ECONOMIC ANALYSIS OF POTENTIALS OF MANGO FRUITS FOR LOCAL AND EXPORT MARKETS IN TANZANIA

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A DISSSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN AGRICULTURAL ECONOMICS OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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ABSTRACT

The study was conducted in three regions of Tanzania which are fairly large producers of mango fruits namely Pwani, Dar es salaam and Morogoro located in coastal Tanzania. The main objective was to evaluate the expanded demand of Tanzanian grown mango fruits in domestic and export markets, which stimulate income generation at household level. Specifically the study aimed at identifying expanded production trends of mango for domestic and export markets in Tanzania; identifying the present major local and export marketing channels and roles played by various marketing participants; and to estimating the market demand for mango both local and export. Primary data were collected using structured questionnaire and analyzed using SPSS computer programme. The standard formula for the annual percentage growth rate indicates that the aggregate national mango production grew at the annual rate of 20% between 1991/1992 and 2001/02 and at the growth rate of 9% per annum between 2001/02 and 2006/07. The study also identified three major marketing channels for mango which are: shipping point markets, wholesale markets, and retail markets. The Concentration index (CI) of 82% was obtained, implying oligopolistic characteristic which is a tendency toward monopolistic market behavior. Constraints that hinder the expansion of mango for export marketing include lack of capital, inadequate suitable varieties for export, pests and diseases particularly the Mango fruit fly. It is recommended that; (i) Measures should be taken to improve the financial investment capital and distribution of suitable mango cultivars (ii) Market channels should be improved more efficient and commercialized.

DECLARATION

I, HABIBU ROBERT MASANJA, do hereby declare to the Senate of Sokoine University of Agriculture that the work presented here is my own original work and has not been submitted for a higher degree award in any other University.

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DEDICATION

To my beloved mother Fatma Said Habib and my daddy, the late Robert Masanja, I pray that the Almighty God to rests his soul in peace. AMEN.

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AMAGRO	Association of Mango Growers
ASDS	The Agricultural Sector Development Strategy
CI	Concentration ratio Index
DS	Desired Sample
EU	European Union
FAO	Food and Agricultural Organization of United Nations
FAOSTAT	Food and Agricultural Organization of United Nations Statistics
GDP	Gross Domestic Product
IPM	Integrated Pest Management
ITC	International Trade Centre
MAFC	Ministry of Agriculture, Food and Cooperatives
MT	Metric Tons
RMCA	Royal Museum for Central Africa
SADC	Southern African Development Community
SF	Sampling Fraction
SUA	Sokoine University of Agriculture
TAHA	Tanzania Horticultural Association
TANTRADE	Tanzania Trade Development Authorities
TDV	Tanzania Development Vision
TRA	Tanzania Revenue Authorities
TSHS	Tanzanian Shillings
UEPB	Uganda Export Promotion Board

UNCTAD	United Nations Conference on Trade and Development
URT	United Republic of Tanzania
USAID	United State Agency for International Development
USD	United States Dollar
VMS	Vertical Marketing System
WCHR	World Conference Horticultural Research
WTO	World Trade Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

Mango (*Mangifera indica* L.), is the second most frequently cultivated tropical fruit worldwide after banana (Hedge and Venkatesh, 2007). Mango dominates world production of tropical fruit at 31.5 million metric tons, comprising a 40% of global tropical fruit output. In 2008-2009, Asia, specifically India, was the largest producer of mango, accounting for 74% of world production by volume, with Latin America and the Caribbean at 16% and Africa producing 10% (USAID, 2010). World production of mango, mangosteens and guavas reached 33 million tonnes in 2007 (FAOSTAT, 2008).

The United States and European Union together accounted for 75 percent of world mango imports (USAID, 2010). India is the main exporter of mangoes in the world, together with Mexico, accounting for 23% and 20% respectively of the world exports in the period of 2003-2005. Other major players on the world export market are Brazil (13%), Pakistan (7%) and Peru (6%). The Netherlands are the major European importer with over 133 650 and 157 651 values in USD in 2006 and 2007 respectively, followed by United Kingdom, France and Germany (FAOSTAT, 2008).

Exports of non-traditional items such as horticultural crops are now more successful than traditional agricultural exports. The trend in value export of non-traditional agricultural crops with an exponential growth of 7% from 2003 and 2007. The non-traditional agricultural crops now accounts about 0.9% of the total exports (MAFC,

2009). Tanzania is the fourth largest producer of mango in Africa after Nigeria, Kenya, and Egypt (FAOSTAT, 2008). Mango production in Tanzania has increased by 58% from 165 514 metric tons in 1994/1995 to 255 000 in 2003/04, which was 21.6% of total horticultural produce. Over the past 3 years Tanzania has increased its exports of mango to both regional and foreign markets by 88% (URT, 2010)

The mango season in Tanzania starts in November and ends in early March. Many improved varieties of mangoes are slowly coming into local markets, which are also demanded internationally. These mango varieties are locally grown by an increasing number of farmers. The Southern African Development Community (SADC) block is another ready and potential market with countries like Namibia and Angola showing interest on importing mango from Tanzania. The Middle East is also a good target since its market has no stringent conditions like European and American markets United Nations Conference on Trade and Development (UNCTAD, 2005). However, actual data on production, demand and export of mango from Tanzania are lacking.

1.2 The roles of fruits in the economy

1.2.1 Income generation

Mango fruits are consumed locally and exported, thus earning the country foreign exchange and also as a potential source of household income for the resource poor farmer (Gathambiri *et al.*, 2009). World Conference Horticultural Research (WCHR, 1998) reported that fruits production and marketing have an important economic significant in the developing countries. Mango gives the multiple products, it is

therefore a potential source of foreign exchange for a developing country, and it is also a source of employment for a considerable seasonal labour force (Simons, 2003). Mango fruit orchards system is providing an alternative/additional source of income from other agricultural activities. Additional benefits of mango production include soil conservation, enhance biodiversity and create the carbon sink (ESD, 2009).

1.2.2 Improvement of nutrition status

In addition to their potential to generate income for smallholder farmers and traders fruits play a critical role in the improving nutritional by providing essential minerals and vitamins. Fruits are not only rich in calcium but also iron and vitamin C and vitamin A (Mendez, *et al.*, 2002; Simons, 2003; West *et al.*, 1988). Also Mango are good source of calories, protein, thiamine and niacin (Simons, 2003). Thus the study revealed that the developed mango fruit bar was found to be rich in micronutrient and it can be given as a supplement for the micronutrient malnutrition (Sangeetha and Lakshmi, 2007; Fowomola, 2010). Mango is rich in a variety of phytochemicals and nutrients that qualify potential health value of certain edible fruits. The fruit is high in prebiotic dietary fiber, vitamin C, polyphenols and carotenoids (Rodeiro *et al.*, 2006).

1.3 The policy context

The Tanzania Agricultural Policy (1997) lists important horticultural crops that are commonly produced for the market and for which efforts to promote their production need to be increased in the next decade. The most important fruits mentioned are

pineapples, passion fruits, citrus fruits, mango, peaches, pears and dessert bananas (MAFS, 2002).

Tanzania Development Vision 2025 (TDV) the vision was adopted by the government in 1999 and its implementation started in 2000 resources towards those core sectors that will enable us to attain our development goals. TDV that envisages raising the general standards of living of Tanzanians to the level of a typical medium-income developing country by 2025 in terms of human development. It identifies three priority goals namely, ensuring basic food security, improving income levels and increasing export earnings. The Agricultural Sector Development Strategy (ASDS) is one of the initiatives of this vision. *Kilimo Kwanza* – "agriculture first" in Kiswahili– adopted in 2009, is a recognition that agriculture can do much more than it has in the recent past, in the right conditions and with the right support. National Vision on Kilimo Kwanza in Pillar No. 1 in section 1.2 states that "modernize and commercialize agriculture for peasant, small medium and large scale producers". This will transform peasant and small farmers to commercial farmers through emphasis on productivity and tradability. Also will promote medium and large scale farmers for the full realization of the vision of Kilimo kwanza.

1.4 Problem statement and justification

Data on export volumes and earnings of the horticulture products in Tanzania are limited, basically due to the un-coordinated institutions responsible for export, monitoring and control. Introduction of new exotic varieties (Alphonso, Apple, Kesar, van dyke, Kent, Tommy Atkins etc) have started in the last few years and are

yet to bear significant results. Hence the data about production and export marketing of improved varieties are scattered and not complete. The Ministry of Agriculture, Food Security and Cooperatives is yet to put in place a reliable system to collect and analyse relevant data (Shack, 2008).

Information available at the ministry level is incomplete. However, available data indicate slow but notable contribution of horticultural crops to the country's total crop exports, which has been increasing since early 1990s to reach 4.6% in year 2001(MAFS, 2001). Both domestic and export markets are probably not sufficiently supplied with the demanded quantity and quality of mango, but no detailed data on this are available. Despite the growing economic importance of mango in Tanzania, its potential has not yet been fully used, and mango production struggles with several constraints along the whole value chain (Kehlenbeck *et al.*, 2010)

Potential for export of mango from Tanzania can be jeopardized by presence of pest quarantine importance, notably fruit flies (*Bactocera invadens* and *Bactocera latifrons*). Sokoine University of Agriculture (SUA) in collaboration with the Royal Museum for Central Africa (RMCA) is conducting trials on Integrated Pest Management (IPM) program for fruit flies attacking mangoes. The program aims at maximizing profit, by reducing the cost of production or by producing high-quality, high demanded product. Successful Integrated Pest Management (IPM) programme should take into consideration the market potential of the treated product. Otherwise there is a danger that a product could be fetching a lower price while produced at a high cost.

Unfortunately, little research work has been conducted on finding out economics of growing mango in Tanzania. Efforts have been made by various individuals to determine economics of orchards Khuda *et al.*, (2006). Ngo and Owens, (2002) determined the profitability of mangoes in the top end. (Nyavanga, 2010) determined the cost – benefit analysis of formulated pest integrated management (IPM) practices for fruit flies on mango in Morogoro. Unfortunately, the farmers and other concerned individuals know very little about economics of growing mango. The farmers need information regarding investment and returns from fruit gardening business. Keeping in view the importance of mango in terms of area, production and foreign earnings from exporting mango, the present study investigates in determining the amount mango produced and how the domestic and export markets are operating in the three coastal regions of Tanzania

1.5 Objectives of the study

1.5.1 Overall objective

The general objective of this study is to assess the production and demand level of Tanzanian grown mango in domestic and export markets to stimulate income generation at household level which involved in commercial mango farming.

1.5.2 Specific objectives

This study sought to achieve the following specific objectives:

a) To identify production trends of mango for domestic and export markets in Tanzania

b) Identify the present major local and export marketing channels and roles played by various marketing participants.

c) To estimate the demand level of mango for both local and export markets.

1.5.3 Research questions

a) What is the level of production and export of mango in Tanzania?

b) What are the major local and export marketing channels for mango?

c) What is the market demand level of mango in export market?

1.6 Organization of the study

The study is organized into five chapters. The first chapter comprises background information entailing aspects of farmers' characteristics, description of the study area and rationale of the study. The second chapter dwells on the relevant literature reviews, the setting and general performance of mango sub sector in Tanzania. The third chapter covers research methodology and the fourth chapter discusses the research findings. Conclusion and recommendations are given in chapter five.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Agriculture sector in Tanzania

The Tanzanian economy depends heavily on agriculture, share of agriculture sector within Gross Domestic Product (GDP) was 49% in 1970, this rate was 46% in 2002 and 26.5% in 2007, provides 85% of exports, and employs 80% of the work force (MAFC, 2008). 85% of the population is involved in farming and agriculture is almost completely rain dependent. Farming is predominantly low-tech with 70% of all farms cultivated with hand hoe. In Tanzania agriculture is the main stay of the economy and for the year 2004 it counted for over 51% of the country's foreign exchange earnings. Agriculture support about 75% total of population and contribute about 26.6% of the GDP (URT, 2010). In spite of the large contribution of the agricultural sector to the economy, the Horticultural industry remained dominant for many years and its contribution to foreign exchange was negligible. This is partly due to the fact that priority was given to production of export cash crops such as coffee, cotton, cashew nut and tobacco. Second priority was given to staple food crops such as maize, beans and sorghum. Therefore, little attention was given to the horticultural sector. This affected the allocation of resources into research, extension and manpower development for this sector (Weinberger and Lumpkin, 2005).

With the decline in terms of trade of the country's export crops and the increase in concern about food security, new strategies had to be adopted so as to diversify the country's exports while ensuring better health for its population. One of the strategies was to promote non-traditional exports such as horticultural crops. Since

then, the horticultural sector received more attention and a much higher priority in the allocation of resources. In terms of production, there has been a significant increase in the horticultural products for both domestic consumption and export in recent years (URT, 2004).

In spite of this increase, mango cultivation has not received due to attention in terms of research or political advocacy as a result production increase with decreasing rate. In general a decline in consumption of tradition food crops and increasing consumption of refined and processed foods, fats and animal foods in an observable trend (Brigitte and Rogier, 2005).

In Tanzania horticultural crops are usually grown on a small scale basis but usually generate higher earnings per unit area and represent an alternative for farmers with too small cultivable land to provide adequate income from field crops. Recently a rapid increase in fruits and vegetable production has occurred in the course of the revival of economic growth and liberalization of non-traditional export marketing (MAFC, 2010).

2.2 Fruit production in Tanzania

A wide range of fruits are cultivated in Tanzania (Brigitte and Rogier, 2005). Fruit production is mainly done by smallholder farmers. Production from smallholder farmers' field is mostly for internal markets. Most of the products are for home consumption and some of them are used in canning industries. USIAD (2010) reported that about 90 percent of tropical fruits produced globally are consumed in

the producing countries themselves, while 10 percent are traded internationally. In Tanzania, over 99% of mango production is consumed by the local market and essentially as a fresh fruit (Shack, 2008)

2.3 Mango production in Tanzania

Mango production in Tanzania is predominantly a smallholder crop, often produced at subsistence level with minimum inputs in terms of crop management. Mango orchards are normally small, not exceeding two to five hectares of land. Mango is one of the rather traditional fruit crop grown mainly in Coastal Zone (Dar es Salaam, Coast, Tanga and Morogoro) and Tabora regions (Shack, 2008). Mango fruit is consumed both locally and exported to earn the country foreign exchange (Gathambiri *et al.*, 2009). Mango is on the list of five top most produced fruits in Tanzania, a list that include banana, orange, pineapples and passion (MAFS, 2008; MAFS, 2010; Shack, 2008). All mango produced in the countries have in common that the vast majority of their mango are consumed domestically. Only a small part is commercial processing and intended for international trade (Brigitte and Rogier, 2005). Smallholder growers scattered all over the country produce mango fruits. Production is often geared towards domestic market and depends on family and unskilled labour with limited access to specialized advisory services. (UEPB and Ssemwanga, 2007) reported that the production is characterized by low input in terms of pest and diseases control, use of improved planting materials and soil fertility enhancement measure.

Table 1 and Figure 1 show that the aggregate national mango production grew at the annual rate of 132% between 1991/92 and 2000/01; and 191% between 2001/02 and 2006/07. Over the entire period, the mango production is estimated to have grown at the annual rate of 19.8%. Indeed, this was reflected in the positive growth rate of per capital mango utilization which stood at 22.7% per annum for the period between 1991/92 and 2001/02 and 9.1% per annum for the period between 2001/02 and 2006/07.

Table 1: Average annual mango production, export and imports in Tanzania (1991/92 – 2006/07)

Period	Growth rate (%)	Production (000t)	Export (000t)[a]	Import (000t)[b]
91/92 -00/01	132	61 680	-	-
01/02-06/07	191	142 300	87	1 802
Entire period	151	357 000	866	2 020

Source: Appendix 2:

Where: [a] Exports
[b] Imports.

Figure 1: Shows the production trends of Mango in Tanzania

Source: MAFC, 2010

The Figure 1 shows that there has been production growth of mango in every three years. This is due to the increase of plantations in many parts of the country.

2.3.1 Mango production in study area

Both local and exotic varieties are grown in coastal regions of Tanzania. The local varieties are Ngowe, Dodo, Boribo, Batawi, Sindano nyeupe, Sindano nyeusi and Boribo Muyuni (Niyibigira, *et al.*, 2008). The exotic varieties include Apple, Kent, Keit, Tommy Atkins, Van Dyke, Haden, Sensation, Sabre, Sabine, Pafin, Maya, Kenston and Gesine (FAO, 2004; Serem, 2010 and Gathambiri *et al.*, 2009). The districts with higher percentage of improved mango varieties are Mkuranga, Bagamoyo, Kibaha and Kisarawe in Pwani region (AMAGRO, 2011).

In this study only high quality fresh mango for the domestic and export market has been documented. Recommended production areas are Kabuku ward in Handeni District in Tanga region, Bagamoyo district, Mkuranga district, Kisarawe district and Kibaha district in pwani region. Kinondoni, Temeke and Ilala district in Dar es salaam. Mikese division in Morogoro districts is to be progressive and more productive growing areas. High invested farms in terms acreages, irrigation systems identified include Mayunga farm in Kabuku, Mr Jan De wolf farm in Kinondoni District, the Natureripe Kilimanjaro Ltd in Mkuranga and Mr Shenyagwa farm in Kibaha district. The production is expected to grow rapid in the coming few years because more 50% of the orchards have the age below 10 years old (AMAGRO, 2010).

2.4 Mango marketing in Tanzania

Mango marketing in Tanzania has usually been conducted by the private traders. Data on actual volumes handled by the private markets are hard to obtain. Less than 1% is handled by export market (USAID, 2010). About 90% of consumers of these products are expatriates, tourists and visitors in hotels and supermarkets. Very few Tanzanians consume the products for status reasons, including income variations. However, some products are sold at premium of up to 100%. This phenomenon is attributed to the quality of the product. It is worth noting that the low income earners in some cases cannot afford to buy the products despite realizing the benefits of the product(s).

2.4.1 Domestic marketing

Most of the mango produced are consumed within the same production area, or sold in urban markets of Tanzania (FAO 2004; USAID, 2010). There are two main market destinations for fresh mangoes, the local and export markets. Exports of fresh mango comprise a small proportion of national production (USAID, 2010). In the year 2008 Tanzanian imported 2 000 tons from Kenya, 1.5 tons from United Arab Emirates and less than a ton from India (FAO 2004). In 2008, Tanzania exported only 200 tons to Kenya and less than one ton to Kuwait. Whereas in the year 2009 Tanzania imported 2 500 to 3 000 tons of mangoes from Kenya, 336 tons from India and 130 kg from United Arab Emirates (Shack, 2008). The relative large imports from Kenya can be explained by the different production calendars. Kenyan producers can produce during a longer period of the year and can export to Tanzania when Tanzania faces a gap of mango supply. Although imports fluctuate, generally

there is an increasing trend for imports for instance in 2004 Tanzania imported 0.4 MT of mango and in the year 2010 it imported 2 020MT of mango only from Kenya. The imports are mostly in the off-season, when there is hardly any local supply. Dazydelian, (2008) reported that Tanzania normally relies on imported mango from Kenya but in October 2009, Tabora and Shinyanga managed to supply the Dar es Salaam market with over 1 500 MT

2.4.2 Export marketing

Bright, (2010) observed that export marketing is the key to high GDP, also the expansion of peasant products, particularly in developing countries bringing hitherto underutilized surplus of labor in the subsistence economy into export production.

The trend in marketing agricultural produce is toward fewer and larger processors and handlers. Farmers, too, are becoming fewer and larger, but their size and power in the market place remain small in comparison with processor/handlers. Growers associations or cooperatives negotiate terms of trade with commercial companies. However, most of the time growers are operating in buyers market because supply of produce is abundant (FAO, 2003). Both growers and exporters have to keep pace with the changing market requirements. The best chance to make a profit for the growers is to meet the market requirements.

Markets for exports and processing show great potential but a strong public-private partnership and market / value chain led approach is needed, to benefit from these opportunities (Khuda *et al.*, 2006). Presently, the Bakhresa group of companies has increased its processing capacity to 165 MT per day of juices and concentrates but also large multinational companies / organizations like Tendaji-agro are increasing their efforts to get involved in the export of mango[1]

As most of the companies in the food-processing sector are in the small-sized category and economies of scale are difficult to attain in storage and transportation. This situation avors a service provider to whom these companies can outsource their

storage and transport functions. The world market is continually making higher demands for presentation, greater shelf life and [1]uniform grading of fruit but also is requesting for more competitive commercial conditions including prices to develop consumption.

There is generally a large price differential between good, average, and poor quality mangoes on the domestic as well as the export markets. Customers are becoming increasingly selective for high quality fruit. Customers are now looking to products safe to eat and less chemical prone during pre and post-harvest operations. Due to poor post-harvest handling and inadequate research to study behavior in controlled reefer atmosphere, Tanzania mangoes have limited shelf life. This result in mangoes being air lifted but air cargo is expensive and has a limited capacity. Improvement in sea cargo handling has encouraged export by sea. Therefore, export to import markets in close proximity like Gulf and Saudi Arabia has almost shifted from air to sea. Efforts are underway to extend this facility to distant markets as well.

In order to expand the capacity sometimes exporters consolidate produce from other farmers. However, to ensure quality is attained, a number of exporters are involved in training farmers on quality aspects likewise the certification bodies train its inspectors to accomplish the task of certification. This kind of market has some limitations e.g. some suppliers often lack expertise to use internet to reach the potential overseas buyers (ITC, 2007) leading to failure to realize the market potential.

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[1] This information was provided by the Ilala city council in Dar es salaam (2011)

2.5 Marketing channels theory

A channel of distribution (sometimes called a trade channel) for a product is a route taken by the title to the goods as they move from the producer to the ultimate consumer or industrial user or as the set of the firms and individuals that take title, or assist in transferring title to the particular good or service as it moves from the producer to the consumer (Timmer *et al.*, 1983; Kotler, 1985; Stanton, 1994 and stern *et al.*, 1996). A channel always includes both the producer and the final customer for the product, as well as all agent and merchant middlemen involved in the title transfer. The channel for product extends to the last person whose buys it without making any change in its form. When their form is altered and another product emerges, new channel is started (Stanton, 1994).

Market chains are important in understanding which firms/dealers are engaged and they can be used to illustrate and clarify not only the movement of commodities, but also financial, credit, and information flows, and the strategic location of storage and processing facilities in the system. The patterns revealed through such illustration may shed light on opportunities and constraints faced by traders, consumers and/or producers (Kotler, 1985). In order to establish meaningful classes of participants in the market chain, criteria used are often specific to the objective of the research. For instance, functional categories, like rural assemblers, wholesalers, wholesaler-retailers, retailers, processors, transporters, farmers-traders, commission agents and money dealers are universally used. Functional categories will often be mutually exclusive through and because individual or firms may combine several market

roles. But through identifying the various functions undertaken, and the exchange relations between the institutions responsible for them, marketing chain can be built up and the means by which commodities move from producers to consumers more clearly understood (Timmer *et al.*, 1983).

Vertical Marketing System (VMS) it sometimes known as conversional marketing channels it consist of an independent producer, wholesaler(s), and retailer (s). Each is separate business entity seeking to maximize its own profit, even if is at the expense of maximizing the profits for the system as a whole. No channel member has complete or substantial control over the other members. Either one channel member owns the others, or franchises them, or has so much power that they all cooperate. VMS can be dominated by the producer, wholesaler or retailer (Eskola, 2005 and Agona, *et al.*, 2002).

The individual farmer in the survey areas has to decide how to allocate his total sales between the different channels. From individual farmers' point of view a critical parameter is his perception of the probability that will face better price if he sells his products to the client who offer better price (Kotler, 1985). It follows, therefore, that in a situation where sales are determined by periodic assessment of mango floods in the open air market (local varieties) whiles the export demand is too low channel choices may not be a crucial issue. This is due to three reasons. First farmer might not be able to predetermine his sales well in advance. Second, and especially after most of the marketable fruits is sold, subsequent fruits sales may be too high in volume to warrant any such consideration. Third, there are few

processing industries and therefore, offer lower prices the that farmers can fetch to other buyers for example Azam Group of companies offers the price of 200 Tshs per one kg of mango which include two or three numbers of mango fruits depending on their size. So this is lower prices compared to the prices of 350 to 500 Tshs per mango fruit at farm - get price offered by retailers or consumers in the open air market and the production costs.

For the purposes of this study Shoprite is regarded as the only formal retail channel of fresh fruit as it is the only large retail chain operating in the cities of Tanzania. Shoprite estimate their market share of the total fresh mango produce market in Tanzania to be less than 2%. Informal markets in the city areas are therefore regarded as the main marketing channel of urban consumption.

Shoprite currently sources fresh produce directly from farmers with the help of local government extension officers. Extension officers approach a number of farmers in an area and facilitate the bulking of the products. Farmers have to deliver the produce to Shoprite and they therefore have to organize and pay for their own harvesting, local transport, loading and regional transport. Shoprite prefers to work through the extension officers as they feel that brokers often take large margins at the expense of the producers. It seems as if the produce in this marketing channel is mostly sourced from medium and large scale farmers (ECI, 2003).

2.6 Market demand of mango in Tanzania

2.6.1 Domestic demand of mango

The various local, regional and international marketing channels for mangoes in Tanzania, emphasizing the actors involved in the process. The export market is served by a few large private sector farms. When in peak supply, mangoes are consumed entirely by all social classes. Many consumers cannot distinguish between the different varieties but pay particular attention to maturity, size, degree of ripeness (half ripe) and external appearance, which must be free from external damage. Local selections such as Dodo Bolibo and Viringe according to retailers have wider consumer appeal because they enjoy recognition both as ripe and unripe fruits (Agona, *et al.*, 2002)

Independent smallholders produce the bulk of the mangoes for domestic markets. The brokers assemble the mangoes from producers and then supply the main open markets in the urban city centers. Once consignments are delivered to the markets, wholesalers buy and sell to retailers who then sell to consumers in streets as fruits vendors, other retail markets, and roadside markets. Processors often acquire the mangoes directly from the producers. At the high end of the market are three main supermarkets Shoprite Kamata along Nyerere road, Shoppers plaza Masaki, Shoppers plaza Mikocheni, Chiddy bazaar, expenses hotels like Paradise City Hotel, Paradise Hobour View Hotel, Paradise Express Hotel, New Africa Hotel, Holliday Inn Hotel, Kilimanjaro/Kenpinsky Hotel, Peackock Hotel, Golden Tulip Hotel which sell high quality mangoes to the upper income consumers. This outlet, however, only accounts for less than 5 percent of the mango distributed in Dar es salaam. The open

market accounts for 56 percent in urban centers and more than 70 percent in rural areas, while kiosks account for 36 percent of mango sales. The figure 2 show the amount of mango supplied at Kariakoo market as the centre of fruits in Dar es salaam the years between 200/01 to the years 2010/11.

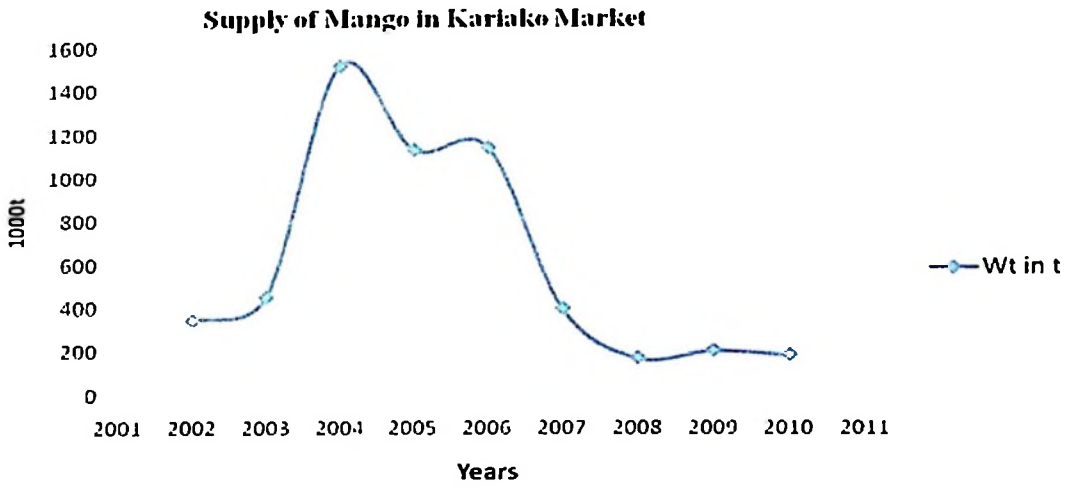

Figure 2: Shows the supplied mango in Kariako Market the production season of 2000/01 to 2010/11

Source: TBS, 2010

The production trends show increasing from 2002/03 and 2004/05 harvesting season but the years later mango supplied at the decreasing rate this explained by the trader that it was due to the increase of the supply of other competitive substitute fruits like Pineapples, Passions, Oranges and banana in the market. The improved mango varieties are not supplied to the open air market rather are supplied either to the supermarket or prepared for export market due to the higher price earned by farmers offered by exporters. It was also reported that most of these fruits are supplied in the same season, lower selling prices due to low production costs compared to mango.

Also the transport costs of these fruits are less because most of Passion and Oranges are produced in the coast regions. Other fruits like banana are obtained from nearby regions like Iringa, Morogoro and Kilimanjaro and Arusha throughout the year. Farmer reported that the occurrences of fruit fly between the year 2000 and 2004 led to the lower production and the supply of mango to the market.

2.6.2 Export demand of mango in Tanzania

Only high quality fruits of exotic varieties are sold in the export markets. There are about 11 mango exporters in Tanzania (TRA, 2011). The districts that export substantial quantities of mangoes include Mkuranga, Bagamoyo and Kibaha. Some of the exporting companies buy mangoes directly from the farms and package them for export. The export market offers better prices than the local market. In cases where the exporting companies buy directly from the farms; farmers sell at better prices than when they sell their products to middlemen. The prices offered also depend on the mango season. The Figure 3 shows the export trends of mango fruits other countries.

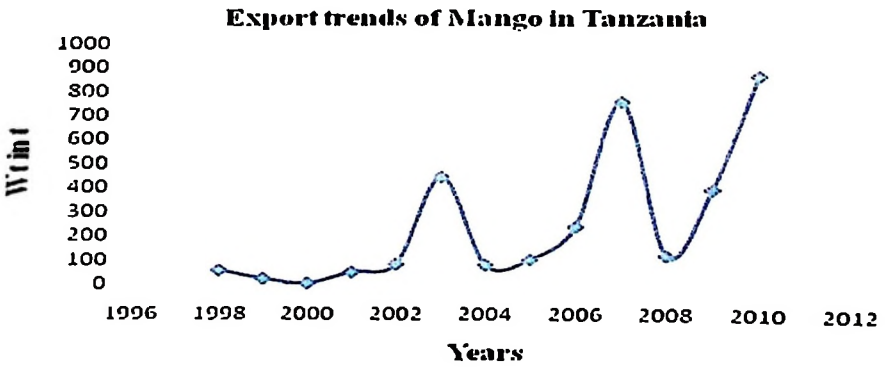

Figure 3: Show the export of mango in Tanzania

Source: TRA, 2010

2.7 Constraints facing mango export in Tanzania

The main constraints include: suitability of only a few varieties for export including Apple, Tommy, Keitt, Atkins and Zill; seasonal variability in output; pests and disease problems; high freight charges; limited cargo space; and lack of technical knowledge on scientific management practices (Niyibigira, *et al.*, 2008; MAFS, 2002; Kehlenbeck, *et al.*, 2010; Mwasha, 2007). Dazydelian, 2008 reported that other constraints in mango export market are scattered production often in remote areas, bad roads, expensive logistics, high wastage, inefficient port and problematic sea freight, Unreliable electricity hence effect cooling chain, inability to comply with various international standard, reluctance by some farmers to be associated with the collective due to the expenses of past socialist era. UNCTAD, 2005 reported some constraints of export in Tanzania supply side (low productivity due to dependence on unreliable and irregular weather conditions. Both crops are adversely affected by periodic droughts. The lack of irrigation makes it difficult to ensure the constant production required by export market; falling land productivity due to application of poor technology. Companies ability to finance export marketing expansion, ineffective government assistance programs, procuring exchange rate, interest rate, trade regulations ability to read, speak and understand the language of potential markets, ability to locate reliable agent/distributor, deterioration of product during transportation, understand price mechanism ability to meet quality and quantity on continuous basis, competition from other domestic and foreign producers in potential market. (Bright, 2010).

CHAPTER THREE

3.0 METHODOLOGY

3.1 The study area

Coastal regions were chosen as the study area because they form a major area where improved varieties of mango are produced. The regions included Dar es salaam, Morogoro and Pwani (see figure 3). However, Dar es salaam was taken as a market place due to its urban nature and being the most urban populated in the country. According to Tanzania population and household census (2002), the total population of Dar es salaam was 2 487 288 residents with the average annual growth rate of 4.4%. According to USAID urban profile (2000), Dar es salaam has had rapid urban growth in the last two decades. Likewise the Tanzania population and housing census, indicated that Dar es salaam had about 53% of the total urban population in Tanzania followed by Arusha (6%), Mbeya, Mwanza, Morogoro and Zanzibar 5% each, Tanga (4%), Dodoma, Moshi, Kigoma and Tabora 3% each.

Based on population Dar es salaam could be the major market for fresh fruits in the country. Kariakoo was found to be the major wholesale market in Dar es salaam with most retail traders in the city relying on it as the major source of fresh mango fruits. Before the sampling was done, main wholesale markets were identified through secondary and primary data information from Ilala Municipal and interviewed traders from Kariakoo, Buguruni, Ilala and Kisutu were identified as additional main wholesale (and retail) markets where large quantities of fresh mango were delivered on a daily basis. Other market surveyed were Kibaha in Pwani regions, Mawenzi and Morogoro town market in Morogoro regions.

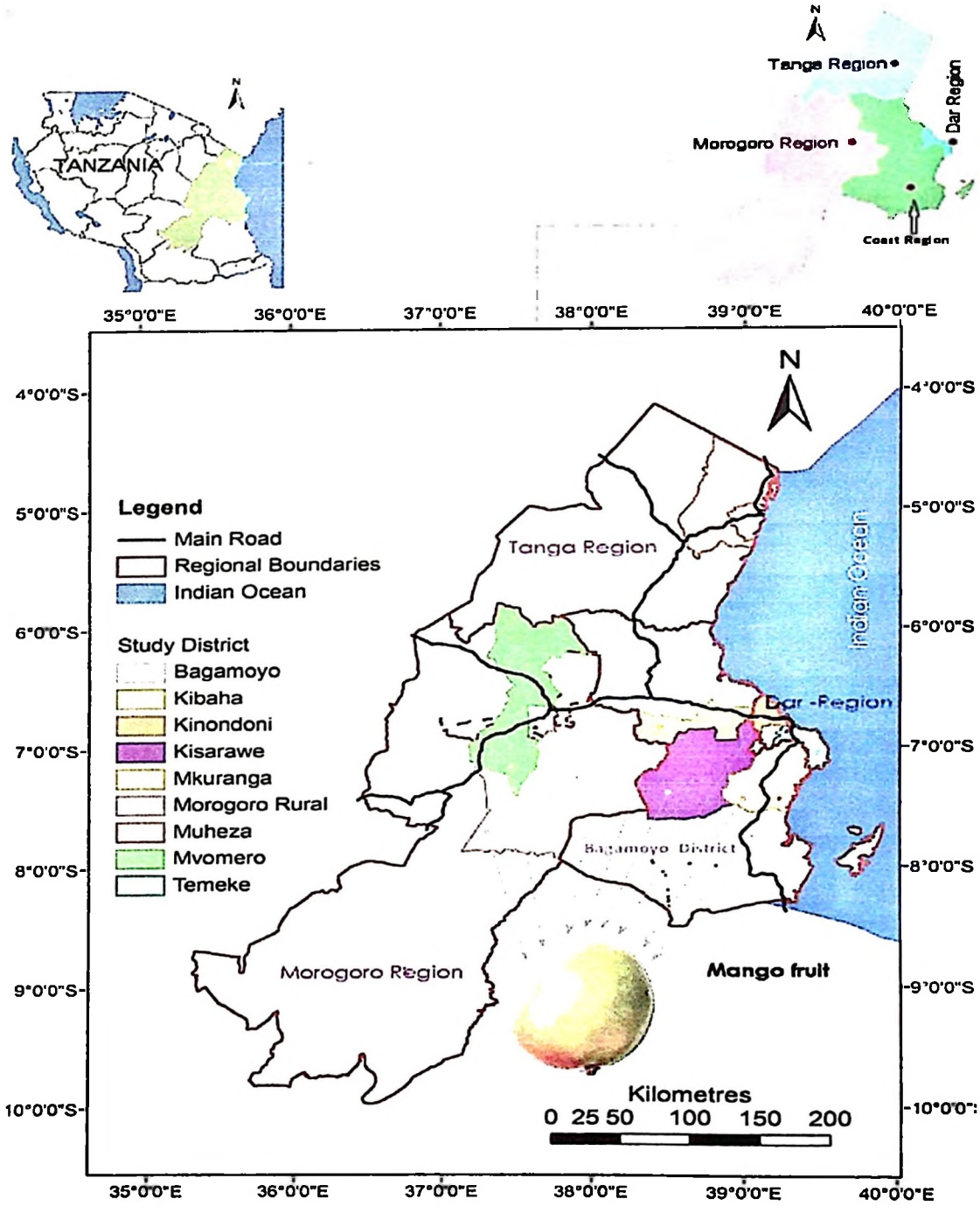

Figure 4: Map of four coastal regions showing the study districts

3.2 Sampling and data collection

3.2.1 Primary data

The primary data for this study was collected through several surveys involving market participants in Kibaha district in Pwani region, Mawenzi and Morogoro market in Morogoro region and Ilala Municipality, Dar es salaam region. The data collection tool was mainly questionnaire. Three surveys were conducted for wholesalers, retailers and producers. Interviews with wholesalers and retailers were done to obtain data that was used to identify the major local and export marketing channels of mangoes. The wholesale survey was conducted in the main wholesale markets in Ilala Municipality; these were Kariakoo and Buguruni markets in Dar es salaam. Also Mawenzi and Morogoro market in Morogoro. Data on the amount of mango delivered, price paid for whole selling or retail selling, the people involved, and variety received as well as the assembling process was collected from the surveyed areas. Sampling fraction (SF) adopted for proportionate stratified sampling (Wholesale and retailers).

Desired sample

$$(DS) = N * (n/N) \quad \text{.....(1)}$$

Where: N = Total number of population and n= sample size

The number of delivery trucks arriving at the market at the time of interview was counted and each was given a number. Each truck delivering product at the market was owned or rented by one or more wholesalers, sometimes referred to as first sellers who traveled with the products from upcountry region and sold their products through an agent operating in the market to retailers at an agreed commission. However, a single wholesaler per truck was considered in the sample. Five

wholesalers from each of the two markets were interviewed. Retail survey was conducted in the retail section in the two main wholesale markets as the wholesale markets have large retail sections.

Three purposively selected main residential retail markets linked to these wholesale markets were also included; these were Ilala and Kisutu, making a total of four markets. At total of five retailer interviews per each market were carried out and ten were interviewed along Morogoro road in Kibaha district two from Mawenzi and Morogoro market. In location where retailers were less than five, all available retailers were interviewed (See Table 1 below). The information collected included products sold, any value added activities conducted and the associated costs, whether products are packaged or not, sources of supply, volume purchased and sold as well as price paid and received.

In these markets where retailers were located near to each other, traders were counted, given a number and a random number table was used to draw a sample. In markets where retailers were scattered, they were grouped with respect to their closeness and randomization was carried out at the group level with the number of traders included in the sample from each group being proportional to the number of traders in those groups.

Table 2: Population and sample of wholesale and retail trader respondents selected

Location	Wholesale		Retail	
	Population	Sample	Population	Sample
Kariakoo	8	4	17	7
Buguruni	14	7	21	8
Ilala	0	0	6	2
Kisutu	0	0	3	1
Kibaha	0	0	32	13
Morogoro market	2	1	2	1
Mawenzi	0	0	4	2
Total	**24**	**12**	**82**	**34**

3.2.2 Secondary data

Secondary data obtained from the Municipal Council in Dar es salaam. The data included list of market. Other were collected from the Tan Trade, Ministry of Agriculture, Food Security and Cooperatives (MAFSC), Tanzania Revenue Authority (TRA), Kariakoo Market Statistics Department, National Bureau of Statistics (NBS) and the Ministry of Industry, Marketing and Trade, Non Governmental organizations particularly Association for Mango Growers in Tanzania (AMAGRO) and Tanzania Horticultural Association (TAHA) for studies and publications on fresh fruits to obtain as insight of the industry on production and marketing trends as well as the internet for population statistics.

3.3 Data analysis

A substantial part of the analysis was based on descriptive statistics to describe the responses, characteristics and trends of the obtained information. Responses from the interviews were coded, summarized and entered in the computer. The data were analyzed

using statistical Package for Social Science (SPSS) computer software. The SPSS was employed for both descriptive and quantitative analysis of the data, based on the stated objectives. Descriptive analysis computations of means, percentages, cross tabulation and ranges while quantitative analysis involved the use of regression analysis and correlation analysis. Descriptive analysis was adopted to describe and characterize the chain. Diagrams and tables were used to illustrate geographic marketing patterns and product flows, seasonality of supply, and relative marketing sizes in the different stages of the chain.

3.4 Assessment of the production trend

In this study the production trend of mango in Tanzania and growth rate were calculated using the standard formula for the annual percentage compound growth as follows (Ashimogo, 1995:24)

$$X_t = X_0[1 + (g/100)^t] \quad \text{.....(2)}$$

g = Three years moving average annual percentage growth rate

X_t = Three-years moving average of data for ending period;

X_0 = Three-year moving average for base year;

t = Number of years from the midpoint of base period to that of ending period

3.5 Assessment of mango market structure

Market structure was analyzed by using descriptive analysis. The area studied under market structure included; market channel structure and distribution, collaboration between market participants and barrier to market entry. The analysis of mango market structure and its distribution was done so as to determine the movement of produce. The following measures of market structure were used.

a) Market channel structure

The analysis of the market structure and its distribution was done so as to determine the movement of produce from point of production to the point of consumption. This was done by looking at various market functionaries and their roles in providing the product with time, form and utility. Respondents were asked to mention sources and costumers of mango for the months of October 2010 to march 2011, means of transport, and costs associated with market of mango.

b) Mango sellers concentration

In this study market concentration of sellers was used in determining the degree of concentration in the market. As defined by Pomeroy and Trinidad, 1995; and Scott, 2006 market concentration is the number and size of distribution of sellers and/or buyers in the market. This distribution can be measured by an index known as seller concentration given by:

$$CI = (XP/IP) \times 100 \quad \text{.....(3)}$$

Where:

CI = Concentration ratio Index

XP = Volume of Mango purchased by big buyers in the reference areas (kg)

IP = Total volume of mango handled in the market (kg)

According to Kohls and Uhl (1990), the concentration ratio of over 50% is an indicator of a strong monopolistic industry, 33-50% weak monopolist industry, less than 33% is an indicator of an un-concentrated industry.

c) Barriers to market entry

Barriers to market entry were addressed by including specific questions in questionnaires such as what constraints they faced with regard to daily marketing activities. Following their responses, answers were analyzed by using descriptive analysis.

3.6 Analytical tools

3.6.1 Descriptive data analysis

Descriptive analysis such as frequencies, percentages, and means used for interpretation of the data obtained between actors in the respective market channels in specific objective one and two.

3.6.2 Market demand analysis

A model is more realistic estimate of demand in outlying areas; the use of demand estimation procedures such as this model can help mangoes business to become more efficient operations (Robert and Duane, 1982) (see appendix 1)

CHAPTER FOUR

4.0 RESULTS AND DISCUSSIONS

4.1 Preamble

This chapter presents results and discussion in linc with the study objectives. The chapter has been subdivided into the following sections; farms characteristics, production trends of mango, market channels of mango, marketing constraints, characteristics of retailers and wholesalers, production and marketing trends of mango for both domestic and export markets in Tanzania.

4.2 Farm characteristics

4.2.1 Form of production

Windle, *et al.*, (2003) found out that form of mango farms are not different from form of other crops as they diversified in a bid to overcome the risks of crops failures which could lead into loss of income. Results in Table 3 show that 61% of mango farmers grow other crops, including Pineapples, Banana, Citrus fruits, Passions, Cashew nuts, Palm and pawpaw. The major reason for growing other crops as reported by respondents was to earn more income for their families. It was also reported that other crops served as source of income during mango off season. Some reported that other fruits ensured sustainability in the flow of fruits for their household consumption. Two farmers from Kisarawe District reported that they owned restaurants in the city which needed a constant supply of fruits.

Table 3: Form of production

Crops patterns	Number	Percent
Mono cropping	25	39
Mixed cropping	40	61
Total	**65**	**100**

4.2.2 Farm size

About 49% of mango farms seemed to be less than 10ha of land for production, 27% allocate between 10 to 20ha, 8% between 30 and 40ha, 6% between 40 to 50ha, 3% between 50 to 60ha, and 2% of the farms land allocated more than 100ha for mango production (Table 4). These large farms are located far away from Dar es salaam city in the places such as Mkuranga, Kibaha, Bagamoyo and Kisarawe. Most of the small land farms for mango production are located in the areas such as Kinondoni, Mbezi, and Kinyerezi within the city outskirts area where the land is very expensive compared to the areas away from Dar es salaam. Some of the areas such as Mbezi, had been notified by the city council to vacate the areas to pave a venues for constructing residential houses, due to population increase in the city centre. It is therefore more likely that the commercialized mango production within the city will cease in the near future due to lack of adequate land.

Table 4: Farm size

Area (ha)	Number	Percent
<10	31	49
10 – 20	17	27
20 – 30	5	8
30 – 40	4	6
40 – 50	2	3
50 – 60	1	2
90 – 100	2	3
>100	1	2
Total	**65**	**100**

4.2.3 Trees age

The study revealed that about 26% of the mango trees had the age of between 8 and 10 years, while 18% of the trees had more than 12 years old (Table 5). This indicates that the mango trees had reached their maximum production age and farmers took advantage of earning high income. However, about 17% of the mango trees were aged between 6 and 8 years old, which is not the maximum production age for mango trees (Ngo and Owens 2002). It was revealed that about 15% and 12% of tree do not produce mango fruits significantly. In addition more than 50% of the orchards produce mango fruit at the rate of less than 50 mangos per tree. According to AMAGRO, 2011 the farm survey indicated that the mango farmers fail to take advantage of the potentials of the crop. These farmers only manage to get an average of 50 mangos per tree (7 020 mangos per Ha after deduction of losses).

Table 5: Tree age

Age (years)	Number	Percent
2-4	10	15
4-6	8	12
6-8	11	17
8-10	17	26
10-12	7	11
>12	12	19
Total	**65**	**100**

4.2.4 Varieties of mango

Table 6 shows that Tommy is the leading variety which is grown by 86% in the visited farms followed by Apple variety (72%), Keitt variety (69%). Other mango trees varieties include Red indian grown by 58% and Zil by 42%, Atikins grown by 41% Muyuni by 16% and beyond the expectations Dodo found be grown by 4% in the farms visited. It was reported by the growers that these varieties gives them higher income. However, it is well known that yield of 25 t/ha and more for Keitt, Kent, Tommy and Atikins if well maintained (ICRAF, 2003).

Table 6: Varieties of mango

Variety	Number	Percent
Tommy	55	86
Alphonso	41	64
Keitt	44	69
Atikins	26	41
Zil	27	42
Red Indian	37	58
Muyuni	10	16
Dodo	4	4
Apple	44	72

4.2.5 Average production

Table 7 revealed that about 28% of the mango farm produces weight of mangoes below 1MT, while 22% produces more than 20 MT. This indicates that the mango trees had reached their maximum production age and farmers took advantage of earning high income (Ngo and Owens 2002). However, about 19% of the mango trees were aged between 10MT and 15MT, which is not the maximum production age for mango trees. It was revealed that about 15% and 12% of tree do not produce

mango fruits significantly. In addition more than 50% of the orchards produce mango fruit at the rate of less than 50 mangos per tree.

Table 7: Average production

Mangoes yield (kg)	Number	Percent
<1000	18	28
1001 – 5000	6	9
5001 – 10000	11	17
10001 – 15000	12	19
15001 – 20000	4	6
20001>	14	22
Total	**65**	**100**

4.2.6 Form of labour used

Table 8 shows labor requirements for mango production from the farms surveyed. It was found out that 92% of farms visited use only hired labor in their mango production process. Majority of farmers who constituted this category were these who were employed in the city and some retired officers. In addition, about 6% of the farms used both family and hired labor these were mainly retired officers living in their farms. Only 2% of the farms use only family labor, these were the entrepreneur farmers. The involvement of family labor in the mango production process implies that mango is potential crop for supporting livelihood in the study area. Furthermore the involvement of both family and hired labor in mango production, suggests that sometimes respondents use their family labor in mango production (Khuda *et al.*, 2006).

Table 8: Form of the labour used

Type of labor	Number	Percent
Household labor	1	2
Hired labor	60	92
Household and hired labor	4	6
Total	**65**	**100**

4.2.7 Form of farm ownership

The main land tenure systems in Tanzania are freehold, leasehold and community system (Alden and Mbaya, 2001). The study revealed that about 95% of the mango producer's freehold the land, while only 5% of the farmers leasehold the land (Table 9). The leasehold farmers are Natureripe Company in Mwanambaya Mkuranga District (Pwani), Shenyagwa Mango Production Company in Kibaha (Pwani) and Jan De wolf located in Mbezi msumi Kinondoni District in Dar es Salaam. Due to freehold some of the areas such as Mbezi and Kinyerezi had been notified by the city council to vacate the areas to pave a venue for constructing residential houses, due to population increase in the city centre.

Table 9: Form of farm ownership

Form of ownership	Number	Percent
Freehold	62	95
Leasehold	3	5
Total	**65**	**100**

4.2.8 Average number of trees

About 21.5% of the farms had the number of mango trees less than 200 (Table 10). Moreover, (43.1%) of farm consist mango trees between 200 and 400. Only the (1.5%) of the farms have 800 and 1000 mango trees. Some (10.8%) had between 600 and 800 trees, (9.2%) had between 400 and 600 and (13.8%) had 1 000 trees.

Number of trees planted in the orchard depended on various factors such as investment capital, land size, farming experience, and period in the production (ICRAF, 2003).

Table 10: Average number of trees

Number of trees	Number	Percent
<200	14	22
200-400	28	43
400-600	6	9
600-800	7	11
800-1000	1	2
>1000	9	14
Total	**65**	**100**

4.2.9 Problems facing mango production

The results in Table 11 below indicate that about (88%) of respondents reported that there were long drought seasons in the recent years which affect their production. In addition (58%) reported that there were pests and diseases and (13%) indicated that there fire risks as farmers in their neighborhood did not practice good agricultural practices. Therefore, it seemed that farmers encountered many obstacles in the mango production. Pests were reported to be the main factor affecting yields. The fruit flies were a major concern and farmers were making efforts to use recommended control measures. For export production, the main difficulty for farmers was to comply with the standards required by the EUREPGAP Control Points and Compliance Criteria, which are required for all fruits and vegetables destined for the EC market (FAO, 2005).

Table 11: Production constraints

Problem	Number	Percent
Long drought season	56	88
Pests and diseases	37	58
Fire hazard	8	13

4.2.10 Marketing constraints facing growers

Responses on marketing limitations experience indicate that farmers encountered many market obstacles in selling mango fruits. Special areas for fruits are not cleared located especially in the open air market. The market fee of 200 Tshs per day in Dar es salaam city center market and 100 Tshs per day in Morogoro market and Mawenzi market in Morogoro seemed to be unfavorable to most of the farmers. The market fee is used by the responsible authorities to maintain the market conditions, including cleanness. It was also revealed that other mango varieties, especially local varieties, posed a big challenge when mature in the same season. Some farmers reported that there were also problems of unfair competition from other sellers who sell their produce outside the market places, including along the roads or these who vendors around streets. Other farmers pointed out that the cooling chain or storage facilities is challenge to keep fruits at long shelf life from the time of harvest to the marketing time.

In view of this most mango farmers who do not have enough capital cannot accrue benefits from the crop as envisaged. These farmers only manage to get an average of 200 to 250 Tshs per mango fruits at the farm get price. This price is offered by retailers and it can be more less if middlemen came at the farm. For the processing

industries they offer 200 Tshs per 1kg of mango which took an average of 3 to 4 mangos. As such, it is pertinent to address such unfavorable conditions in order to promote and realize the potentials of mango crop.

4.2.10 Other crops grown in the mango farms

Table 12 shows that pineapples are grown by 48% of the respondents followed by citrus trees (42%), Cashew nuts (25%). Farmers reported that most of palm trees and cashew nut trees were in the farms as they bought the land. Some farmers maintained the tree as others uprooted the same to plant the desired crops. Other fruit trees include banana plant grown by 15% and passions by 3%. This is contrary to the open air markets where passions, citrus fruits, and bananas seemed to be more competitive against mango fruits as consumes used them as alternative fruits during mango fruits deficit or off seasons. The aforementioned completion from other fruits is due to the fact that such fruits are produced in different regions including Iringa, Arusha and Mbeya (Festo, 2008)

Table 12: Distribution of other fruit crops grown by mango farmers

Crops	Number	Percent
Pineapples	19	48
Banana	6	15
Cashew nuts	10	25
Passion	1	3
Palm trees	7	18
Citrus trees	17	43

4.3 Production trends of mango

Figure 5 shows the actual production of the farms in the visited over the years. The aggregate mango production grew at the annual rate of 246% between 2004/05 and 2010/11 due to the increase number of commercial farms in the area. Indeed, this was reflected in the positive growth rate of per capital mango utilization in the study area. But in the production season of 2005/06 the annual growth rate was 28% while in 2010/11 there was a negative growth rate of 67%. This is due to some challenges facing farms like drought, pests and diseases as well as wildfire occurrences as reported by farmers.

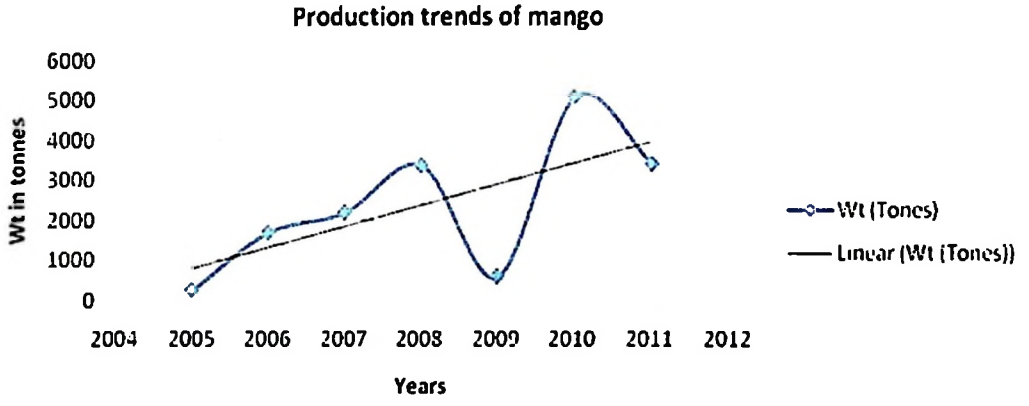

Figure 5: Production trends of mango in Coast region of Tanzania

Source: Appendix 4

4.4 Marketing channels of mango

4.4.1 Producer level

It was observed that producers have more than one place for selling their produce. The places identified were at the farm (field) at the town market (city), and at home. According to informal interview with some producers, most of their customers came

directly to negotiate for the produce at farm or at home. The customer was allowed to harvest the crop upon agreement on prices. The town markets are places where larger populations and all sorts of grading activities take place and operating all days of the week. Village markets were regarded as seasonal market having specific days of the week for operating. Some farmers had ability to carry the entire harvested crop to the market in the city, but some were workers who sold their produce directly to their fellow workers at their working places. Most of them avoid selling mango in the farm due to their workers untruth worth (labor defaults).

Table 13, shows that in overall crops were mainly traded in the market. About 68% of the producers reported to sell their produce in the town market. 32% sold at their home places and the rest (19%) sold their crops at their farms (fields)

Table 13: Producer's main places for selling mango

Place of sale	Overall (%)
At home	32
At the field	19
At the market	68

Note: Producer's N=65

4.4.2 Link between farmers and wholesalers

Wholesalers go straight to farmers where they negotiate prices. When agreed, the wholesalers harvest the produce. The costs of harvesting and packing were borne by the wholesalers themselves. Some farmers harvest their own produce and bring them to the markets either in town market or village markets. Some producers reported that some wholesales did not abide by the agreements made and failed to come and

harvest the crops. When this happened, producers sold directly to retailers and to end users (consumers). Usually retailers did not place orders in advance.

4.4.3 Link between wholesalers and retailers

Retailers receive the produce from wholesalers or any middlemen and they sell them to end consumers on retail basis. There were no specific measurement units for selling mango fruits. Some used to count individual mangoes and sold individually while others sold the mangoes according to the boxes used to peak the mango number of mango or tengas and boxes for selling mango. Table 14 indicates (60%) reported to sell their crops to retailers, (20%) sold to individual customers, (though some resold crop in the streets). It was observed that, wholesalers found it difficult to characterize the nature of their customers. However, some admitted to be familiar with some hotel and restaurant owners who bought mangoes from them. About (15%) of wholesalers reported to sell their produce to hotel and restaurant owners. The Red Indian and Alphonso varieties were mostly purchased by hotel owners compared to other varieties.

Table 11: Wholesale main buyers

Buyers	Crops (%)
Middlemen	5
Retailers	60
Individual consumers	20
Hotel and restaurants	15

Note: Wholesaler's N=12

4.4.4 Link between farmers and exporters

Exporters go straight to farmers where they negotiate prices. When agreed, the exporter harvests the produce. The costs of harvesting and packing were borne by

exporters. Some farmers harvested their own produce, sorted and graded the mango in sized according to the consignment agreed and sent them to the town markets. It was revealed that the preferred mango size ranged from medium to large sized mangoes. Exporters reported that after receiving produce from farmers they re-graded so as to obtain the quality needed in the market. A few producers reported that after grading the mango fruits, the remaining were sold at the local markets or consumed at home. Export market offers better prices than the local market. In cases where the export companies bought mangoes directly from the farms, farmers sold at better prices than when they sold their products to middlemen. The prices offered also depended on the mango season (FAO, 2004).

4.4.5 Mango suppliers

4.4.5.1 Wholesale level

Table 15, indicates the source of purchasing mango crops at wholesale market level. The study revealed that 77% of wholesalers purchased from producers while 23% sourced from collectors. Mango was mainly transported to other regions such as Dar es salaam.

Table 12: Suppliers of produces to wholesalers

Source	Crops (%)
Collectors	23
Producers	77

Note: Wholesaler's N=12

Public transport was the main means of transporting mangoes to the markets. Respondents reported that the involvement of collectors in the market chain was very

seasonal. They were shifting from one crop to another depending on the market conditions and season of the years.

4.4.5.2 Retail level

More than (50%) of the retailers bought mangoes from the wholesalers' level. Table 16 shows that (53%) of retailers sourced from wholesalers while 42% sourced from producers at the market places. Only (6%) bought from the middlemen. It was also noted that retailers by pass middlemen and wholesalers to minimize costs and maximize their returns. However, among the retailers who live to the farmers had the advantage of buying produce from farmers compared to these who get the product in the city market.

Table 13: Suppliers of produces to retailers

Source	Crops (%)
Producers	42
Wholesalers	53
Middlemen	6

Note: Retailer's N=32

At retail level they also reported that it was tricky to distinguish between different customers unless they had long term "customer seller" association. Nevertheless, over 50% of the respondents customers were individual customers.

Table 14: Retailer's main buyers

Source	Crops (%)
Individual customers	94
Hotels and restaurants	6
Total	**100**

Note: Retailer's N=32

4.4.5.3 Mango fruits marketing channels

Mango fresh fruit markets have long marketing channels which cause many problems, for example: high price and risk of loss especially in perishable products. There are three types of markets: shipping point markets, wholesale markets, and retail markets (see Figure 6) and this system depends on vertical integration, decentralization, new handling and transportation methods, and the growth of the away-from-home and direct farmer-consumer markets. (Kohl & Uhl 1998)

Figure 6 illustrates marketing channels of mango fresh fruits; the products are marketed from farms to consumers through:

- Roadside and farmers markets, directly to consumers.
- Shipping point firms that prepare the products for market by performing different functions like sorting, grading, cleaning, packaging, and storing, and then allocate these bulks of products to fruits and vegetable markets (the export market, wholesale terminal markets, and retail- wholesale distribution centers). After that, these fruits are delivered to consumers through retail food stores (supermarkets, fruit, and vegetable markets) or through food service firms (restaurants, institutions).

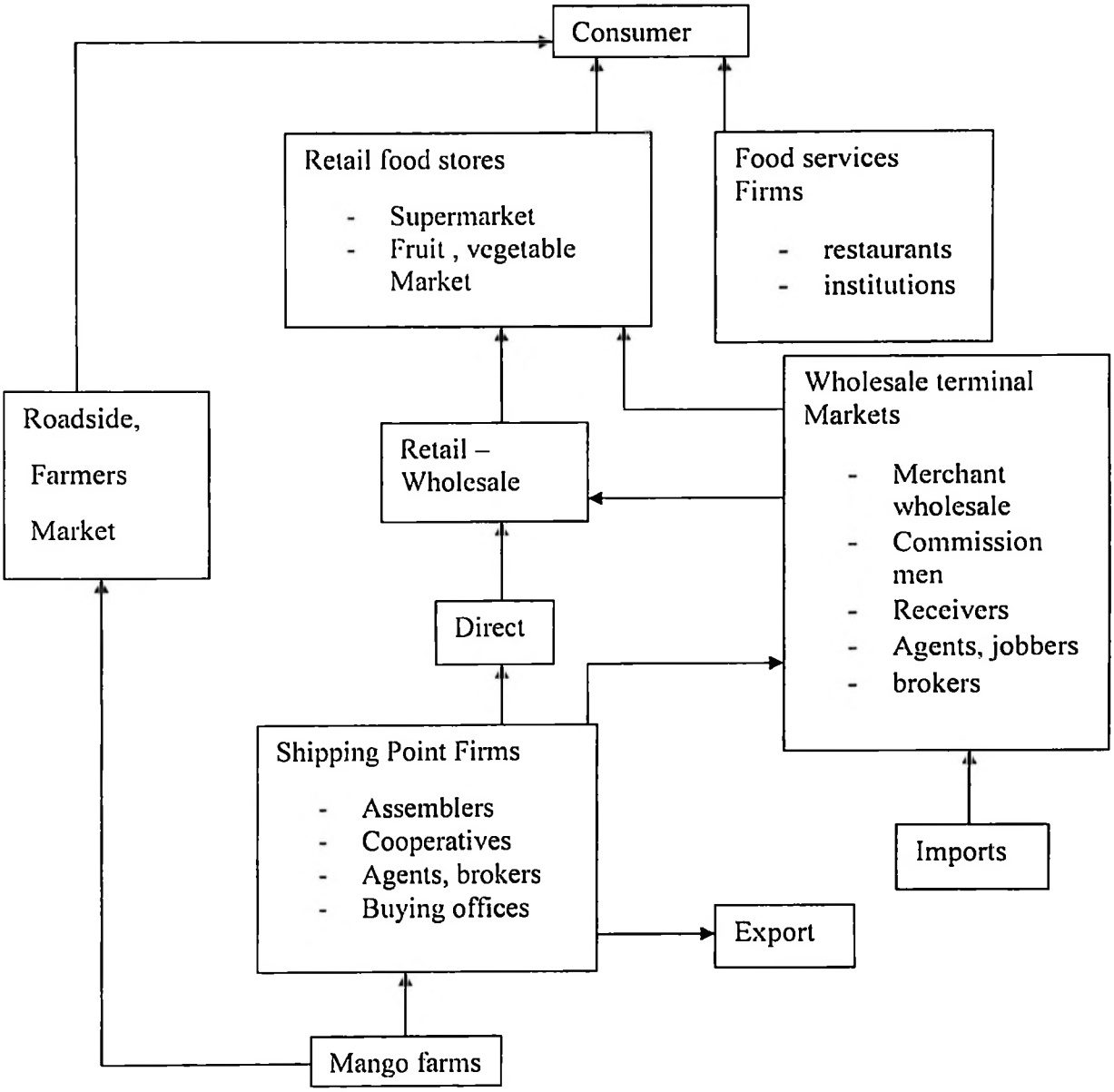

Figure 6 Market channels for mango, Coast region 2010/11

4.4.5.4 Market information

Table 18 shows market information received by market participants. In overall, 17% of respondents did not receive any information that would facilitate trading on their crops. Farmers and wholesalers were in most cases by passed in receiving market information among the actors. It also was noted that many farmers were acting as

retailers. About 40% of all categories received price information and farmers were more informed on prices than other categories of players in the channel. Was interesting to find out that information on mango crop was highly demanded in the market as it was not flowing well among the actors. They were bringing their produce as is their traditional to do so. All actors did not pay attention on finding information on product quality standard and size and other physical attributes of the crop (e.g. shape and size of fruits). Only few farmers who hold their produce to highly standard destinations such as supermarkets and to exporters had such information.

Table 15: Marketing information received

Information received	Categories (%)			
	Farmers	Wholesalers	Retailers	Overall (%)
Price	51	33	34	40
Product quality	14	17	22	18
Mango physical traits(e.g. size)	6	8	16	10
Mango demand	9	17	22	16
Did not respond	20	25	6	17
Total	**100**	**100**	**100**	**100**

4.4.6 Efficiency analysis for mango marketing system

4.4.6.1 Market structure and prices

Marketing outlets for mango included local, regional and export markets. The collected data indicated that the numbers of traders who were doing mango business ranged from 25-100 with the mean of 51 traders. The traders were responsible for bringing products to local consumers in mango-deficit regional and cities in the coastal regions. Basing on the existing number of mango traders and exports in Dare s salaam, low barriers to entry and homogeneous nature of the locally grown mango,

the market structure for mango in coastal regions can be categorized as competitive. Marketing costs and profits do not appear to be excessive and the product losses during marketing appear to be low. Prices fluctuation is a source of uncertainty that confronts mango growers in the study area. As negotiations and trade take place between buyers and sellers, mango prices may change from week to week, from day to day or within the trading day depending on the amount of mango available in the market with respect to the harvesting season. Prices at farm places influence the prices at Dar es salaam markets. Prices are somewhat below the annual average during the main harvest season i.e. between November and March.

4.4.6.2 Market transparency

Market transparency affects the intensity of competition. If buyers or sellers do not have proper knowledge about market conditions, the intensity of completion is low despite the sufficient number of market participation to ensure competition. The most important aspect of market transparency is information transmition process in the marketing system which implies information about prices, grades and standard size of the product in question. During this study, it was revealed that the level of market transparency was low. There were also no uniform measurements, weights or standard grades. Market traders used different measurement devices such as bags, tins, tengas and heaps such that price comparisons were very difficult. For instance, some traders used tengas and wood boxes which contained up to 90kg instead of the standard weight of 25kg. Market retailers sold individual mangoes or in heaps whose weight could not be easily determined. Therefore, although the price within the

market tends to be uniform, the amounts sold for a given price differs greatly i.e. price variations are replaced by quantity variations.

4.4.6.3 Barriers to market entry

Barriers to market entry reduce the threat of potential competition and therefore impede marketing efficiency. Barriers could result from know-how, capital requirements and institutional restrictions and non competitive reaction of established traders (Eskola, 2005). The major entry barriers included shortage of capital and or credit facilities and lack of marketing information associated with poor infrastructure and transport facilities. All mango traders admitted that mango business was open to anybody provided that she/he had enough capital. Some traders indicated that they were constrained by capital where by 68% reported that they could not access credit. It was noted that majority of traders did not collaterals to meet requirements imposed by credit institutions. In addition the acquisition of credits from formal institutions such as banks is coupled with long bureaucratic procedures. In view of these, farmers are discouraged from seeking for loans from the financial institutions.

According to traders, the market fee of 200-500/= Tshs per day is charged for selling mango fruits at the markets. Sometimes, the fees are charged more than once per day. It was also noted that city security guards disturbed the traders in some occasions and caused great loses to the trader. It was also noted that most of the market places are constructed without considering a place for fruits business. On the

basis of the highlighted unfavorable conditions, markets entry seemed to have a number of variables which served as barriers to the expansion of mango business.

4.4.6.4 Market concentration index

The concentration indices (CI) were obtained by dividing the volume traded by few largest traders by total volume traded by sample traders in the 2010/11 season. The respondents were divided into two groups. The first group comprised of respondents who handled volumes below the sample mean while the second group comprised of respondents who handled volume above the sample mean. The volume for the first group was calculated and those above the mean were taken as a few largest traders in the marketing system. Table 19 show that concentration indices for mango traders were; retailers (34%), wholesale (83%), transporter (42%) and overall traders (87%). The index of 87% for mango traders suggest that the mango market was highly concentrated.

According to Kohls and Uhls, (1990) the concentration index of over 50% is an indication of a strong concentrated (oligopolistic industry), 33%-50% a weak concentration and less than that, unconcentrated industry. In the study area, the concentration ratio of 34% and 46% for retailers and transporters respectively implied that the market was weakly concentrated. The CI of 82% for wholesalers indicated that the market was highly concentrated implying oligopolistic market behavior which is a tendency towards monopolistic market behavior. The higher concentration ration of the traders which reflect barriers to entry manifests its effect on the conduct of price formation

Based on the CI of retailers and transporters which was the prominent group among traders, it can be concluded that the number of traders in the mango marketing system in the study area was high enough to prevent monopolistic tendencies among traders.

Table 16: Coastal regions: Market concentration index

Amount (80 kg boxes)	Retailers	Wholesaler	Transporters
Total amount traded	135 744	191 481	314 000
Amount traded by big buyers	102 247	157 016	145 130
Concentration ration (b/ax 100%)	**34**	**82**	**46**

4.5 Estimation of mango demand for both local and export markets

4.5.1 Demand of mangoes for local market

Change in Tanzania dietary life have been observed for the past two decades as economic growth have made improvement in the standards of living possible. Mango is one of the most popular fruits among Tanzanian consumers. Consumption of mango is growing due to consumers' increasing health awareness. Mangoes consumption has been increasing, instead (Shack, 2011). This is the part effort to increase mangoes production. In the year 2003 and 2004 domestic demand of mangoes increased by 0.023% and 0.006% respectively. While in the year 2008 the Tanzania mango domestic demand increased by 60% where the domestic supply of mangoes was 3 000MT and the demand of mango for domestic was 4 802MT (TRA, 2011). For the 2008 year with few exceptions, domestic mango demand has been exceeding domestic mangoes supply. Figure 5 shows the gradual declining trend in

domestic mango production and imported over time. The negative gap between the domestic production and consumption has been generally filled with carry – over mango from import from other countries (Shack, 2011). Data from food balance sheet of MAFC, 2010 show the availability of mango was the lowest by 0.36 MT in 2005. This has been increased by 1 802 MT in 2008. Mango demand positively increased by 28.5% and 59% in the year 2005/06 and 2007/08 respectively. But in the year 2009/10 there were a slight negative change of mango demand by 9% from the midpoint. The main destination markets are shown in the appendix 6.

4.5.2 Demand of mango for export market

As mentioned before, the United Arab Emirates market is the main market for the Tanzanian mango; it absorbs more than 34% of the overall export followed by Hong kong, and Oman (see appendix 7). Geographically the Saudi market is the nearest and the biggest market in the Gulf countries that import competitive products with high quality, and it is specialized by free trade. (Kotler *et al.*, 2002). Contracts for exports are on individual bases between the Tanzania exporters and the Saudi importers. Some of the importers pay certain amount in advance, and send the cartons for the packing and then pay the nylon so as to cover some of the exporters' expenses but sometimes the exporters covers their own costs. When the importers receive the product they sell it by auction and at the end of the contract they do the balance sheet, which usually results in an exporter loss. The exporters receive the return of their product through the bank in cash money or by a letter of credit (Sanna, 2009). The actual data for mango export started to be documented around 1998 by 61 MT while orders of mangoes from various countries were documented 2 000MT

in 2009 and 4 000MT in 2010. Demand of Tanzanian mango increasing at the rate of 100% between 2009/10 and 201011 (see appendix 5). The export market is promising regardless its constraints. Tanzanian mango farmers fail to fulfill the gap of mango demanded in the European countries like Turkey which demand 100 tones of fresh mango per week.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Major findings and conclusions

The study found out that cash earnings, good prices, market availability, home consumptions and cultural reasons were the main reasons for practicing mango production in the surveyed areas. On the basis of these results, it could be stated that, mango production seemed to be potential in improving nutritional status in both in rural and urban population as well as country's GDP by increasing individual's income. Both males and females involve in the mango business although males seemed to dominate the business.

The first objective of the study was to identify production and expand trends of mango for local and export markets in Tanzania. The range of production and expansion trends was identified in this study. The study revealed that several commercial farms had been established in coast areas of Pwani and Morogoro. Several new farms were also established in Tabora, Morogoro, Dodoma, Kilimanjaro, Iringa, Tanga and Mwanza regions. Most of the newly established farms were producing the improved varieties that are demanded by both the local and the export markets. Future mango production in the coastal regions as well as in Tanzania will increase, putting pressure on domestic markets. The industry would need to increase its efforts to export more in the future to keep demand/supply and price at a reasonable level for growers

About 70% of the orchards in the study area had the age below 8 years. In addition. 92% of the farm owners hired labor which indicated that these were commercialized farms. About 29% of the farmers owned the mango trees more than 200 mango trees. The second objective was to identify the present major local and export marketing channels. The study revealed that the mango production and marketing system had several channels. These included: (1) farmers → exporting companies → European markets/other world markets → consumers; (2) Farmers → supermarkets → Consumers; (3) farmers → assemblers' → wholesalers' → retailers' → consumers. (4) Importing companies→ supermarkets → Consumers, (5) farmers → middlemen → retailers →consumers. Most of the fresh mangoes are sold at the open air markets, about 5% were sold through supermarkets to local and expertise consumers and about 95% were sold through local markets (open air markets).

Retailers were found to have relative high market power with the average return of 552Tsh/ piece of mango traded. They had also more access to market information than other actors. The overall market power was distributed in descending order as follows: retailers' → farmers→ wholesalers' → assemblers.

The third objective was to estimate the market demand for mango both for local and export purposes. It was revealed that there was no any formal organization among chain actors along the chain. Moreover, different chain actors had no storage facilities as mango fruits were stored on the floor. The quality attributes which influenced the business among the marketing agents included freshness, maturity,

color and shape. Access to market information was found to be biased among chain actors with wholesalers having more access to market information than other chain actors. Wholesalers used phones to obtain information about quantities to be supplied to the market. The challenges identified by respondents about the business included: seasonal production of mangoes, water scarcity, lack of organization among actors, high incidences of diseases and pests during production season and limited access to market information.

5.2Recommendations

The following are recommendations based on the findings of this study.

5.2.1 Production

i. Measures should be taken to improve the financial resources of mango growers to enable them practice commercialized farming. This could be successfully done through provision of credit facilities to enable farmers invest in large farms hence improving economies of scale.

ii. The department of land use planning should develop a long term land use plan so as to avoid human settlement in unplanned areas as in the case of Mbezi Msumi and other areas in Kibaha District.

iii. The Agriculture research institutions should collaborating in research efforts put in place initiatives for insuring quality and sufficient mangoes are produced throughout the country to breed better mango varieties for both the domestic and overseas markets

iv. Government should identify the constraints facing exports markets, and steps should be taken by to remove these constraints such as expanding tree nurseries, pricing, providing extension services to farmers, training and investing much on researches.

5.2.2 Marketing

i. It is also important for the responsible authorities such as city councils to design markets which will take consideration of the fruits business, including mangoes. This is due to the facts that the current arrangement does not take into consideration allocating places for fruits business. The other alternative is to construct market especially for fruits only. The private sector should be encouraged to take part in activities geared at value addition.

ii. The Ministry of Agriculture should revise its policies in order to make the market channels more efficient.

iii. It should be noted, however, that the survey data are observations of selling purchase behavior, which may not be the same as consumption behavior. The results of this research based on Almost Ideal Demand Model (AIDS). This is especially true for mangoes because households buy mango in response to changes in price: substantial variations in mangoes prices among households and months of production. Further research should be done to these differences might have been caused by quality differences; high-income households tend to buy higher-quality mangoes than lower-income households do. This report does not answer the question regarding differences between purchase and consumption.

The issue is important and a more elaborate modeling framework, based on the concept of infrequency of purchase, should be used to address it.

iv. Finding of this study based on aggregated time series data and do not shed light on debate about the income and price effects of food demand, especially for mangoes in Tanzania. The results presented in this report should also be useful to agricultural policy-makers in assessing the impacts of various agricultural and trade policies.

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APPENDICES

Appendix 1: Estimation market demand model of pest free mango for domestic and export marketing.

$$TD = M = \sum_{i=2}^{I}\sum_{j=2}^{J} M_{ij} \quad \text{(i)} \quad (4)$$

$$n_{3jl} = \frac{\sum_{l=1}^{L} N^2{}_{3jl} s^2{}_{3jl} \,/\, W_{3jl}}{N^2{}_{3jl} D + \sum_{l=1}^{I} (N^2{}_{3jl} s^2{}_{3jl})} \quad \text{(ii)}$$

$$w_{3jl} = \frac{N_{3jl} s_{3jl} / (c_{3jl})^{1/2}}{\sum_{l=1}^{L} N_{3jl} s_{3jl} / (c_{3jl})^{1/2}} \quad \text{(iii)}$$

$$D = B^2 / 4N^2{}_{3jl} \quad \text{(iv)}$$

$$s_{3jl} = \left(\frac{\sum_{k=1}^{n3jl} (Y_{3jlk} - Y_{3jl})^2}{n_{3jl} - 1} \right)^{1/2} \qquad l = 1,2,3.....L$$

$$j = 1,2,3,.....J \quad \text{(v)}$$

$$k = 1,2,3,.....n_{3jl}$$

$$\text{Population estimates} = M_{3j} \pm \sqrt{V_{3j}} \quad \text{(vi)}$$

$$\text{Where } M_{3j} \approx \sum_{l=1}^{L} (N^2{}_{3jl} Y_{3jl}) \quad \text{(vii)}$$

$$V_{ijl} = \sum_{l=1}^{L} N^2{}_{3jl} \left(\frac{N_{3jl} - n_{3jl}}{N_{3jl}} \right) \frac{s^2{}_{3jl}}{n_{3jl}}, \; j = 1,2,3,....., J \quad \text{(viii)}$$

$$Y_{ij} = B_0 + e_{ij} \quad \text{(ix)}$$

$$Y_{ij} = \frac{Y_{t-1,j} + Y_{t-2,j} + Y_{t-3,j} + ... + Y_{t-n,j}}{n} \quad \text{(x)}$$

Definition of the abbreviations

TD = Total demand for Mangoes

I = number of distribution markets

J = number of distribution components

M_{ij} = sales estimates in market i through distribution component j

N_{ijl} = actual number of distributions component j in market i

n_{ijl} = sample size in market i for distributions component j

s_{ijl} = estimate of σ_{ijl} in market i distributions component j

W_{ijl} = fraction of observations in the market i in component j

c_{ijl} = cost of sampling in market i for component j

B = error of estimation

Y_{ijl} = the k th observations in the j th distribution component in the i th market

Y_{ijl} = the sample mean of the i th market for the j th component

V_{jl} = estimated variance of the population for the i th market for the j th component

B_0 = constant level of the series

etj = a random disturbance at a time period t for component j with mean zero and variance $\delta^2 e_{ij}$

Appendix 2: Production, Export and Import trends of Mango in Tanzania

Years[a]	Production (000t)[1]	Import(000t)[b]	Export (000t)[c]	Export demand (000t)
1990/91	61680	-	-	-
1991/92	45850	-	-	-
1992/93	154921	-	-	-
1993/94	161619	-	-	-
1994/95	165514	-	-	-
1995/96	124227	-	-	-
1996/97	157846	-	-	-
1997/98	190023	-	61	-
1998/99	197038	-	25.74	-
1999/2000	142300	-	8.50	-
2000/2001	145000	-	35.77	-
2001/2002	146000	-	87.50	-
2002/2003	154302	0.36	446.70	-
2003/2004	255000	0.156	83.60	-
2004/2005	257550	-	107.20	-
2005/2006	309174	0.4	242.00	-
2006/2007	334986	0.514	757.78	-
2007/2008	300000	1802	1204.00	-
2008/2009	-	2866	397.40	2000
2009/2010	-	2020	865.81	4000

Source: MAFC, 2010

"0" Not available/applicable

[a] Refers to end of July-June production or market year

[b] Net import of mango

[c] Export of mango

Appendix 3: Estimates sales of the fresh mango in the sampled visited markets 2010/11, Coastal Regions

S/No	Name of Hotel/Supermarket	Weight in kg
1	Paradise City Hotel	6381
2	Paradise Hobour View Hotel	4512
3	Paradise Express Hotel	3782
4	New Africa Hotel	1825
5	Holliday Inn Hotel	1376
6	Kilimanjaro/Kenpinsky Hotel	4500
7	Peackock Hotel	3830
8	Golden Tulip Hotel	1323
9	Shoprite Kamata	5232
10	Shopper Plaza Masaki	1700
11	Shopper Plaza Mikocheni	8400
12	Kariakoo	43807
13	Kibaha retailers	59953
14	Kisutu	15092
15	Buguruni	40060
16	Ilala	28050
17	Morogoro market	29958
18	Mawenzi	56345
19	Export market	865809

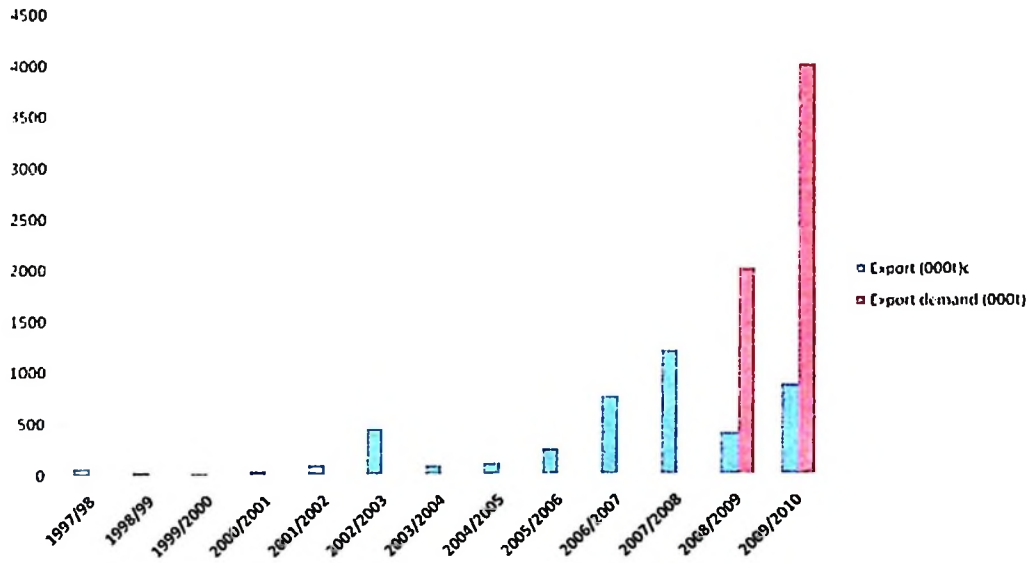
Source: own survey, 2011

Appendix 4: Production trends of mango 2010/11, in the Coastal Regions

Time (Year)	Wt (Tones)	Trends (%)
2005	269	537
2006	1714	28
2007	2205	52.7
2008	3368	- 81
2009	622	713
2010	5061	- 67
2011	3396	

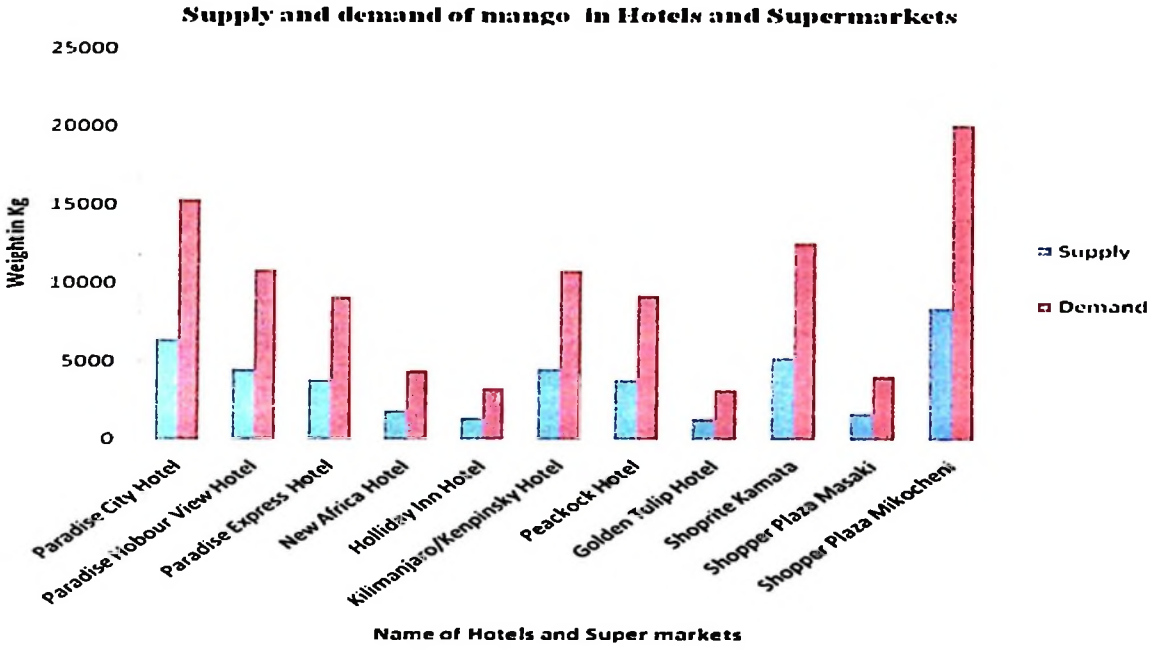
Source: Own survey, 2010/11

Appendix 5: Shows the actual mango exported and the export demanded



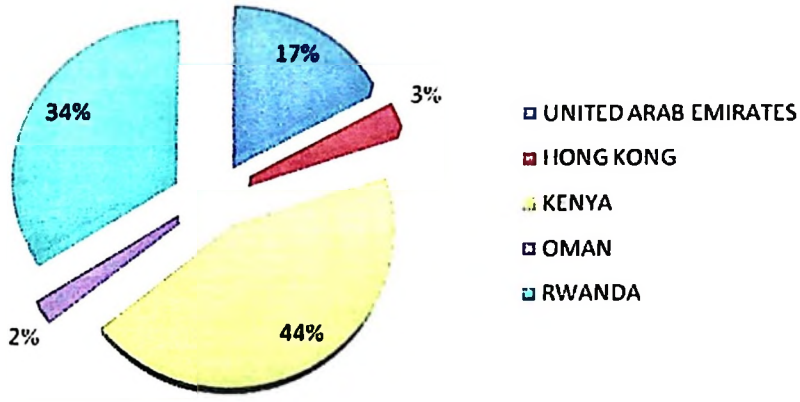
Source: TRA, 2011

Appendix 6: Shows the actual mango demanded



Source: Own survey, 2010/11

Appendix 7: Destination of Tanzanian mango to the foreign market



Source: TRA, 2011

Appendix 8: Producers' questionnaire for mango marketing in coastal regions.

Questionnaire No.....Date of interview..... ...Interviewers name.....

Farmers name.....

Division.....Ward.....Village.....
.....

Section 1: Farmers characteristics

1. Age of the respondent.....(years)
2. Gender of the respondent 1=Male 2= Female [ ]
3. Level of education of the respondent 1= No formal education 2= Primary education 3= Secondary education 4= Post secondary education
4. Age of the household head.....(years)
5. Source of labour in the mango orchard 1= from household 2= Hired [ ]
6. Main source of income 1= Sales of crops 2= Sales of livestock 3= Off farm income [ ]
7. What is the income level per year 1= below 400,000 2= 400,000 – 600,000 3=600,000 – 800,000 4=800,000 – 1,000,000 5= Above 1,000,000 [ ]

Section 2: Mango production and marketing

1. Cropping pattern 1=Mono cropping 2= Mixed cropping [ ]
2. What are other fruit crops grown in the farm.....
3. What is the total area for mango production.....(ha)
4. What is the total area for other fruit produced.....(ha)
5. What is the total area of your farm.....(ha)
6. How did you acquire the land? 1= Inherited 2= Bought 3= Hired 4= Rented 5= others (others).....
7. How do you own the land? 1= Own 2=Rented 3=Leased 4=Family land 5=Inherited 6=Own and rented 7=Own and family 8= Own and inherited 9= Rented and leased [ ]
8. Reasons for mango growing? 1=Good price 2=available market 3=home consumption 4=contract with partners 5=cultural reasons [ ]
9. How many mango trees do you have in your orchard?.....
10. How old is your mango orchard?.....
11. How many mango do you harvest per tree.....(tengas/tree)
12. How many mango do you sell for export market.....(tengas or kg)
13. How many mango do you sell for local market.....(tengas or kg)
14. How much do you consume at your household level? .....(tengas or kg)
15. Do you process your mango fruits? 1=Yes 2= No [ ] if not why and what should be done to improve your mango fruits

Reason	Possible solution

If yes explain why and what should be done to improve

.....

16. What are the major varieties produced

Variety	Amount (tenga)	Years

17. What is the amount sold in each variety

Variety	Amount (tenga)	Years

18. What are major varieties of mango produced for export?

i.....ii.....iii.....

19. What are major varieties produced for local market?

i.....ii.....iii.....

20. Do you sell your produce to the hotels? 1= Yes 2= No [ ] If Yes mention name of hotels

i.....ii.....iii.....

21. Do you sell your produce to the supermarket? 1=Yes 2=No [ ] If yes mention the names of the supermarkets

i.....ii.....iii.....

22. Where do you sell your products in the open local market? 1= In the cities 2= Within districts 3= foreign market [ ]

23. Mention the name of the market

i.....ii.....iii.....

24. What are problems facing in production and marketing?

.....

25. Do you access export association/ company? 1=Yes 2=No [ ] if yes which association/company (specify)

i.....ii.....iii.....

26. What are the major buyers of the produce? 1= Traders 2=Middlemen 3=Industrial processors 4=Retailer 5=Consumers 6= exporters 7= others (Specify) [ ]

27. What is the price per piece of mango do you sell? 1= 50-100 2=100-150 3=150 - 200 4=200 - 250 5= 250 – 300 6=300 – 350 7=350 – 400 8=400 – 450 9=450 – 500 [ ]
28. Do you know who will buy your produce before crop harvesting season/processed? 1=Yes 2=No [ ]
29. How the price of the produce is is determined? 1=Size 2= Season 3= Colour 4=Market price 5=others(specify) [ ]
30. Where do you normally contact buyers 1= at home 2= at the field 3= at the market 4=others(specify) [ ]
31. Which period there is high demand of mango? 1= at the beginning of the period 2= at the middle 3=at the end [ ]
32. In which form do you sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= others (specify).....
33. What is your comment about the mango industry in Tanzania?
i.....

Thank you for your cooperation

Appendix 9: Questionnaire for mango retailers in coastal regions markets

Questionnaire No.....Date of interview..... ...Interviewers name.....

Retailers name.....Sex 1=Male 2=female [ ]
Age.....

Division.....Ward.....Name of
market.....

1. Where do you buy your produce (name of the area/market).....
2. From whom do you buy your produce [ ] 1=Producers 2=Middlemen3= Traders 4=Others(specify)
3. What is the price per piece of mango do you purchase? [ ] 1= 50-100 2=100-150 3=150 - 200 4=200 - 250 5= 250 – 300 6=300 – 350 7=350 – 400 8=400 – 450 9=450 – 500
4. How much tengas do you purchase?.....(tengas/month)
5. Do you export your product? 1= Yes 2= No [ ]
6. If yes how much tengas do you purchase for export?

Variety	Amount(tengas)	Years	Destination

7. Where do you sell your products in the local market? 1= In the cities 2= Within districts 3= foreign market [ ]
8. Mention the name of the market
i.....ii.....iii.....
9. To whom do you sell your products? [ ]
1=Traders(wholesalers) 2=Retailers 3=Middlemen 4=Industrial processors 5= Consumers 6= Hotel or restaurants 7= Others (specify)
10. Do you sell your produce to the hotels? 1= Yes 2= No [ ] If Yes mention name of hotels
i.....ii.....iii.....iv
.....
11. Is access to market a problem? 1= Yes 2=No
12. If yes mention the problem encountered and possible solution

Problem	Possible solution

13. What is the means of transport?
14. Where do you get market information? [ ] i. traders ii. Friends and relative iii. Radio iv. Internet v. Magazine vi Others
15. Do you sell your produce to the supermarket? 1=Yes 2=No [ ] If yes mention the names of the supermarkets
i.....ii.....iii.....
16. How much is the price per piece of mango do you sell? 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5=500 – 700
17. How much do you sell for local market

Variety	Amount(Kg)	Years

18. Do you know who will buy your produce before crop harvesting season? 1=Yes 2=No [ ]
19. How the price of the produce is determined? [ ] 1=Size 2=Season 3= Colour 4=Market price 5= Others (Specify).....
20. Where do you normally contact buyers? [ ] 1= At home 2= at the field 3=at the market 4= others (Specify).....
21. Do you have any access to credit facility? [ ] 1=Yes 2=No
22. Which period there is high demand of mango? [ ] 1= at the beginning of the season 2= at the middle of the season 3= at the end of the season Specify months.....
23. In which form do you buy and sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= others (specify).....
24. What are your comments concerning mango industry in Tanzania?
i.....

ii.....

Thank you for your cooperation

Appendix 10: Questionnaire for local traders of mango in the coastal regions

Questionnaire No.....Date of interview..... ...Interviewers name.....

Traders name.....Sex 1=Male 2=female [ ]
Age..... marital status .....

Division.....Ward.....Name of market.....

1. Where do you buy your produce (name of the area/market).....
2. From whom do you buy your produce [ ] 1=Producers 2=Middlemen3= Wholesaler 4=(specify)
3. What is the price per piece of mango do you purchase? [ ] 1= 50-100 2=100-200 3=200 - 300 4=300 - 400 5= 400 – 500
4. How much tengas do you purchase?.....(tengas/month)
5. Do you export? 1= Yes 2= No [ ]
6. If yes how much tengas do you purchase for export?

Variety	Amount(tengas)	Years

7. Which varieties are more preferred for export with reasons

No	Variety	Reasons

8. Where do you sell your products? 1= In the cities 2= Within districts 3= foreign market [ ]
9. Mention the name of the market
i.....ii.....iii.....
10. To whom do you sell your products? [ ]
1=Traders(wholesalers) 2=Retailers 3=Middlemen 4=Industrial processors 5= Consumers 6= Traders 7= Others (specify).....
11. Is access to market a problem? 1= Yes 2=No
12. If yes mention the problem encountered and possible solution

Problem	Possible solution

13. What is the means of transport?
14. Where do you get market information? [ ] i. traders ii.Friends and relative iii. Radio iv. Internet v. Magazine vi Others
15. Do you sell your produce to the hotels? 1= Yes 2= No [ ] If Yes mention name of hotels
i.....ii.....iii.....iv .....
16. Do you sell your produce to the supermarket? 1=Yes 2=No [ ] If yes mention the names of the supermarkets
i.....ii.....iii.....
17. How much is the price per piece of mango do you sell? 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5=500 – 700
18. Do you export your mango? 1=Yes 2=No [ ] if Yes to which destinations? Mention if any?
i.....ii.....iii.....
19. How much do you sell for export?

Variety	Amount(Kg)	Years

20. How much do you sell for local market

Variety	Amount(Kg)	Years

21. Do you access export associations/ companies 1=Yes 2=No [ ] if yes mention some
i.....ii.....iii.....
22. Do you have any access to credit facility? [ ] 1=Yes 2=No
23. Do you know who will buy your produce before crop harvesting season 1=Yes 2=No [ ]
24. How the price of the produce is determined? [ ] 1=Size 2=Season 3= Colour 4=Market price 5= Others
(Specify).....
25. Where do you normally contact buyers? [ ] 1= At home 2= at the field 3=at the market 4= Others (Specify).....

26. Which period there is high demand of mango? [ ] 1= at the beginning of the season 2= at the middle of the season 3= at the end of the season Specify months.....

27. In which form do you buy and sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= others (specify).....

28. What are your comments concerning mango industry in Tanzania?

i.....ii

.....

Thank you for your cooperation

Appendix 11: Checklist for Supermarkets mango market in Dar es Salaam city

Questionnaire No.....Date of interview..... ...Interviewers name.....

Name of respondent.....Age.....Sex.....

Supermarket name.....City.....Districts.....

1. From whom do you buy your produce [ ] 1=Producers/farmers 2=Middlemen 3= Traders 4=Retailers 5=Others(specify)
2. What is the price per piece of mango do you purchase? [ ] 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5= 500 – 600 6=600 – 700
3. How many pieces of mango do you purchase per month?.....

Variety	Amount(tengas)	Years

4. Which varieties are more preferred for your hotel with reasons

No	Variety	Reasons

5. How much is the price per piece of mango do you sell? 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5=500 – 700
6. Mention problems facing your products in the market
i.....ii.....iii.....
7. Do you know who will buy your produce before crop harvesting season 1=Yes 2=No [ ]
8. How the price of the produce is determined? [ ] 1=Size 2=Season 3= Colour 4=Market price 5= Others (Specify).....
9. Where do you normally contact buyers? [ ] 1= At home 2= at the field 3=at the market 4= Others (Specify).....
10. Which period there is high demand of mango? [ ] 1= at the beginning of the season 2= at the middle of the season 3= at the end of the season Specify months.....
11. In which form do you buy and sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= processed 6=others (specify).....
12. What are your comments concerning mango industry in Tanzania?i.....

Thank you for your cooperation

Appendix 12: Checklist of hotels for mango market in Dar es Salaam

Questionnaire No.....Date of interview..... ...Interviewers name.....

Name of respondent.....Age.....Sex.....

Hotels name.....City.....Districts.....

1. From whom do you buy your produce [ ] 1=Producers 2=Middlemen3= Traders 4=Others(specify)
2. What is the price per weight (Kg) of mango do you purchase? [ ] 1= 500-1000 2=1000 – 1500 3=1500 - 2000 4=2000 – 2500 5= 2500 – 3000 6=3000 – 3500
3. What is the average consumption of mango in your hotel per day?.....
4. How many kilogram (Kg) of mango do you purchase per month?.....
5. Which varieties are more preferred for your hotel with reasons

No	Variety	Reasons

6. How much is the price per piece of mango do you sell? 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5=500 – 700
7. Do you know who will buy your produce before crop harvesting season 1=Yes 2=No [ ]
8. How the price of the produce is determined? [ ] 1=Size 2=Season 3= Colour 4=Market price 5= Others (Specify).....
9. Where do you normally contact buyers? [ ] 1= At home 2= at the field 3=at the market 4= Others (Specify).....
10. Which period there is high demand of mango? [ ] 1= at the beginning of the season 2= at the middle of the season 3= at the end of the season Specify months.....
11. In which form do you buy and sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= processed 6=others (specify).....
12. What are your comments concerning mango industry in Tanzania?

Thank you for your cooperation

Appendix 13: Checklist for Exporters of mango market in Dar es salaam

Questionnaire No.....Date of interview..... ...Interviewers name.....

Name of respondent.....Age.....Sex.....

Company name.....City.....Districts.....

1. From whom do you buy your produce [ ] 1=Producers/farmers 2=Middlemen 3= Traders 4=Retailers 5=Others(specify)
2. What is the price per piece of mango do you purchase? [ ] 1= 100 – 200 2=200 – 300 3=300 – 400 4=400 – 500 5= 500 – 600 6=600 – 700
3. How many pieces of mango do you purchase per month?.....

Variety	Amount(Kg)	Years

4. Which varieties are more preferred for export purposes with reasons

No	Variety	Reasons

5. Do you know who will buy your produce before crop harvesting season 1=Yes 2=No [ ]
6. How the price of the produce is determined? [ ] 1=Size 2=Season 3= Colour 4=Market price 5= Others (Specify).....
7. Where do you normally contact buyers? [ ] 1= At home 2= at the field 3=at the market 4= others (Specify).....
8. Which period there is high demand of mango? [ ] 1= at the beginning of the season 2= at the middle of the season 3= at the end of the season Specify months.....
9. In which form do you buy and sell your produce? [ ] 1=fresh 2=canned 3=frozen 4= dried 5= processed 6=others (specify).....
10. What are your comments concerning mango industry in Tanzania?

i.....

ii.....

Thank you for your cooperation

Appendix 14: Criteria for mangoes wholesalers

- Has large warehouses designed for storage
- Has ability to move large amounts of producers with one transaction
- Contract for produce can sometimes be secured before crop harvested
- Diversification amounts and quantity are desired by the buyers