

**MARKETING CHAIN ANALYSIS OF SAWN-WOOD FROM MUFINDI
DISTRICT TO DAR-ES-SALAAM CITY AND ARUSHA MUNICIPALITY**

BY

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN
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ABSTRACT

This study sought to analyse marketing chain of sawnwood from Mufindi District to Dar-es-salaam City and Arusha Municipality. Specifically, the study focused on examining the existing marketing chain of sawnwood, assessing chain's key actors and how they develop chain strategy in the marketing of sawnwood, identifying main factors affecting marketing chain from producers to enduse manufactures, determining preliminary estimate of marketing margins at wholesale and retail sale nodes and examining price and cost changes at different stages in the market chain. A random sample of 270 respondents was selected in the study area. Data was collected using questionnaire survey and participant observation. The analysis was done using Statistical Package for Social Science (SPSS) and Microsoft Excel computer programmes. The study revealed that sawnwood were marketed through four channels. These included; Producer -Traders-Enduse manufactures, Producer-Middlemen-Traders-Enduse manufactures, Producer-Traders- Other traders - Enduse manufactures, Producer- Enduse manufactures. It was also revealed that, there were differences in prices at different levels of market. For example the distance from Mafinga to Dar es Salaam is more than 600 kilometers and the average transportation fee is Tshs 63 750 per m³ which takes 26% of the sawnwood price to the market whereas the distance to Arusha is 1000 kilometers but the cost of transport is Tshs 80 000 shillings per m³ due to its distance which counts 25% of the selling price at the Arusha market. Furthermore observation revealed that, there is a great number of traders, indicating competitive situation in the marketing system. Given the importance of marketing chain of sawnwood from production to the market in improving the economy, hence, this study recommends that the Government and its authorities should establish commonly accepted and workable quality, grades and standards for sawnwood for improving the quality of sawnwood sold in the market.

DECLARATION

I, Consolatha Kapinga, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my own original work and has neither been submitted nor being concurrently submitted for a higher degree award in any other institution.

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Date

The above declaration is confirmed

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Date

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

ECA	-	East and Central Africa
ERP	-	Effective Rate of Protection
ERV	-	Exchange Receipt Voucher
FAO	-	Food and Agriculture Organization of the United Nations
FBD	-	Forest and Beekeeping Division
GDP	-	Gross Domestic Product
Ha	-	Hector
IFAD	-	International Fund of Tropical Agriculture

IITA	-	International Institute of Tropical Agriculture
MNRT	-	Ministry of Natural Resources and Tourism
m ³	-	Cubic metres
SAFIA	-	Sao Hill Forest Industry Association
SPSS	-	Statistical Package for Social Science
SHFP	-	Sao Hill Forest Plantation
TP	-	Transit Pass
Tshs	-	Tanzania Shillings
TRA	-	Tanzania Revenue Authority
TWICO	-	Tanzania Wood Industries Company
NDC	-	National Development Corporation
USD	-	United States Dollar
USAID	-	United State Agency for International Development
URT	-	United Republic of Tanzania
VAT	-	Value Added Tax
LMDA	-	Logging Miscellaneous Deposit Account

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Tanzania is among the countries in the Eastern and Central Africa (ECA) region with a high production of tree products for both wood based and non-wood products. It is endowed with large and valuable forest resources, which cover 38 percent of her total land area (MNRT, 2001). Forests are undeniably important ecosystems of both rural and urban livelihoods. Forest-based income accounts for a large share of rural income in many places in the country. The role of forests and trees in food security, providing economic alternatives and support to other sectors is also being recognized.

In Tanzania, many people use wood products to sustain livelihoods. According to the present economic forces, the majority of urban population in Tanzania will continue to depend on wood products for a long time to come. It has been reported that Tanzania population increase is projected to take place at 2.9% annually (URT, 2003). This will continue to put pressure on the natural and plantations forests, where most timber species are exploited. According to Monela *et al.* (2000), households living in miombo woodlands in Tanzania derive more than 50% of their cash incomes from selling of forest products such as honey, wild fruits, charcoal and firewood besides other timber product. According to the World Bank (1991), about 55% of total demand for forest products is for fuelwood primarily in developing countries like Tanzania and the remaining 45% is composed of industrial forest products, two third for pulp and one third for timber.

In Tanzania, timber is harvested mostly by pit sawyers and several licensed sawmills. Pit sawing alone meets almost half of the total wood requirement (Wells *et al.*, 2005).

The most important industrial wood product from the woodlands is sawnwood, which is the most important wood product in the country used primarily in building and construction, joinery, furniture making and packing. Forestry industry has changed from using not only the indigenous hardwood from natural forests but also using softwood from plantations. It is estimated that 70 – 80% of the total log consumption is from softwood plantations with a large surplus of softwood (FBD, 2000).

The main sources of the common commercial timber species in Tanzania include the Miombo woodlands of Tabora and Rukwa Regions, the coastal forests of Lindi, Mtwara, Coast, Morogoro and Tanga Regions (Salmi and Monela, 2000). Currently, the main sources of softwood in Tanzania are the industrial plantations of pine and some cypress, in Iringa Region. The majority of the sawnwood sold in Arusha and Dar es salaam are coming from Sao Hill Forest Plantation and private farms in Mufindi District in Iringa Region (Msuya *et al.*, 2006; Wells and Wall, 2005). Arusha municipal and Dar es Salaam city are famous commercial areas for sawnwood for local and export to other countries. This is due to an increase in household income and economic growth which lead to increased demand for hardwood and softwood.

1.2 Problem Statement and Justification

Increasing demand for sawnwood in urban areas like Dar es Salaam City and Arusha Municipality has been attributed to increase in population and development activities. The prominent sawnwood market, offering competitive prices are in Dar es Salaam as well as Arusha and neighboring regions (FBD, 2000). Mufindi District in Iringa Region is a major source of sawnwood for Dar es Salaam City and Arusha Municipality, of which some is exported to Kenya and Somalia and other countries like China (FBD, 2000). The markets for sawnwood have a long chain ranging from production to consumption areas.

The final consumption takes place after a great number of processes have taken place from production to consumption in the so called production – product - marketing chain. This chain is tracked by some of the gaps in each stage in the marketing chain of sawnwood. One of them is lack of reliable information on marketing for sawnwood from producers to suppliers then to end use manufactures. The unclear information is on who pays what, how much, where and how to get/sell sawnwood products.

Pricing is also a major entity in the marketing chain of sawnwood. Unreliable information on pricing cause difficulties for producers to determine what is a "good" price and the "real" value. Not only does the producer lack information on the current market price, but also lacks access to information as to what the consumer wants, hence receiving low price. Furthermore, lack of information about the value of products, causes the producer to be unable to negotiate for a better price. According to Kotler (1985), most of the producers work together with the intermediaries to bring their products to the market. Few producers (or middlemen) may know the final price paid by the consumer or processor. Producers get price information from the customers (Msuya *et al.*, 2006).

In Tanzania, the process of marketing sawnwood to urban users is influenced by economic and political changes (Shayo, 2004). However, this process is constrained by lack of market integration, lack of post - harvest technologies (value - addition of sawnwood products), poor market access, weak linkages between farmers to major wood consumers and lack of policy incentives to enhance commercialization of sawnwood and subsequent participation of different stakeholders in the markets. Various studies conducted on forest products trade in Tanzania have concluded that legally traded forest products accounts for less than 20 percent of the total volume of wood products traded (MNRT, 2001; Salmi and Monela, 2000).

Moreover, the current knowledge on physical distribution is still scanty. In this, there are problems on proper knowledge on where to store and handle the quality as well as availability of sawnwood to customers at the right time and place. This is because most of the forest resources in the country are located in areas with poor infrastructure, particularly roads. This has impaired initiation and development of forest - based industry in terms of access to the raw materials and availability of the necessary facilities such as electricity. Again markets and marketing of products remain a problem in these areas, hence a need for the products to be transported to other areas for marketing.

Marketing chain analysis calls for greater communication between the various actors along the chain, to highlight the need of sawnwood to remain competitive in marketing outlets and to argue for more sustainable systems of production and support for local and international markets. Thus, the study aimed at assessing the marketing chain of sawnwood from Mufindi District to Dar es Salaam City and Arusha Municipality. Findings from this study were envisaged provide significant insights on how benefits are shared among actors along the sawnwood marketing chain.

1.3 Objectives

1.3.1 General objective

The overall objective of this study was to analyze various marketing chains and price changes that could be used to determine and improve marketing of sawnwood.

1.3.2 Specific objectives

The study sought to attain the following objectives

- (i) To examine an existing marketing chain of sawnwood in the study areas.
- (ii) To assess chain's key actors and how they develop chain strategy in the marketing of sawnwood.
- (iii) To identify main factors affecting marketing chain from producers to end user manufactures.
- (iv) To determine marketing margins at wholesale and retail sale nodes for sawnwood.
- (v) To examine price and cost changes at different stages in the market chain.

1.4 Research Questions

- a) Are there any factors affecting the marketing of sawnwood?
- b) How many sawnwood market chains exist?
- c) How are the profits distributed among different marketing actors along the chain?
- d) What are the gaps in the marketing channels of sawnwood?
- e) Is there a significant change in prices and pricing mechanisms at different levels of the market chain?

1.5 Conceptual Framework

Conceptual framework shows the factors affecting marketing system of sawnwood from supply side to demand side and the gaps along the marketing chain. The factors are the basic instrument to reach the markets, satisfy the wants of customer and make profit (FAO, 1996).

Sawnwood chain involves several interconnected stages from sawnwood production to consumption (Fig. 1). Each stage of the chain is influenced by both supply factors, which

include product management, market opportunities and socio-cultural aspects and demand factors including quality of the product, destination, and consumer behaviour and buying price. Poor interaction of both supply and demand factors affects the activities at each node in the marketing chain. These give rise to the gaps in the nodes in the interconnected stages. The gaps may be in terms of marketing information, services provided by middlemen, marketing practices and capabilities, existing legal instrument and physical-distribution decisions.

The trader's objective is to make profit by investing in the sawnwood business, supplying quality products focusing on supply factors. The consumers on the other hand, maximize satisfaction given demand factors. Filling the gaps in the chain will have great impact in the marketing chain activities.

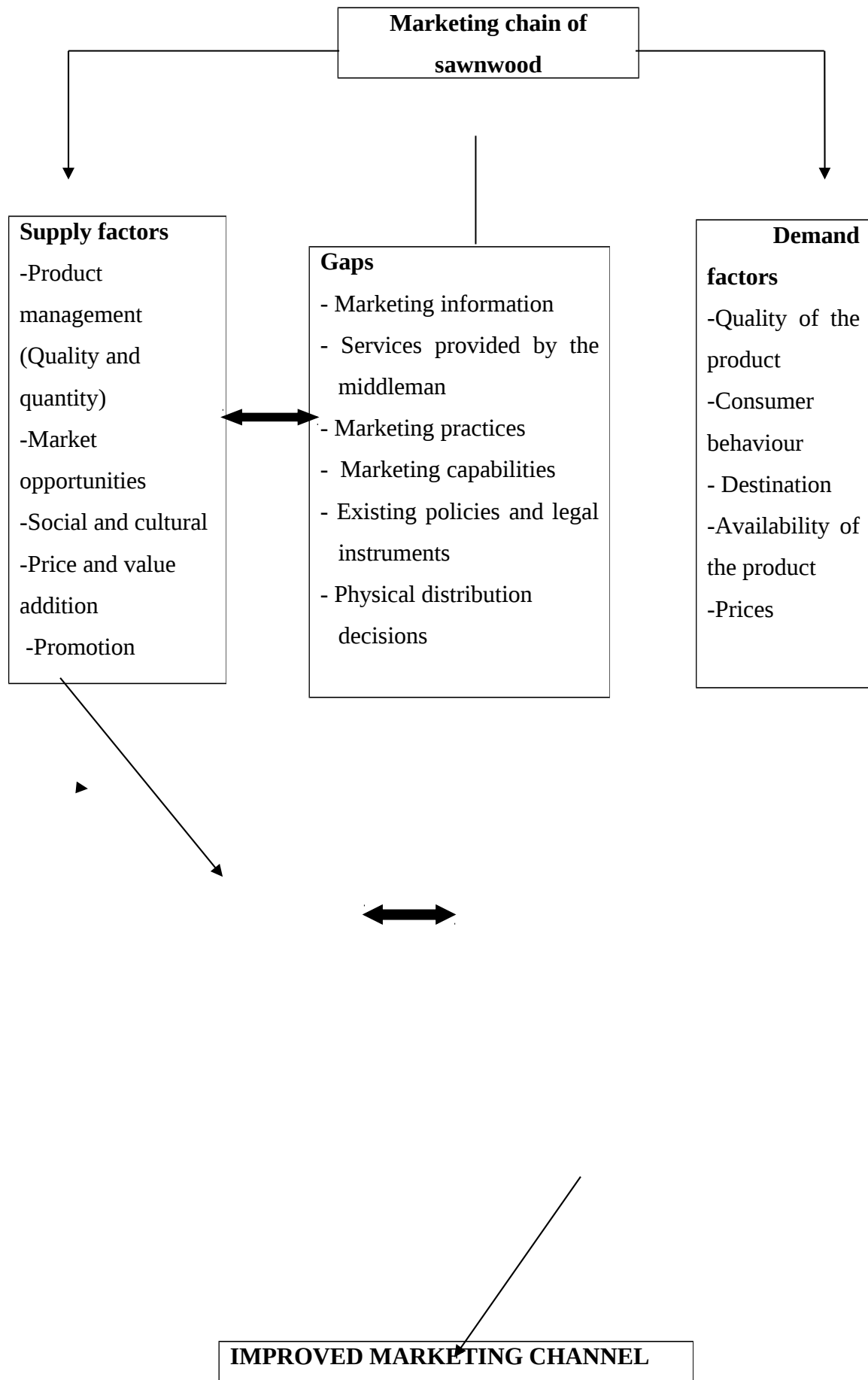


Figure 1: Conceptual framework for the study

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Concept of Market and Marketing

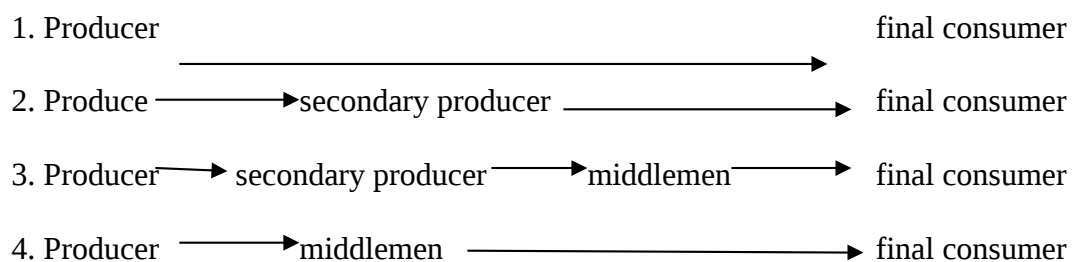
2.1.1 Definition of marketing

Market is the overall demand for a product at a given price, place and time, under specific standards and conditions. Kracmar (1973) defines the market in a business sense as aggregate demand of buyers for product or service. Marketing is a set of activities by which the demand structure for goods, ideas and services is managed in order to facilitate the exchange process satisfactory (Kotler, 1985). Marketing is the process of exploring which products potential customers will purchase and then producing, processing, promoting and distributing the products at a profit (LeCup, 1994). Marketing suggests to producer what to produce and directs the development efforts of processing industry to inform the customers about the availability, quantity, quality, price and distribution of product. It makes the products and services available to customers in the most desirable and efficient way (FAO, 1996).

2.1.2 Marketing chain

Marketing chain is movement of product from production to consumption. Also it can be defined as the full range of service and activities that are required to bring the product from its conception to its end use, through different phases of production (involving combination of physical transformation and the input of various producer services), delivery to consumers and final disposal after use (Kapilinsky *et al.*, 2001). Marketing of sawnwood product is demand driven. The final consumption takes place after a great number of processes have taken place from production to consumption areas in the so called production-product-marketing chain. The processes can be contained within a single

firm or divided among different firms and can be done within a single geographical location or spread over a wide areas (USAID, 2006). There are different stages in marketing chains. These can be directly from producer to consumer, producer to secondary producer then to final consumer, or producer to middlemen to final consumer. A study on marketing chain and trade arrangements of forest product conducted in Arusha by Msuya *et al.* (2006) revealed that there are four different distribution channels.



The middlemen may not know what is desired by the final consumer and may not effectively get this information to the producer (Msuya *et al.*, 2006). The efficiency of a market is achieved by filling in the gaps between producers and the consumer or large processor, evaluating costs and prices at different levels of the market chain (Nyange, 2003).

2.1.3 Marketing information

Marketing is largely information - based, "soft" technology. Efficient marketing requires relevant quantitative and qualitative information regularly, reliably and at the lowest possible cost (Msuya *et al.*, 2006). Information is needed on markets (demand, end-uses, and supply), marketing factors (products, marketing and distribution channels, promotion and prices), competition, marketing environment (comprising social, economic, political, technological, regulatory, legal, cultural, infrastructural, environments etc) and institutions associated with marketing (Raintree and Francisco, 1994). A well - defined classification of products is the cornerstone for efficient collection of data and information. FAO (1995)

has taken the first step in setting up a classification and definitions system for wood forest products by presenting a tentative classification scheme for discussion, refinement and adoption. Available descriptions of marketing practices are very often limited to portraying them as physical activities which include, transport, sorting, grading, packaging, storage, display and so on. Value - based descriptions of marketing practices are really rare inspite of the fact that, ultimately, the buyer is influenced by the values that are provided through the physical activities. Marketing studies are needed to analyze the potentials and limitations of markets in order to get the right information at a reasonable cost (Kotler, 1985).

2.1.4 Services provided by the middlemen

Most of the producers work together with the intermediaries to bring their products to the market (Kotler, 1985). One of the unfortunate results of the lack of information as to what occurs in the marketing channel from when it leaves the producers and reaches the final consumer is that the role and the services provided by the middleman are misunderstood or distorted. Sometimes middlemen try to forge the chain (Kotler, 1985). The middleman is often perceived as being the villain, and while exploitation such as debt bondage does occur, the services provided by the middleman should not be overlooked. Nor should it be assumed that the middleman is taking the greater portion of the final price. If the middleman is cut out of the marketing chain, then the services that the middleman provides (cash advances, transport, storage, etc.) must be assumed by other organizations or agencies. These services provided by the middleman/trader are therefore proving to be vital.

2.1.5 Valuation and pricing in marketing

According to Bon (2001), based on data collected in Africa, including Tanzania, and South-east Asia, consumers' decision about what and where to purchase are based on price, qualitative characteristics of the product and on the availability of the product in the market. Also Barness (2000) reported that, consumer's value quality, prices, delivery reliability, packaging and flexibility as some of the most important factors before making purchase decisions. One of the most difficult but most important aspects of marketing product effectively is setting the price correctly to ensure that it is enough to meet expenses and allow business to grow and not to discourage consumers. Retailers, brokers and distributors will also have an interest on how you price your products since it must allow them to make profit while distributing the product (White, 1992). The price has great influences on decisions to buy a particular product. Each price that the seller might charge will lead to a different level of demand and will therefore have a different impact on product marketing (Kotler, 1985).

According to Chautin (2005) the objective of pricing is to maximize profits while remaining competitive in the marketplace. Pricing can be based on either the cost price or market price (What will the market pay?). Regardless of the pricing method used, it is critical to know all costs involved in the delivery of the product or service to avoid possible under pricing and operating losses. If the market will not support a price level sufficient to cover costs, it will be necessary to investigate whether costs can be lowered or alternatively, if it may be necessary to abandon the business.

With cost-oriented pricing, the producer tries to recover all the expenses of bringing the product to the market including raw materials, processing, labour costs, delivery costs and plus profit. Competition-oriented pricing also aims at recovering product costs, and

delivery cost, plus profit but may adjust profit to establish a purchase price that equals or “beats” market rivals (FAO, 1996). In some circumstance a producer may be forced to sell at a price lower than the costs of production to maintain her or his market share. For example in a case where the consumer is so weak, the products may have to be sold at a loss. On the other hand, high demand may lead to products scarcity and increased price (FAO, 1996).

Mlambiti (1975) revealed that potential sources of pricing inefficiency were lack of information and lack of standards. The study also revealed that optimization of markets depends very much on the existence of an environment that allows technical and pricing efficiency to be attained. This is an environment that allows: (a) a demand driven flow of inputs and outputs, (b) availability of market information and (c) existence of no barriers to market entry or exit.

2.1.6 Existing problems in the market

Many people do not understand well how the market works and why prices fluctuate. They have little or no information on market conditions and prices; they are not organized collectively; and they have no experience on market negotiation (IITA, 2001; Heinemann 2002). Quite often producers experience a weak bargaining position vis-à-vis traders because they do not have timely access to salient and accurate information on prices, locations of effective demand, preferred quality characteristics of some produce, nor on alternative marketing channels.

Most of the literature related to marketing e.g. Dorward *et al.* (1998), Freeman and Silim (2001), IFAD (2003), Jayne *et al.* (2002), Kherallah and Kirsten (2002) and Killick *et al.* (2000), reiterate the problem of market access which is linked to the following constraints:

price risk and uncertainty, difficulties of contract enforcement, insufficient numbers of middlemen, cost of putting small dispersed quantities of produce together and inability to meet standards. Other compounding problems relate to physical market access like physical infrastructure-roads, market facilities, power and electricity.

Lack of infrastructure and thus high transaction costs is a well-known problem in the developing world. Delgado (1995) argues that especially in Africa, market reforms alone are not sufficient as high transaction costs leave the countries only semi-open. Pedersen (2003) agrees that despite years of development and liberalisation, transportation and markets are still underdeveloped and present a major constraint for trade in Sub-Saharan Africa. A common argument in favour of infrastructure development is that trade liberalisation policies would yield much greater responses if aided by investments in infrastructure which would, first of all, decrease the transportation costs and, secondly, integrate the currently isolated households (Key *et al.*, 2000; Heltberg and Tarp, 2002). It is important to bear in mind that transaction costs are not merely affecting local trade but also supply and demand of imports and exports (Milner *et al.*, 2001). In many cases the transportation costs actually represent a greater implicit tax to the exporters than explicit distortions (trade policy) at the Marco level.

A recent study by Kweka (2004) in Tanzania estimated that the efforts for transport costs constitute over one third (33%) of total Effective Rate of Protection (ERP) implying that the share of explicit tariff is about 70%. Domestic producers face therefore an additional barrier for trade which diminishes the volume of traded goods. Consequently, the recent trade reforms pursued by the Tanzanian government have not been effective in promoting export, although they have led to a notable growth of imports (Kweka, 2004). Thus, the author concludes that trade liberalisation efforts will only be effective when they are

supported by efforts to overcome structural bottlenecks related to high transaction costs, distribution channels, and efficient markets.

To overcome these problems, producing communities have formed cooperatives, collective marketing associations, and other mutual alliances to increase their bargaining power when buying and selling in market places. Larger commercial players have also been active, forming mutually beneficial alliance with farmers supplying marketable products at agreed prices. Clearly, it is only by such means that most developing country farmers can move from a poverty cycle to an income cycle, and begin to make a real contribution to overall economic development (IITA, 2001). Other options explored in literature include warehouse receipt systems (Coulter and Onumah, 2001); contract farming rural assembling point system (Freeman and Silim, 2001). Other firms have embarked on a process specifically termed: vertical integration, where specific arrangements with different players at all stages of a product processing are made, resulting in a value adding chain. The South African situation is much the same because the private sector is striving to fill the gap left by parastatal organization.

2.2 Sawnwood Production

2.2.1 Sawnwood industries in Tanzania

The sawnwood industry started more than 100 years ago, when Indian settlers and missionaries owned and operated mills, which mainly utilized hardwoods while the first softwood sawmills utilized thinning. Between 1967 and 1990, most of the mills were under state ownership after the nationalization policies of 1967. However some mills were left under private hands. In the late 1990's, all the mills under Tanzania Wood Industries Company (TWICO) and National Development Corporation (NDC) had some operational

problems and most of the mills halting the operations and finally collapsed. Due to that situation, most of mills were privatized.

The forest industry in Tanzania has traditionally been dominated by sawmilling, and to a lesser degree, fibre board, chipboard and joinery and furniture. Earlier processing capacity of sawmills was 900 000 m³ roundwood in the country of which 33.3% is related to natural forest and 66.7% to plantations (Ngaga *et al.*, 2001a). To date, sawnwood industry in Tanzania is dominated by some 367 sawmills with a capacity of 2 203 703 m³ of soft wood logs and 458 482 m³ of hardwoods with total capacity of 16% of the total installed capacity being utilized (MNRT, 2005). Above that, between 2005-2008 there was an increase of about 64 sawmills which increased 420 000 m³ per year from Government forest plantations and 25 000 m³ from private forest plantations (MNRT, 2008). The sawnwood production from Tanzania has low quality and quantity and thus has low share in the international market. Due to dwindling of common commercially used tree species, the markets are now resorting to other hitherto used ones. These products have mostly relied on few fine hardwood and plantations species. This has been a result of limited knowledge or inadequate promotion and awareness creation on lesser-used tree species and non-wood forest products and services (Wells and Wall, 2005).

The other problem is that the sawnwood production is dominated by small sawmills, which can only handle medium size logs of 20 - 35 cm diameter. The major causes of this situation are related to managerial, financial and technical aspects. However, in most cases, financial problems obscure other problems. However and under such circumstances financial support alone will not help in the improvement of wood industries operations; the problems need critical analysis and solutions be applied consecutively (MNRT, 2005).

There is also limited knowledge on markets by local and international producers and inadequate marketing skills (MNRT, 2008). Among forest industries in the country sawnwood production (saw milling and pit sawing combined) has the biggest share of the capacity standing at more than 71% followed by pulp and paper production having a share of 21% and the rest are wood based products, joinery and furniture (MNRT, 2000).

2.2.3 Factors influencing sawnwood demand-supply situation in Tanzania

There are a range of factors that influence demand for wood and wood products. These include, the price of the products themselves; the price of substitute products; population and income levels; and trends in consumer preferences (FAO, 1999). In addition to these factors, most forest products are intermediate goods. They are used in other industrial processes or commercial activities (e.g. construction), such that technological changes in these processing or end-use sectors can have a major impact on the demand for forest products through the efficiency with which they are transformed into other products (FAO, 1999).

Global demand for industrial wood and wood products is expected to increase by 25% to 1.90 billion m³ approximately per year by 2010 (FAO, 2004). The most important industrial wood product is sawnwood which is mainly used in construction, joinery and furniture making and packaging. The end sectors as well as the use per capita sawnwood are increasing and therefore the sawnwood demand is increasing (TFAP, 1998). Almost half of the total demand is presently met by pit-sawyers but, their role is gradually being replaced by industrial production. In Tanzania the projected demand of wood product is average as follows;

Table 1: Projected demand of wood products in Tanzania ('000 m³)

Product	Year		
	1998	2003	2008
Sawnwood	270	320	380
Wood based panels	20	26	33
Paper and boards	40	55	75
Pulp	52	73	92

Source: TFAP (1998)

2.2.3.1 Population growth

In recent years, the demand for forest products have been growing, as the population levels are increasingly high (FAO, 1999). The increasing population combined with slow economic growth increases, places a high demand on, among other things, forest products and services (FAO, 1998). Population factors impinge on development and the welfare of individuals, families, and communities at the micro level, and the district, regional and the national level as whole at the macro level by tending to increase outlays on private and public consumption (URT, 1992). People have different needs for their various development activities. These different development activities become the basis for demand of particular items, and to accomplish their demand levels, their economic activities become the basis that facilitates their purchasing powers. With population growth, the forests are to succumb to enormous pressure from expansion of agricultural activities, livestock grazing, fires, charcoal burning and other human activities.

Population and income growth may not only affect the demand for forest products, but may also effect the supply of wood raw materials. For example, increasing population density increases the pressure of converting forestland into other uses and higher incomes tend to result into higher demands for environmental services from forests (FAO, 1999). Thus, the changes outlined above are likely to put pressure on forest resources both in terms of the wood goods and services that they will be expected to produce (which may consequently reduce their availability for timber supply).

2.2.3.2 Resource availability for sawnwood manufacturing

The supply of raw materials for the forest industry is becoming very uncertain, as the actual resource base is not well known. The development of forest industry and products are one of the primary obligations of the forest sector (MNRT, 1998). This can be accomplished by guaranteeing long - term availability of the raw materials for the industry among others. The use of wood products in the future will continue to be challenged by substitute products from the metals, plastics, agricultural, cement, and chemical industries. A correlation between increasing incomes and preferences for environmentally friendly products and outcomes suggests a future of increasingly complex interplay in the demands placed on forests and the relative acceptability to consumers of forest products and competing non-forest substitutes (FAO, 1999).

In Tanzania, there are two sources of wood. These are natural forests and industrial plantations. Most of the wood is cut from natural forests in pole form for construction, charcoal production and fuel wood and the rest being cut for sawnwood production through pit sawing (FAO, 1998). The role of the plantations in supplying wood to the towns has increased dramatically, while the role of the natural forest has diminished. Maintaining the supply of wood from the plantations is of critical importance for the provision of affordable timber to urban households, as well as for the attainment of other development objectives such as relieving pressure on the indigenous forest and supplying raw materials for the development of wood industries (Wells and Wall, 2005). In rural communities, harvesting in natural forests and plantations for timber has been driven by needs to make tools and handles, furniture, build boats, and many construction works. Also Lack of employment opportunities outside agricultural and

livestock production as common ventures in the rural areas, intensifies dependency on forests for livelihood of ever - growing human population and more serious encroachments for production of food and cash crops (FAO, 1999). However, of late, there is growing pressure to conserve these ecosystems for biodiversity and other utilities. These are two competing ends and the chances are that wood industries stand to lose the game.

Despite the protected status, supply potentials from natural forests for industrial round wood are constrained by various circumstances and the main ones are: high demand for few species both for wood fuel, sawnwood and other uses (FBD, 2000). The supply network for plantation softwood, whether hand or machine sawn, is very much simpler than that of hardwood from the natural forest, with greater integration between functions, a more concentrated source and absence of intermediate trading (Wells and Wall, 2005). This, together with a clearly demarcated and densely distributed tree resource, makes the regulation of harvesting and collection of fees much more straightforward (Wells and Wall, 2005). However for survival, improved technology and management techniques are necessary and in some areas the numbers of sawmills are too high. And, as earlier indicated, farmlands are increasingly becoming source of raw materials.

Further more, the industrial plantations, dominated by softwoods especially pines and eucalyptus are the main source of round wood in the form of saw logs, pulpwood and transmission pole (MNRT, 2000). Cypress species also occupied a reasonable proportion of the industrial plantations but, their share has been considerably reduced by the emergence of aphids (*cupressii cinara*). While most plantation wood end up in wood industries, a majority of people living adjacent to these forests are increasingly benefiting

from them as a source of fuel wood and semi-processed construction material (Wells and Wall, 2005).

2.2.3.3 Increase in income

The Gross Domestic Product (GDP) measures the economy. The GDP is commonly used to measure the economy and economic growth (Braguinsky, 2005). This is a measure of all products and services produced in a country (CIA, 2006), and which is also known as income or wealth (Whiteman *et al.*, 1999). It can be used along with other variables like infant mortality rate, freedom and literacy, to give a reasonable picture of national wealth and progress. Though it is the best measure of aggregate economic activity that is available, there are some measurements that make economic growth often underestimated. GDP only measures products and services that are bought or sold, but does not take into account things that are bartered or traded with neighbors, or friends (Doepke, 2003). Such an economic activity that is not reported to the government was termed as an underground economy (Braguinsky, 2005; Doepke, 2003).

People who work for cash but do not report this income are part of the underground economy. Other activities not considered by GDP for measurement include subsistence farming, household production of meals cooked, caretaking, and related activities, which are certainly valuable and externalities which include pollution from factories (Braguinsky, 2005). GDP does not account for changes in quality of products. For example, when computers become more powerful, they are still counted as the same product, even though they can work better. Thus economic growth is often underestimated (Doepke, 2003). The underground economy could be as large as the officially measured economy in some countries (USAIDS, 2006).

Globally there are sharp contrasts in world GDP distribution. About 80% of world GDP is shared among only 29 countries, which have a low share of the world population of 20%. In contrast to this distribution, the Asian and other less developed countries, which have 80% of the world population, share only the remaining 20% of world GDP among themselves. Despite the poor distribution of world GDP, many less developed countries are expected to have their GDP growths at over 3% per annum (and some much higher than this), while that of the developed will grow at 2% to 3% in most developed countries. Thus, by 2010, the share of world GDP produced in less developed countries is expected to increase from 20% to around 35% and double the sizes of their economies by year 2010 (FAO, 1999). These developments may have profound effect on the demand for forest products.

2.2.3.4 Employment in sawnwood activities

Sawnwood based enterprises provide direct and indirect employment in a variety of ways. In some countries forest industries make up nearly one-fifth of total manufacturing employment. At the same time, many people find work in the forest and wood products industries in both urban and rural areas. Rural small-scale forest industries provide the principal employment for between 20 and 30 percent of the rural labour force in many developing countries (FAO, 1996). A survey of employment in small-scale wood products businesses in six southern African countries found employment in wood products to be growing at 30% a year (FAO, 1996). In Tanzania forests employ officially approximately 1 million mainly rural people and about 5 to 10 times more unofficially (DPG, 2005). Additionally, FBD (2000) reported that wood forest based activities generate employment to over 800 000 people half of them being women. Ensuring an adequate supply of timber is therefore a key factor in sustaining livelihoods and containing poverty. It

is estimated that 1.60 billion people on varying degrees depend on forests for their livelihoods, with 350 million living in or, near dense forests on which they depend “to a high degree, Belcher (2005) and Poschens (1997) estimated that industrial forestry accounted for approximately 1 million full-time equivalent (FTE) jobs in developed countries and 2.70 million FTE jobs in developing countries, while an additional 350 million people are directly dependent on forest resources for subsistence or income. Moreover 1.20 billion people in the developing countries use trees on farms to generate food and cash. It is against this background that trade in forest products and a service is vital for economic growth as well as for safeguarding sustainable livelihoods in rural areas throughout the developing world (www.fao.org/forestry/9608/en).

2.3 Market of Sawnwood Products

2.3.1 Existing market situation of sawnwood in the World

The global value of round wood, sawnwood, pulp and paper, was estimated at approximately US\$150 billion in 2003 (FAO, 2004), with paper accounting for nearly half. Trade in secondary processed wood products added approximately US\$40 billion to the total. The trade in all product categories of tropical timber accounted for only US\$16 billion in 2002 – roughly 10 percent of the total (Ryttonen, 2003). While most of the international trade in forest products takes place between developed countries and rapidly emerging markets such as China and India, exports from developing countries offer much-needed opportunities for income. In 2000, planted forests were estimated to supply about 35 percent of the global industrial wood, with a further increase to 44 percent expected by 2020 (Carle *et al.*, 2002). Much of the wood that is not sourced from plantations is from semi-natural forests, with the share of wood from natural forests in international trade becoming increasingly small despite an increase in the share of tropical round wood in the global market (FAO, 2004).

During the period 1996 to 2010, the annual global industrial forest product production and consumption are projected to increase at the rate of about 2% per year, giving a total increase of 26% over the whole period. Growth in production and consumption in Africa will be slightly less than the global average due to the fact that most forest-based production is for consumption in the domestic markets of producing countries. This may occur for two reasons. Firstly, because countries will continue to develop value-added industries in their own countries (e.g. to process rather than export round wood and pulp); and secondly in the development of significant domestic markets of their own due to strong economic growth export (FAO, 1999).

In many developing countries, domestic forest products trade is important for economic development and the livelihoods of rural communities, even if it may appear to contribute relatively little to the gross national product. However, while FAO and other institutions maintain data on product composition, volume and directions of trade at the international level, data on domestic trade in forest products, including non-wood forest products, and on trade between neighboring countries are rarely available, and most of the existing statistics take mostly timber into account. Thus, despite the importance of domestic trade, its specific impact on forest management has rarely been analysed.

International trade in non-wood forest products, (NWFP's) is very limited, but it is likely that these products will continue to have an important role in rural income through trade in well-established local markets. It is estimated that over 80 percent of the rural poor depend on NWFP's for subsistence (FAO, 2004).

2.3.2 Existing market situation of sawnwood in Tanzania

In recent years, the demand for sawnwood products has been growing, as the population levels increase (FAO, 1999). Most of the mills in Tanzania have been producing for the local market. The growth and sustainability of sawnwood industries in Tanzania is influenced by factors that include type and distribution of forest resources and local demand transportation system (Shayo, 2004). Markets for softwood has been expanded; recent trends indicate that the export of softwood timber is increasing (FOSA, 2003).

Despite the high prices, Tanzanian wood commands high demands internationally. Attempts have been made to secure export market but mostly hardwood fetched good market abroad. For example there is a large internal demand for tropical timber in china, thus have now increased demand for local and export market (MNRT, 2000). It is important to bear in mind that costs are not merely affecting local trade but also supply and demand of imports and exports (Milner *et al.*, 2001). In the context of Tanzania markets for her wood products, there are exports of the products to various countries in the world prominently to Asian countries of India, Indonesia, China, United Arab Emirates and European countries and in the Africa region (FAOSTAT, 2007).

However transport problems present major impediments to improved processing and marketing of wood, both for the domestic and export markets (MNRT, 2000, Delgado 1995). Pedersen (2003) agrees that despite years of development and liberalisation efforts, transportation systems are still underdeveloped and present a major constraint for trade in Sub-Saharan Africa, Sawnwood must often be transported over long distances from the isolated forests to ports or major population centers. A common argument in favour of infrastructure development is that trade liberalisation policies would yield much greater responses if aided by investments in infrastructure which would, first of all, decrease the

transportation costs and, secondly, integrate the currently isolated households (Key *et al.*, 2000; Heltberg and Tarp, 2002). In many cases the transportation costs actually represent a greater implicit tax to the exporters than explicit distortions (trade policy) at the macro level.

Due to trade liberalization, wood products are now imported in the country and these products like plywood and furniture are of higher quality compared to those produced in Tanzania (Msuya *et al.*, 2006). There is need to improve product qualities in order to compete in the market. This also necessitates improvement of the quality of raw materials.

2.3.2 Policies and regulations governing trade in sawnwood

The forest policy of 1998 has the objective of enhancing the contribution of the forestry sectors in poverty reduction and thereby improving the economic development of Tanzania, and the conservation and management of natural resources for both the present and future generations (MNRT, 1998). The policy instructed that trade in wood offers considerable potential for increased economic development through income and employment generation as well as export earnings. Main legal instruments supporting forest trade include: the Forest Act No. 14 of 2002; the Forest Act Regulations of 2004. Also the Forest Act empowers Local Authorities to license timber extraction in Local Authority forest reserves, while Central Government is empowered to license timber extraction from Territorial forest reserves and unreserved land.

Sawnwood business is regulated by most of the policy instruments. In implementation of these policy instruments, Government notice No. 69 and 70 of forest product harvesting (URT, 2007a) and new royalty rates for forest product from Government notice No. 231 (URT, 2007b), are mainly used by all the traders. But tree products trade can create

opportunities for corruption if law enforcement is not done properly (Nshubemuki *et al.*, 2006).

This policy instruments governs procedure of sawnwood business and government revenue collection processes of forest product and involves registration of traders, licensing, assessment and the actual collection, accounting and reporting both for Forest and Beekeeping or Local Government Authorities (Savcor, 2005). Anyone wishing to participate in forest products business in Tanzania must first be registered and pay a fee (Wells and Wall, 2005). Certificate of Registration is compulsory for any one engaged in forest product trade as stated by Forest act 2002 (MNRT, 2002). This is one year certificate that is issued in July and expires end of June the following year. After registering, a license is required to fell trees and royalty has to be paid on the standing volume. Traders dealing with sawnwood are also required to pay annual registration fees to the Ministry of Natural Resources and Tourism in addition to business license to local authorities.

Licenses and permits govern the legal harvest, transport, sale and export of sawnwood products in Tanzania (MNRT, 2002). Licenses for harvesting and transporting forest products are normally issued by authorized forest officers (Kaale, 2004). Forest and Beekeeping Division is responsible to license trees, timber, logs and poles from natural forest and plantations. The procedure of licensing in natural forest is different from forest plantation (MNRT, 2002).

Transit passes (TP) are provided to allow transport of sawnwood product from harvesting site to storage or business town. Licensee has to apply Transit pass before the expiry of the license (MNRT, 2002). Transit passes were introduced for control but their use is not

enforced effectively, for example Transit Passes issued in some regions indicated some volumes obtained from respective licenses without proof of any surcharges (MNRT, 2002). TP's are to be used within a region for one month and being checked to every checkpoint during transporting forest produces.

Check points are purposely established by Forestry and Beekeeping Division at strategic location. These are established along the roads to check and control movement of forest produce from production area to the markets. Sawnwood traders have to stop at each check point and have forest produce checked for illegality and the Transit Passes endorsed. Despite a number of checkpoints along the all major roads entering Dar es Salaam, still a lot of illegal forest products coming from as far Lindi, Tabora, Iringa and Morogoro regions are encountered (Savcor, 2005). Also due to shortage of forestry revenue collectors, Milledge and Kaale (2004) indicated that sawnwood revenue in the coast regions of Tanzania is only collected if harvesters and transporters of sawnwood products happen to pass at natural resource checkpoints. Since many traders however bypass the checkpoints, a significant amount of revenue is lost (Milledge and Kaale, 2004). Also some check points do not keep any records for monitoring. For example few consignments may be recorded to in the check points register and sometimes all the recorded are illegal. In other cases cheating of forest produces dealers made the check points useless. For example having forging registration and sawnwood hidden in the agricultural products (Savcor, 2005).

The forest produce dealers are required by law to maintain stock register, keep copies of licenses, Exchange Receipt Vouchers (ERV), Transit Passes (TP) and when sales take place, they are required to enter details regarding quantity sold and keep record properly for inspection. But Very few forest produce dealers keep and maintain such a register.

Lastly, Reporting is done every month by the forest plantation managers and other Government officials to Ministry of Natural Resource and Tourism all licenses issued for harvesting.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Mufindi District, Arusha Municipality and Dar-es-Salaam City. These sites were selected because of their close market relationship and the volume of sawnwood traded. Mufindi District is treated as the supply side (producer market). The District has a large area of forest reserves and many forest resources where forest produce are harvested. On demand side, Arusha Municipality and Dar-es-salaam City represent some of the major markets (consumer market) of sawnwood product. These are major towns and most populated in the country. According to Tanzanian Population and Housing Census of 2002, Dar es Salaam comprises 53% of the total urban population in Tanzania followed by Arusha which has 6% (URT, 2003a). These scenarios imply an increase in the demand of sawnwood products for building and construction, joinery, furniture making and packing.

3.1.2 Dar es Salaam city

Dar es Salaam City is located at an altitude of about 14 m above sea level (URT, 2003b). The city shares border with Indian Ocean on the east and surrounded by the Coast Region on northwest. Dar es Salaam has a coastal climate typical of equatorial regions, characterised as hot and humid, with small seasonal and daily variations in temperature.

The city has a total land area of 1350 km². The rainfall regime is bimodal with two rainy seasons and two dry seasons, in which monthly average rainfall is about 250 mm. Dar es Salaam is a commercial city, with 80% of the residents engaged in non - agricultural production. Most Dar es Salaam city dwellers are employed workers, and business persons who are permanently or temporarily living in the city. The city is highly populated with a population of 2.5 million according to 2002 Census (URT, 2003a), and inhabited by people of different ethnic groups from different parts of the country who have migrated to the area.

3.1.3 Mufindi district

Mufindi district is one of the 7 districts in Iringa Region of Tanzania. It is located at longitudes 30° - 36° E, and latitudes 8° - 9° S. The district covers an area of 7 122 km², with the altitude varying from 800 to 2 200 meters above sea level. It is generally mountainous with one of the coolest and rainiest climate in Tanzania. The climate of the district varies with altitude which can be distinguished as highland and lowland. The temperatures vary from 13.2° C in July to mean monthly maximum of 18 ° C in November. Rainfall ranges from 950 - 1600 mm. The district population is estimated at 282 071 (URT, 2003a). The main economic activity in the Mufindi district is agriculture, which employs more than 90% of the population. Other activities of economic importance are livestock keeping and forestry. There are wood related manufacturing industries in the district, of which the most important ones being Mufindi Paper Mill, Sao Hill Industries, Mufindi Wood Pole Plant and Timber, and Wood Works, and other small processing units (URT, 2006).

3.1.4 Arusha municipality

Arusha municipality is located between longitudes 34° 20' S to 36° 4' E on the southern slopes of Meru Mountain. Arusha's elevation of 1400 m on the southern slopes of Mount

Meru keeps temperatures down and alleviates humidity. It has an average rainfall of about 500 to 1100 mm per annum. The average temperature is around 25°C. The Municipality is rapidly expanding with a population of 270 485 according to 2002 population centres (URT, 2003a). The rapid growth of the population has made Arusha become the commercial area, and inhabited by people of different ethnic groups from different parts of the country and nearby countries like Kenya who have migrated to the area. Most of this people rely on non-agricultural activities. In saying so, several industries for various products including saw mills, fibre products and flower farming, several tourists' hotels, banking and shops stimulate the business activities of the municipality (URT, [2008](#)).

3.2 Data Collection

3.2.1 Research design

A cross sectional research design was used in this study. Cross sectional data was collected from participants and transactions at production to consumption levels. The population of interest constituted sawnwood producers and traders in Mufindi District, Arusha Municipality and Dar es Salaam City. In Dar es Salaam, various markets with stake in the trade of sawnwood from Ilala, Kinondoni and Temeke Municipalities were visited and data on sawnwood consumption from timber yards was collected.

3.2.2 Sampling procedure

In this study, the target population was all sawnwood marketing chain actors from production to end use manufacturers. Spot survey procedure was used in this study to obtaining the market information. The procedure has been used by other researchers elsewhere (Ngaga, 1998 and Openshaw, 1971). The procedure is considered to be one of the most effective in obtaining market information since the survey is done on the spot. A list of

producers, traders, transporters and end use manufacturers were first requested from village, district, municipal and city authorities.

A sample of 55 sawnwood producers of which 36 were from Sao Hill Forest Plantation and 19 from private woodlots from different villages in Mufindi District, Iringa Region was drawn from the requested list. The list of producers involved saw millers in the study area. On the other hand a sample of 130 sawnwood traders of which 13 from Iringa District, 11 from Kibaha District, 6 from Kilimanjaro Municipality, 51 from Arusha Municipal and 49 from Dar es Salaam City was drawn from the given list by authorities. The list also included timber yards or trading sites. A total of 50 end use manufacturers were surveyed in the study areas out of which 35 came from Dar es Salaam city, 12 from Arusha Municipality and three from Kibaha District. The list also involved carpenters, contractors and public organization sector. Lastly, a total of 15 transporters were interviewed from the visited areas. So a total of 270 respondents were interviewed in the study areas.

3.3 Data Collection Methods

This study aimed at assessing marketing chain characteristics and their influence on sawnwood marketing. Two types of data were collected. These included primary and secondary data. Primary data collection was done by using reconnaissance survey, questionnaire survey and participant observation. Secondary data collection was mainly done through documentary reviews.

3.3.1 Primary data collection

Primary data on marketing chain of sawnwood were collected in the selected district, municipality and the city using reconnaissance survey questionnaire survey and participant observation.

3.3.1.1 Reconnaissance survey

Reconnaissance survey was conducted so as to provide a general picture of the research area. The aim was to identify the location of the research sites and size of sawnwood producers, traders and end use manufactures. Pre - testing of the questionnaire was done in order to verify if questions could be understood and to check if they address matters under investigation.

3.3.1.2 Questionnaire survey

A mixture of open and closed - ended questions was used. The design of the questionnaires was such that they allowed acquisition of both quantitative and qualitative information. Four types of questionnaires were designed, and administered to four target groups (Appendices1-4): producers, traders, transporters and end use manufacturers from which stakeholders were interviewed to end up with a data matrix that was analyzed statistically. The data collected included the information on distribution channels and their problems, prices, costs, factors affecting sales, consumption, end manufacture's preferences, quality and means of communication.

3.3.1.2 Direct observation

Supplementary information was collected through personal observation in the field and in the market for the purpose of cross - checking some of the information obtained from questionnaire survey. The information focused such as sawnwood production, handling, storage, packing and means of transport used.

3.3.2 Secondary data collection

Secondary data was obtained by reviewing relevant documents like publications, journals and books. Some information was obtained from Mufindi District, Sao Hill Forest Plantations, Arusha Municipality and Dar-es-Salaam City offices and Forestry and

Beekeeping Division (FBD). Secondary data were collected so as to form an overview of what has been done in relation to the study, and identify gaps in the available information.

3.4 Data Analysis

The components of verbal discussion were analyzed in detail with the help of content analysis method. Recorded conversations with respondents were broken into smallest meaningful units of information or themes and tendencies. This helped in ascertaining values and attitudes of respondents.

Statistical Package for Social Science (SPSS) and Microsoft Excel computer programmes were also used in the data analysis. Quantitative data collected were summarized to ensure that they were suitable for addressing both the objectives and the method of analysis used. This was done while ensuring that original meaning of the statements made by respondents is maintained. The summarized data were then coded and used for subsequent statistical analysis.

3.4.1 Descriptive statistics

The analysis involved the use of statistical means, standard deviation, ranges and frequency distribution to describe general characteristic of the data. The approach was found to be suitable in understanding and evaluating existing sawnwood marketing chain in the study area.

3.4.2 Marketing margin analysis

Market margin refers to the difference between the buying and selling price of a commodity in question. In this study, the marketing margin aimed at making comparison between prices at two different market levels i.e. retailers and wholesalers. The whole sale margin was based

on the difference in prices at production level (ex-mill) and retail margin was based also on differences in prices at retail level.

The general market margin equation for each level is given by

$$MM = SS - BP \dots\dots\dots (i)$$

(i)

MM = Market margin

BP = Buying price for sawnwood in specified level

3.4.3 Buyers concentration index

In sawnwood marketing, number of buyers and producers are suggestive of competitive conditions, and therefore the main focus in analysing market structure is on the number and size of market participants (degree of concentration). If at any point in the marketing chain, only one or few buyers dominate the market, uncompetitive behavior is possible. Sellers and buyers concentration ratio indices are a common measure for market structure (Caves, 1992). In this study only buyers /traders concentration index has been examined because of its influence to the chain in the market.

The buyers' concentration index is calculated by the formula

$$C = (XP/IP) * 100 \dots\dots\dots (ii)$$

Where;

C = Index of concentration

XP = aggregate number of output for few large buyers in the market

IP = Total number of output of the buyers' in the market

Where as a concentration ratio of over 50% is both an indicator of high buyers' concentration and strong oligopolistic industry, that of between 35 - 50% is both an indicator of moderate buyers' concentration weak oligopolistic, and less than that it is uncontrolled industry (Kohls and Uhl, 1990).

To obtain the output in volumetric terms for the largest few sawnwood buyers/traders, the respondents were divided into two groups. The first group comprised respondents whose volume handled was above the sample mean, and the second group comprised respondents whose volumes were less than the sample mean. The mean for the first group was calculated and those above the mean were taken as a few largest buyers/traders in the marketing system.

3.5 Limitation of the Study

Some limitations encountered during this study include the following;

- Most of the interviewees had no records of data for their business. A few of them had managed to keep records for a short period of not more than a year. Most of the information they had was based on memory and some of them were not willing to release such information as they claimed that business owners were not around and hence they were not allowed to release information. It took some time to explain to respondents about the objective of this study so as to make them give out their business information they had and to give out what they knew or remembered about their business. Some times some questions were repeated in order to capture missed or suspicious responses.
- Secondary data on sawnwood marketing especially those concerning quantity of sawnwood transported, sold and consumed in Tanzania was too limited. Most of the reviewed literature did not have sufficient information concerning the actual marketing situation. Much time and efforts were used to find and review different relevant documents so as to get the needed information.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Sawnwood Production at Mufindi District

Sawnwood is mostly produced at the Sao Hill Forest Plantation (SHFP) and small quantities are produced by small private woodlots in the villages around the plantation in Mufindi District, Iringa. Table 2 shows that there was an increase in standing volume for sawnwood production from 155 048 m³ in 2000 to 432 228 m³ in 2008. For 2009 about 930 559 m³ were scaled at SHFP in all divisions for harvesting. The increase was due to the facts that, population increase necessitated increase in demand of sawnwood product for different purposes. Wells and Wall (2005) revealed that the majority of households depend upon sawnwood to meet their requirements for shelter (roofing, doors, windows, scaffolding) and basic household furniture.

At the same time, many people find work in the forest and wood products industries in both urban and rural areas. Moreover, due to increased deforestation rate, the government controls harvesting of natural forests of which a few species exist. Such situation has lead to people's change of wood preferences whereby soft wood is being used as alternative so as to satisfy their human needs. Harvesting is mainly done by customers in what is known as '*customers own logging*'.

On the other hand, there are private woodlots around the study area producing sawnwood. These individual woodlots are small in size ranging between 0.1 to 66 ha. During the

study, it was also revealed that most of them produce between 50 m³ to 650 m³ of sawnwood per annum.

Table 2: Areas allocated for harvesting at of Sao Hill Forest Plantations from 2000 – 2008 in Mufindi District

Year	Area Allocated(Ha)	Volume (m ³)
2000/2001	673.10	155 048.00
2001/2002	462.63	122 165.95
2002/2003	685.40	216 947.00
2003/2004	636.30	222 721.02
2004/2005	866.60	303 313.10
2005/2006	1 280.00	447 500.00
2006/2007	1 614.90	645 990.00
2007/2008	1 080.00	432 228.00

Source; SHFP (2008)

4.2 Characteristics of the Respondents

4.2.1 Producers of sawnwood

Results indicate that, majority of the producers (49%) were operating in Sao Hill Forest Plantation (SHFP), while private woodlots contributed 35% (Table 3). Only 16 %were producing from both SHFP and private woodlots. This shows that SHFP is the major source of sawnwood to both domestic and export market. SHFP is the largest government forest plantation; there is an assurance of availability of resources throughout the year. Therefore such an advantage has made it possible to accommodate most of the producers. This was also confirmed by the increased number of registered producers at SHFP from 302 in 2007/2008 to 374 in 2008/2009 (MNRT, 2008b).

Further more the results show that the number of stakeholders involved in the production of sawnwood at Sao Hill Forest Plantation are categorized into large producers (1%),

medium producers (18%) and small producers (81%) (Fig.2). Large scale producers are the ones who receive a large portion of the area allocated for sawnwood production which is greater than 10 000 m³ per year. This is done by signing a contract with the Government of harvesting the allocated area. This also means that they have a large capital which enables them to utilize effectively the area allocated. The large scale producers who have large industries for sawnwood production include Mufindi Paper Mill which is allocated up to 200 000 m³ per year, Sao Hill Industries allocated up to 250 000 m³ per year, Mufindi Wood Pole Plant and Timber Ltd allocated up to 33 000 m³ per year (MNRT, 2008b). In 2008/2009, it was found out that, the Sao Hill Industries received 150 000 m³ of roundwood which was 16 % of the whole area allocated for harvesting in that year. Producers in this category include Government industries, Sao Hill Industries and Mufindi Wood Plant and Poles.

Table 3: Location of Producers of roundwood at Mafinga, Tanzania

Producers	No. of respondents	Percentage
Sao Hill Forest Plantation	27	49.0
Private woodlots	19	35.0
Both	9	16.0
Total	55	100.0

The number of the middle scale producers is more than that of the large scale producers. In this category, producers also receive a relatively large allocation of up to 10 000 m³ of roundwood per year according to their mills capacity and their previous records at Sao Hill Forest Plantation. There are two groups of the producers in this category. The first group is that of producers with medium capital and have stationary sawmills for sawnwood production capable of utilizing the allocated area. Another group involves villages around Sao Hill Forest Plantation. The villages surrounding the forest plantation are considered in the allocation due to their influence in the conservation of the SHFP. It was revealed that in

2008/2009, 47.9% of the producers were from villages surrounding Sao Hill Forest Plantation (MNRT, 2008c).

The small scale producers are those producing less than 1000 m³ of sawnwood per year. This category has the largest number of members compared to other categories. Most of the participants in this category are those with small capital of not greater than Tshs 10 000 000, hence, they are allocated small areas for sawnwood production. They produce small quantities for a long period of time. The producers in this category use small and local machines in the production of sawnwood, popularly known as mobile machines. In this study, it was found out that more than 70 small scale sawnwood producers with their mobile machines were producing in the forest plantation.

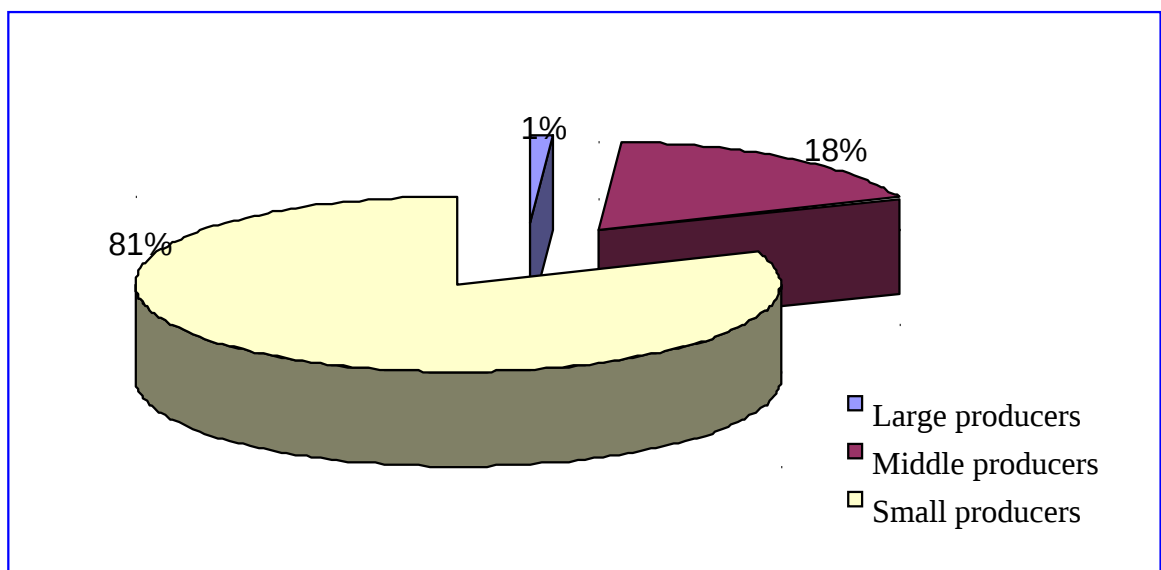


Figure 2: Category of sawnwood producers at Sao Hill Forest Plantation in Mafinga

4.2.2 Sawnwood traders

It was also revealed in the current study that, majority of traders was from Dare es salaam (39%) and Arusha (37%) among the five surveyed regions (Table 4). This could be attributed to the fact that the two regions are major sawnwood market centers for both domestic and export purposes.

There were a few traders of sawnwood from Mafinga in Iringa Region (10%) compared to other surveyed regions. This is because most of them obtain sawnwood from near by villages. In Coast Region, most of the traders were those selling building materials/equipment (Hardware shops). These traders sell sawnwood among other products in their stores. In Moshi Municipality in Kilimanjaro region, very few traders sell sawnwood from Mafinga. It was found out that only 6 timber yards sold sawnwood from Mafinga. Most of them receive sawnwood from home gardens and a few from Rongai and West Kilimanjaro Plantations (Msuya *et al.*, 2006).

Table 4: Surveyed traders of sawnwood product from Dar es Salaam, Arusha, Iringa, Coast and Kilimanjaro Regions

Region	Number of traders	Percentage
Dar es Salaam	51	39.0
Arusha	49	37.0
Iringa	13	10.0
Coast	11	9.0
Kilimanjaro	6	5.0
Total	130	100.0

4.2.3 Sawnwood end use manufactures

Results in Table 5 show that, most of the end use manufactures (52%) were individuals, 34% were private companies and 14% Government Institutions. They mostly consume sawnwood for furniture making and construction purposes. In this study most of the respondents admitted to consume more sawnwood for furniture industry (62 %) than for construction industry (38%). The implication is that, majority of individuals depend upon sawnwood to meet their requirements for basic household furniture making and construction. The quantity of wood used by households in 2008 to meet their demand for furniture making and construction industry was

calculated in relation to population growth. This is due to the fact that both regions have high population with different economic activities. According to the data collected from the interview with enduse manufacturers, it was revealed that in 2008 a total of 37 868 m³ of sawnwood was consumed in Arusha Municipality and 576 267 m³ in Dar es Salaam City.

The 1000 per capital consumption of sawnwood for Arusha Municipality and Dar es Salaam City was 140 and 230 respectively (Appendix 6). This implies that Dar es Salaam city consumed more sawnwood than Arusha municipality. The difference in consumption between the two areas is an indication that there is great timber business taking place in Dar es Salaam than in Arusha.

The relatively higher consumption of sawnwood in Dar es Salaam City can be attributed to the fact that Dar es Salaam City has a population of 2.5 million with growth rate of 4.4% which is higher compared to Arusha Municipality which has the population of 282 712 with growth rate of 5.50% (URT, 2003a). The demand of sawnwood is higher in Dar es Salaam city due to the fact that it has big number of industries followed by Arusha. Arusha Municipality has a total of 5 827 establishments related to manufacturing, building and trade (Machumu, 2008). In addition, Dar es Salaam City has a unique status. It is being a major City of Tanzania and the center of Government administration, industry, commerce and banking activities. In the absence of any reliable official data on the quantities of timber produced or consumed in Tanzania, the information provided by respondents was the main source of data from which an estimate of the

total quantities of timber consumed and the balance between hardwood and softwood could be derived. However this proved extremely difficult as majority of enterprises selling timber are small, do not keep records and have no idea of the quantities of timber traded.

Table 5: Category of sawnwood end use manufactures observed in the study area

Category	No. of Respondents	Percentage
Individuals	26	52.0
Private companies	17	34.0
Government Institutions	7	14.0
Total	50	100.0

4.2.4 Sawnwood transporters at Mafinga town

4.2.4.1 Type of vehicles used in transporting sawnwood

Transporters are facilitators of trade but not traders themselves. They take the goods from one trader to another for an agreed fee which is paid for in cash. The transporters may be part of a large transportation company but most often work on freelance bases driving a hired truck or are paid by the owner to drive goods on demand.

Large trucks like semi trailers were found out to be mostly used in transportation due to their capacity to carry large quantities of sawnwood of different sizes over long distances. This helps them to transport large quantities of sawnwood from 25 m³ to 50 m³ per trip. Table 6 shows that 80% of transporters use trucks in transporting with only 13 % and 7% using Lorries and pickups respectively. The problem with these means of transport is that trucks are not specifically designed for sawnwood transportation. Most of them are used to transport other products like cement to other regions like Mbeya and Ruvuma and on their way back is when they venture into sawnwood transportation. This is with exceptional of

few stakeholders of sawnwood like Sao Hill industries who has the ability to transport sawnwood product they produce to their customers.

Table 6: Type of vehicles used by transporters of sawnwood to different regions

Type of vehicle	No. of Respondents	Percentage
Truck	12	80.0
Lorry	2	13.3
Pick up	1	6.7
Total	15	100.0

4.3 Gender Involvement in Sawnwood Business

4.3.1 Gender aspect of sawnwood producers in the visited area

During the study, it was revealed that 89% of respondents are males while only 11% are females. This suggests that, production activities are gender sensitive, and such a trend could be attributed to nature of activity as it involves several aspects which include staying at production sites for quite some time. These production areas are not conducive to women as they exhibit harsh conditions. Most of the production sites are in remote areas and production is taking place in the forest. In 2008/2009 the production area was 25 km far away from where the villages are. Producers are supposed to have a temporary stay within the production sites to accomplish their activities.

It is also important to know that, sawmilling operations are cumbersome and labour intensive for women to afford. Most of the producers use mobile machines, which need to be shifted now and then. Most of sawmills operators are casual labors who are stubborn and need closer supervision. This is not very easy for women and few of them who were found in the production site are only supervisors.

Sawnwood production is time consuming. It has a lot of processes ranging from tree felling to the point of getting sawnwood. It was revealed that, it takes more than 3 months to finish the allocated volumes. The producer is suppose so stay in the production areas for such a time due to unfaithfulness of assistant workers. This is to say, it is not easy for women to stay in that situation as they have also to take care of the families.

4.3.2 Gender aspect of sawnwood traders from visited area

The results show that, there were sex disparities in sawnwood trading activities in the study areas. It was revealed that, in Arusha Municipality, there were large number of females (35) than in Dar es salaam City and the rest of the regions (Table 7). Where as under normal circumstances, it is expected that sawnwood marketing activities are preferentially done by males, this was proved wrong by Arusha traders. Arusha municipality is a tourist town and developed as a capital city of East Africa where gatherings for local, national and international conference take place. As such so it has created opportunities for most of women to invest in different activities including sawnwood business.

Table 7: Gender aspect of traders of sawnwood product in the study area

Region	No. Male	No. Female	Total
Dar es Salaam	41	8	51
Arusha	16	35	49
Iringa	9	4	13
Kilimanjaro	2	4	6
Coast	8	3	11
Total	76	56	130

4.3.3 Gender aspect of sawnwood transporters from surveyed areas

In the survey carried out, most transporters are males (87%) and only 14% are females (Table 8). This indicates that transportation activity is rather an activity which is mostly

preferred by men. This job is time consuming because it takes from single day to more than two days on the road, so it is not convenient to most of the women who have a lot of family engagements.

Table 8: Sex category distribution of sawnwood transporters observed in surveyed areas

Transporters	No. of Respondents	Percentage
Male	13	86.7
Female	2	13.7
Total	15	100.0

4.4 Marketing and Distribution Practices

4.4.1 Sources of sawnwood traded in Dar es Salaam and Arusha

Results in Table 9 show that, Dar es Salaam and Arusha are the main destinations of the sawnwood from SHFP as revealed by 27% and 32% of respondents respectively. Sao Hill Plantation in Mufindi District is the main source of softwood timber to many places in Tanzania. It is the giant source which supplies mostly pine (Wells and Wall, 2005). However in other regions like Iringa, Kilimanjaro and Coast only a small amount of sawnwood from Sao Hill Plantation is made available. It is also important to note that, there are other places like Kilolo, Makete, Njombe Districts and Mbeya and Ruvuma Regions which supply sawnwood but in small quantities.

Table 9: Sources of sawnwood to different destinations

Region	Sources of timber	Number of Respondents	Percentage
Arusha	SHFP	41	31.5
	SHFP and private woodlots	7	5.3
	private woodlots	3	2.3
Dar es salaam	SHFP	35	26.9
	SHFP and private woodlots	6	4.6
	private woodlots	8	6.2
Iringa	SHFP	2	1.5
	SHFP and private woodlots	3	2.3
	private woodlots	8	6.2
Kilimanjaro	SHFP	5	3.9
	SHFP and private woodlots	1	0.8
	private woodlots	0	0.0
Coast	SHFP	10	7.7
	SHFP and private woodlots	1	7.6
	private woodlots	0	0.0
Total		130	100.0

4.4.2 Marketing chain of sawnwood

4.4.2.1 Sawnwood marketing channels

From the survey carried out, most of producers supply sawnwood to different stakeholders along the chain before reaching end use manufactures. The producers can sell their products either to the traders, middlemen, or hire a truck to take the products directly to the market. The results indicate that, most of the traders (48%) receive sawnwood from the producers (Fig. 3). Traders from different areas have a tendency of communicating directly with producers through cellular phones on availability and price of sawnwood. The traders then orders the amounts of sawnwood needed and the producers prepare the same.

Majority of sawnwood traders (45 %) receive market information from the middlemen. Middlemen are the ones who serve as intermediaries between the producers and the traders.

Middlemen were observed to be the ones who connect producers to sellers and then end use manufacturers. Middlemen are working to facilitate rapid dissemination of large quantities of products to the market. They sell the products to wholesalers or directly to retailers coming from different markets. They first communicate with producers on the availability of sawnwood and its price at a specific time. With this information on hand, traders are informed of availability and prices of the product to be supplied for sale. Later, they buy sawnwood from producers and supply them to traders in different areas at negotiable prices.

Sawnwood trade is dependent upon personal relationships. It was observed that, most of the traders were reluctant to do business with unknown partners. Thus brokers are crucial in several parts of the supply chain to transfer information on quantities and prices, and acting as guarantors of the parties involved in the market. However, something notable for brokers, they do not have sufficient working capital to act as large scale traders, transporting goods to markets but serve as a link between the producers, traders and end use manufacturers for a small commission. Very few traders own their own means of transport; many hire trucks once they have bought the goods. It is pointed out that brokers are needed to link the producers or traders in need of transport to the drivers waiting for sawnwood to be transported (Fig. 3).

It was further observed that, there was a certain percent (5%) of respondents who buy sawnwood product from other traders (Fig. 3). These are normally small scale traders who have small capital, hence unable to travel and or to place sizeable orders of sawnwood from producers or middlemen. Interestingly, it was also found out that, 2% of traders were producers at the same time. This type of traders produces sawnwood from their own woodlots or government plantation and transport to their marketing areas for selling to end

use manufacturers. However, this category has few numbers of traders because it involves woodlot ownership, large capital and time to excel.

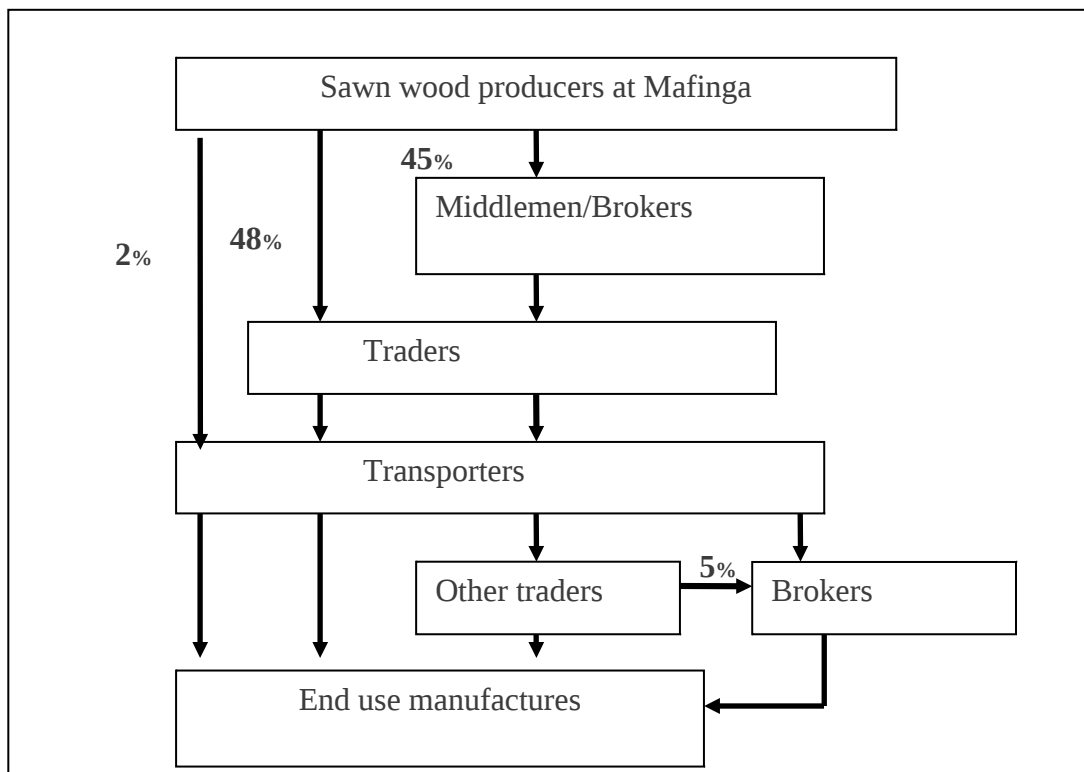


Figure 3: Systematic representation of existing marketing chain of sawnwood observed in the study area

4.4.2.2 Drivers of engagement in sawnwood business by producers, traders and end use manufactures

According to the findings, there were several reasons for some respondents to engage themselves in sawnwood marketing activities. Income generating activity (98%) was the major reason, as population increase creates high demand of sawnwood for different development activities like construction and furniture making. This comes as a result of the essential social services, such as education, health, water, transport and housing. The quantity of wood used by households in 2007 to meet their demand for furniture making was calculated from data on household expenditure on furniture in the Household Budget Survey (URT, 2007c) adjusted for population growth and inflation.

On the other side, sawnwood business creates employment to both urban and rural population. Increasing participation in sawnwood business is one of the measures of increasing income of the majority of the people which lead to reduction of poverty and increase economic growth (URT, 2007c). The national informal sector survey (URT, 1991) found 157 168 people working in the wood products sector, 116 634 in rural areas and 40 534 in the towns.

Some respondents claimed that; supply of sawnwood help them to create opportunities for diversifying business. For example, some of the traders with hardware shops (selling building materials), engaged in sawnwood business so as to create an opportunity for consumers to get all products at the same point. This was quite observable in Coast Region.

4.5 Factors Affecting Marketing Chain of Sawnwood

4.5.1 Distance from sawnwood production to the marketing sites

It was found out in this study that different factors affect the whole chain of marketing sawnwood products. Distance from production to the marketing sites was the factor explained by most of the respondents (Table 10). In 2008/2009 the area allocated for sawnwood production at SHFP was far from places where producers could get both customers and transport facilities. As it was revealed by 96% of the producers, production site was located at Kilosa – Mufindi, about 25 km from Mtikilwa (the nearby village from production site) and 70 km from Mafinga Township. Such a situation necessitates producers to produce and use local transport facilities (small pick ups and Lorries) which can reach remote areas to take sawnwood to the markets. As such, costs (in terms of time and transport charge) rise up.

About 78 % of the interviewed traders, revealed that the distance from where they get sawnwood (Mafinga) to marketing places was too far. They gave an example of more than 500 km from Dar es Salaam and more than 1000 km from Arusha (Table 11). This has implication on costs of transporting sawnwood. It was further noted that, the average transport cost of sawnwood is Tshs 63 750 and Tshs 85 000 per m³ from Mafinga town to Dar es Salaam city and Arusha municipality respectively. The total transport fee depends on the distance and condition of the road (Eskola, 2005). This lead to the increase in cost of sawnwood to the market places as it was revealed by 64% of producers, 74% of traders and 84% of end use manufacturers.

Table 10: Responses on factors affecting marketing chain of sawnwood

Factors	Producers	Traders	End use manufactures
	Percentage	Percentage	Percentage

Originality/distance	96.0	78.0	55.0
Poor infrastructure	84.0	74.0	64.0
Poor quality of sawnwood	80.0	83.0	62.0
Seasonality	84.0	60.0	65.0
Drivers in sawnwood consumption	75.0	87.0	0.0

4.5.2 Inadequate physical infrastructure

The study found out that, 84% of the interviewed producers admitted to face difficulties in the transportation of sawnwood from production site to the market. This is due to fact that roads within the production sites are not well maintained. Most of the roads in production sites are feeder roads, which at their current state are in poor condition. Poor feeder roads hinder producers from easily accessing the markets hence leaving them with very little choice. Poor infrastructure leads to increased cost of transportation and market delays, hence decreasing profits (Eskola, 2005). This was also indicated by traders (74%) and end use manufacturers (64%). Kaleshu (2000) points out that those improving feeder roads provide wide ranging welfare benefits in forms of more reliable supply at the market and better choice of livelihood strategy.

4.5.3 Quality of sawnwood produced

Another factor indicated by the respondents was poor quality of sawnwood produced from SHFP (Table 10). The reason for this was that, some areas allocated for production did not have good trees as most of them had burnt by fire in the past years. About 80% of producers, 83% of traders and 62% of end use manufacturers claimed that sawnwood produced from that area was of low quality. The products were easily bending. A lot of rejects were found out when producers and market places were visited. The other contributing factor for the low quality of sawnwood is that in most of the private woodlots the harvested trees were undersize and immature.

4.5.4 Seasonality in sawnwood business

It was also revealed that, there is high demand of sawnwood products almost throughout the year with an exception of a few months. Producers are licensed to produce for one year. Each year, production usually begins in July and end up in June. About 84 % of the interviewed producers claimed undertake production activities during rainy season, production was halted due to poor infrastructures which become worse in such seasons. Traders (60%) stated that price of sawnwood at production site is high during the rain season due to inaccessibility to the production sites (Table 10). It was also found out that, during rainy season, most of construction activities are stopped, hence affecting the sawnwood business. This is the period when traders receive a few customers.

4.5.5 Drivers in consumption of sawnwood

The findings of this study indicate that, consumption of sawnwood is influenced by several factors. These include ready market, increased demand and competition as shown by 75% of producers and 87% of traders (Table 10). Dar es Salaam city and Arusha municipality are the commercial, industrial and tourist places where sawnwood business was found out to flourish (URT, 2003b).

4.6 Development of Chain Strategy in the Marketing of Sawnwood among Chain

Actors

4.6.1 Market actors' relationship

The study revealed that 75% of the sawnwood producers and 92% of traders deliver the product directly to specific customers (Table 11). When asked to give reasons for trading with specific customers, they indicated that, relationship and reliable markets with regular payments were the factors influencing trading with specific customers. According to the respondents, such a relationship developed after trading together for a long period.

The relation they had compliances with partners in trading, facilitate marketing of sawnwood, build trustfulness among trading partners and reduce transaction cost of sawnwood (Pascal, 2006). These findings are similar to those of Abdulai and Delgado (1999) who found that, relationship reduces costs among trade partners. This relationship informs who wants to venture in the marketing of sawnwood because it may take sometimes to get customers. This kind of relationship enabled producers to communicate directly with traders in Arusha and Dar es Salaam to provide information on availability of sawnwood.

Table 11: Market actors' relationship along the chain

Relationship	Producers		Traders	
	No of	Percentage	No of	Percentage
	Respondents		Respondents	
Specific customers	42	75	120	92.0
Not specific customers	13	25	10	8.0
Total	55	100	130	100.0

4.6.3 Sawnwood quality attributes

According to the market respondents, quality attributes was stated in terms of wood size, knots and straightness. The distribution of respondents according to their quality criteria is presented in Table 12. Producers (55 %) claimed to produce sawnwood of good quality so as to meet needs of their customers. Some producers claimed to face the problem of being allocated to areas (Kilosa - Mufindi) with poor trees for sawnwood production. Such trees were not suitable for quality sawnwood production.

Traders also described quality attributes according to their customers' needs. About 39 % of visited traders reported to supply to their customers sawnwood of good quality. However, they noted that, sometimes they face the problem of getting poor sawnwood from

producers. During the study, some rejects of sawnwood were found out in some visited timber yards. These included sawnwood which were of undersize and were easily bending. When asked about the size, they claimed that sawnwood with size up to 3m long was most preferred by customers. The implication is that if the wood is undersize, it is difficult to get customers.

Table 12: Sawnwood quality attributes

Category	Good size, no knots and straight % of respondents	Moderate size, few or no knots and straight % of respondents	Under size, a lot of knots and not straight % of respondents	Total
Producers	55	36	9	100
Traders	39	35	26	100
End use manufactures	50	30	20	50

4.6.5 Sawnwood marketing information sources

Market information is one of the essential factors in enabling marketing of sawnwood. The study revealed that 53% of the producers received information from traders and other producers (Table 13). This shows that there is a good link between traders and producers in the marketing processes. On other hand, 58% of traders receive information from end use manufacturers. It was noted that through phone calls and good relationship among members, the market information is transferred easily between and among business members.

Table 13: Response by producers and traders of sawnwood on sources of marketing information

Sources of Marketing	Producers	Traders
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information	No of Respondent s	%	No of Respondent s	%
End use manufactures	15	27.0	75	58.0
Traders and Other producers	29	53.0	30	23.0
Middle men	11	20.0	25	19.0
Total	55	100.0	130	100.0

4.6.6 Problem faced by sawnwood marketing agents along the chain

According to the results, 49% of respondents indicated that an increase in price of raw materials was the major problem they faced (Table 14). This is because since 2006, prices of standing trees have increased by 500% (URT, 2007a). This situation has influenced the increase in price of sawnwood available in the market. Most of stakeholders (23%) reported to have little entrepreneurial skills (Table 15). They were just using experience in marketing. Poor infrastructure was found out to be another problem reported by the respondents (17%) in transporting sawnwood from producers to customers especially during rain season.

Table 14: Responses by producers and traders on major problems faced by marketing agents along the chain

Problem	No of Respondents	Percentage
High price of the raw material	90	49.0
Marketing system	44	23.0
Infrastructure	31	17.0
Seasonality	20	11.0
Total	185	100.0

4.7 Sawnwood Price Mechanism

4.7.1 Price setting

One of the most difficult but most important aspect of marketing product effectively is setting the price correctly to ensure that it is proportional to meet expenses incurred (Eskola, 2005). The price set should also allow business to grow without compromising consumers expectations. Results have indicated that most producers (51%) and a few

traders (18%) who are actors in the chain, set price through negotiations with their customers (Table 15). With cost-oriented pricing, the producer tries to recover all expenses of bringing the product to the market including labour costs, delivery costs and profit.

On the other hand, most of the producers are price takers because of their limited information on the existing sawnwood markets. Results show that, producers (28%) set price with reference to the existing market price. Nyange *et al.* (2000) and Kitule (1999) found out that producers are mostly price takers because the middlemen have greater power of negotiating for prices and can easily secure means of transport. Similarly, White (1992) found out that, retailers, brokers and distributors have also an interest on how you price your products since it must allow them to make profit while distributing the product. However, it was found out that, price is set by both traders (75%) and producers (18%). The percentage of traders is greater than that of producers because they are normally have prior information on the current supplies and demands of sawnwood in relation to the needs of their customers. It was also revealed that producers (3%) and traders (6%) depend on all both market price and negotiations. In the production and market centres, it was also found out that, there was a difference in price between treated sawnwood and untreated sawnwood. The price of treated sawnwood higher than price untreated sawnwood.

Table 15: Response on sawnwood price setting mechanism along the marketing chain

Price setting mechanism	Producers		Traders	
	No. of	%	No. of	%
	Respondent		Respondent	
	s		s	
Market price	15	28.0	4	3.0
Negotiation	28	51.0	21	16.0
Trader/producer	10	18.0	97	75.0
Market price, Negotiation,				
Trader/producer/consumer	2	3.0	8	6.0
Total	55	100.0	130	100.0

4.7.3 Prices of sawnwood at different market centres (Mafinga to Dar es salaam City and Arusha Municipality)

There was price difference at different levels of market chain from production site to the market destinations where sawnwood were sold. The results show that at production site (Kilosa - Mufindi) the buying price is lower than that of market centers. The results, further show that, at the production areas the average price was Tshs 115 000 per m³ (Table 16). According to producers, prices are determined based on costs incurred in the production process. But in some circumstances a producer may be forced to sell at a price lower than the cost based price in order to maintain his / her market share. For example in a case where the consumer is so weak, the products may have to be sold at a loss (Eskola, 2005).

The price start to increase as sawnwood is transported from production site and reaches other destinations like Mafinga Town where the average price of sawnwood was Tshs 144 000 per m³ which was an increase by 3 % from production site. When the wood is further transported far more, the price increases even more. For instance from Mafinga to Dar es Salaam and Arusha Municipality, the price increase ranges from 18% to 30% (Table 16). The increase in price from one destination to another is due to transport cost, storage, seasonality and demand of sawnwood at that particular time and place. At production site, most of sawnwood produced is sold at whole sale price with an exception of private woodlots. In private woodlots, most of producers sell their sawnwood in retail price. The price depend on size and ranges from Tshs 700 to 2500 per piece. At most of the destinations like Dar es Salaam, Arusha and other places, most of traders sell sawnwood on retail basis. A piece of sawnwood is sold at Tshs 1000 to 10 000 depending on size.

It was also found that prices differ throughout the year following production trends. Prices were high during November to March (rain season) when costs of production are usually high. It was revealed that during the rain season, sawnwood price ranges from Tshs 100 000 to Tshs 180 000 per m³ and after rain season the prices are not so high and usually range from 80 000 and 150 000 at production sites. However, bad weather, condition for sawnwood production, poor infrastructure and availability of customers lowers the quantity of sawnwood produced.

Table 16: Price comparison in different destination from Mafinga to Dar es salaam City and Arusha Municipality

Area	Average buying price per m³ (Tshs)	Price increase	Percentage increase in price
Production site	115,000	0	0.0
Mafinga town	144 000	29 000	3.0
Iringa	170 000	55 000	7.0
Coast	240 000	125 000	17.0
Dar es salaam	250000	135 000	18.0
Kilimanjaro	290 000	175 000	24.0
Arusha	340000	225 000	30.0

4.8 The Roles of Physical- Distribution Decisions in Attracting and Satisfying

Sawnwood Customers

4.8.1 Promotion

Improvement of promotion activities is one of the factors that influence consumers to have a desire to buy sawnwood product as stated by 68% of visited traders. It was revealed that through advertising and visiting the customers of sawnwood to their working places, traders improve market conditions by receiving more orders of sawnwood. Some of the traders in Dar es Salaam city and Arusha municipality advertise on the television and radio stations about availability of sawnwood in their timber yards. Despite the promotion efforts, the current market price of sawnwood seems to hinder traders' efforts.

Good communication among trade partners and improving relationship among themselves in order to capture market was another factor which was reported by 54% of respondents. With good communication, traders sell their products effectively as they promote each others' business.

4.8.2 Value addition, packing and grading

Improvement of the value of the product is another major factor. This was highlighted by both traders (22%) and producers (24%). Value-based descriptions of marketing practices are notably rare in spite of the fact that, ultimately, the buyer is directed by the values that are provided through the physical activities (Eskola, 2005). In the production and market centres, value addition is done through differentiating between treated and untreated sawnwood. The study found that, there was difference in price between treated sawnwood and untreated sawnwood. Treating sawnwood is done in order to protect sawnwood from fungi and insect attack. This can be done by using pressure method and non pressure method like dipping in preservatives (local method) and spraying preservative and diffusible preservative like water borne preservatives (Findlay, 1975). By doing so it adds value to the sawnwood, hence deserving high grade and thus higher prices too. The average price for treated sawnwood is Tshs 180 000 per m³ and that of untreated sawnwood is Tshs 150 000 per m³. In order to win the market, some of the producers treat their sawnwood locally by shallow dipping (Plate 1). Packing is done in such a way that sawnwood are neither bending nor breaking from production areas to the market places (Plate 2).



**Plate 1: Treating sawnwood at production area at Kilosa -Mufindi,
Mufindi District**



**Plate 2: Loading sawnwood at production area at Kilosa -Mufindi,
Mufindi District**

4.8.3 Transportation of sawnwood from production site to the market

Transportation of sawnwood is done by taking the goods from one trader to another for an agreed fee which is paid for in cash. Transporters are facilitators of trade but not traders by themselves. The poor infrastructure in terms of roads, railways and telecommunication has greatly effected on transportation over the years. The transportation system is inadequate and there is lack of resources to maintain or expand the existing roads and railways (Ngaga *et al.*, 2001b). All respondents indicated that transportation costs of sawnwood products are quite high. In addition, some of them pointed out that the distance between the mills and the raw material sources aggravates the situation.

This observation is similar to what is reported in the study by Binomugiz *et al.* (1991) that long distance transport from the roadside to the mills is the major cost item due to high cost of trucks and their maintenance and spare parts. In addition, the Forestry and Beekeeping Division has indicated poor transport and communication infrastructure as well as limited accessibility to and within the plantations as major constraints, which have made all forest management and harvesting operations cumbersome to implement (MNRT, 1998).

However, more common cause of delays is the road blocks by the police. There are several weighting stations along the roads to ensure that trucks are not carrying loads beyond recommended weight. The fine for excessive weight must often be paid by the transporters. Some of the interviewed transporters gave out their personal experience of being attacked by armed bandits who stop the vehicle by blocking the road with either a fallen tree, or nails which may cause a puncture. During the attack the drivers are forced out of the vehicles and the goods transported are stolen. Sometimes the bandits drive away the truck leaving the driver in a remote area.

4.8.4 Sawnwood transport costs

The transporters may be part of a large transportation company but most often they work on freelance bases driving a hired truck or are paid by the owner to drive goods on demand. Goods and routes driven depend on the season. The transporters usually get information about goods to be transported through a broker both in the regions as well as in Dar es Salaam. However the role of the broker can also be fulfilled by the people who are looking for working opportunities to load and offload trucks coming to their market.

The broker knows the local demand for transport services and sells the information to the transporters for 10 percent commission of the transport fee. Dealing with a broker is the safest and often the way of getting goods to transport. The fee for the broker is paid in cash immediately even though the transporters themselves most often do not get paid before the goods are sold at the final destination, and the money is sent back to the producer once the seller's fees and transportation costs have been deducted. Poor road conditions can sometimes stop the trucks completely in rural areas, which again is costly for the driver who has to pay for his accommodation while being stuck.

The driver of the truck often gets a very modest fee as the owner of the truck takes share of the profit. Also the price of fuel has risen in recent years and fluctuations in fuel price means fluctuation in transporters' income. The total transport fee depends on the distance, condition of the road, and a possibility of getting something to ship back on return. For example the distance from Mafinga to Dar es Salaam is more than 600 kilometers and the average transportation fee is Tshs 63 750 per m³ which takes 26 % of the sawnwood price to the market whereas the distance to Arusha is 1000 kilometers but the cost of transport is Tshs 80 000 shillings per m³ due to its distance which counts 25% of the selling price at the Arusha market (Table 17). The full list of current transportation fees is presented in Table 17.

Table 17: Average transport cost to different destination from Mafinga to Dar es salaam City and Arusha Municipality

Place	Average price per m ³	Average transport cost per m ³	% of price that goes to transport
Kilosa Mufindi-	115 000	1 500	1.0
Mtikilwa			
Mtikilwa - Mafinga	144 000	3 250	2.0
Mafinga-Iringa	170 000	8 750	5.0
Mafinga - Coast region	240 000	55 000	23.0
Mafinga-Dar es Salaam	250 000	63 750	26.0
Mafinga-Kilimanjaro	290 000	80 000	28.0
Mafinga-Arusha	340 000	85 000	25.0

4.8.5 Responses on availability of storage facilities

For sawnwood to be of good quality, good storage facility is one of the fundamental requirements. Only 45% of the producers interviewed reported to have storage facilities for sawnwood after production (Table 18). Majority of producers (55%) who do not have storage facility claimed that, it is not easy to prepare storage facility in the plantation because the place is temporal and normally sawnwood are sold just after production (Plate 1). Sometimes producers were supposed to dry and treat sawnwood before selling although they do not have storage facilities. On the other hand all interviewed traders (100%) reported to have sawnwood shelters known as '*timber yards*' which served as storage facilities (Table 18). The shelters help to maintain the quality of sawnwood as they are free from rain and sun damage.



Plate 3: Storage of sawnwood at production area at Kilosa -Mufindi, Mufindi District.

Table 18: Responses by producers and traders on availability of storage facilities

Storage facilities	Producers		Traders	
	No. of Respondents	Percentage	No. of Respondents	Percentage
Availability of storage facilities	25	45.0	130	100.0
Unavailability	30	55.0	0	0.0
Total	55	100.0	130	100.0

4.9 Sawnwood Marketing Margins at Wholesale and Retail Nodes

4.9.1 Wholesale gross margin at production site

The average profit margin of the quantity produced per month was estimated to be Tshs 512 375. Returns per shilling invested was Tshs 3.46 where by returns per m³ produced was Tshs 5 375 and returns per labour days is Tshs 17 379 (Table 19).

Table 19: Whole sale gross margin of sawnwood whole selling at production site (ex-mill), Mafinga, Iringa Region

Parameters per (month)	Parameter's units
Quantity produced in m ³	97

Operation costs per m ³	100 705
Taxes (Tshs) per m ³	20 489
Transport cost per m ³	25 704
Total costs (Tshs) per m ³	146 898
Total costs (Tshs) per quantity produced	14 249 106
Total labour days	30
Average selling price per m ³	152 273
Gross profit (Tshs)	14 770 481
Gross margin (Tshs)	512 375
Returns per labour days(Tshs)	17 379
Returns per quantity produced	5 375
Returns per shilling invested	3.46

The majority of producers were observed to sell their sawnwood product on wholesale basis. This led to gross margin at whole sale node to be high. The reason for this is that, sawnwood product is bought in bulk at production site by most traders. So this minimizes other costs to producers. On the other hand it was found out that returns per shilling invested were found out to be Tshs 3.46 at the wholesale stage which is high (Table 19). This implies that, costs incurred at the wholesale stage are low. This was also proved by other measures of efficiency such as labour.

4.9.2 Gross margin at retail market level

The average profit margin of the quantity bought per month was estimated to be Tshs 310 243. Returns per shilling invested was Tshs 1.2 where by returns per quantity sold was Tshs 43 992 and Returns per labour days is Tshs 10 341 (Table 20).

Table 20: Retail gross margin at retail market site

Parameters per (month)	Unit
Quantity bought	47.7
Average buying price per m ³	197 000
Purchasing cost	9 396 900
Operation costs(Tshs) per m ³	231 109
Taxes(Tshs) per m ³	19 857
Transport cost per m ³	50 857
Total costs(Tshs) per quantity bought	9 304 723
Total labour (days)	30

Average selling price per m ³	245 923
Gross revenue (Tshs)	10 009 066
Gross margin(Tshs)	310 243
Returns per labour days	10 341
Returns per quantity sold	6 504
Returns per shilling invested	1.2

Results shows that, the returns per shilling invested is Tshs 1.2 which is lower than to the returns per shilling at the whole selling node (Table 21) This is because, it takes more time to sell a load of sawnwood because the selling is in pieces. It was also found by other measures of efficiency that returns per labour (10 341) was also lower than that of the wholesale node. This shows that efficiency at retail node is still relatively lower than that at wholesale node. This obeyed the rule of economies of scale since at the wholesale node, the amount of sawnwood handled was larger than that at retail node, and the proportion of reject sawnwood was much higher in retail node than that at wholesale node. The proportion of reject is explained by poor quality of sawnwood produced.

4.9.3 Sawnwood market power

Whole salers were found out to have relatively more market power than retailers. This was revealed by the efficiency measures of returns per labour and returns per shilling invested (Table 21). Returns per labour and returns per shilling in whole sale are higher than other chain actor. The reasons for the large returns at wholesale node are accounted for with time. It was found out that, the whole sellers use few hours to sell a load collected or produced and what is invested to labour is low at whole sale compare to what is invested to labour at retail node. As at the whole sale, less time is used to keep the labour while at retail node labour are suppose to be on the timber yards all the time. During the study, it was revealed that most of labourers are sellers and supervisors of sawnwood in the timber yards rather than the traders themselves.

Table 21: Market power at different nodes

Node	Returns per labour	Returns per shilling invested
Whole sale	17 379	3.46
Retail sale	10 341	1.2

Another reason for the high market power of whole sale; is the large volume of sawnwood handled. Wholesalers handled 97 m³ of sawnwood while retailers handled 47.7 m³ of sawnwood per month. On the other hand access to market information of which most of them get it from traders made the wholesaler to have power in the chain. Through improved technology, the use of cellular phones has a big influence on market availability and price determination. In ascending order market power along the chain was distributed from wholesalers to retailers.

4.9.4 Sawnwood market concentration

During the study, it was revealed that there is a great number of traders in the sawnwood marketing system. This was confirmed by District, Municipal and Ministry of Natural Resource and Tourism. This is also supported by the results of buyers concentration ratio obtained. The total volume for sampled traders was 5291 m³ of sawnwood with the average of 40.7 m³ per trader. The total output above this average was 1880 m³ and the average for the group was 52.2 m³ per trader. The total volume above this average was 779.5 per m³ and was used in the calculation of buyer's concentration index (Table 23).

Table 22: Sawnwood buyers concentration ratio at market level

Unit	Quantity
a. Average total volume traded	5291 m ³
b. Number of cases	130 people
c. Average volume traded per trader(a/b)	40.7 m ³
d. Quantity above average volume per trader	1880 m ³
e. Number of cases	36 people
f. Average volume traded above the sample (d/e)	52.2 m ³
g. Quantity above average of the sample 52.2	779.5 m ³

It follows that; the concentration ratio of buyers is;

$$\begin{aligned} C &= 100 \cdot (779.5/5291) \\ &= 14.7 \sim 15\% \end{aligned}$$

According to Scarborough and Kydd (1992) unconcentrated industry, is that, with no group of traders that is strong enough to control the sawnwood market. This is an indication of competitive situation in the market system. Thus, it can be concluded that the number of buyers in the sawnwood market in Iringa, Coast, Kilimanjaro and Arusha is high enough to break monopolistic tendencies among traders.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study revealed that sawnwood production and marketing had four channels. The most practiced sawnwood channel is from producers who supply sawnwood to traders then to end-use manufacturers. Another preferable channel of sawnwood marketing is via middlemen to traders who then supply to end use manufacturers. These first two channels are mostly practiced due to their efficiency to the market. This is because the methods save time and reduce disturbances among actors even though processes are usually long. On the other hand, the least practiced channels were where producers sell sawnwood to traders

who sell to other traders who then sell to end use manufacturers and the last channel is where producers sell directly to end use manufacturers.

Income generating activity is one of the drivers for most of stakeholders to engage themselves in sawnwood business. This is due to the fact that, there is high demand of sawnwood for different development activities like construction and furniture making. In so doing, it creates employment for some of the population. Also population increases has resulted into increased demand of the essential social services, such as education, health, water, transport and housing. In addition to that, promotion, value addition, grading, standardized storage facilities and transportation are the major factors of which producers and traders entailed to satisfy their customers need.

It was also found out that, there are different factors which affect the whole process of supplying sawnwood product. The study revealed the distance from production to the marketing sites, physical infrastructure, quality and seasonality factors which influence sawnwood consumption. These factors create gaps in the chain which reduce efficiency of the sawnwood market. In turn, these factors contribute to the development of market strategies as one way of reducing or removing gaps. Developing relation ship among actors is one of the strategies. With good relationship, producers at Mafinga communicate with traders in Arusha and Dar es Salaam on availability and price of sawnwood. In addition, other strategies include good quality attributes, proper market information, improving market strategies and revealing different problems faced by each actor along the chain.

This study also found out that, there was a difference in price at different levels of the market from production site to different destinations where sawnwood were sold. Majority of producers are selling their sawnwood product under wholesale basis. At production site,

sawnwood were sold in wholesale an average price of Tshs 115 000 per m³. When sawnwood is transported from production sites, prices increase. This is due to increased costs of loading transport, storage and offloading. It costs Tshs 3750 per m³ and Tshs 63 750 per m³ to transport sawnwood from production site to Mafinga town and Dar es Salaam city respectively.

In private woodlots, most of the producers sell their sawnwood in retail price. The price depend on the size and ranges from Tshs 700 to 2500 per piece. As sawnwood reaches most of the destinations like Dar es Salaam, Arusha and other places traders usually sell their sawnwood on retail basis. A piece of sawnwood is sold at Tshs 1000 to 10 000 depending on size of the wood.

Moreover, the study has revealed that strong factors that influence enduse manufacturers' desire include increase of the quantity of sawnwood product to the market, improvement of existing marketing strategy, improvement of the quality of the product, satisfaction of stakeholders need and availability of product at the right time.

The study has also revealed that there is a great number of traders in the sawnwood marketing system. This was confirmed by government officials and supported by the results of buyers concentration ratio obtained. The results shows that there is no single group of traders that is strong enough to monopolize the sawnwood market. Every trader has equal chance of entering the market.

5.2 Recommendations

With reference to the results obtained from the study and the conclusion made, the following recommendations are made:

- Improvement of physical infrastructures such as roads should be given priority by responsible institute so as to improve sawnwood business. This is because, most of the sawnwood production areas are found in remote areas and use feeder roads of which most of them are in poor conditions, This will help in reduction cost of produces and increase quantity of the sawnwood in the market
- It is also recommended that the government and its authorities should establish and enforce commonly accepted and workable quality, grades and standards for sawnwood for improving the quality of sawnwood sold in the market. This is because most of the stakeholders use local methods of adding value to the sawnwood.
- Most of the sawnwood traders lack knowledge on the business. This can be achieved by responsible authorities to conduct seminars on business administration, marketing and policies governing sawnwood business at least once a year . This is important because all actors will be familiar with procedures on sawnwood business to avoid illegal business.

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
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APPENDICIES

Appendix 1: Questionnaire for sawnwood producers

A: Identification variables

1. Name of interviewer.....2. Date
3. Name of interviewee.....4. Questionnaire number.....
5. District.....6. Region.....
7. Place of data collection
8. Individual or Organization (institution).....
9. Education level
 - a) Formal education
 - b) Primary education
 - c) Secondary education
 - d) Post education
10. Sex of respondent
 - a) Male
 - b) Female
11. Marital status of respondent
 - a) Single
 - b) Married
 - c) Widowed
 - d) Divorced

B: Information regarding production

What are Trees/ plants species used to produce your products

Tree species/plant	Preference (Rank)	Products produced



1. Do you sell sawnwood you produce? **Yes/No**
2. If yes, to whom do you sale
 - 1: Middlemen 2: Final consumer 3: Other producers
 - 4: Others specify.....
3. If no, how do you use these sawnwood
4. List the type of sawnwood you sold, quantity sold and price

Type of sawnwood	Quantity	Price (TAS)	Revenue

From above list type of sawnwood, which are, preferred most by your customer.....

- 7 Are there any cost incurred in sawnwood production

Item	Unit cost	Total cost

- 8 Who are your customers (Institutions, Individuals, Private companies)?

.....

Customer	Specify

9. What are the sources of raw materials for making these products?

Raw materials	Source	<input type="text"/>

- 10 Are the sources satisfactory? **Yes/No/Don't know**
- 11 What suggestions do you have for the sustainability of the sources of forest products?
11. How do you sell sawnwood products
- a) 1: Taking them to market
- b) 2: On site
- c) 3: Others, specify.....
- 12 What benefit do you gain from the business
14. How do you get market information.....
15. Do you process your products prior to sell? Yes/No
16. Do you pay tax for the sawnwood you are producing? Yes/No
17. To whom or where do you pay tax?
18. Amount of Tax payable per product.....
19. Do you know policies, policy statements favoring, or hindering sawnwood trade? Yes/No

Policy	Favouring	Hindering

20. Are there any problems of getting
21. customers for your products **Yes/No**
- List them
22. Are the products satisfying your customers? **Yes/No**
23. If no what are your suggestions?
24. Are there any opportunities favoring your business? **Yes/No**
- If yes List them
- If no, what do you consider to be the opportunities
26. Are there any constraints related to policy instruments hindering your activities?

Appendix 2: Questionnaire for Transporters

A: Identification variables

- 1 Name of interviewer.....2. Date

3. Name of interviewee.....4. Questionnaire number.....
 5. District.....6. Region.....
 10. Place of data collection (market, office).....
 11. Individual or Organization (institution)
 12. Education Level
 a) Formal education
 b) Primary education
 c) Secondary education
 d) Post education

10. Sex of respondent
 a) Male
 b) Female
 11. Marital status of respondent
 a) Single
 b) Married
 c) Widowed
 d) Divorced

B: Information on supplying sawnwood

13. What type(s) of sawnwood do you supply?

.....

14. Quantity of sawnwood sold per month

Sawnwood	Quantity	Unit Price (TAS)	Revenue

15. Where do you get these products
 16. How do you get sawnwood you sold?

How far is the sawmill from which the products you collect?.....

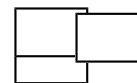
17. In comparing with the past 5 -10 years, how can you consider the distance?

1: Increasing

2: Decreasing

3: Constant

4: Do not know



18. Where do you supply sawnwood,

1. Inside the country

2. Outside the country

3. Both

19. Costs involved per month

Sawnwood supplied	Place of supplying	Quantity	Buying price	Other cost

20 Who determine the price of the sawnwood you supply?

.....

Could you rate your frequency for supplying the products?

1: Daily

2: Weekly

3: Monthly

4: Occasionally

20. Could life be possible without these products? **Yes/No**

21. For how long do you think these products will continue to be available

.....

22. Is there any attempt of establishing your own woodlots/forest plantation? **Yes/No**

If yes, for which species and why.....

If no, Why.....

23. Who are your customers?

24. How do you get customers?

25. Why have you decided to supply sawnwood forest products.....

26. Do you know institutions regulating sawnwood products trade? **Yes/No**

27. If yes, what are these institutions?

28. Do you know the resource base of the products you are supplying? **Yes/No**

29. Can you tell us the status of the resource base in comparison to the past five years?

1. Increasing

2. Decreasing

3. Constant/ stable

4. Don't know

☐

30. Do you think sawnwood trade is profitable and why.....

31. Do you pay tax for the sawnwood you are trading? **Yes/No**

32. To whom or where do you pay tax?.....

33. Amount of Tax payable per product.....

Sawnwood Product	Tax payable (amount Tshs)	Quantity

34. Do you know policies/policy statements favouring or hindering sawnwood trade?

Yes/No

List them

35. Do you know other stakeholders dealing with supplying sawnwood products? **Yes/No**

List and categorize them

36. Can you comment on the sawnwood products business?

37. Are there problems of getting customers of your products? **Yes/No**

List the problems

38. Are the products satisfying your customers? **Yes/No**

39. If no what are your suggestions?

40. Are there any opportunities favoring your business? **Yes/No**

If yes List them

If no, what do you consider to be the opportunities

Appendix 3: Questionnaire for sawnwood traders**A: Identification variables**

1. Name of interviewer 2. Date
3. Name of interviewee..... 4. Questionnaire number.....
4. District.....6.
- Region.....
7. Place of data collection (market, office).....
8. Individual or Organization (institution)
9. Formal education
 - a) Primary education
 - b) Secondary education
 - c) Post education
10. Sex of respondent
 - a) Male
 - b) Female
11. Marital status of respondent
 - a) Single
 - b) Married
 - c) Widowed
 - d) Divorced

B: Information on selling sawn timber

12. What type(s) of sawnwood do you sell?.....
13. Quantity of sawnwood sold per month

sawnwood	Quantity	Unit Price (TAS)	Revenue

14. Where do you get these sawnwood products
15. How do you get sawnwood you sold?.....
- How far is it?.....

16. In comparing with the past 5 -10 years, how can you consider the distal

1: Increasing

2: Decreasing

3: Constant

4: Do not know

17. Where are your customers coming from,

1. Inside the country

2. Outside the country

3. Both

18. Costs involved per month

Sawnwood	Quantity	Buying price	Other cost	Total cost

19. Who determine the price of the sawnwood?

.....

Could you rate your frequency for selling the products?

1: Daily

2: Weekly

3: Monthly

4: Occasionally

20. Could life be possible without these products? **Yes/No**

21. For how long do you think these products will continue to be available

.....

22. Is there any attempt of establishing your own woodlots/forest plantation? **Yes/No**

If yes, for which species and why.....

If no, Why.....

23. Who are your customers?

24. How do you get customers?.....

25. Why have you decided to sell sawnwood forest products

26. Do you know institutions regulating forest products trade? **Yes/No**

27. If yes, what are these institutions?

28. Do you know the resource base of the products you are selling? **Yes/No**

29. Can you tell us the status of the resource base in comparison to the past five years?

1. Increasing
2. Decreasing
3. Constant/ stable
4. Don't know

☐

30. Do you think forest products trade is profitable and why.....

31. Do you pay tax for the forest products you are trading? **Yes/No**

32. To whom or where do you pay tax?

33. Amount of Tax payable per product.....

Product	Tax payable (amount Tshs)	Quantity

34. Do you know policies/policy statements favouring or hindering forest products trade?

Yes/No

List them

35. Do you know other stakeholders dealing with forest products production and trade?

Yes/No

List and categorize them

36. Can you comment on the forest products business?

37. Are there problems of getting customers of your products? **Yes/No**

List the problems

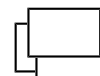
38. Are the products satisfying your customers? **Yes/No**

39. If no what are your suggestions?

Are there any opportunities favoring your business? **Yes/No**

If yes List them

If no, what do you consider to be the opportunities

Appendix 4: Questionnaire for sawnwood end use manufactures**A: Identification variables**

1. Name of interviewer.....2 Date
- 2 Name of interviewee..... 4. Questionnaire number.....
5. District.....6.Region.....
7. Place of data collection (market, office).....
8. Individual or Organization (institution).....
9. Education level
 - a) Formal education
 - b) Primary education
 - c) Secondary education
 - d) Post education
11. Sex of respondent
 - a) Male
 - b) Female
12. Marital status of respondent
 - a) Single
 - b) Married
 - c) Widowed
 - d) Divorced

B: Information on consumption sawn timber

- 1 Which type of sawnwood do you use or consume?

Type of sawnwoods	

2. Quantity of sawnwood consumed per month and its cost.

Sawnwood	Quantity	Unit Price (TAS)	Total expenditure

3. How can you compare the price with those for the past 5-10 years?

.....

4. Where do you get sawnwood products?

5. How do you get sawnwood products?

1. Free
2. Purchase
3. Both

3. Are there any changes on the availability of the products for the past 5-10 years?

Yes/No

If yes, what are the changes.....

7. Problems encountered in getting sawnwood products?

8. Do you know other stakeholders involved in sawnwood consumption? **Yes/No**

If yes, list them

9. Do you know institutions governing sawnwood products consumption/utilization?

10. What are constraints and opportunities in obtaining and using sawnwood?

.....

- 11 Do you have any special preferences for the sawnwood products? **Yes/No**

If yes, fill the following table

Product	Preference (Rank)

12. What are your suggestions for improving future availability of forest products?

.....

13. Problems encountered in getting sawnwood products?

14. Do you know other stakeholders involved in sawnwood consumption? Yes/No

If yes, list them

15. Do you know institutions governing sawnwood products consumption/utilization?

16. What are constraints and opportunities in obtaining and using sawnwood?

.....

17. Do you have any special preferences for the sawnwood products? Yes/No

If yes, fill the following table

Product	Preference (Rank)

18. What are your suggestions for improving future availability of forest products?

.....

Appendix 5: Checklist questionnaires

1: Regional/District Natural Resources Advisor

1. Which forest products are being traded in your region?
2. Which stakeholders are involved in sawnwood trade?
3. What are their role in sawnwood trade
4. What opportunities are there regarding policy instruments on trade of sawnwood in the region?
5. What are the policy constraints on sawnwood trade?
6. How do the district/ region benefits from the trade of sawnwood ?
7. What advice/support to stakeholders dealing with forest products' trade do you normally offer?
8. Do you have problems related to sawnwood trade in the district/ region?
9. What is the market chain from production to consumptions?
10. Tell us about market centres/segments you know?
11. Who collect tax/royalties during trading process?
12. What categories of taxes/royalties are there?
13. Are all sawnwood traded legally harvested?
14. How about illegal harvesting of sawnwood .
15. How can one know that the sawnwoods traded are legally or illegally harvested?
16. Who are stakeholders dealing with forest products trade in your region? Categorize them
17. Mention problems affecting marketing of sawnwood
18. Where the sawnwood is traded coming from?

2: MNRT/FOREST DIVISION

1. Which policies/policy statements supporting sawnwood trade/marketing?
2. Which policies/legislations regulating trade/marketing of sawnwood ?
3. Policy opportunities to sawnwood trade/marketing
4. Policy constraints to sawnwood trade/marketing
5. Do stakeholders dealing with sawnwood trade know policies and legislations supporting or hindering this trade
6. Training and seminar to the stakeholder involved in sawnwood on policy related issues

7. How do you involve regional administrations and district councils in getting information and regulating sawnwood trade?
8. Are your collaborators in the regions and districts known policies and legislation related to sawnwood trade?
9. Is the trade of forest products legally and illegally conducted?
10. What are penalties/fines/regulations for illegal harvesting?
11. List forest products which are need permits and those which do not need permits in harvesting?
12. What is the contribution of the sawnwood to the National income?

Appendix 6: Per capital consumption formula

Per capital consumption = (Total consumption/Total population)*1000

- a. Arusha 1000 per capital consumption= $(37\,868/270\,485)*1000=140$
- b. Arusha 1000 per capital consumption = $(576\,267/2500000)*1000=230$

Appendix 7: Buyers concentration ratio formula

- a. Average total volume traded = 5291 m³ of sawnwood
- b. Number of cases = 40.7
- c. Average volume traded per trader (a/b) =130 people
- d. Quantity above average volume per trader=1880 m³
- e. Number of cases = 36 people
- f. Average volume traded above the sample (d/e) =52.2 m³
- g. Quantity above average of the sample 52.2=779.5 m³

It follows that;

$$C = 100*(779.5/5291)$$

$$= 14.7\sim 15\%$$