5	Nundwe village	387,000	TGA
6	Matekeleza Changa	1,200,000	Individual
7	Chesco Ng'umbi	650,000	Individual
8	UWAMIMA-Mafinga	4,700,000	TGA
9	Bahati Mhapa	2,420,000	Individual
10	Luhunga village	236,460	Village council

Source: Mufindi District forest office (2014)

Most of the raised seedlings are for own use and sell to others. However, some public and private companies usually distribute some of their seedlings to local communities.
Tanzania Forest Research Institute (TAFORI) continues to conduct tree improvements programmes such as production of new genetic combinations through controlled pollination, selection and hybridization of local tree species/landraces so as to provide better planting materials to operators in the primary forest production. One of the on-going researches is on performance of Eucalyptus clones in Tanzania.

The Sokoine University of Agriculture (SUA) offers professional forestry education while the Forest Training Institute- Olmotonyi, and the Forest Industry Training Institute (FITI) offer technical forestry programmes at different levels(Certificate and Diploma) to build the bulk of required professional and technical personnel capacity in the sector. SUA also offers research and consultancy services. The Industry-Training/education-Research link needs to be strengthened so that solutions to problems facing the forest sector can be addressed adequately.

2.1.1.5 Competing land users
These are people or groups of people who desire or opt to convert forest land into other land uses. These may include crop farmers, pastoralists and investors in development projects (e.g. biofuel production, road construction, mining, settlements, etc). It is not unusual, unfortunately, to find in this group politicians who advocate for conversion of forest lands into settlements or grazing land. They do so for various reasons including luring confidence and votes. Such cases have been observed in Katavi, Geita and Arusha regions (Tanzania Association of Foresters, unpublished). Farmers-pastoralist conflicts are also prevalent in some parts of the country. Therefore, cross-sectoral approaches that address needs of each group could reduce if not completely eradicate these conflicts. Political intrusions in technical issues should be eradicated and preferably through appropriate law.

2.1.1.6 Community based organizations (CBOs) and Non-Government Organizations (NGOs)
Various local CBOs and NGOs are operating in the country mainly in the areas of awareness creation, extension services, legal and political advocacy for institutional reforms, financing of forestry and environment activities, promotion of gender roles, women empowerment, revenue collection, etc. Some of the active NGOs in forestry development in the country include: the Tanzania Association of Foresters (TAF), World Wide Fund for Nature (WWF), Tanzania Forest Conservation Group (TFCG), *Mitandao ya Jamii ya Usimamizi wa Misitu Tanzania* (MJUMITA), i.e. Community Network in Forest Conservation in Tanzania, Mpingo Conservation Development Initiative (MCDI), Forestry Development Trust, to mention a few. Therefore, CBOs and NGOs are increasingly becoming important actors in forestry whose roles need not be neglected but strengthened.

2.1.1.7 Donor community
For many years, the forest sector of Tanzania has been receiving technical and financial support from the donor community. Donors support in development of policies and programmes, capacity building, poverty reduction efforts, forest resource assessment,

etc. Currently, for example, since 2014 the Government of Finland in collaboration with the Government of Tanzania is supporting a 16-year programme called “Private Forestry Programme” commonly known as *Panda Miti Kibiashara*. The Programme supports private plantation forestry and value chains in the country. The aim being to increasing rural income in the Southern highlands area of the country, thereby reducing poverty and inequality, through developing sustainable plantation forestry, value addition activities that create employment in the entire production value chain from quality seeds to quality products in markets (PFP, 2013). Another milestone that received donor support was the NAFORMA project which received financial and technical assistance from the Government of Finland, FAO and FAO-FIN Technical Unit at FAO Headquarters in order to assess the forest resources in Tanzania Mainland. Therefore, donors are commendable partner actors in development of the forestry industry in the country.

2.1.1.8 Media

Television, radio, and newspapers have been and are very instrumental in cultivating public attention and creating awareness on issues related to forestry. Coverage of workshops, seminars and conferences has been mostly through the media.

2.1.2 Key actors and their roles in the secondary forest production

Secondary forest production takes in wood harvesting and processing which are important nodes along the forest-based value chain. Wood processing in Tanzania involves different types of industries which differ in size and capacities, types of materials being processed, and their products. It should be emphasized here again that, the private sector plays an enormous role in this aspect. Apart from TASCAN co.LTD which is on private public partnership arrangement, the others are owned by private companies.

Key actors in secondary forest production are:

2.1.2.1 The government as a regulator

The roles of the government as a regulator in secondary forest production are almost similar to those already highlighted for primary forestry production. However, more players come in here because of the nature of activities in secondary forest production. The Ministry of Industries, Trade and Cooperatives (MITC), Tanzania Bureau of Standards (TBS) and Tanzania Revenue Authority (TRA) are the additional players. TBS is an organ mandated to set standards in Tanzania while TRA is a tax collection organ for the Central Government. The dual set standards and taxes within their mandate, respectively. Those in secondary forest production need to comply with the set standards and taxes.

2.1.2.2 The private sector

The actors in this group are represented by companies and individuals, traders of forest products, transporters, and federations of forest-based SMEs. Forest-based federations include *Shirika la Viwanda vya Misitu Tanzania* (SHIVIMITA), with subsidiaries of SaoHill Forest Industries Association (SAFIA) in the Southern Highlands, UWAMBU (Umoja wa Wafanya Biashara ya Mbao Buhindi) in Lake zone, Northern Forest Industries Association (NOFIA) in Northern Tanzania. Furniture makers also have their own apex body called the Tanzania Wood Working Federation (TAWOFE). There are other federations which are more inclusive (i.e. take in forest and non-forest based-industries). These are the Tanzania Chamber of Commerce, Industries and Agriculture (TCCIA), the Tanzania Foundation for Private Sector Development (TPSF), the Confederation of Industries in Tanzania (CIT). Other associations are more localized such the MTTCS, the association of charcoal sellers in Njombe township, Umoja wa Mafundi Seremala na wauza mbao at an area popularly known as Fire (i.e. near fire station) in Morogoro Municipality, etc. These federations are lobby bodies that should safeguard the interest of their members. It should be emphasized here that although on the surface the private sector seems to be well organized, there are a lot to be done. These apex bodies are mostly weak in terms of financial capacity, managerial capacity, coverage and membership enrolment and engagement (Kushaba, Mgohole and Lemm, personal communication, 2015) and therefore cannot effectively represent their members. At individual level, there are small, medium and large companies. Large companies include MPM, Fibre Board Africa Ltd (FAL), TANWAT, New Forest Company (NFC), KVTC, and Saohill Industries Ltd. Small and medium forest-based enterprises (Fig. 4) are mostly sawmillers which largely operate informally. However, if they could be better organized, could significantly contribute to national economy in terms of employment creation and revenue generation.

Figure 4: Small (L) and medium (R) size-sawmills.
Source: Field photo (2015).

The timber impregnation industry is an industry that is growing fast in Tanzania. In the country there are low to high tech impregnation plants. SaoHill Industries Ltd has the largest and fairly modern impregnation plants (Fig.5). Similar plant is installed at NFC.

Figure 5: One of the impregnation plants at SHI. Source: Field photo (2015)

The furniture industry is a tertiary sub-sector that is also growing fast but mostly operates informally. It has considerable potential to engage youths from vocational training institutions. Further, the beekeeping industry and other non-timber forest products such as herbal products and handcrafts are growing but at a slow pace and without adequate supporting polices, investment in value addition, marketing infrastructure.

2.1.2.3 Commercial users/consumers of forest products

The main forest products in Tanzania are timber and utility wooden poles. The key consumers of these products are construction companies and the Tanzania Electric Supply Co Ltd (TANESCO), respectively. Majority (62%) of timber produced in country is consumed by the construction industry (Indufor, 2011) mainly by the National Housing Corporation and individual building contractors. TANESCO consumes most of the transmission poles produced in country, but of recent, the Rural Electrification Authority (REA) which oversees countrywide rural electrification projects is another upcoming consumer of treated wooden poles.

2.1.2.4 Training and research institutions

The Faculty of Forestry and Nature Conservation of the Sokoine University of Agriculture (SUA) is involved in building professional capacity. SUA is as well involved in research and consultancy services that support the development of the sector. The certificate and diploma forestry training are offered by Forestry Training Institute (FTI) at Olmotonyi in Arusha region while the Forest Industry Training Institute (FITI) in Moshi in Kilimanjaro region offers training in harvesting and wood processing at certificate and diploma levels. On the other hand, the Vocational Education Training Agency (VETA) provides training on wood working and joinery. The Private Forestry Programme which supports private plantation forestry and value chains in Tanzania has developed a VETA level 3 programme which is to be offered to primary school leavers in order to impart them with necessary skills required to support themselves, in addition to supporting operations in primary and secondary forest production (PFPa, 2015).

2.1.2.5 Machinery and tools suppliers

These are individuals and companies who supply forest machinery such as sawmills, chainsaws, saw blades, etc. In this category, also included are workshops that fabricate push benches commonly known as “ding dong.” Among key suppliers of sawmills in Tanzania include KARA, Timber King and Wood Mizer. Push bench fabricators in Mafinga township for example, are individuals known by their names, e.g. Mr. Kisweswe, Mr. Nyenza, Mr. Rupelo, Mr. Msalilwa, Mr Sheddy, etc.

2.1.2.6 Financial institutions

In order to support their operations, operators in the secondary forest production have acknowledged to have received loans and grants from locally operating banks. Such banks include CRDB-Bank, National Microfinance bank (NMB) and Kenya Commercial Bank (KCB).

2.1.2.7 Traders: Local traders, importers and exporters

Forest products are being traded both locally and internationally. The National Bureau of Statistics report (URT, 2013) indicated that forest products are traded within the country, regions (i.e. Eastern African Community and Southern African Development Corporation) and internationally. Timber and furniture yards/shops are spread in almost all towns in Tanzania. In Dar es Salaam city, for example, about 12 foreign furniture shops were operating and registered by the Tanzania Investment Centre (TIC) by 2012 (Indufor and Mutalemwa 2012). The number might have increased by now. As recommended earlier-on, for a successful and growing forest sector in the country, the interests and roles of all these actors i.e. in primary and secondary forest production need to be considered.

2.2 TREE SPECIES RAISED AND MANAGED AND THEIR DISTRIBUTION BY AREA, AGE CLASSES, AND VOLUME

2.2.1 Forest resources in Tanzania mainland

As mentioned in the introduction, the resource base of Tanzania Mainland is mainly described by NAFORMA report (MNRT, 2015). The vegetation type classification system used in NAFORMA was based on land cover classes that fit in well with FAO classification (2013) and were customized further to suit local conditions. Therefore, in Tanzania Mainland, forest resources were classified as i) forests i.e. montane forests, lowland forest, plantations and mangroves, ii) woodlands, which are further subdivided into open and closed woodlands, iii) bushland i.e. bushland thicket, bushland open and bushland dense, iv) other wooded land; which takes in grassland, cultivated land (including shifting cultivation), open land and other areas and v) inland water; which is typically water bodies such as major rivers, lakes and water reservoirs. In summary, the vegetation type, coverage, volume and their productivity are presented in Table 2.

Table 2: Coverage and growing stock by vegetation types

Primary Vegetation Type	Classification of Vegetation Type	Area(ha)	Volume (,000) m^3	Volume m^3/ha	Trees/ha	Basal Area m^2/ha
Forest	Humid montane	995,300	169,541	171.0	1,871	20.0
	Lowland	1,656,500	162,300	98.3	2,331	14.2
	Mangrove	158,100	7,696	48.8	3,403	10.8
	Plantation	554,500	35,426	64.1	1,033	8.1
Woodland	Closed (>40%)	8,729,000	691,751	79.5	1,462	11.5
	Open (10- 40%)	35,997,300	1,764,501	49.2	954	7.5
	Scattered cropland (Unsp. density)	2,530,900	59,243	23.5	983	3.8
Bushland	Thicket	971,900	19,812	20.5	2,992	5.5
	Dense	2,012,400	54,987	27.4	2,625	6.4
	Open	2,843,500	46,434	16.4	1,295	3.6
	Emergent trees	309,400	8,057	26.1	1,373	5.0
	Thicket with emergent trees	308,300	11,034	35.9	2,118	7.4
	Scattered cultivation	1,162,700	15,654	13.5	1,870	3.2
Grassland	Wooded	4,712,300	41,741	8.9	307	1.9
	Bushed	438,900	2,723	6.2	683	1.2
	Open	3,091,100	2,373	0.8	40	0.2
	Scattered cropland	593,600	2,791	4.7	201	0.9
Cultivated land	Agro-forestry system	1,373,000	17,131	12.5	229	2.4
	Wooded crops	1,521,100	30,759	20.3	571	4.0
	Herbaceous crops	5,045,400	39,192	7.8	168	1.4
	Mixed tree cropping	154,700	9,981	64.8	783	7.7
	Grain crops	9,866,700	85,910	8.7	97	1.5
Open land	Bare soil	161,100	985	6.1	589	1.4
	Salt crusts	18,300	90	4.9	181	1.2
	Rock outcrops	73,100	364	5.0	758	1.3
Water	Inland water	154,700	2,271	14.7	103	1.9
	Swamp	1,007,900	8,376	8.3	119	1.4
Other areas	Unspecified	1,892,700	31,669	16.8	298	2.8
Total/mean		**88,334,300**	**3,322,791**	**37.7**	**877**	**5.8**

Source: MNRT (2015)

Table 2 indicates that the area of forest and woodlands category of Tanzania mainland covers about 48.1 million ha and total wood volume for all forest types is estimated at 3.3 billion m^3. The average volume of wood for all categories is 37.7 m^3/ha. Humid montane records the highest volume of 171 m^3/ha while open grassland has the lowest volume, i.e. 0.8 m^3/ha. Further, despite woodlands occupying the biggest proportion of land and having a large volume of growing stock, its productivity is very low, i.e. almost half of that of the forest. Similarly, the number of trees and basal area per hectare in the woodlands is lower compared to that of the forest category. The woodlands have been highly degraded through encroachment for agriculture, illegal logging, charcoaling, grazing, forest fires, etc (Malimbwi *et al.,* unpublished)

The forest land use classes were also reported in NAFORMA (MNRT 2015). According to land use classification used by NAFORMA, the 945,100 km^2 of land of Tanzania mainland is covered by or used for: production forests (22.7%), protection forests (10.5%), wildlife reserves (22%), shifting cultivation (6.7%), agriculture (23.2%), grazing land (10.5%), built-up areas, i.e. settlement and mining (2.2%), water bodies (0.7%) and other lands (1.6%).

On the other hand, from Fig. 6 it is noted that that despite its current small representation in terms of forest and woodland ownership (in Fig.1), the private sector is earmarked to be the future supplier of wood materials beginning 2017 (MNRT and Indufor, 2011). By 2017, a significant drop in wood supply from government forest plantations and natural forests is predicted. Major cause of this drop comes as a result of decline in harvesting levels at the largest forest plantation and major supplier of wood i.e. Sao Hill Forest Plantation (SFP). By 2017, at SFP only a small volume of wood will be harvestable because about 50% of the current stock is younger than 10 years of age and thus will not ready for harvesting by then. The wood supply from this plantation is projected to drop from the current 1 mil. m^3 to less than 200,000 m^3 (MNRT and Indufor, 2011).

It is estimated that by 2025 the total wood supply will be around 1.75 mil m^3. About 70% of the supply will come from private plantations owned individually and by companies while public plantations will only supply 30% (MNRT and Indufor, 2011). This important signal should serve as a driver towards spiriting the government to create an enabling environment for the development of the private forest sector in the country. In addition, the signal should as well attract the attention of the business community to take advantage of this opening window of opportunity and plant more trees since the market will be there.

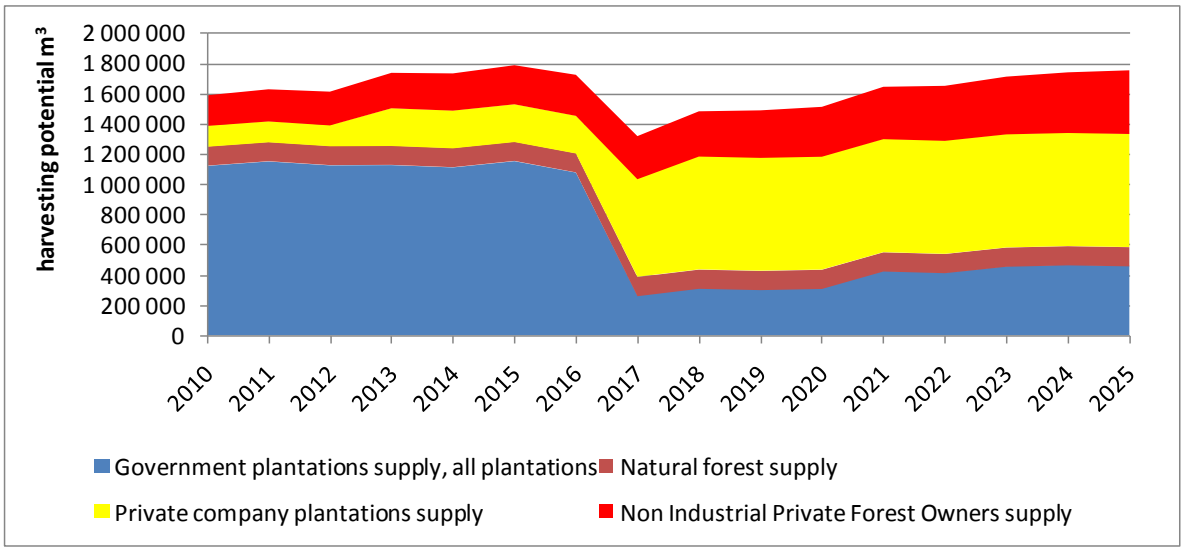

Figure 6: Future wood supply forecast (2010 – 2025).
Source: MNRT and Indufor (2011).

It is interesting to note that private companies have started to take initiatives towards planting trees as seen in Table 3. Despite figures of planted areas being low, they are strong enough to demonstrate new development in the private forest sector in Tanzania. Many of the companies have much more land for tree planting (see land bank in Table 3). The Government of Tanzania could therefore be encouraged to support the sector so that it can increase its contribution to national economy.

Table 3: Areas of forest plantations planted by private companies

SN	Name of the industry	Area planted (ha)	Land bank
1	MPM	36,000	30-40,000 ha
2	TANWAT	14,500	-
3	Green Resources Ltd	12,000	70,000
4	KVTC	8,162	28,132
5	NFC	1,400	4,000
6	Matekeleza & Co	3,500	-
7	Manhatann Inv	6	
8	Pilly Mashombo	100	
9	Ihembe Timber Products and Poles Ltd	300	
10	White Rose Investment	50	
11	Heri Luvanda	50	
12	Halidi Entreprises	9	
13	Dama Mkonge	45	
14	Sheda General Enterprises	500	

Source: Field data (2015).

Serial numbers 6-14 in Table 3 are individuals who also own small or medium sawmills. It a paradigm shift, i.e. in past, it was common for sawmills to depend solely on raw materials originating from public plantations and they never touched tree planting. Currently, the shift is observed where sawmillers apart from of their core business of sawmilling they also plant trees.

2.2.1.1 Common tree species and sizes in natural forests

(a) Common tree species

It is estimated that there are about 77.2 billion trees in Tanzania mainland and most of them (32.2%) are in production forests followed by wildlife protected areas (23.3%). About 96.2% of the trees are from natural regeneration, 2.5% are from coppicing and only 1.3% are planted (MNRT, 2015).

The NAFORMA report (MNRT, 2015) produced a list of the most common tree species. In the list arranged in the order of abundance, are: *Diplorhynchus condylocarpon, Combretm zeyheri, Brachystegia spiciformis, Combretum molle, Julbernardia globiflora, Brachystegia boehmii, Dichrostachys cinerea, Pseudolachnostylis maprouneiolia, Combretum sp, Grewia sp, Grewia bicolor, Commiphora Africana, Acacia sp, Commiphora sp, Markhamia obtusifolia, Uapaca kirkiana, Terminalia sericea, Brachystegia longifolia, Diplorhynchus mossambicensis and Dalbergia sp.*

(b) Sizes

While it was not easy to get diameters of each tree species in the various forest types, NAFORMA (MNRT, 2015) reports diameter at breast height (DBH) by species classes as appearing in Figure 7. While the vertical column on the right side of Fig.7 shows the growing stock, the left vertical column indicates the commercial volume, i.e., living trees belonging to any of the classes IA, IB, II or III of the species list (see hyperlinked in the reference list the Forest (amendment) Regulations, 2015 of the Forest Act- URT 2002) with a DBH greater than or equal to 20 cm. It can be discerned from Fig.7 that commercial volume is below 50% of the growing stock. Further, commercial species in classes IA (e.g. *Dalbergia melanoxylon*), IB (e.g. *Pterocarpus all sp*) and III (e.g. *Morrus lastea*) are almost disappearing implying that Tanzania mainland remains with majorly commercial stocks in class II such as *Parinari curatellifolia, Podocarpus all Spp, etc*. Figure 7, also gives the distribution of both commercial and growing stocks by administrative regions in the country. The regions with the largest commercial volumes are Morogoro, Lindi, Ruvuma, Katavi, Mbeya, and Tabora.

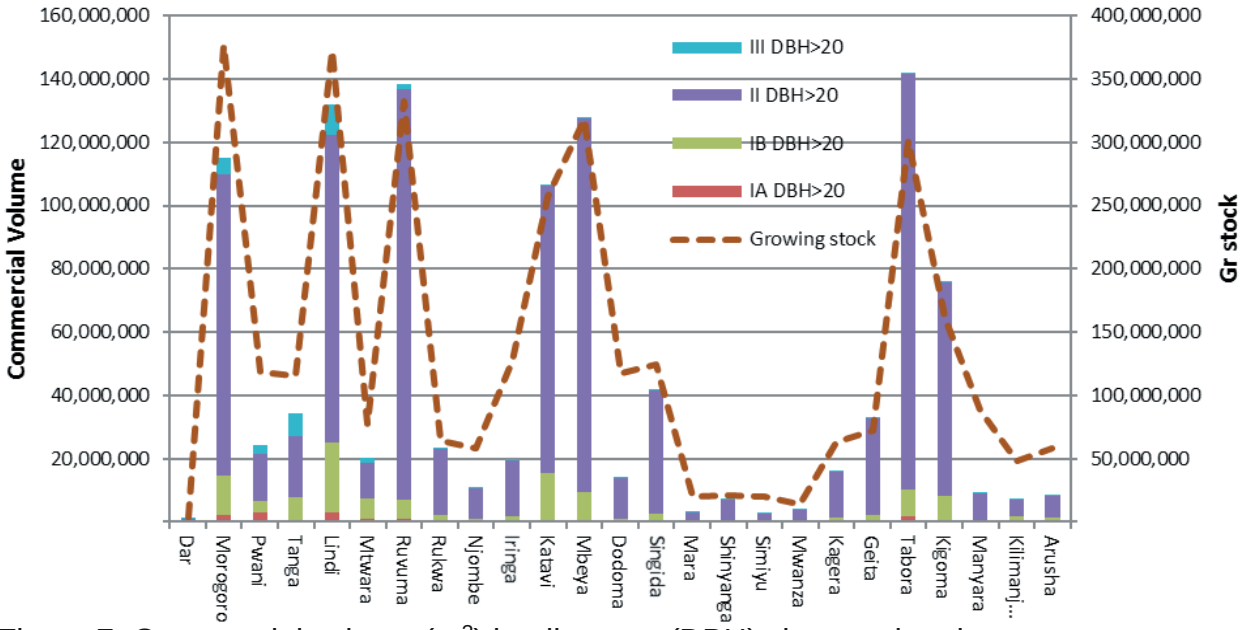

Figure 7: Commercial volume (m^3) by diameter (DBH) class and region
Source: MNRT (2015)

2.2.1.2 Vegetation types and plantation forests

According to Ngaga (2011) in Chamshama and Nshubemuki (2011), forest plantations in Tanzania are estimated to cover about a gross area 250 000 ha. However, this area has been recently expanded to 552,576 ha. The additional area comes from tree plantations developed by private companies and individuals in terms of woodlots (Malimbwi, *et al*., unpublished). The most important plantation species are various species of pines (i.e. *Pinus patula*, *P. elliottii* and *P. caribaea),* cypress (mainly *Cupressus lusitanica*), eucalyptus (mainly *E.Saligna and E. maidenii*) and teak (*Tectona grandis*). Figure 8 shows the distribution of forest plantation areas in Tanzania. The Southern highland zone has the majority of the plantations

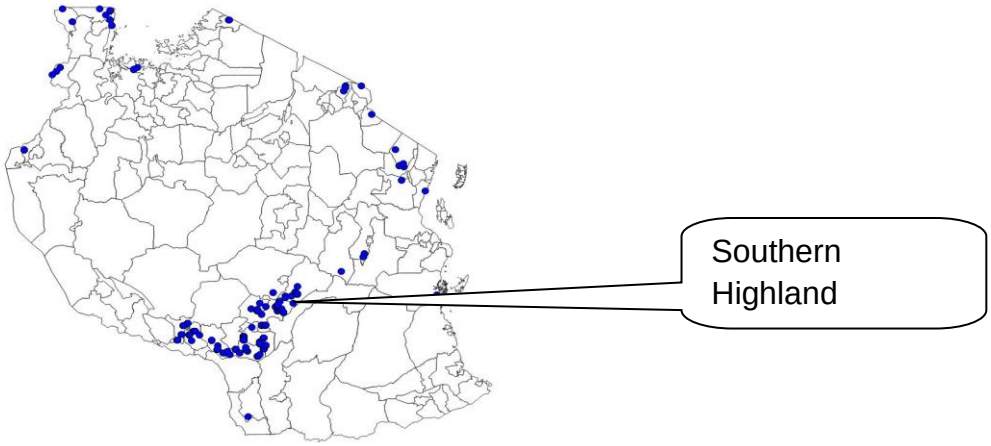

Figure 8: Distribution of forest plantation areas in Tanzania
Source: MNRT (2015)

2.2.2 Forest resources in Tanzania-Zanzibar

Tanzania-Zanzibar is comprised of the islands of Unguja and Pemba. The Zanzibar Woody Biomass Survey (ZWBS) was conducted by Indufor and the Ministry of Agriculture and Natural Resources (MANR), in Zanzibar (2012-2013) with financial support from the Royal Norwegian Government. The Zanzibar Woody Biomass Survey follows the land cover classes defined at the national level by the MANR/Department of Forestry and Non-Renewable Natural Resources in Zanzibar. According to ZWBS, the main land use classes in Zanzibar are as presented in Table 4.

Table 4: Land cover classification in Zanzibar in 2012

Class	Unguja		Pemba	
	Hectares	%	Hectares	%
Native forests	71,068	44.9	15,114	14.9
Mangroves	5,274	3.3	11,214	11.1
Tree plantations(casuarina, acacia, teak)	2,688	1.7	1,100	1.1
Wetlands	273	0.2	612	0.6
Agroforestry systems	35,441	22.4	44,951	44.4
Agriculture	25,903	16.4	13,877	13.7
Mixed woody vegetation	0	0.0	7,149	7.1
Built-up areas	16,460	10.4	6,278	6.2
Bare land areas	1,230	0.8	871	0.9
Total	**158, 337**	**100.0**	**101 168**	**100.0**

Source: Indufor (2013).

From Table 4, it is noted that in Unguja, native forests which include low coral rag vegetation (i.e. Ferns, grass, individual trees or group of trees), intermediate coral rag vegetation (i.e. bush vegetation, crown cover >50%), high coral rag vegetation (i.e. bush and tall trees within coral rag) and high forests are the dominant land use classes while in Pemba, agroforestry systems (i.e. clove and coconut plantations) dominate.

2.2.2.1 Growing stock by volume and species

(a) Volume

According to ZWBS (Indufor 2013), it is estimated that the total wood volume in Unguja is 5 523 536 m^3 while that of Pemba is 3 109 754 m^3 with stocking average of 34.9 m^3/ha and 30.7 m^3/ha, respectively. Main contributors to these volumes in Unguja include coconut plantations, a mixture of trees with agricultural crops, and wood volume from trees in towns and villages. In Pemba, cloves plantations and mangroves, coconut plantations, a mixture of trees with agricultural crops, are the main contributors (Table 5).

Table 5: Average and total volume in Zanzibar

Vegetation Class	Unguja			Pemba		
	Area (ha)	Volume (m^3/ha)	Volume (m^3)	Area (ha)	Volume (m^3/ha)	Volume (m^3)
Low coral rag vegetation	29,599	9.3	274,922	7,060	5.3	37,127
Intermediate coral rag veg.	35,057	13.6	477,099	3,956	15.0	59,202
High coral rag forest	5,352	64.6	345,769	763	57.3	43,776
High forest	1,027	135.3	138,917	2,743	62.9	172,556
Other native bushland	34	8.4	287	592	10.2	6,052
Mangrove	5,274	18.9	99,875	11,214	38.3	429,445
Forest tree plantations	1,840	28.5	52,363	108	13.8	1,488
Rubber plantations	848	153.2	129,889	992	64.9	64,377
Clove plantations	2	0.0	0	15,326	35.5	544,138
Coconut plantations	9,755	112.6	1,097,984	7,143	63.9	456,506
Mixture of trees and agricultural crops	25,684	66.3	1,703,914	22,482	30.7	689,621
Large-scale field assortments	4,432	4.3	18,906	2,957	8.9	26,265
Subsistence agriculture	11,249	7.1	79,599	2,181	3.3	7,153
Paddy fields (rice / sugar cane)	10,222	1.3	13,232	8,739	0.0	0
Mixed woody vegetation	0	0.0	0	7,149	37.1	264,978
Towns and villages	14,915	73.0	1,088,922	5,650	54.4	307,071
Other built-up areas	1,545	1.2	1,857	629	0.0	0
Bare land	1,503	0.0	0	1,484	0.0	0
Total	**158,338**	**34.9**	**5,523,536**	**101,168**	**30.7**	**3,109,754**

Source: Indufor (2013).

(b) Species

The ZWBS established the type of tree species, their number and average volume per ha (Table 6). The survey found that as single species, coconut and mangos are the dominant tree species in Unguja while coconut is a dominant tree species in Pemba.

Table 6: Stem number and volume of some major species and species groups

Species	Unguja			Pemba		
	N/ha	N (10^3)	Volume (m^3/ha)	N/ha	N (10^3)	Volume (m^3/ha)
Coconut	14.5	2,288	10.6	10.3	1,044	6.6
Clove DBH > 2 cm	1.7	270	0.2	34.2	3,457	3.6
Clove 1-2 cm	0.0	7	0.0	3.9	398	0.0
Mango	7.9	1,255	10.2	5.2	527	4.4
Other fruit trees	150.1	23,761	2.7	29.1	2,944	3.2
Other spice trees	0.1	17	0.0	2.9	298	0.0
Other palms	0.3	40	0.2	2.0	201	0.8
Plantation trees	170.8	27,041	0.7	4.8	486	0.2
Rubber trees	1.1	171	0.6	2.1	208	0.7
Mangrove trees	256.5	40,611	0.6	684.6	69,261	4.3
Other	2,538.3	401,903	9.9	680.5	68,849	7.1
Total excluding clove 1-2 cm	3,141	497,355	34.9	1,443	147,277	30.7
Total	**3,141**	**497,362**	**34.9**	**1,460**	**147,675**	**30.7**

Source: Indufor (2013)

A total of 90 species were identified in coral rag forests. Out of the 90 species, 57 occurred in areas with low coral rag vegetation, 46 in areas with intermediate coral rag vegetation and 43 in areas with high coral rag forests. The dominant species in low coral rag vegetation class in Unguja included *Euclea natalensis, Syzygium cuminii* and *Maytenus mossambicensis* while in Pemba Grewia sp, *Cocos nucifera and Lannea schweinfurthii* were reported to be the dominant ones.

In the intermediate coral rag vegetation class, the ZWBS reported that *Trichilia emetic, Pyrostia bibracteata, Macphersonia gracilis, Turraea floribunda, Ficus sur and Acacia auriculiformis* were the dominant species found Unguja while in Pemba, *Adansonia digitata, Lannea schweinfurthii, Tarenna pavettoides, Clausena anisata* and *Flueggea virosa* were the dominant ones.

Clove plantations found in Pemba are mainly of *Eugenia caryophyllus* (57%) while coconut plantations in both Unguja and Pemba are mainly of *Cocos nucifera*. When agricultural crops are mixed with trees, often a mixture of *Mangifera indica* and *Cocos nucifera* is the most prevalent mixture in the two islands.

2.3 INDUSTRY TYPE AND ACTORS IN SECONDARY FOREST PRODUCTION

Section 5.1.2 of this report highlights actors/ companies that produce forest products in the country. They include operators of impregnation plants, sawmillers, plywood manufacturers and producers of NTFPs. This section of the report narrates information on industry type, capacities and production volumes in last five years.

2.3.1 Impregnation plants

As was pointed out, timber impregnation business in Tanzania is booming. From Table 7, it is noted that in recent years, i.e. 2013 and 2014 all visited companies had boosted their production volumes. The NFC which is considered new in Tanzania since it started its operations in March 2013, it is growing very fast. Saohill Industries Ltd has been consistently producing large volumes of poles. These industries majorly use *E. Saligna* sourced from own plantations, Saohill forest plantation, and individual tree farmers.

Table 7: Production capacities of major impregnation plants operating in Tanzania

SN	Name of the Industry	Installed capacity, poles	Capacity utilization,	Production volume, units of poles				
				2010	2011	2012	2013	2014
1	NFC	156,000	40%				40,000	60,000
2	TANWAT	30,000	68%	4,856	3,947	15,028	19,969	15,969
3	Saohill Industies Ltd	100,000	40%	28,952	29,625	16,801	20,382	26,034
4	Ihembe Timber products and Poles Ltd	30,000	10%			2,000	1,800	2,500
5	SHEDA General Supplies Ltd	21,600	68%	10,600	2,300	1,800	10,150	14,400

Poles' demand is a constraining factor to improved capacity utilisation of most plants.
Source: Field data (2015).

2.3.2 Sawmills

Sawmilling is the dominant forest industry in Tanzania. It can be categorized into large, medium and small size-enterprises. However, in term of product lines sawmills are categorized into those which produce sawn timber (both treated and untreated), value added products and dry timber.

During this study, a sample of large, medium and small sawmills (Table 8), (Table 9) and (Table 10) were visited. Saohill Industries Ltd is the largest sawmill in Tanzania. It has two production lines of which one is fully automated with quite modern hewsaw machine. However, this automated factory is sometimes down (S. Mathisen, personal communication 2015) because of technical failures, particularly the software of it, i.e. the programming part which demands expertise from outside the country. Also, it is sometimes down because of lack of materials of appropriate sizes to process. The line processes limited sized (i.e. top diameter of 9-26 cm) and therefore the logs need to be pre-sorted in diameter classes before being processed.

About 50% of sawlogs received by the SHI qualify to this mill while the remaining goes to an old mill, at the same site, which is capable of sawing large sized logs. Sao Hill Industry (SHI) is also equipped with a modern high-tech timber drying kiln with three chambers each capable of drying 150 m^3 and other two chamber which can dry 60 m^3 of timber per charge. The factory sources its sawlogs (pines and eucalyptus) from Saohill Forest Plantations.

KVTC owns the largest teak-processing sawmill in the world (KVTC, 2015), which is integrated with a drying facility and processing plant. The processing plant produces sawn timber, floorings and panels for export mainly to India. The company owns 8,162 ha of teak plantation which serves as the main source of her raw materials. It also, buys logs from the out grower programme that it supports.

There is a notable decrease in timber production volumes at TANWAT sawmill. The scenario is by design and not by chance. The company's interest is shifting to a plywood plant which started production in mid-2014. For the first four months of operations, it was able to produce 40,000 pieces of plywood.

Small and medium sawmills, each produces timber in a range of 80 - 10,000 m^3 per annum. This amount is not the maximum they could process as their installed capacities in Tables 9 and 10 show but shortage of raw material to process is one of the limiting factor. Hence they record very low capacity utilization. For example, CF Ng'umbi is capable of processing about 20,000 m^3 of sawlogs but in 2015 received only 1000 m^3 of round wood per annum. However, it survived through buying more wood raw materials from woodlots.

Most of these factories receive wood raw materials from Saohill Forest Plantation whose annual allowable cut is insufficient to meet full demand for each sawmill. Therefore, what the plantation administration does is to allocate volumes in such a way that everybody gets but certainly the allocation is inadequate. On the other hand, small scale sawmillers are using inefficient and wasteful sawmill technology. The conversion efficiency of these sawmills ranges between 28-30%, literary to mean wasting 70% of wood while already there is a deficit in raw material supply.

Table 8: Production volume of some large sawmills operating in Tanzania

SN	Name of the Industry	Installed capacity, m^3	capacity utilization m^3,	Production volume, m^3				
				2010	2011	2012	2013	2014
1	KVTC	45,000	68%	5,551	10,084	10,869 (1,013)*	10,629 (4,386)*	13,153 (4,217)
2	SaoHill Industries Ltd	48,000	53%	20,552	21,180	20,798	35,005	29,906
3	TANWAT	20,000	30%	4,400	4,174	5,877	3,121	2,035

*- Volume of round wood sold locally. Source: Field data (2015).

Table 9: Production volume of some medium scale sawmills operating in Tanzania

SN	Name of the Industry	Installed capacity, m^3	capacity utilization,	Production volume, m^3				
				2010	2011	2012	2013	2014
	Ihembe Timber Products and Poles Ltd	120,000	5%					600
	Mzee Emmanuel Akyoo Co.Ltd	35,000	52%	35,000	32,000	6,400	7,000	9,750

Source: Field data (2015).

Table 10: Production volume of some small scale sawmills operating in Tanzania

SN	Name of the Industry	Installed capacity, m^3	Average capacity utilization, %	Production volume, m^3				
				2010	2011	2012	2013	2014
1	Manhattan Investment	3,120	3%	600	620	470	180	-
2	Rashid Mnyenyelwa	3,000	64%	2,400	2,400	2,450	1,600	700
3	Dama Mkonge	3,000	68%	3,000	1,500	2,250	1,750	1,500
4	White Rose Investment	3,000	10%	250	250	450	-	200
5	Paulo Yona Investment	3,120	6%	300	240	210	150	90
6	Nyetha Timber and Construction Co. Ltd	3,000	27%	300	350	160	80	70

Source: Field data (2015).

2.3.3 Paper boards

Tables 11 and 12 present production of paper and paperboard at MPM and plywood at TANWAT factories. MPM receives its raw materials mainly of pine and eucalyptus from Saohill Forest Plantation. Table 11 shows that the mill's production volume slowed down in 2013 because it was going through major rehabilitation (B. Kigodi, Personal communication, 2015). The main products include kraft liner paper and natural sack kraft.

Table11: Production of kraft liner paper and natural sack kraft

SN	Name of the Industry	Installed capacity, metric tones	Average capacity utilization (%)	Production, metric tones				
				2010	2011	2012	2013	2014
	MPM	60,000	70	43,326	43,229	41,009	38, 152	46,003

Source: Field data (2015).

A plywood factory installed at TANWAT is a new one and it is in its first year of operations. The first four months of operation in 2014, it produced 40,000 pieces of plywood (Table 12).

Table 12: Production of plywood at TANWAT

Name of the Industry	Installed capacity, pcs	Capacity utilization	Production (pieces)				
			2010	2011	2012	2013	2014
TANWAT	720,000						40,000

Source: Field data (2015).

2.3.4 Production of honey

In 2014, about 34,000 tons of honey worth 36 billion TZs was produced compared to 15,000 tons in the preceding year (URT, 2014). Unfortunately, data for other previous years, i.e. 2010, 2012, was not found by the time of writing this report.

2.3.5 Production of tannin

There are two factories which produce tannin in Tanzania and are TANWAT and Lion Wattle Co Ltd. Lion Wattle could not be reached because of financial constraint and therefore no data is reported. Production volume of Tannin at TANWAT has been stable for the past five years as presented in Table 13.

Table 13: Production of wattle extract at TANWAT (2010-2014)

Installed capacity metric tons	Capacity utilization, (%)	Production (metric tons)				
		2010	2011	2012	2013	2014
4,500	56	2,801	2,604.7	2,178	2,378	2,810

Source: Field data (2015).

2.3.6 Production of charcoal

Annual charcoal consumption estimated at about 1 million tons per year- valued at approximately TZS 310,845,934,157 per year, about US$250 million (Sawe, 2009). Table 14 depicts charcoal consumption in rural and urban areas in Tanzania. It estimated that Tanzania loses about 17.5 million cubic metres of round wood annually which are inefficiently converted to charcoal.

Table14: Consumption of charcoal in rural and urban areas in Tanzania

Estimated Tanzania charcoal consumption 2012	Quantity
Total urban households (tons)	1,513,602
Total rural households (tons)	515,740
Non-household (commercial, Institutional) all urban (tons)	304,401
Estimated total charcoal consumption (tons)	2,333,743
Estimated total Tanzania wood used for total charcoal consumption (m^3)	17,546,939

Source: Sawe (2009).

2.4 EMPLOYMENT OPPORTUNITIES, POLICIES, GENDER, MARKETING AND TRADE IN FOREST PRODUCTS

2.4.1 Employment opportunities and income creation in both primary and secondary forest production

In order to gauge employment opportunities in the forest sector, it is important to know the constitutes of the forest sector. According to FAO (2014), the forest sector should include commercial activities associated with establishment and management of the forests, logging, production of wood fibre (i.e., production of industrial roundwood, woodfuel and charcoal; sawnwood and wood-based panels; pulp and paper; and wooden furniture). It also includes activities such as the commercial production and processing of non-timber forest products (NTFPs) and the subsistence use of forest products. In addition, it includes economic activities related to provision of forest services (e.g. forest inventories, forest management consulting services, training, timber evaluation, forest fire, etc). Furthermore, part of activities such as manufacture of forestry machinery, transport, wholesale and retail trade, private household and recreational activities are also forest related and should also be considered in forest produce due to their association with the forest sector.

Viewed this way, the forest sector, is therefore, very wide and it is a very potential generator of employment opportunities, both formal and informal. Unfortunately, there is a paucity of reliable and current estimates on employment on various activities mentioned above. In an attempt to estimate the number of employment created, different publications were reviewed and physical visits were conducted.

Among those visited include government institutions (National Bureau of Statistics, Tanzania Forest Service, the Prime Minister's Office- Regional Administration and Local Government, District Councils). Others included private forest-based enterprises (sawmills, plywood mill, tree nursery practitioners, paper mill, furniture workshops), traders of forest products (mainly timber and furniture) and lobby bodies like SaoHill Forest Industries Association (SAFIA), Tree Growers Association- Mufindi, Makambako Timber Traders Cooperative Society (MTTCS), Umoja wa Mafundi Seremala Njombe, Umoja wa Wauza Mkaa Njombe, and the Tanzania Wood Working Federation (TAWOFE). These sources of information reported different figures of employment.

For example, MNRT (2008), reports that the forest sector provide about 3 million person-years of employment. Ngaga (2011) and Chamshama (2011) quotes a study (SUA and IRA, 2006) which puts a figure of total direct employment in forest related activities at 1 373 000. This figure however, does not include indirect jobs or employment from transporting and trading of charcoal, and sawmilling (which employs c. 10 000 people).

Another source (NBS, 2014) puts the number of employees as presented in Table 15 in industrial establishment with 10 or more workers which include most of the formal industries in the sector. The numbers, exclude small and medium enterprises and more importantly the informal sector which is known employ many people (Ngaga, 2011). Also, during this study, it was established that TFS alone employs 2,088 people (M. Mrutu, personal communication, 2015).

Table 15: Number of employees in industrial establishment with 10 or more workers

Type of establishment	Number of workers by years			
	2010	2011	2012	2013
Manufacture of wood and wood products except furniture	1,232	1,293	1,358	1,426
Manufacture of paper and paper products	2,686	2,820	2,961	3,109
Manufacture of furniture	2,813	2,954	3,102	3,257

Source: NBS (2014).

It was established during this study that the formal private sector especially large forest-based companies contribute fairly well to employment creation (Fig. 9). Number of employees at MPM is above 1,600 while at TANWAT there are about 1,105 people on average.

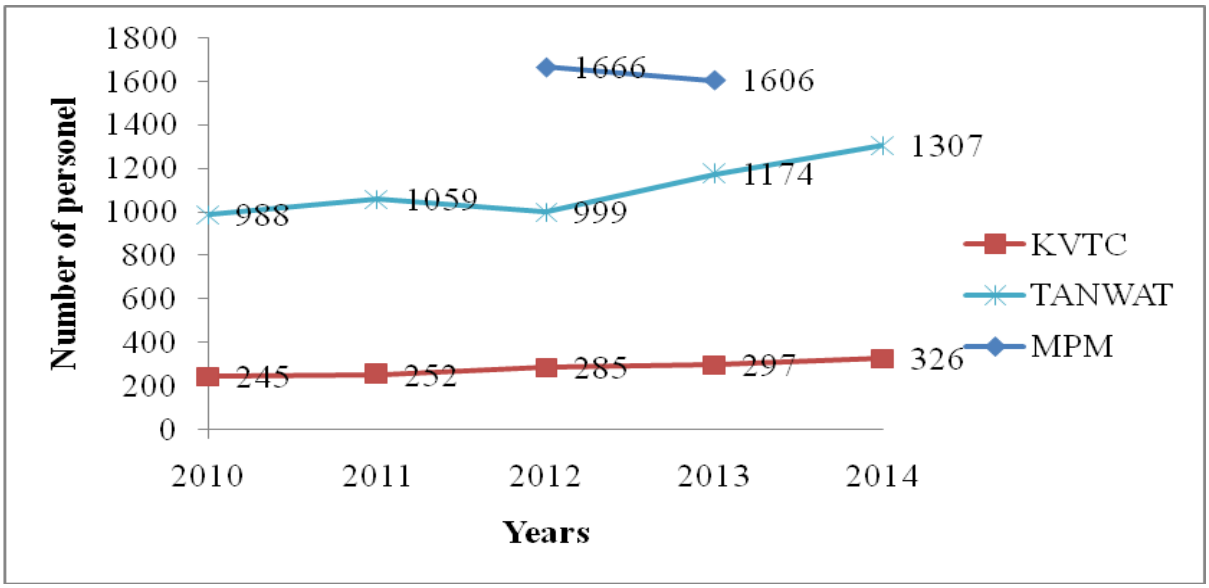

Figure 9: Employment trend in some private forest-based industries Source: Field data: (2015).

During the study it was noted that different databases have different product classifications. For example, the classification “Manufacture of wood and wood products except furniture” is being used by National Bureau of Statistics. The Tanzania Revenue Authority (TRA) uses the following classification: wood in the rough or roughly squared or wood sawn or chipped lengthwise, sliced or peeled. On the other hand, TFS uses sawn timber classification. There is need to harmonise the products’ classifications which will be used by all institutions in the country. Also, there is need to harmonise the databases hosted by different institutions so that the country has common statistics.

The International Labour Organisation report (ILO 2001) reports that informal sector accounts for about two-thirds of the total employment in the forestry sector. So employment figures in the forestry sector could be much higher than what is reported. In Tanzania, the private sector plays a significant role in creating both formal and informal employment opportunities. For example, the total number of employees in the formal sector in Tanzania mainland stood at 1,858,969 in 2013 out of which 1,233,068 came from the private sector (NBS, 2014). Also, the private sector has a significant potential in creating job opportunities in the informal sector. Few case examples will be highlighted to show this potentiality:

(a) Establishment and management of the forests:
A study visit (conducted in October-November 2015) to Mufindi District in Iringa region where communities are highly motivated in tree planting, revealed that a total of 12,536, 070 seedlings were raised by individuals and village councils (Mufindi District report, 2015). If these seedlings are to be sold at a minimum price of 100 Tsh and a maximum of 250 Tsh, these could generate a minimum income of about 1,253, 607,000 TZS (about 569,820 USD) or a maximum of 2, 507,214, 000 TZS (about 1,139,642 USD). Similar figures or close to these could be estimated for districts such as Njombe and comparatively lower figures in Makete District.

Forest management was also found to be one of the employment and income generator. Large and small tree planting companies engage people in tree planting, tending and harvesting. KVTC for example, engages about 105 people in the management of its plantation. Small scale tree farm owners such Pili Mashombo, Sheda Enterpisises, Heri Luvunda and of the like, manage trees farms in a range of 50-500 ha, each employing about 3-4 people. Although statistics were not available, such owners in Southern Highlands of Tanzania are many thus creating a fairly good number of employment opportunities.

Sawmills operating informally, mainly small scale which are close to 300 in Mafinga alone each engages on average about 22 people in total (Table 16). This number of workers include those who do tree felling, de-branching and cross-cutting, skidding, sawing, timber loading and offloading, transportation and stacking of timber at the lumber yard. It is likely to say that in Mafinga alone, sawmilling business may informally engage about 6600 people. In addition to this figure, is the presence of 2-3 people, mainly women per sawmill who serve as food vendors (i.e. *mama ntilie*), making around 600 more people. Such sawmills are also found in Northern Tanzania, Lake Victoria zone and a few in the Southern part of the country in Ruvuma region adding figures of employment on what is reported.

Table 16: Sample of employment level in forest-based SMEs

	Name of the entrepreneur	Type of activity	Installed capacity, m^3	Number of employees
	White Rose Investment	Logging, sawmilling and timber trade	3,000	21
	Manhattan Investment	Logging, sawmilling and timber trade	3,120	16
	Dama Mkonge	Logging, sawmilling and timber trade	3,000	19
	Pili Mashombo	Logging, sawmilling and timber trade	3,000	19
	CF Ng'umbi	Logging, sawmilling and transport	20,000	39
	Paulo Yona Investment	Logging, sawmilling and timber trade	3,120	20
	Halidi Enterprise	Logging, sawmilling and timber trade	15,000	25
	Average			**22**

Source: Filed data (2015).

(b) Carpentry

Carpentry is another potential generator of employment in the country. The furniture industry is traditionally labour-intensive, of low-start up costs and has the advantage that it can be operated both in rural and urban areas (Indufor 2011). The less stringent and enabling characteristics of the industry make it a potential employer of most youths who leave primary and secondary schools and find themselves jobless thereafter. It was noted during this study visit to Dar es Salaam, Iringa, Morogoro, Njombe regions (conducted in October-November, 2015) that most of the respondents engaged in

furniture business were youth (88.5%) mostly with primary education. This finding is supported by other studies such as those conducted by the Embassy of Finland (2011) and National Economic empowerment Council of Tanzania (2008) which found that 68 and 77% operators of the carpentry units in Dar es Salaam were primary school leavers.

Figure 10: A furniture cluster in Kinondoni Biafra-Dar-es-Salaam.
Source: Field photo (2015).

More interestingly, these units have organized themselves into furniture clusters, such as those found in Keko, Manzese, Kinondoni-Biafra (Fig.10), Kinondoni Moroko, etc. These clusters engage between 10 people (lowest observed in Manzese) to close to 1000 in Keko. In these clusters, some work as producers of furniture while others are sellers or brokers of furniture. The product lines are so diverse. They include home and office furniture, parts of furniture and of recent is the upcoming, metal furniture.

In order to get a feel on how many people could be absorbed in the industry, in a survey conducted during this study in Morogoro municipality, Mafinga and Njombe towns, it was found that there are about 100, 18 and 130 carpentry units, respectively. Most of these units have about 2-3 people working together. If one assumes that on average in a district center and townships are represented by a conservative average of Njombe and Mafinga i.e. 74 units, then 148-222 people informally work in workshops per centre/town. Countrywide with over 120 districts, this could be a huge number of people, over 17,740 people. Indeed, the industry's potential as an employer could be well taped in the future if constraints facing it such as low access to finance, youths' inadequate entrepreneurial skills, poor technology and low quality products (Indufor 2011) are addressed. Shortage of traditional raw materials was also cited as a problem facing the industry. Timbers from trees such as mango (*Mangifera indica*), Eucalyptus (*Eucalyptus globulus*) and Avocado (*Persea Americana*) that were never used for furniture in past, are now common in the market.

(c) Beekeeping

The beekeeping sub-sector is another potential employer. According to Ebong and Uliwa (2012), honey sub-sector is playing a significant socio-economic role as a source of food for rural people, raw materials for industry and income for beekeepers and intermediaries. It is estimated that the sector generates about US$ 19 million per annum and employs some 2 million people in Tanzania, though not always on full time basis. The number could improve if the industry exploited its maximum potential. It is estimated that as a country, we only produce 3.5% of the production potential of bee products (MNRT, 2001).

(d) Commercial biomass energy

Mbise (2013) reported that commercial biomass energy accounts for over 90% of Tanzania's energy needs and accounts for over TZS 1.6 trillion (equivalent to about 761,904,762 USD) in rural and urban revenues a year, more than all other energy sources combined. Present consumption of biomass energy saves Tanzania over US$3 billion a year in imported petroleum fuels that would be necessary, if biomass energy resources were not available to meet urban, business and institutional energy demand. Charcoal production and trade provides vital income to several hundred thousand people in both urban and rural areas. It is estimated that a total of 9,198 man- years are employed in charcoal business both directly and indirectly (Mbise, 2013).

(d) Transporters

There is also a good number of people who receive their livelihood through transportation of forest products. Figure 11 shows monthly movement of trucks moving timber from Mufindi District to various destinations. In 2014, a total of 7,840 trucks were in record to have transported timber from Mufindi district, the epicenter of timber production in the country (District report, 2015). Scrutiny of the truck list done during the study revealed that majority (80%) of the trucks originates from Mafinga town and these very same trucks transport timber from Mafinga to other destination now and then. On average in 2014, only 20% of the trucks were found to have come to Mafinga once. An average number of trucks per annum of 653 was taken an estimate of trucks involved in timber transportation annually and if an assumption of a minimum of two people being employed in a single truck is made; therefore, in Mufindi alone, transport employs about 1,306 people. Countrywide, this number may grow up significantly when other timber production centers such as Njombe, Kilolo, Makete, and Mbeya rural Districts are taken into account. Furthermore, the Northern part of the country and Lake Victoria Zone which are also good producers of timber, could also be candidates to top up the employment figures in transportation sector.

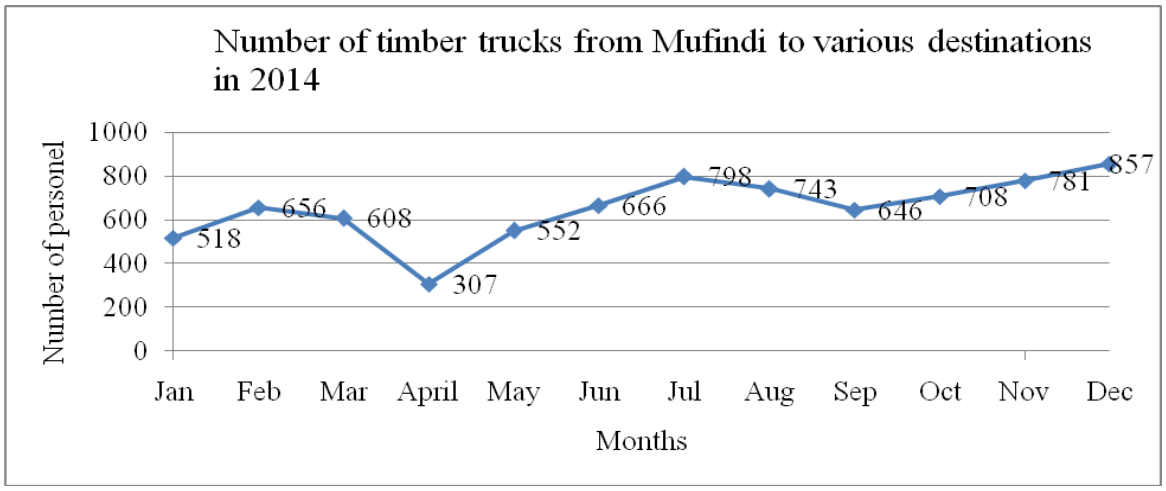

Figure 11 : Transportation of timber from Mufindi District in 2014.

Timber Traders

Timber trading (Fig.12) is another line where Tanzanians get engaged. For example, in Morogoro Municipality alone, there are about 10 timber selling yards. Apart from those directly involved in selling timber, other jobs which are created as multiplier effects include transporters (i.e., vehicles and motorcycles), providers of air-time and tele-money services, food vendors, etc. Summing all these people, at a timber yard called Fire in Morogoro municipality for instance, there are about people 500 people. In Makambako township, timber traders have an association called Makambako Timber Trader Cooperative Society (MTTCS) with 61 members of which 14 are women. In parallel to MTTCS, there is Makambako Timber Transport dealers Association with about 40 members. Timber yards are everywhere countrywide providing employment opportunities to young women and men.

Figure 12: Timber trading in Makambako Township.
Source: Field photo (2015).

In summary, one could say that the forest sector could be a dependable employer in the future if it is supported and expanded. Informal forest sector is the potential employer of the future. There is need for it to be formalized and capacitated. Inadequate allocation and or shortage of raw material to process were sighted by many sawmill managers as one of the factors limiting industries to create more employment opportunities. Most of these industries receive wood raw materials from public plantations but plantations have inadequate stocks compared to what is demanded by the industries. In fact, during the survey, most mills particularly SMEs were founded closed because of shortage of wood raw materials. Shortage of materials is associated with poor cash flows which eventually make it difficult to retain skilled and qualified personnel in the industries.

2.4.2 Policies, regulations and factors facilitating and/or constraining the development of the of the forest product industry

The Forest Policy of Tanzania (URT, 1998) and the Forest Act Cap 323 [R.E.2002] (URT 2002) are the two prime documents for the facilitation and development of the forest industry in the country. The former has a very courageous statement and directions (refer to Box 2) in respect to development of the forest industry. The Forest Act, on the other hand, provides the legal framework which is geared to ensure sustainable supply of forest products and services by maintaining sufficient forest area under efficient, effective and economical management (section 3(e)). Section 3(f) of the Act seeks to enhance the quality and improve the marketability of forest products and regulate their export.

Box 2:
Policy Statement (38): An enabling environment and regulatory framework for the private sector involvement in forestry will be created through secured raw material procurement, training, research, and transfer of technology. Incentives and credit facilities for investments will be promoted and joint ventures will be encouraged.

Source: URT, 1998

The provisions in the two documents connote the political will of the Tanzanian government to develop the forest industry in the country. More so, the government shows willingness to facilitate and involve the private sector into the play. In addition, the National Forest Programme II (NFP II, 2015 – 2024**)** which is an instrument to implement the National Forest Policy has five programmes of which development of forest based enterprises is one of them. The lines of action of the forest based enterprises include: forest industry technology development, marketing of forest products, business and entrepreneurial development for SMEs governance and commercialisation of wood fuel. Despite the government's political will to the industry, a general picture of the forest industry in the country is ugly.

A SWOT analysis; an output of a focus group discussion with owners of forest product industries, shows that besides meager successes achieved, the forest industry in the country is in bad shape.

Strengths of the forest product industry

i) Supportive policy and legal framework;
ii) Eager for development and committed private sector;
iii) Notable paradigm shift of forest industry owners to establishing and managing forest plantations as indicated earlier (*Section 5.2*) that was not common in the past;
iv) Initial steps towards solid and organized private sector. Though fragmented and weak, there is emerging organised leadership at different levels and production lines (e.g. SHIVIMITA(encompassing SAFIA, NOFIA and UWAMBU), TAWOFE, MAKONDE HANDCRAFTS, etc)

Weakness of the forest product industry

Regardless of the above mentioned strengths of the industry, it has also its weaknesses which are:

i) Lack of private forest sector umbrella body, which could represent the private sector;
ii) Inadequate professionals in the industry;
iii) Low quality products and hence limited access to international markets;
iv) Low recovery in wood processing accompanied with lots of wastes (i.e. under-utilisation of raw materials both in logging and processing areas). This is associated with poor technologies applied;
v) Lack of industrial integration and inadequate facilities and skills for value addition;
vi) Inadequate and absence of timber drying facilities contribute to losses associated with timber drying;
vii) Absence of a forum between the government and private sector to discuss matters of mutual interests cultivates tug of wars between the two parties instead of creating synergies to efficiently reach national goals;
viii) Poor linkage between higher learning and research institutions on one side and the industry on the other. Therefore, generated research outputs are not adequately used;
ix) Lack of investors in Non-Timber Forest Products (NTFPs) and inadequate NTFPs market information;
x) Flaws in allocation of raw materials for wood industries e.g.- issuance of harvesting permits to those who do not qualify;
xi) Inadequate innovation and affordable alternative sources of energy;
xii) Unavailability of database for wood industries and market information of the industry products;
xiii) Overdependence by the industry on supply of raw materials from public forest plantations; although this is expected to change in a near future;

xiv) Narrow product range (i.e. lack of product diversity);
xv) No functioning grading system especially for local market timber;
xvi) Lack of detailed data on forest composition at district and individual forest level (NAFORMA report doesn't provide this);
xvii) Lack of database on the number of beekeepers and hives countrywide;
xviii) Poor facilities for harvesting, processing and packaging beekeeping products;
xix) Overdependence on forest products from natural forests-i.e. there is very few plantations compared to the needs (i.e., failure to establish new forest plantations);
xx) Lack of management and business skills with forest-based SMEs;
xxi) Failure to trust each other has led to failures in having successful joint ventures, apex bodies, etc

Opportunities for the industry

There are opportunities which the forest sector could benefit from. These opportunities include:

i) Available market both domestically and abroad. Demand for timber and timber product is increasing following population growth in the country. The building industry is on the rise and is currently consuming about 65% of all timber produced in the country (Indufor 2011). There is an opening market for sawn timber in Asian countries particularly in China, India, Malaysia and Vietnam. Also, there is existing market for timber and other forest products in Kenya and South Africa. Forest industries need to capitalise on these opportunities;
ii) Presence of forestry higher learning and research institutions in the country which not only can serve as a source for professionals required by the industry but also a suppliers of extension services that can help to drive the industry forward. Recruitment of graduates from universities by the private sector has been growing but at a slow pace denying the industry the required professional impetus. Similarly, use of research findings from universities by the forest sector is only to a limited extent. The two fronts need to pushed forward in order to support the development of the sector;
iii) Presence of supportive policies and strategies (e.g., the National Forest Policy (URT, 1998) and the National public private partnership policy (2009). While the former provides for support of the private sector (Box 2) the latter gives room for the private sector to enter into joint ventures with the government. This is an opportunity that has been inadequately exploited by the private sector and needs to be strengthen;
iv) Of recent, it has been discovered that the country is endowed with large stocks of natural gas and coal. These could be a good source of energy that could replace the expensive and unreliable hydro-electricity. The forest industry could power boilers and drying kilns using either natural gas or coal;
v) There are areas in the forest sector that are underdeveloped. Such areas include furniture making, eco-tourism, beekeeping and commercialisation of non-timber forest products, forest products certification and industrial clustering. If these

areas are to be well developed, they could be avenues of employment and income generation;

vi) It is said that 92% of about 45 million Tanzanian population use charcoal for cooking (URT, 1992). Here is an opportunity where this large market could be exploited sustainably. It could be done through establishment of fast growing tree plantations for charcoal purposes, use of advanced and efficient technologies in charcoal production, diversification of charcoal products (e.g. briquettes, charcoal balls, etc) and improve charcoal packaging in a way that charcoal could be sold in super markets likely at better prices. Asian countries particularly China is known to import charcoal from Tanzania- this is another avenue that needs to looked at to develop the biomass energy sector;

vii) Availability of forest land particularly the village forest land which is underdeveloped, This is an opportunity to develop private forest plantations to mitigate wood deficit.

viii) Availability of technologies to use wood wastes. Logged areas are left large amounts of wood wastes (Mwamakimbullah 1996). Similarly, sawmills with an average recovery of 40% produce significant amount of wood wastes (Mwamakimbullah and Hamza, 2005). However, due to available technologies, it is possible to turn these wastes into financial gains. For example, Green Resources Ltd has established a briquette plant using sawdust; MOTOBORA in Kilombero District, Morogoro region produces carbonized charcoal from wood wastes; and Mufindi Wood Poles and Timber Ltd produces charcoal balls from sawdust. These are few initiatives that have been taken to exploit the potentials of wood "wastes".

Threats to the industry

The forest industry is also faced with some threats that challenge its existence. They include:

i) Inadequate supply of wood raw materials for the industry;
ii) Too many taxes charged on the same product e.g. by central government, LGA and village councils;
iii) Too many forest products' check points on the roads coupled with poor client/ customer care at the points which discomfort traders;
iv) Difficult terms to access loans for capital investment in forestry industries particularly for SMEs;
v) The private forest sector not being given due priority by the government regardless of its importance;
vi) Excessive bureaucracy in issuance of forest licenses. The process is said to be long and costly to license-applicants;
vii) Political/social interference in technical matters;
viii) Forest fires and forest encroachment reduce bee habitats and displace bee colonies, destruct hives and other NWPFs;
ix) Illegal harvesting of forest products;
x) Poor quality of raw materials and

xi) Higher prices of wood raw material compared to neighbouring countries out-competes Tanzanian businessmen. For example, while 1 m^3 of timber is sold at 130-150USD in Zambia (Ngandwe, personal communication, 2016) it sold at 225 USD at SHI (SHI reports, 2015),

The Tanzanian forest based industry with the exception of a few large industries is characterised by a very weak base (in terms of capital, technology, professionalism and innovativeness), low products diversity and faces a myriad of threats and weaknesses. A major reform in the industry is called for and mandatory. A proposal to establish wood based clusters for forest-based SMEs and incubator programmes for starters should be looked at. The general outlook is that the forest industry is capable to produce high quality products with prices being differentiated by quality of the product, an industry which employs skilled personnel, an industry that uses high technology, an industry which is integrated and focused more on value addition, an industry which is competitive in the regional and global market.

It is important to emphasize that the private sector has a vital role to play in this sector. Despite recognition by the government of the private sector as a central driving force for building a strong, productive and renewing economy; much haven't been done on the ground. The following issues need to be addressed to give it the required support:

i. Land is a prerequisite requirement for forest establishment. The private sector and private forest developers find the processes of acquiring land Customary Certificate of Right of Occupancy (CCRO), Granted Right of Occupancy (GRO) and lease are expensive, slow, and lengthy thus need to be looked into (PFP, 2013);
ii. There is need to improve infrastructure particularly roads in logging areas. So far, roads in the forests are in bad shape which eventually leads to increased maintenance and operational cost to operators in the industry. The railway network; central line i.e. Dar es salaam- Mwanza and the Tanzania Zambia Railway Authority (Dar- Zambia) which are very useful in hauling timber from concentrated production areas e.g. in Tabora, Mwanza and Makambako to big markets in Dar es salaam are depilated and need to be strengthened. Use of railways is cheaper compared to road transport which is currently used. Use of road transport increases the prices of timber in the market. Shifting to railway transport will definitely lead to better timber prices;
iii. The Forest Act Cap 323 [R.E.2002] (URT 2002) regulates grading of timber for export but it is silent on grading timber for local market. Product grading is important in order to establish and maintain an acceptable uniformity in the wood products from different mills, so that a given grade will represent the same quality and be usable for the same purpose, regardless of the nature of the raw materials from which it was derived or the plant by which it was produced. Timber grading enables better uses of sawn wood or wood poles in terms of safety. Through grading, customers get products equivalent to value of money whereas producers as well deserve premium prices for quality products. A policy directive or guide in this regard appears desirable. This should go hand in hand with

intensified efforts to build capacity in timber grading personnel which currently is in acute shortage;

iv. During discussions with the representatives of private sector in the wood industry (2014) held in Tabora, Iringa and Lake Victoria zone, they asserted that check points for natural resources products were many and inconveniencing both transporters and traders. For example, it was reported that between Bukoba and Mtukula (i.e. Tanzania/Uganda border), a distance of 80 km there are 12 check points whereas from Mtukula to Entebbe - 280 km apart, there is only one checkpoint! This practice frustrates many business operators especially those from neighbouring countries. This is in addition to a regulation that restricts movements of forest products up to 6.00 pm only. There is therefore a need to drastically reduce the number of check points and prolonged delays at each of them;

v. The Forest Act Cap 323 [R.E.2002] (URT 2002) requires timber dealers to pay royalty and Logging and Miscellaneous Development Account (LMDA) fees for timber volumes bought from public forest plantations and village land forest reserves. The government allows public forest plantations to retain part of the LMDA for silviculture and infrastructure development. Unfortunately, the Act is silent on the same issues with respect to private forest plantations. It is conceivable that the private forest sector equally incur cost of silviculture and infrastructure and therefore similar arrangements could also be extended to forest plantation developed by the private sector;

vi. The private forestry sector claims that the tax regime has been unfriendly for their development (SAFIA, personal communication, 2015). They argue that the number of taxes and amount payable need to be revisited. Tax incentives have been used in many countries to getting the private plantation sector off the ground, generating jobs and increasing forest products both for local and export markets. Nations with growing private forest plantations have done so through offering tax incentives to private forest plantation investors. This has worked well in Brazil, Asia-Pacific Countries, Costa Rica, Guatemala, Chile and many more (De Camino *et al.* 2000, de León, 2010, Enters *et al.,* 2004, Karsenty *et al.,* 2008). Waving off for example, income tax or VAT to a level which is acceptable by both sides could boost the initiative of developing private forest plantations in the country; and

vii. Need to re-organise the private forestry sector into one apex body that could have powers to speak on behalf the sector and engage with the government on issues of mutual interest and others is an urgent requirement.

2.4.3 Gender inequalities in both primary and secondary forest production

Gender as put by Parker (1993) and IFAD (1999) defines the socio-cultural roles, functions and characteristics of men and women as they relate to each other within a specific socio-cultural context and is a key factor that shapes people's access to, use of

and control over natural resources. Accordingly, this broad definition gives us pointers to potential sources of gender inequality in the forest sector which may include:

i) Men and women having unequal rights over natural resources;
ii) Due to their different roles based on the gender division of labour; men and women have different priorities and benefit differently from natural resource use and management (IDRC, 2000);
iii) Men and women have different realities (Ostergaard, 1992) and therefore, use natural resources in different ways and at different rates (Byers and Sainju, 1993).

NAFORMA report (MNRT, 2014) points gender inequalities in the forest sector in Tanzania. It acknowledged gender inequality in forest product use (Figure 13). From the figure, it is apparent that apart from firewood, men and women- headed households use forest products differently.

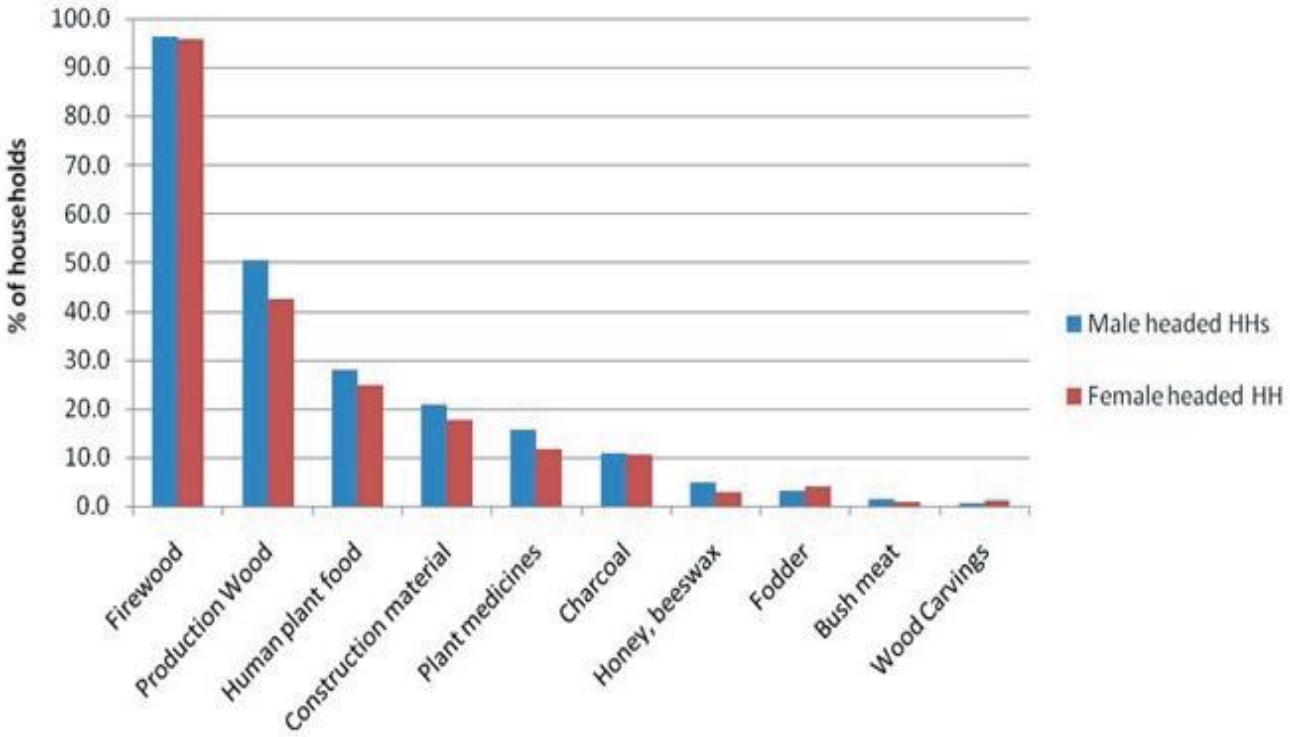

Figure 13: Use of forest products by gender.
Source: MNRT (2015).

This inequality is similarly observed when forest-based activities are segregated into who does what by gender (Table 17). Some activities are predominantly done by men e.g. production of production wood, charcoal and bee products while others are largely done by women such as firewood collection.

Table 17: Harvesting of forest products by gender

	Harvesting of forest produce by gender (%)				
	Only men	< 30% women	30-70% women	>70% women	Only women
Firewood	4	4	13	34	45
Charcoal	54	28	8	5	4
Production wood	63	20	8	4	4
Human plant food	3	11	42	28	15
Honey and beeswax	89	3	2	1	6
Construction material	37	15	15	11	22

Source: MNRT (2015).

Such patterns of inequality were also observed by Jacobson (1992) and WEDNET (1991) who noted a general trend that women gather forest products for fuel, food, fodder, herbs for medicinal purposes, raw materials for small-scale income-generating activities, whereas men gather wood for selling or for construction. The difference in product uses and roles among men and women triggers for another type of gender inequalities, i.e. inequality in knowledge and information about the various forest products and preference of species (FAO, 1998; Dodo, 2007).

Other types of gender inequality include:

i. Based on socio-cultural norms and practices, men and women have differential rights over land (private forests, and trees). Women's ownership of land is scant despite their important role in forestry activities (Dodo 2007);
ii. In many forest-related institutions, female employees in Tanzania are less in numbers than men. Few examples were put forward by Dodo (2013) where ratios (in brackets) between women and men were as follows TAFORI (1:5), TAF(1:7); TTSA(1:4). It was also noted during this study that in TFS, among the top 22 positions (i.e. senior staff at the Headquarter and Zonal managers), only four are women. This observed disparity could have been attributed by low enrolment of women in forestry training and more so in higher learning institutions. However, of recent years, there are have been remarkable improvement in women enrolment particularly in higher learning institutions. For example, at SUA, female enrolment into BSc Forestry constituted of 25, 29 and 22% compared to men in 2013/2014, 2014/15 and 2015/2016, respectively compared to 7% reported by Dodo in 2013;
iii. Both women and men are members in TGAs in the country. However, on average, women make about 35.7% while men take up the remaining 63.4% of all TGAs members (MNRT, 2011). On the other hand, their involvement in TGA leadership which consists of a chairperson, secretary, and treasurer; Table 17 indicates that there are less women in TGAs' top positions i.e. chairmen and Secretary (Vainio-Mattila, 2011).

Table 18: Distribution of position between men and women in eleven TGAs

Position	Male	Female
Chairperson	11	0
Secretary	9	2
Treasurer	2	9

Source: Vainio-Mattila (2011).

Based on the fact that gender inequality is real; it is important that whatever changes that are made on the forest resource; be policy change or change in a status a forest, consideration should given to the fact that the change will impact men and women differently. Therefore, identifying beforehand, the potential consequences of the planned/desired change will help policy makers, donors, investors and other actors to make more informed decisions about choosing the right conservation, climate change mitigation or adaption, and other strategies (Manfre and Rubin, 2012). They also stress that roles and relations are dynamic. They evolve over time in response to changing circumstances, needs and interests. Just as forests grow, shrink, change and shift, so gender roles and relations also undergo constant renegotiation.

2.4.4 Factors inhibiting or promoting the full and equal participation of marginalized groups

In a study (Impact, 2012) conducted in Njombe, and Mufindi Districts, it was found that 56-83% of the communities were either too old, too young, too sick or not participating in any economic activity. Such people included women, single mothers, youths, landless people, poorest population in villages, etc.

Each category of these marginalized groups faces different scenario that might hinder her full participation in forestry or other economic activities. Few cases are highlighted:

i) According to World Bank (2000), culture has been set to legitimize differences in gender status, values, and roles and to justify unequal gender relations in a manner that to a large extent favours men and disadvantages women. In Tanzania for example, de jure, the legal system supports equality between men and women in many aspects, however, de facto, for example, in land registration, land that is owned by a family is registered in the name of the male household. Only when such cultural barriers are removed, we may not see full participation of women in forestry activities. Unfavourable land tenure, ownership and control of land, and mandates on revenues collected from sales of forest produce that culturally favour men, are dispiriting women to totally engage themselves in forestry activities;

ii) Where women do not have access and control over forest land, their workload and time consumption is more as they may have to walk to distant forests to gather forest products they need, thus adding to their drudgery and putting their security at risk, in unfamiliar forests (Mehta, 1991);

iii) Culture is also blamed to have crafted a scenario where in a society women are looked at as housekeepers but not decision makers (Dodo, 2013). Such a position has influenced to have fewer women in decision-making machinery in

forestry or women being underrepresented in management and therefore face more challenges than men in advocating for their rights. The TFS example above and similar scenario in the structure of the Department of Forestry and Non-Renewable Resources (DFNRNR) in Zanzibar where only 11 out of 42 key staff positions are headed by women (Kingazi, 2013) need to be looked into;

iv) Youths, at times, find it difficult to participate in activities that will enhance their economies and also empower them, due to being uninformed, in short of capital and skills (Indufor 2011); there is need to empower this life skills

These factors need to be resolved to ensure that marginalized groups also find space in the play.

2.4.5 Gender based control and access to assets and resources in the sector

A study conducted by Chingonikaya, *et al.* (2007) in Njombe District shares results on gender control and access to required resources. The resources in topic include land, capital, cash income, cash crops, and food crops. Results show that over 73%, 90%, 80%, 83%, and 60% of interviewed households; men had control over land, capital, cash income, cash crops and food crops, respectively.

On the other hand, unlike control to resources, it was found that a larger proportion of female has access to productive resources. For, example, 86, 83, 83, 70, and 86 % of the sampled households indicated that women had access to land, capital, cash income, cash crops and food crops, respectively. The same scenario was as well observed in NAFORMA (MNRT, 2015).

Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN) which is a women-led international membership network of women and men professionals provides an interesting response to a question: What would happen if women had the same access and control of land, forests and water as men? It says “If women had the same access and control over (of land, quality seeds, technologies, financial and extension services, etc) as men, they could increase yields of their farms by 20-30 percent”. It therefore, important to:

- Design gender responsive initiatives;
- Build financial and technical capacities of women and engage them in decision making;
- Review and revise legal frameworks and investment strategies relate to land rights and forests to integrate women’s concerns; and
- Build cross-sectoral, multi-stakeholder platforms to drive innovative gender-responsive landscape approaches and collaborations.

2.4.6 Marketing and trade in forests products

Most of the visited forest-based SMEs produce and sell their products locally. This refers to sawmills, furniture, honey and wood impregnation plants. Prices for timber vary among producers. For example, SHI sold 1 m^3 of timber in 2014 for approximately 225 US$ while small sawmills sold the same for around 218 US$.
Poles at Sheda General Supplies Ltd were sold in a range of 45 (in 2010) – 82 US$ (in 2014) for 9m poles while at SHI in the same years and same products were sold 80.9 US$ in 2010 – 94.5 US$ in 2014. Large companies tend to have higher prices over SMEs because of comparatively higher administrative costs in part but also produce better quality products.

Large companies on the other hand, produce and sell large proportions of their products internationally. For example, 95% of the produced squares and sawn timber at KVTC are exported (KVTC reports, Unpublished). At MPM, about 65% of the production volume goes into export (Company reports, Unpublished). SHI had indicated though that a very small quantity (0.5%) of the produced timber is sold abroad. Prices of exported products also vary according to product type. The prices showed an increasing trend. For example, at KVTC, squares of teak in 2010 were sold at 436 US$/$m^3$ but are sold at 480 US$/$m^3$ in 2015. Value added panels were sold at 481 US$/$m^3$ in 2010 while in 2015 are sold at 1,100 US$/$m^3$. Prices of kraft liner paper at MPM are currently sold at 750 US$/metric ton which is a 10% increase from prices of same in 2010. The same increase is observed in other products i.e. natural sack kraft and fluting media which are currently sold at 900 and 725 US$/metric ton, respectively.

Details on companies' profitability were not easily accessed because were considered proprietary and therefore are not reported.

2.5 THE RELATIONSHIP/LINKAGES BETWEEN ACTORS IN PRIMARY AND SECONDARY FOREST PRODUCTION

In previous sections of this report, a number of actors involved in primary and secondary forest production were identified. This section presents an evaluation of relationship between the actors.

2.5.1 The relationship/linkages among actors in primary forest production

Tree growers have not been able to organise themselves into an national body that may serve as a "one-contact point" of the kind of the Forestry South Africa (FSA)- the apex body of all tree growers in South Africa. The FSA has registered around 95% of all tree growers in South Africa as her members (FSA Annual report, 2014). On her membership list, there are large, medium and small-scale tree growers groups.

In Tanzania, there is evolving development towards this direction particularly with respect to small-scale tree growers who have started to organise themselves into tree growers associations (TGAs). Such groups are observed in Iringa, Njombe and Mbeya regions where the Private Forestry Programme (PFP) is assisting in organising them. Currently, there are over 150 TGAs. These associations are however, young and of limited capacity in terms of leadership, business planning and marketing and forestry management (Vainio-Mattila, 2011 and Impact, 2012). In 2015, PFP facilitated the formation of TGA apex body to promote the interests of tree growers and deliver programme support packages (PFP, 2014/2015 report). Large tree growers such as NFC, GRL, KTVC, TANWAT and MPM support TGAs but are not members of TGAs. They do so as part their corporate social responsibility.

There is need for the establishment of a strong apex association for all tree growers being large or small that will provide a platform through which collective voices could be raised and heard when articulating their issues with the government and other institutions.

2.5.2 The relationship/linkages among actors in secondary forest production

Unlike tree growers, in this category there are some positive development in terms of collaboration. Small and medium scale forest industries have organised themselves into what is called the Tanzania Forest Industries Federation or SHIVIMITA (*Shirika la Viwanda vya Misitu Tanzania in Kiswahili*). SHIVIMITA is the apex body while SAFIA (SaoHill Forest Industries Association), NOFIA (Northern Forest industries Association), and UWAMBU are subsidiary associations in the Southern highlands, Northern and Lake zone regions, respectively. The three associations make up SHIMIVITA. However, SHIMIVITA does not include all forest industries in the country. Large forest-based companies companies such as MPM, SHI, NFC, and the like are not part of SHIMIVITA (Mwaniki, unpublished). These large companies appear to have their own “informal” loose association that is not registered and formally operational (H. Lemm, personal communication, 2015).

There is therefore need for establishment of apex association that will promote the interests of all forest industry operators; big or small. An association that will provide a formal voice on behalf of all operators of the forest industry, individually or collectively.

Tanzania Wood Working Federation (TAWOFE), is the apex body of the wood furniture manufacturers in the country and is based in Dar es Salaam City without any representation countrywide. Since 2014, there was effort to link TAWOFE with large furniture shops like Furniture Centre but the strength of this link remains weak (S. Kushaba, personal communication, 2015).

MAKONDE HANDCRAFTS- This is a group of wood artisans who produce and sell crafts in Mwenge, Kinodoni District in Dar es salaam city. It’s a representation of many groups in the City working individually or collectively.

There are similar groups in Lindi, Coast, Mtwara, Morogoro and Ruvuma regions. Similarly, there is no apex/national level association representing interests of craft artisans in the country.

2.5.3 The relationship/linkages between actors in primary forest production and secondary forest production

Linkages between actors in primary and secondary forest production have been minimally recorded. The relationships have been in terms of provision of extension services and seedlings. GRL for example, gives 10% of the seedlings produced back to the community for free and provides 10% of the benefits of carbon trading back to the communities as cash as a way of demonstrating their corporate citizenship and social responsibility. KVTC supports a tree outgrower programme which supports local communities in tree planting. It provides to local farmers inputs such as seed, fertilizers and logs purchase guarantees (i.e. ensured purchase of logs from farmers) and technical support in forest management (KVTC, 2015).

2.5.4 The relationship of the central and local governments and other actors

It is appreciated that some efforts to organize the forestry private sector in country have taken place but more needs to be done. One would wish however, to see stronger and more vibrant associations, examples of the Sawmilling South Africa, Forestry South Africa which represent all sawmillers and tree growers, respectively. A platform or forum is needed where the private sector could sit and discuss with the Government bilateral issues. At such a forum, the Government could table policy and strategic issues whereas the private sector could present much of operational issues. Eventually, a consensus on the way forward will be reached amicably. In South Africa, for example, they have what is called “Commercial Forestry Liaison Forum” where associations and the government meet to a draw an annual action plan (P. Nkhwashu, personal communication, 2015). Thereafter, they meet quarterly to discuss accomplishments and challenges and synergistically draw strategies to address the challenges. Such a forum and relationship between the central government and other actors is missing in Tanzania and therefore should be cultivated. Nkhwashu, further indicated that South Africa has also the Chief Executive Officers’ (CEOs) Forum where the government meets with CEOs from institutions of Agriculture, Forestry, Fisheries, Research and Funding agencies. Both fora are coordinated and funded by the government. The government of Tanzania and the private forestry sector could borrow a leaf from South Africa.

In order to jump start the process, the Tanzania Private Forest Foundation (TPFF), an apex body is proposed. The apex body could be composed of the national product/business line associations such as the Tanzania Sawmillers Association, Tanzania Wood Preservers Association, Tanzania Tree Growers Association, etc. Each

of these Association could be organized in such a way that the interests of small, medium and large actors who are members are also taken into consideration through their fair representation in the apex body. Gender equity and social inclusion in management of the associations be secured. Within the individual product/function line national bodies, committees to represent the strata in them (i.e. small, medium and large actors) are to be formed. For example, there should committees to represent large, medium and small/individuals tree growers in the Tanzania Tree Growers Association. The same applies for sawmillers. Bottom- up approach in managing this structure is proposed.

For operationalising day to day activities of the apex body, there should be a national secretariat answerable to the National Executive Committee composed of selected members from constituting product/function line associations. The proposed structure is presented in Fig. 14 including 10 proposed national product/business line associations based on earlier identified actors. The Secretariat is to be recruited competitively. There should a forum where the government meets either with the apex body, CEOs or individual product/function line associations whichever is appropriate and depending on issue on the table.

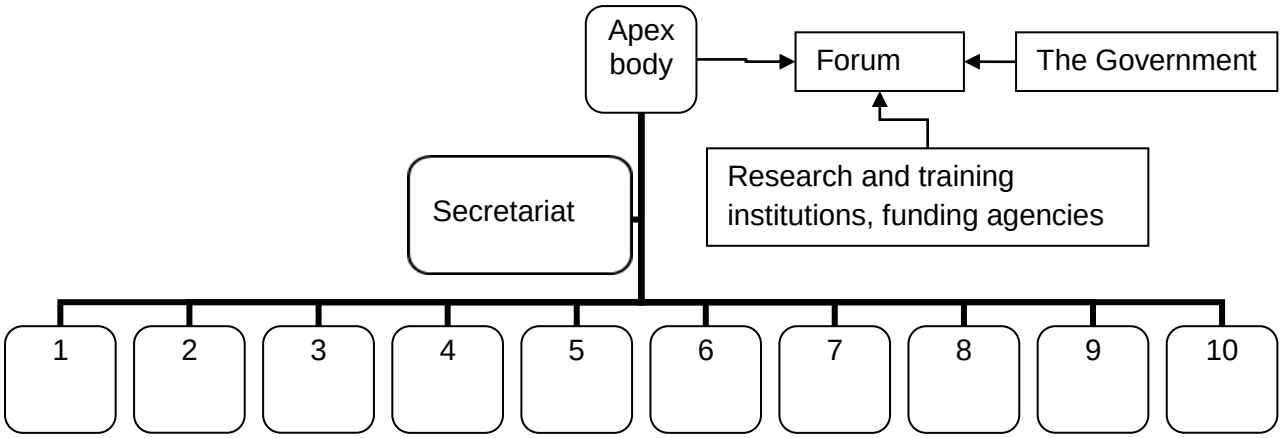

Figure 14: Proposed organization structure of the Tanzania private forestry sector

Key:

1- Tanzania Tree Growers Association, 2- Tanzania Transporters and Traders of Forest Products, 3- Tanzania Wood Working Federation, 4- Sawmillers Association of Tanzania, 5- Tanzania Wood Preservers Association, 6- Tanzania Panel Manufacturers Association, 7- Tanzania Association of Building Contractors, 8- Tanzania Association of Charcoal Producers and Traders, 9- Tanzania Network of Forest-related CBOs and NGOs 10- Community-Based Forestry Association

2.6 THE SCOPE FOR PUBLIC PRIVATE PARTNERSHIP IN FORESTRY

There is no one widely accepted definition of public-private partnerships (PPP). However, according to the National Public Private Partnership policy (2009), the concept of PPP entails an arrangement between public and private sector entities whereby the private entities renovate, construct, operate, maintain, and/or manage a facility in whole or in part in accordance with output specifications. The private entity assumes the associated risks for a significant period of time and in return, receives benefits/financial remunerations according to agreed terms; which can be in the form of tariffs or user charges. PPP is therefore a cooperative venture built on the expertise of each partner that best meets clearly defined public needs through the most appropriate allocation of resources, risks and rewards.

According to this policy, there are two main types of PPPs in Tanzania: PPPs for operation of existing public asset or PPPs for development and operations of new facilities. In the forestry sector in Tanzania, the former PPP type is observed and is well supported by the Forest Policy (1998) and the Forest Act (2002) through participatory Forest Management (PFM) and concession arrangements.

PFM was introduced into law with the passing of the Forest Act of 2002, which provides a clear legal basis for communities, groups or individuals across mainland Tanzania to own, manage or co-manage forests under a wide range of conditions. There are two different types of PFM:

i. Community Based Forest Management (CBFM)- This enable local communities to declare – and ultimately gazette – Village, Group or Private Forest Reserves and
ii. Joint Forest Management (JFM) which allows communities to sign joint forest management agreements with government and other forest owners, mainly local governments

In this section, it is the second type of PFM, i.e. JFM which is of interest. JFM normally takes place on “reserved land” – land that is owned and managed by either central or local government. Villagers typically enter into management agreements to share responsibilities for the management with the forest owner. Since its inauguration in the early 1990s, about 5,392,095 ha and 1052 villages have been put under the JFM arrangement (Table 19).

Table 19: Coverage of Joint Forest Management in mainland Tanzania

1	Area of forest covered by JFM management arrangements	5,392,095 hectares
2	Percentage of total area reserved by National or local government under some form of Joint Management Agreement	41%
3	Primary forest types where JFM has been promoted	Montane, mangrove and coastal forests

4	Number of national forest reserves with JFM	181
5	Number of local authority forest reserves with JFM	101
6	Administrative regions where JFM implemented	Morogoro, Iringa, Pwani, Tanga and Kilimanjaro
7	Number of villages where JFM has been established, or in process of being established	1,052
8	Number of villages that have signed Joint Management Agreements (JMAs)	171
9	Number of districts where JFM is implemented	65

Source (MNRT, 2012)

Despite the acceptance of JFM across the country, it hasn't been very popular among some communities because since its inception there has been lack of clear-cut cost benefit sharing mechanism between the parties. Communities spend time on planning and establishment of PFM, undertake regular patrols inside forest management areas, Village Natural Resource Committees (VNRCs) spend time in coordinating various forest related activities which in total culminate into high opportunity costs on communities' side (Blomley and Iddi, 2009). These effort deserve fair and equitable arrangement that can reward and in turn enhance community welfare and social inclusion.

There are JFM arrangements that are not provided for in the law but hold good potential (Simula and Kaduvage, 2005):

i) JFM between central government and TGAs. TGAs are new but upcoming players in the forest sector;
ii) JFM between village governments and TGAs or between Community groups and TGAs and
iii) Out-grower arrangements between tree farmers or TGAs, and industry companies such as the one practiced by KVTC

These recent JFM arrangements look more likely to improve social inclusion, address gender aspects and enhance the livelihood of the communities especially when they operate within the boundaries of bylaws set by communities themselves.

A concession arrangement as put by PPP policy (2009) is an arrangement whereby the government grants private entity exclusive rights to provide, operate and maintain an asset over a long period of time in accordance with performance requirements set forth by the government. The public sector retains ownership of original asset while the private entity retains ownership over any improvements made during contract period. The Forest Policy (1998), on other hand, defines concession as a long-term agreement between the government and a forest industry enterprise with the government entrusting the latter to manage a government forest reserve, industrial plantation or part thereof mainly for timber production. The forest is managed in accordance with an approved management plan. The company is responsible for all harvesting and silviculture activities including road construction and maintenance. The government collects the agreed royalties and concession fees.

In Tanzania there is no forest concession in operation (Ngaga, 2011) and if one was operational, mechanisms for monitoring forest concession are not available (PFP_b, 2015). Experience from Democratic Republic of Congo (DRC) and Congo-Brazzaville has shown that insufficient monitoring of forest under concession has resulted to forest degradation and conversion to other land uses (Karsenty *et al*., 2008). It is important; therefore, as this arrangement is maintained in the forest policy, the government should craft a mechanism to monitor forest lands under concession.

2.7 TRENDS ON PRODUCTION, TRADE AND CONSUMPTION ON TIMBER AND NON-TIMBER PRODUCTS

2.7.1 Timber production

Table 20 presents a trend of timber production volume beginning 2010 to 2014 as reported by the National Bureau of Statistics (NBS, 2014). Despite that data in table shows an increasing trend, it underestimates what is actually produced countrywide. For example, data collected during this study from some large forest industries and a few small and medium forest enterprises shows much higher production volumes (Figure 15) than what is reported by NBS.

Table 20: Timber production volume as reported by NBS

Products	Unit	Year			
		2010	2011	2012	2013
Timber	m^3	34,861	30,587	35,151	41,106

Source: NBS (2014).

The production volume reported in Figure 15 could have been even higher if volumes produced by all small and medium enterprises and those from natural forests were available and added. Unfortunately, it was not possible to capture them because of paucity of data and budget limitation.

In Figure 15, there is a decline in production volume in the recent last three years that could have been associated with the decrease in supply of wood raw material to be processed from the largest forest plantation- SaoHill Forest Plantation.

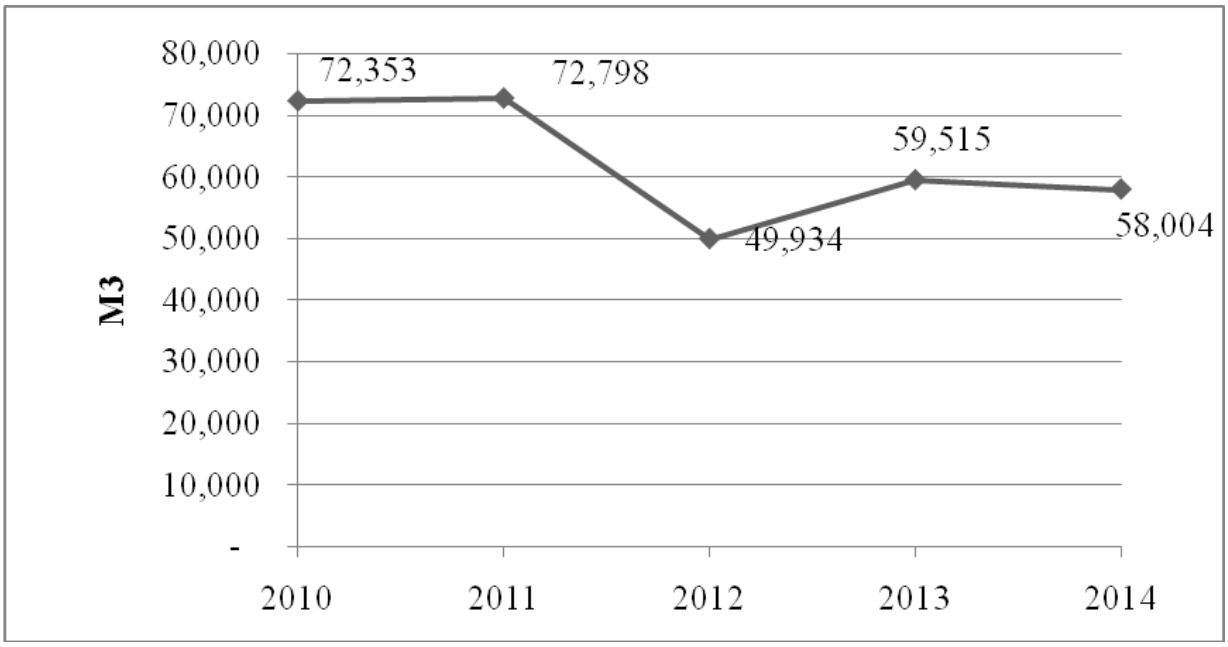

Figure 15: Softwood timber production volume trend.
Source: Field data (2015).

NBS also keeps production data on selected panel boards (Table 21). In general, production volumes of the panel boards fluctuate from year to year, i.e. no definite trend.

Table 21: Production volume of some forest products

Products	Unit	Year			
		2010	2011	2012	2013
Plywood	m^3	988	1,007	1,031	1,043
Chipboards	ton	1,985	2,045	2,087	1,544
Hardboards	ton	-	-	-	56
Paper products	ton	14,711	13,492	14,879	13,767

Source: NBS (2014).

2.7.2 Trade and consumption on timber and non-timber products

2.7.2.1 Timber and non-timber trade

The Tanzania Forest Policy (MNRT, 1998) and Forest Act (MNRT, 2002) have provisions to promote legal trade both locally and internationally. As was for production, data on trade are highly fragmented and there is no one stop centre where one could access all data required. In an effort to capture some data on forest product trade the following institutions were contacted: The National Bureau of Statistics (NBS), The Tanzania Revenue Authority (TRA), Tanzania Forest Service Agency and Mufindi District Council.

(a) Timber traded from Mufindi District council

The Local Government Act, 1982 and Urban Authority Act of 1983 empower any LGA to pass by-laws that allow the Authority to charge local taxes and collect levies and fees within its command. Accordingly, Mufindi DC collects produce cess and transit pass fees from transporters of timber from the district. Files for cess and transit pass have made possible to record amount of timber traded or moved from the district. Figure 16 shows that during the mid of the year the timber business slows down. The reason behind is that this is a transition period between material allocation periods, i.e. the ending of the current allocation and beginning of a new one. The old allocation is finishing up while applications for new material allocations are being processed up until to August/September when production picks up again.

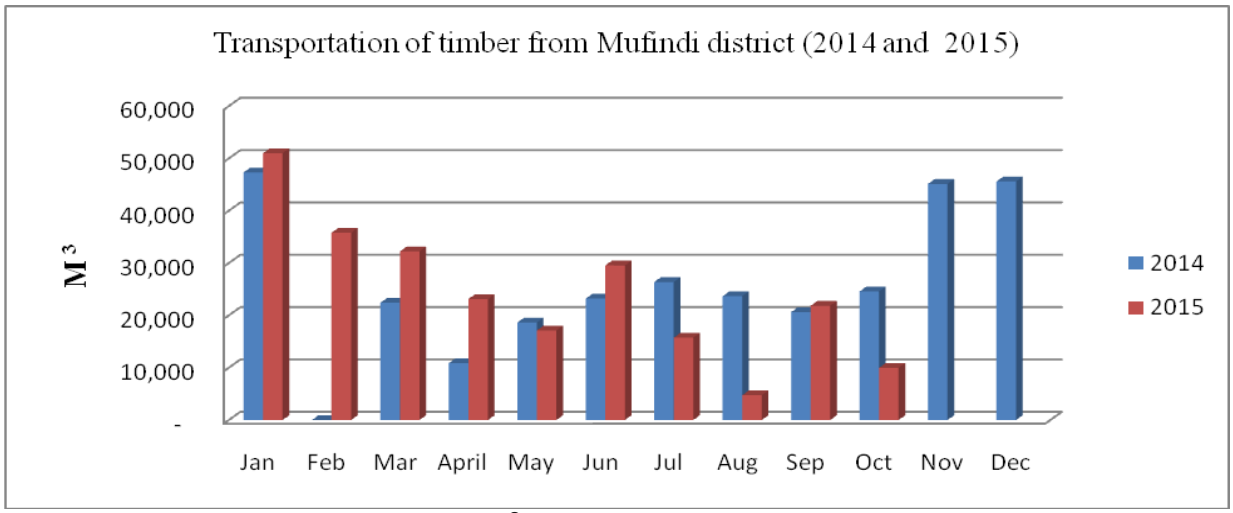

Figure 16: Movement of timber in m^3 from Mafinga District
Source: Field data (2015)

The NBS keeps export and import data on some forest products as indicated in Table 22. The Table shows value of commodities exported worldwide and to partners in the East African Community (EAC). On the other hand, Table 23 shows imports from the rest of the world, including from EAC and Southern African Development Corporation (SADC). In general, common commodities traded are paper and paperboard, furniture and wood and wood articles.

Table 22: Value of commodities exported

Exported Products:	Value, million USD			
	2010	2011	2012	2013
Paper and paperboard (worldwide)	43.31	24.77	22.53	33.60
Export to EAC partners:				
Paper and paperboard	14.7	21.9	19.6	25.7
Wood and articles of wood and charcoal	5.21	3.87	3.80	4.52
Total	**63.22**	**50.54**	**45.93**	**63.82**

Source: NBS (2014).

Table 23: Value of commodities imported

Imported Product	Value, million USD			
	2010	2011	2012	2013
Wooden furniture (worldwide)				
Office	3.21	3.09	3.54	2.96
Kitchen	0.84	1.11	1.86	1.92
Bedroom	1.91	2.63	2.85	3.23
Wooden furniture	6.05	6.54	8.09	8.72
Imports from EAC partner States:				
Paper and paperboard	4.30	6.46	5.36	4.71
Imports from SADC partner States:				
Paper and paperboard	22.46	23.44	23.63	21.26
Wood and articles of wood; wood charcoal	5.34	7.30	10.07	8.70
Total	**44.11**	**50.57**	**55.4**	**51.5**

Source: NBS (2014).

The Tanzania Forest Service had better and detailed information on the exported products. The database included name of the exporter, the product and species type, destination, its value both in US$ and TZS, export and royalty fees. However, some data in the database are reported by calendar year while others are on financial year. Notwithstanding, if it is to be organized, the database provides a very good source of information on export of forest products. Table 24 shows organised data in financial years for exported sawn timber volume and value. Although exported volume in 2011/12 is the highest in the reported years, it fetched the lowest revenue. The main reason being high priced teak and other prime hardwoods were sold in subsequent years. The major destinations of sawn wood are India, China, Malaysia and Vietnam.

Table 24: Exported sawn timber (2010-2014)

	July 2011 -June 2012	July 2012 -June 2013	July 2013 -June 2014	July 2014 -June 2015
M3	569,300	280,564	282,524	166,878
Value, USD	8,441,391	12,668,407	12,658,569	10,598,923

Source: TFS (2015).

(b)Export of natural honey

Data for export of natural honey was collected from TRA and presented in Table 25. It is noted amount of natural honey that is being exported from Tanzania is decreasing. Notwithstanding, the trend may be reverted in near future as there is an ongoing strong campaign for beekeeping in Tanzania.

Table 25: Export volumes of honey (2010-2014)

Years	Net Weight (Kg)	FOB Value, (USD)
2010	1,459,039	577,782
2011	1,246,422	578,783
2012	241,665	387,020
2013	209,766	275,646
2014	85,114	203,573

Source: TRA (2015).

2.7.2.2 Timber consumption

Sawn timber and utility poles are the main timber products on the Tanzanian market. The major consumer of sawn timber is the construction industry. The construction sector which includes residential and development projects consume about 62% of the total 1.46 million m^3 of sawn wood produced annually in Tanzania (Indufor, 2010). On the other hand, the major consumers of utility poles are the Tanzania Electric Supply Co (TANESCO) and the Rural Electrification Agency (REA). In 2010 and 2011, TANESCOs utility poles requirements ranged from 80,000 to 120,000 units (Ngaga, 2011) but currently the requirements have gone up to a range of 100,000 and 165,000 poles per annum (Mabula, personal communication 2015). The common pole lengths are 9, 10, 12, 13 and 15m. It is estimated that 55% and 50% of the TANESCO and REA poles' requirement are imported (Mabula and Msofe, personal communication 2015), respectively. REA annual poles' consumption is presented in Table (26).

Table 26: REA's pole consumption

Year	2010	2011	2012	2013	2014	Total
MV Lines (km)	100	250	5,500	8,000	6,000	19,850
LV lines(km)	50	350	2,500	6,000	5,000	13,900
Total poles for MV lines, Average 12 poles/km	1,200	3,000	66,000	96,000	72,000	238,200
Total poles for LV lines, (Average 20 poles/km)	1,000	7,000	50,000	120,000	100,000	278,000

Source: Field data (2015).

It is obvious that demand for utility poles is increasing. In order to supplement wooden poles, TANESCO is set to start production of concrete poles through PPP arrangement in 2016.

2.7.2.3 Timber demand projection

Timber demand projections in Tanzania were made by the Ministry of Natural Resources and Tourism and Indufor (2011). Demand projections were made taking into account the existence and strength of the demand drivers, i.e., population growth, economic growth, urbanization, globalization, preferences. Major assumptions which were considered in the projections included: 1) population growth will trigger demand for more wood uses, 2) the urbanisation move: as old townships are upgraded and new

ones are developed timber demand will be escalated, 3) globalization will enhance existing or open up new international markets leading to increasing timber demand, 4) discovery of oil and gas in the country, infrastructural development and other government efforts towards development will lead to economic growth that eventually will raise wood per capita. In making projections, three scenarios were constructed:

- Baseline scenario
- Realistic scenario
- Optimistic scenario

In the baseline scenario, it assumed that the 2010 wood consumption level per capita (i.e. 2.8 kg/year/capita) continues (no increase) and future growth is based solely on population growth (2.1% per annum) estimates. This does not take into account economic growth, urbanization or increased wood use per capita. Also it is assumed that substitution of wood products by other products continues. With these assumptions, wood demand will rise to1.33 million by 2025. This scenario is unlikely to happen since economic growth and globalisation are likely to boost timber demand. Trends in forest products observed within Eastern African partners have evidenced this (Tables 22&23).

The second scenario, i.e. realistic, it is assumed that together with the population growth; economic growth and urbanization will increase the wood use and hence the per capita wood use. Furthermore, in the scenario it assumed that wood supply will be able to respond to demand and no major substitution by other materials is taking place. Some amounts of wood products are exported. If this assumptions hold true then wood demand will rise to 3.6 million by 2025, demand will be 3.7 times higher than today, wood prices will rise rapidly which will eventually lead to substitution by other materials.

In the optimistic scenario, it is assumed that wood use is promoted actively and people understand and appreciate the benefits of wood products over other products. Wood products become an important source of export income for companies and the country. Wood use per capita increases in Tanzania. If this happen, wood demand will rise to 5.4 million by 2025 and demand will be 5.55 times higher than today. Of the three projections, the second scenario looks more probable looking at the background of our people, economic endeavours taken by the government and observed foreign product influxes and the therefore is taken as the future timber demand projection.

On the wood supply projections, supply estimates are expected to come from the 82 000 ha of productive forest public plantations and from private forests. The fact that Sao Hill Forest Plantation which covers about 50% of the total planted area and currently supplying over 85% of raw material consumed by industries has an age structure which is not optimal (i.e. few hectares of over mature trees and once harvested then there is not much left for the next 15 years) was taken into account. Furthermore, it is assumed that land will be available and that private companies such as MPM, GRL, TANWAT, KVTC, NFC which have been involved in tree planting will continue to do so. Also, private individuals (wood lots) have been planting and will continue to plant trees independently regardless whether there is or not a grant scheme.

Other basic assumptions include 8 and 20-25 year rotation years for Eucalyptus and pine species, respectively. The wood demand /supply balance is presented in Figure 17.

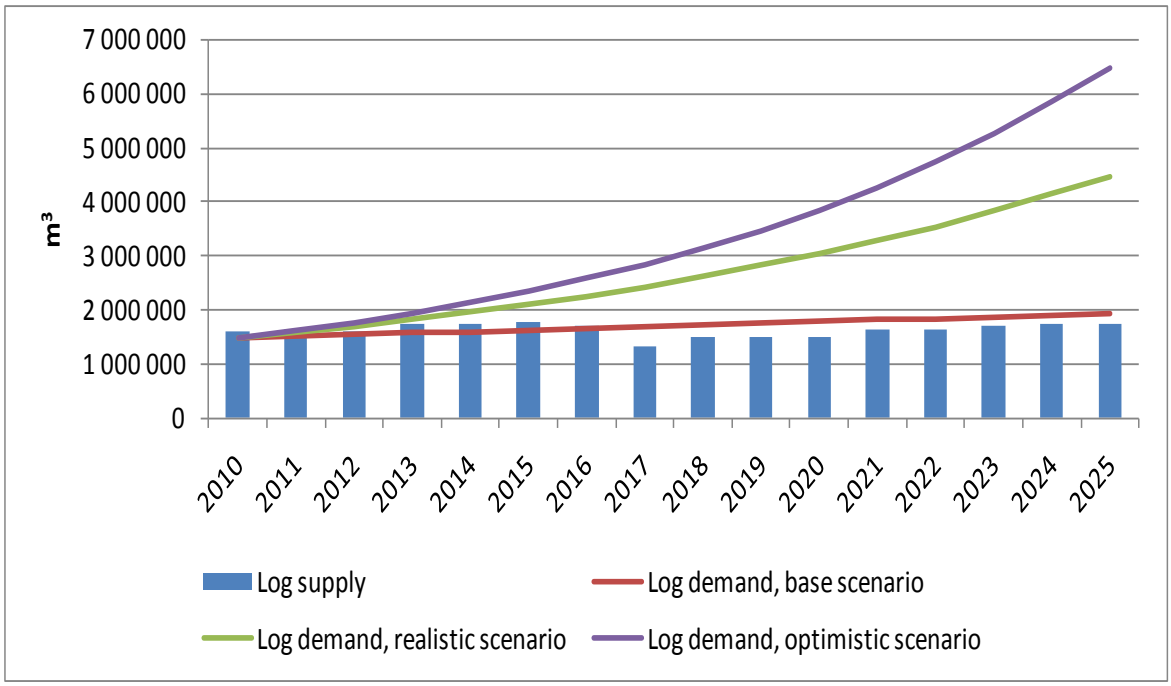

Figure 17: Future wood supply and demand forecast, 2010 – 2025
Source: MNRT and Indufor, (2011)

The bars in the figure represent expected annual wood supply. When the demand (realistic scenario graph line) is compared with annual supply; a gap between the two graph lines opens up. The opening is even wider as 2025 is approached; reinforcing observations by NAFORMA (MNRT, 2015) that the total annual supply (growth) of wood at national level is estimated at 83.7 million m^3 while only about half of this, i.e. about 42.8 million m^3 is available for harvesting at a sustainable level. On the other hand, the annual demand (consumption) of wood (based on literature studies) is estimated at 62.3 million m^3; meaning that consumption exceeds the sustainable supply and therefore causing an annual wood deficit of 19.5 m^3.

TFS proposes a way forward to address the wood deficit through tree planting (Figure 18). If no additional planting is done, by 2030, the deficit is expected to grow to a tune of 47.5 million m^3. If 109,000 ha are planted annually, the current deficit is maintained. In order to remove the deficit completely, nationally, it is required that 185,000 ha of forest plantations are established annually. Accordingly, intensive tree planting and sustainable utilization of the existing forest resources should be the way forward for the nation to meet her increasing wood demands. The private sector is expected to shoulder much of this load.

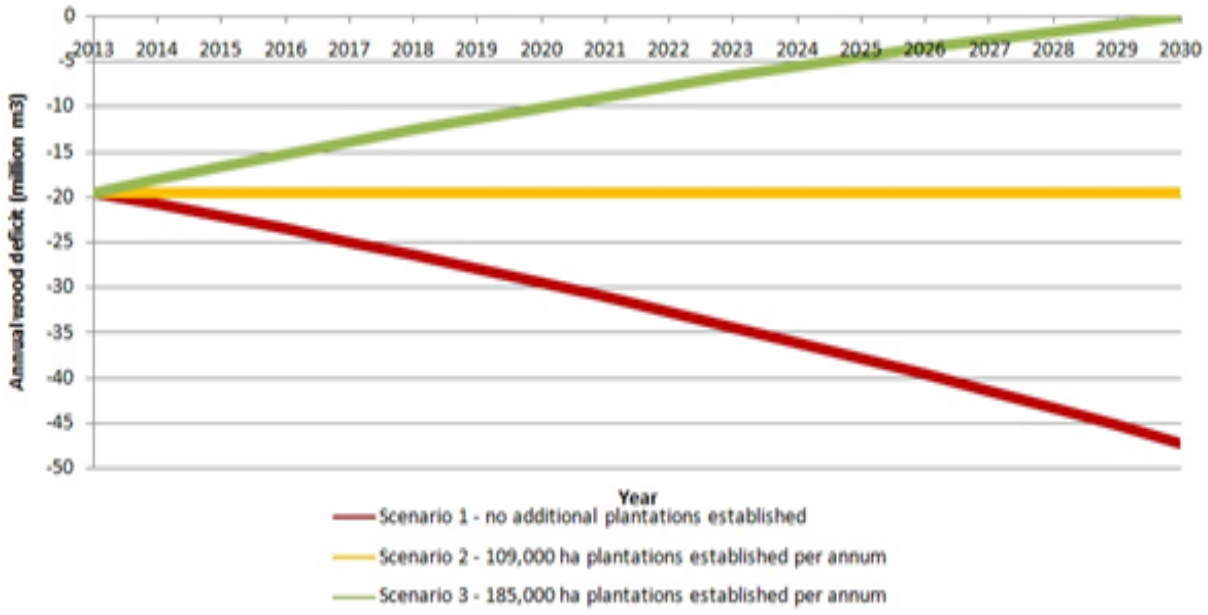

Figure 18: Tanzania Mainland, projected wood deficit (2013-2030)
Source: TFS (unpublished).

2.8 CONTRIBUTION OF PRIVATE FORESTRY SECTOR ACTIVITIES TO LOCAL LIVELIHOODS AND NATIONAL ECONOMY

The discussions in the preceding sections have highlighted to a large extent the contribution of the private forest sector to local livelihoods and the national economy. The private sector plays a crucial role in employment creation, i.e. formal, informal and casual labourers; for example:

a) GRL facilitates socio-economic development and poverty alleviation in rural areas through provision of employment, infrastructure development, schools, health and other community development. It supports villages to run carbon projects and has agreements with local villages it cooperates with, guaranteeing that 10% of the gross revenues to go to community projects;

b) KVTC supports an outgrower programme where households with land banks are advised to convert from one to 50 ha of their existing farm land to teak forestry. The company provides inputs such seeds, fertilisers, technical support in managing the forests, and KVTC has a purchase agreement for the crop. The objective of such programs is to facilitate local farmers to transit from subsistence farming to market-focused production.

The company hires, trains and shops locally. According to Lemm (Personal communication, 2015) procurement from local business last year stood at 1.0 million USD. This means that KVTC has become a reliable market for various products produced within the 14 villages associate with it. The 1.0 million USD that has trickled into the villages definitely will support livelihood at individual and community levels.

c) Seedlings giveaway by forest companies to communities surrounding private forest plantations has been a practice of almost all companies. GRL, TANWAT, MPM and NFC have been and continue to do so.

d) Contribution to national economy in the form of taxes and fees. Such taxes include i) corporation tax which is 30% of the profit (Section 4 of the income Tax Act (2004)), ii) Value Added Tax. It should be noted that sawlogs, pulp and timber are not among goods that are VAT exempted; all taxable goods and services are charged VAT at standard rate of 18% of the value goods supplied (VAT Act 1997), iii) LGAs collect produce cess of 5% and fees for business licenses which is a minimum of 100,000 Tsh equivalent to about 45 USD, iv) Royalty fees as categorised by species classes (Forest Act, 2002), v) a levy of 2% of any royalty payable under the Forest Act, vi) Annual factory registration fee, vii) Logging Miscellaneous Account (LMDA) fee, etc All these taxes and fees go to boost the national economy.

3.0 CONCLUSION AND RECOMMENDATIONS

i. The key actors in both primary and secondary forest production were identified and are the government and its institutions, private sector (in forestry and forest product industry), village councils, TGAs, CBOs and NGOs, development partners, transporters and traders of forest products, financing institutions, providers of inputs and services, the media, forest users/groups, politicians, and other forest land users. Interests of such groups/entities have to be taken into account in plans in order to adequately address their needs and in ways that could make forestry sector operate effectively and efficiently. In this regard, the link between primary and secondary forestry production on one hand and forestry training/education and research institutions needs to be better understood and strengthened;

ii. The NAFORMA report (MNRT, 2015) and the ZWBS (Indufor, 2013) describe the tree species, distribution by area, age classes, and volume in Tanzania mainland and Zanzibar, respectively. In Tanzania mainland, the area under major forest categories, i.e. forest and woodlands is about 48.1 million ha out of which 554,500 ha are from plantation forests. Total wood volume for all forest types is estimated to be 3.3 billion m^3. In Tanzania- Zanzibar, it is estimated that the total wood volume in Unguja is 5,523,536 m^3 while that of Pemba is 3,109,754 m3.

Main species from natural forest on Tanzania mainland are *Diplorhynchus condylocarpon, Combretm zeyheri, Brachystegia spiciformis, Combretum molle, Julbernardia globiflora, Brachystegia boehmii, Dichrostachys cinerea, etc to mention a few. From plantation forests are various pines (Pinus patula, P. elliottii and P. caribaea), cypress (mainly Cupressus lusitanica), eucalyptus (mainly E. saligna and E. maidenii) and teak (Tectona grandis)*. On the other hand, in Unguja, native forests and agroforestry systems are the largest land cover classes covering 71,068 and 35,441 ha in Unguja and Pemba, respectively.

By 2017, a significant drop in wood supply from government forest plantations and natural forests is predicted because of a decline in harvesting levels at SaoHill Forest Plantation; the largest forest plantation and major supplier of wood in the country. About 50% of the growing stock at this plantation is currently underage and therefore not ready for harvesting. Given this scenario, it is envisaged that by 2025 about 70% of the supply of industrial round wood will come from private plantations; therefore, it is necessary o make plans for this to happen. There is also need to address challenges facing the private forestry sector and put in place an incentive scheme that will allow sector grow smoothly and swiftly to enable it take up this task;

iii. Industry types operating in the country include sawmills, impregnation plants, paper mills, veneer factories, fibreboard and plywood production and two emerging wood briquette factories under construction in Kilombero District (BoraMoto) and at SaoHill Industries Ltd. The types of products include kraft paper, sawn timber, utility poles, seedlings, veneer, furniture, charcoal and bee products. Apart from KVTC and Saohill Industries sawmills whose sawmills use advanced technologies i.e. laser technology and hewsaw at KVTC and Saohill Industries Ltd, respectively, most of the other sawmills use inefficient and old technologies in processing wood and with small scale sawmills being particularly wasteful. A cluster initiative could be a worthy strategy to consider in order to enable forest-base SMEs to jointly build the required capacity and shift to new technologies. Inadequate supply of materials has been cited by almost all plant managers to contribute significantly to underutilization of plant installed capacities. Incentives and programmes to promote the establishment of private plantation forests in the country should be cherished;

iv. The forest sector in general and the private forest sector in particular, has been found to have significant potential to contribute to the national economy and social development in the country; specifically in terms of job creation and income generation. Sawmilling, timber and poles treatment, paper manufacture, tree nurseries, furniture making, transport and timber trading, imports and exports all open opportunities for employment and especially to the fast growing youth population. While the government has expressed political will to provide an enabling environment to facilitate the growth of the private sector, more is required of it to remove the remaining hurdles that constrain the pace of establishment and development of the private forestry sector. For example, putting in place mechanisms for formalisation of the informal part of the sector could significantly improve the growth and the contribution of the private forestry sector;

v. Gender inequalities were observed in the forest sector where men are more favoured by customary law than women. Although women have fairly good access to important resources that would allow one to fully participate in forestry activities, control of the resources rests on hands of men. Only when such cultural barriers are removed, one could not see full participation of women in forestry activities. While land tenure, ownership and control of land, and mandates on revenues collected from sales of forest produce culturally favour men, they are essentially are discouraging women to take active participation in forestry activities. On the other hand, youths also find it difficult to participate in forestry activities that could improve their employment and income situation, largely because they are in most cases uninformed of opportunities in the forest sector and also in short of capital and skills. There is need therefore to empower women and youths in forestry activities;

vi. There have been commendable efforts to organize the forestry private sector in the country through institutions like TGAs, TAWOFE, SHIVIMITA (which include

SAFIA, NOFIA and UWAMBU), and MTTCS. However, one would wish to see a stronger, united and more vibrant apex body for private forest sector which could speak and stand for the sector. It is therefore, recommended that an apex body be formed for example in name of the Tanzania Private Forestry Foundation (TPFF). This should go hand in hand with the formation of national product/business line associations as founding members. The proposed national product/business line associations are: 1) Tanzania Tree Growers Association, 2) Tanzania Transporters and Traders of Forest Products, 3) Tanzania Wood Working Federation, 4) Sawmillers Association of Tanzania, 5) Tanzania Wood Preservers Association, 6) Tanzania Panel Boards Manufacturers Association, 7) Tanzania Association of Citizen Contractors, 8) Tanzania Association of Charcoal Producers and Traders, 9) Tanzania Network of Forest-related CBOs and NGOs and 10) Tanzania Community-Based Forestry Association. This proposed arrangement takes in almost all actors identified in this study.

Furthermore, it recommended that a competitively recruited secretariat should be run the day to day activities of TPFF. The National Executive Committee selected from member associations could be the governing body of the Foundation. Individual associations such as the Tanzania Association of Sawmillers could have committees within it which will deal with issues in respect of individual/small, medium and large members in the Association. Such arrangement applies to all other associations.

vii. In the forestry sector in Tanzania, the PPP arrangement which is supported by the Forest Policy (MNRT, 1998) and the Forest Act (MNRT, 2002) can be operationalised through PFM and concession arrangement. The PPP arrangement in PFM is implemented in a Joint Forest Management (JFM) which allows communities to sign joint forest management agreements with government and other forest owners, mainly local governments. Since its inauguration in the early 1990s, about 5,392,095 ha and 1052 villages have been put under the JFM arrangement. Despite acceptance of JFM across the country, it hasn't been very popular among some local communities. Such communities claim that they spend more than they benefit from JFM. In order to sustain JFM as a management option, the Government therefore, should come out with a realistic cost benefit sharing mechanism as *quid pro quo*;

Other JFM arrangements that could be tested although not provided in law are: JFM between Central Government and TGAs, JFM between village governments and TGAs or between community groups and TGAs, and out-grower arrangements between tree farmers or TGAs, and industry companies such as the one practiced by KVTC. These other more recent JFM arrangements appear more likely to improve social inclusion

There is no forest concession in operation. This is something that could be raised in the proposed forum in sub-section 5.5.4 to gauge the acceptance of this approach and how it can be implemented;

viii. Sawn timber and utility poles are the main timber products on the Tanzanian market. Data collected during this study from some large forest industries and a few small and medium forest enterprises shows an increasing trend in timber production i.e., 72,353, 72,798, 49,934, 59,515 and 58,004 m3 in 2010, 2011, 2012 and 2013, respectively. The major consumer of sawn timber is the construction industry. The construction industry which includes residential and development projects consume about 62% of the total 1.46 million m3 of sawn wood produced annually in Tanzania. On the other hand, the major consumers of utility poles are the Tanzania Electric Supply Co (TANESCO) and the Rural Electrification Agency (REA). In 2010 and 2011, TANESCOs utility poles requirements ranged from 80,000 to 120,000 units but currently the requirements have gone up to a range of 100,000 and 165,000 poles per annum. REA's annual requirement ranges has increased from 2,200 in 2010 to 172,000 in 2014

Internationally, trade in timber has dropped from 12,668,407 US$ in 2012/2013 to 10,598,923 US$ in 2014/15. However, business in Eastern African region and the Southern African Development Corporation region has been promising. For example, import of paper and paper boards from EAC partner states increased from 4.3 million USD in 2010 to an average of 5.51 million USD per annum. Export on the same product to EAC region increased from 14.7 million USD in 2010 to 25.7 million USD in 2013. From SADC, on the other hand, import values have been stable in a range of 22 million USD per annum.

ix. The private forest sector has considerable potential in creating employment and social livelihood support for local communities. All private companies hire locally where they operate and provide support in development projects such as building schools, dispensaries, village government offices, dispensaries and roads. Also, communities around private companies are being supported to establish tree nurseries and plant trees. The private forest sector also contributes to the national economy through taxes and fees. Given these and other contributions it can make, the private forestry sector deserves the support of the Government.

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APPENDICES

Appendix 1: List of people contacted

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2. J. M. Njenga- Manager Poles, Timber impregnation and Charcoal, Green Resources Ltd
3. J. Mgoo- Chief Executive, TFS
4. M. Mrutu – Investment office, TFS
5. Eng B. Msofe- Director Technical Service, REA
6. Eng. M. Mabulla- Safety Manager, TANESCO
7. H. Lemm- CEO, KVTC
8. Dr J. Steenkamp- South Africa Forestry Contractors Association
9. B. Breedt- Executive Director, South African Wood Preservers Association
10. Kiwale- TANWAT, Njombe
11. W. Mgowole- Executive Secretary SAFIA Mafinga
12. B. Kigodi, MPM
13. S. Mathiesen- Saohill industries
14. S. Lukambinga Managing Director, Ihembe Timber Products and Poles Ltd
15. G. Chalamila- Sheda Genaral supplies Ltd
16. F. Ukwate- Furniture vendor Kinondoni Biafra, DSM
17. B. Mtupa- Furniture vendor , kinondomni Ndugumbi, DSM
18. S. Kushaba- Treasurer, TAWOFE, Keko DSM,
19. W. Kaduma- Chairman, Umoja wa Mafundi Seremala, Njombe
20. J. Kilagwa, MTTCS Makambako

African Forest Forum

A platform for stakeholders in African forestry

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