

**VALUE CHAIN ANALYSIS FOR ORANGES IN MUHEZA DISTRICT,
TANZANIA**

BY

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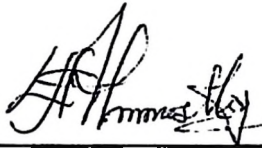
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ABSTRACT

A study was conducted in Muheza District, Tanga from mid 2006 to mid 2007 to identify the existing value chain for orange in the study area; assess the performance of the value chain as well as the contribution of income from orange to total household income; and identify the problems and constraints facing the value chain for orange in the study area. The findings in this study showed that the value chain for oranges in Muheza District is dominated by middlemen who fall under four levels: the “junior” and “senior” middlemen based in the villages and the “junior” and “senior” middlemen based in Muheza town. On average, orange producers obtained the lowest gross margins ranging from Tshs 89 550 to 459 362 per annum. The wholesalers from Nairobi earned the highest margins (average of Tshs 6 449 450 per trip). The analysis of household incomes at the producer level showed that income from oranges constituted about 51% (Tshs 260 000) of the total household income. The following were identified as major problems/constraints facing orange producers in the study area: poor bargaining power, loss of produce, selling of immature oranges and poor access to financial capital. The study recommends for an establishment and strengthening of farmer’s associations and/or trading societies, establishing and sensitization of farmers to join local financial institutions (e.g. SACCOS) and the need to develop the fruit processing industry in Tanzania as the alternative means of alleviating the farmers’ problems.

DECLARATION

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



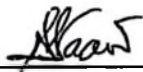
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DEDICATION

To my mother, the late Mama Opportuna J. Moshu for her love and encouragement during the period of the study, though she passed away few months before the accomplishment of the study.

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ACRONYMS AND ABBREVIATIONS

ASDP	Agricultural Sector Development Program
ASDS	Agricultural Sector Development Strategy
BET	Board of External Trade
BOT	Bank of Tanzania
cm	Centimeter
DAI PESA	Development Alternative Inc. Private Enterprise Support Activities
DALDO	District Agricultural and Livestock Development Officer
EAC	East African Community
FAO	Food and Agriculture Organization
FGD	Focused Group Discussions
GDP	Gross Domestic Product
GEL	Gomba Estate Limited
GM	Gross Margin
G2G	Gateway to Growth
HLSLB	Higher Learning Students' Loan Board
ILO	International Labour Organization
ITF	International Trade Forum
Km	kilometer
KShs	Kenyan shillings
LGA	Local Government Authority
LDCs	Least Developed Countries
MI	Market Intermediary

CHAPTER ONE

1.0 INTRODUCTION

1.1 Overview

This chapter presents the background information about fruits, vegetables and their marketing in Tanzania. This chapter also presents the problem statement, objectives of the study and research questions.

1.2 Background information

Fruits and vegetables are the main sources of micronutrients (vitamins and minerals). These micronutrients are required in relatively small amount as compared to other nutrients (macronutrients) but they perform vital roles in the human body systems. Deficiency of these micronutrients may lead into a number of diseases due to malfunctions in the human body systems.

In Tanzania, one of the Sub-Sahara countries, the problem of vitamin A deficiency has been reported for many years. The results of vitamin A deficiency leads into a disease known as night blindness. Night blindness disease affects 15% of children under five in African countries including Tanzania (Nyange, 1993). Either, 61% of the country's population suffers from vitamin A deficiency. Women and girls suffer more as they tend to eat least in times of food shortage (Food and Agriculture Organization, 2004). The best way of combating this problem as suggested by health and nutritional institutions, is to consume a substantial amount of fruits and vegetables in the daily menus. Fruits such as oranges, pawpaw and vegetables such as amaranths and cassava leaves are rich in vitamins A, C and Group B vitamins.

The most prominent Districts of Tanga region, as far as fruits production is concerned, are the Muheza, Lushoto and Korogwe, with the Muheza District being the most important producer of oranges in the region. The District is also the largest producer of oranges in Tanzania. The oranges produced are partly consumed domestically in the region while a greater portion is offered for sale in other cities such as Dar es Salaam, Morogoro, Arusha, Moshi and Nairobi. Orange farming employs over 40% of household both as sole and complement economic activity in Muheza District (Mwezimpya, I. personal communication, 2006).

The country's per-capital annual income is about US\$ 280, with agriculture playing a dominant economic role, accounting for nearly three-quarter of merchandise, 45-50% of GDP and employing around 70% of the labour force, especially in the rural areas. Growth in tourism has been one of the major driving forces in commercialization of high value products in Tanzania. From 1991 to 2003, tourist numbers tripled from 186 800 to 576 000, hotel numbers doubled from 205 to 469; and total earnings from tourism rose from US\$ 94m to US\$ 731m. Increasing urbanization and incomes is another strong driver of the economy. Poverty has declined more rapidly in the major urban areas such as Dar es Salaam (from 28% in 1999 to 18% in 2005) and less rapidly in rural areas (from 41% in 1999 to 39% in 2005), resulting into an increase in purchasing power in urban areas (Ashimogo, 2006). The aim of the study is therefore to assess the performance of the value chain for orange using the case of Muheza District in Tanzania.

1.3 Problem statement and justification

In Tanzania, Tanga region is famous for production of both food and cash crops. The cash crops produced in the region include tea, sisal, coconut and spices. Food crops include fruits and vegetables, maize and legumes. Despite of the economic potential of the region, the income of its people is still low (United Republic of Tanzania, 2004). One of the major reasons for this is high losses the producers suffer especially for perishable foods- fruits and vegetables. According to the Ministry of Agriculture and Food Security (2006), Tanga region suffers a loss of up to 50% of the total produced fruits and vegetables per annum. It has been reported that 40% of the total production (equivalent to 65,000 tones of oranges) is wasted annually (Mlulla, 2003). DAIPESA (2006) reported that in Tanga and Morogoro regions fruits loss was as high as up to 80% per year. The reasons behind these losses are, among others, unreliable markets, little knowledge of the farmers about the existing marketing functions such as grading, assembling, transportation and distribution.

Regional trading linkages have been enhanced by increasing cross-border investment in Tanzania in the late 1990s to early 2000s by South African supermarkets, hotels, mining enterprises and financial institutions. Despite the growth of the investments, small-scale farmers have difficulties in accessing such niche markets as supermarkets and tourists hotels because of the difficulty in adhering to quality and safety standards (Ashimogo and Greenhalgh, 2006). In 2003, Shoprite had five branches in Tanzania – four in Dar es Salaam and one in Arusha. Apart from imports from South Africa, Shoprite has local partners who are either individuals or companies (e.g. Fruits and Vegetables Limited) that supply it with mainly fruits and vegetables. In this arrangement, however, risks are fully borne by suppliers because, interested suppliers must first bring test samples to Shoprite

and subsequent supplies depend on sales of the test samples. Shoprite also imports fruits e.g. apples, pears and citrus from South Africa to cater for low off-season production and for poor quality varieties. The growth of imports highlights the inadequacies in the domestic processing industry which could add value to the local agricultural products (Ashimogo and Greenhalgh, 2006).

In spite of the endowment in horticultural production, only 4% of the available fruits and vegetables are processed (Ndaba, 2001). Addressing this problem to the parliament of Tanzania, (Mzindakaya, 2006) pointed out that most of fruit juices produced in industries within the country are not made from pure fruits but sugar, permitted food colours and artificial flavours. This denies the fruit growers the opportunity to access market for their produce. Market quota for agricultural products has reached between 15 and 20% in United States, Japan and Europe. But the 25 companies appointed by the government of Tanzania to search markets for farmers have failed to connect them to these foreign markets (Kawambwa, 2006).

Despite the increase in investments such as supermarkets and tourist hotels, and elevation of purchasing power in the major urban areas like Dar es Salaam, Tanga and Arusha, small-scale farmer still face difficulties in utilizing these opportunities to market their crops. Moreover, the existing market quotas in the foreign countries such as US, Japan and Europe are underutilized, resulting in reduced market accessibility by the small-scale farmers.

Several studies have been conducted on the horticultural crops in Tanzania. Some of which are Nyange *et al.* (2000) on the fresh fruit marketing in Tanzania, Mlulla (2003) assessing cross-border trade in Northern Tanzania, and Ndaba (2001) on the impact of Sanitary and Phytosanitary (SPS) on fish and horticultural products from East Africa. However, these studies have not concentrated on the general performance of value chains on fresh fruits, especially orange. Therefore, little is known about the general performance of the orange value chain in Tanzania and its contribution to total household income, leave alone the specific problems that face the industry. This study was therefore an attempt to fill that gap.

1.4 Objectives of the study

1.4.1 General objective

The main objective of this study was to assess the performance of the value chain for oranges in Muheza District in Tanzania and come up with recommendations for improvement.

1.4.2 Specific objectives

The specific objectives of the study were:

- (a) To identify the existing value chains for orange in the study area,
- (b) To assess the performance/contribution of income from orange to total household income, and
- (c) To identify the problems and constraints facing the value chain for orange in the study area.

1.4.3 Research questions

- (a) What are the existing value chains for orange in Muheza?
- (b) Is there any contribution of income from orange farming to the total household income for Muheza farmers?
- (c) What are the problems and constraints facing the orange farmers in Muheza?

1.5 Organization of the dissertation

The remainder of the dissertation is organized into four main chapters. Chapter two presents a review of different literature on marketing of agricultural products, production losses at farm level as well as the previous studies done in the study area and elsewhere in Tanzania. The methodology used in the study is presented in chapter three. The results of analysis and discussion are presented in chapter four, including the analysis and discussion of the contribution of income earned from oranges to total household income; existing orange fruit market chains and problems/constraints facing farmers in the study area and other actors in the value chain for orange. The dissertation winds up by chapter five which presents some concluding remarks and recommendations emanating from the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This chapter provides a review on literature which relate to agricultural production and marketing of non traditional agricultural products in general.

2.2 Global orange production and trade

2.2.1 Global outlook

Brazil contributes about 50% of the world orange production. The country is the largest producer of oranges in the world, followed by Israel, while United States ranks the third (Appendix 9). According to the report by Phillipez and Fernando (2004), the largest orange producing province in Brazil is Sao Paulo which produces about 70% of the total amount of oranges produced in Brazil. About 10% of the total oranges produced in the country is processed into juice and exported. Ninety percent of the produce is consumed in fresh form through the domestic market. As per statistics provided in Appendix 9, the amount of orange produced by other countries (Tanzania being one of these countries) constitutes only 26.6 %. Tanzania's annual production of oranges is estimated at 160 000 metric tones (MOAFC, 2006).

In terms of export trade, Brazil also takes a lead, followed by US, and Israel (Appendix 10). As far as import trade is concerned US is the largest importer, followed by Japan, (Appendix 11). Virtually, the market opportunity for oranges is highest in US, followed by Japan. However, although South Africa could not be given a rank in terms of

production, it ranks the fifth in terms of export trade for orange. From the information given in Appendices 10 and 11 Morocco and South Africa are the only famous countries from Africa which fall within the ten largest countries as far as international trade on oranges is concerned.

2.2.2 Horticultural production in Tanzania

According to the Bank of Tanzania (BOT) report, 60 % of foreign currency earnings in Tanzania come from agricultural exports. Agriculture supports about 80% of the country's population. Mlulla (2003) reports that, 47% of the Tanzania's Gross Domestic Products (GDP) comes from Agricultural products. According to the BOT financial report for the year 2005 - 06, agricultural sector contributes about 45% of the country's GDP. In spite of the large contribution of the agricultural sector to the national economy, the horticultural industry has remained dormant for many years and its contribution to foreign earnings has been considered as unimportant. This can be attributed to the government's insistence on cultivation of cash crops such as coffee, cotton and tobacco. For food crops the government has emphasized on cultivation of staple food such as maize, wheat and beans. Moreover, the government's worries about unreliable rainfalls, has insisted the farmers to cultivate draught resistant food crops such as millets, sorghum and cassava. This had an impact on the resources allocation in terms of capital, extension services and manpower (Nyange, 1993).

In the early 1990s, the country's trade of its main traditional export crops such as coffee and cotton started to decline. This, together with the government's concern on food security has pushed it to adopt new strategies for diversifying the country's export, while

ensuring a better health of its population. Strategies on export of agricultural products including horticultural crops were set. Since then, the horticultural sector had received more attention and much higher priority in the allocation of resources. However, commercial production of horticultural crops is practiced in very few areas in the country. The famous regions for these activities are Arusha and Kilimanjaro (for flowers), Tanga (for some fruits and spices), Morogoro (for some fruits and vegetables) and Iringa (for a few vegetables and spices). The greater part of fruit production, including oranges, is still being grown in areas where these fruits can tolerate the climate. Such regions include Tanga (for oranges, pears, peaches, apples and plums), Morogoro (oranges and pineapple); Coastal region (pineapple and pawpaw). Despite the increasing trend in the number of farmers involved in production of horticultural crops (particularly foreign investors) Tanzania still lags behind as compared with other countries in Northern and Southern Africa (URT, 2005).

2.3 The global market structures and financial institutions

2.3.1 The role of market structures and financial institutions

In general, the problem of declining trend for agricultural commodity prices continues to depress the export earnings of least developing countries (LDCs). These commodity export prices are of particular importance to countries that are highly specialized in the export of only a few commodities (Rakotoarisoa and Shapouri, 2001). According to Rakotoarisoa and Shapouri (2001) in the analysis of market structures, high import concentration can be applied to explain the link between currency depreciation and market price adjustment. In an imperfect market, a large trader can adjust prices accordingly when exchange rates change. The paper also shows that more than 50% of all the vanilla beans that US supplied

worldwide involved exercising market power and the state could adjust prices when exchange rates varied. The authors also show that, a key microeconomic policy such as exchange rate adjustment can lose its effectiveness for generating export revenue in the face of imperfect markets. Voituriez (2001) also argues that incomplete markets (markets where not all risks can be hedged) lead to inefficiency and that market liberalization, which may generally increase the size of markets, will not necessarily reduce price volatility. Moreover, financial instruments such as contract options can undoubtedly help to mitigate price risk and to ensure farmers' income.

Food and export crops are substitutes in production in the short run. Total agricultural output responds negatively to increase in export prices and positively to increase in food prices. A plausible explanation is that as farmers shift resources to export crop production, food supply falls in the short run while the increase in export supply may take several years to materialize. The exchange rate is significant in explaining both food and export crop production and aggregate agricultural supply, suggesting that the exchange rate is acting as a proxy for excluded macro-economic variables or changes in the exchange rate that are not passed immediately through prices (Lamb, 2002).

2.3.2 Market Intermediary Management (MIM)

The Market Intermediary (MI) concept is a smallholder development approach in which processors, traders or exporters promote the establishment of intermediary entities to both access the production from small-scale growers and develop with them the capacity to successfully manage the production of export crops. It is a structured system based on the demand-side development of the market chain that argues that small-scale grower

capacity-building should follow without precede, the identifying and securing of export market (Ashimogo and Greenhalgh, 2006).

In Tanzania, Market Intermediary Management Limited (MIM) is a registered company limited by guarantee, which was established as a non profit organization. Its vision is to create an entity which connects market to growers through the creation of grower's groups specifically tailored to fulfill contracted market undertakings. Closely related to MIM is the Gomba Estates Limited (GEL) which is a group of Tanzanian registered companies involved in the production and export of horticultural crops. GEL owns 75% shares in MIM and has supplied MIM with market and MI conceptual structures. Gateway to Growth (G2G) is another entity - a UK-based NGO specializing in developing projects to bring African smallholders into the market chain supplying the UK and continental supermarkets. G2G owns 25% shares in MIM and has access to pool of technical and financial experience in the fresh produce (Ashimogo and Greenhalgh, 2006).

2.4 The role of intermediaries in enhancing market efficiency

For the past two decades, the recognition of the critical role of the markets in economic development has prompted sweeping market reforms across a number of developing countries. In spite of these reforms, symptoms of poorly functioning markets in much of Sub-Saharan Africa are evident in the segmentation of markets, low investment in the market infrastructure, the persistence of high margins and of market thinness, and the limited progression toward more complex market arrangements such as forward contracting.

A large majority of Ethiopia's grain traders, up to 85%, regularly use brokers known as *delali* on their long-distance transactions. Brokers fulfill a purely intermediary role of matching geographically dispersed buyers and sellers and, in return, receive a fixed commission (Gebre-Madhin, 2001). In the remainder of the paragraphs a review of market search *with* and *without* brokerage is presented.

In the presence of a representative risk-neutral broker, who does not trade on his or her own account, traders choose whether to use a broker or not, and if they opt to search on their own, they choose the optimal level of search intensity. Each trader has a unique probability of choosing a broker in a given transaction. Since other traders in the market do not know this probability, each trader makes conjectures about the probability that others will choose the services of brokers. An important feature of this economy, observed directly in the Ethiopian grain market, is that a trader who has opted to search without a broker can only search for a partner among the pool of traders who are similarly searching on their own. Conversely, once a trader has chosen to use the broker, he or she exists from the direct search market. This phenomenon of segmentation into a 'direct search market' and a 'brokered search market' is observed in the Ethiopian grain market, where traders who opt for brokerage physically ship grain to their brokers and stop searching on their own, while brokers who have received grain from clients tend to contact brokers who represent distant clients. Important from a policy perspective is that traders who were doing well without brokers stand to lose from the presence of brokers because of the shrinkage of the search market that ensues (Gebre-Madhin, 2001).

2.5 Socioeconomic characteristics and production analysis under risk

Operators who are less risk-averse choose a riskier career-practicing intensive agriculture which requires a sizeable capital investment. Several characteristics of the farmer and his/her family affect risk-taking behaviour. In addition, large family sizes for most farmers particularly in developing countries, often make them to become more cautious and exercise a conservative behaviour. On the one hand, a large family size represents a large labour force for the household and this can therefore be expected to have a negative effect on risk-aversion. On the other hand, a large family size means more mouths are available to be fed which might as well increase the degree of risk-aversion. Contrary to the effect of family size, more experienced (measured by age) and education (measured by years of schooling), farmers show more readiness to try new treatments on their farms (Feinerman and Finkelshtain, 2003). One of the important risks considered by farmers in a developing country like Tanzania is probably that which relate to post harvest losses. The following section presents a review of post harvest losses with regard to horticultural crop production in Tanga region.

2.6 Horticultural post harvest losses in Tanga region

It is estimated that Tanga region suffers a loss of up to 50% of the total fruits and vegetables produced (MOAFC, 2006). Others reports (e.g. DAIPESA, 2006; Mlulla, 2003) have indicated that annual losses at farm levels in Muheza District range between 35 and 57%. Post harvest losses therefore erode quite a huge portion of total household income in Tanga region, and particularly in Muheza District knowing that more than 50% of the total household income in the District comes from orange farming activities (DAIPESA, 2006).

In spite of the potential that the District has in horticultural production, only 4% of the available fruits and vegetables are processed. Furthermore, an estimated production of 2.75 million tones of fruits and vegetables, the bulk of which is consumed fresh and a substantial amount of 30% to 40% is lost due to inadequate post harvest facilities (Mlulla, 2003). The absence of communication in rural areas is identified as a serious constraint to the dissemination of knowledge and market information, both of which are vital to prosperity of farmers in a free market economy. Limited capital and access to financial services is another constraint which renders the farmer inability to either expand their production through yield increase or expanded production area (Ndaba, 2001). Understanding this, the government has been undertaking reforms with the major aim of addressing major constraints to the economic development and improvement of livelihoods for the rural poor and national at large. The next section presents a review of the various public sector policies and strategies that are in place to achieve this goal.

2.7 The public sector policies and strategies

The government of Tanzania has implemented various poverty reduction initiatives including among others, the Tanzania's Development Vision 2025; the Poverty Reduction Strategy Paper (PRSP) – followed by the National Strategy for Growth and Reduction of Poverty (NSGPR); the Rural Development Strategy (RDS); and the Agricultural Sector Development Strategy (ASDS).

The Tanzania's Development Vision 2025 provides the guiding framework for all public sector policies. The vision is for Tanzania to move from a less developed country (LDC) to a middle-income country by 2025, with a high level of human development. Specific

targets include: a high quality livelihood, which is characterized by sustainable and shared growth (equality), and freedom from abject poverty; good governance and the rule of law; and a strong and competitive economy capable of producing sustainable growth and shared benefits. This vision is furthermore supported by the currently launched National Strategy for Growth and Reduction of Poverty (NSGRP), better known by its Kiswahili acronym as MKUKUTA (*Mkakati wa Kukuza Uchumi na Kuondoa Umaskini Tanzania*), the final version of which was produced in June 2005. The MKUKUTA is a broader, comprehensive and more outcome-focused than its predecessor - the PRSP which was launched in October 2000 and sets out the Tanzania's medium term strategy for poverty reduction and the indicators it will use for measuring progress.

The NSGRP has deliberately set out to mainstream cross-cutting issues as integral to the strategy and not as "add on". A very important feature of the development of the review leading to MKUKUTA has been national ownership and the implementation of extensive consultation with a wide range of stakeholders on the content and focus of the strategy with the aim to make it a national strategy. The MKUKUTA is based on the achievement of three major clusters of broad outcomes for poverty reduction, namely: growth and reduction of income poverty; improved quality of life and social well being; and good governance and accountability. Its targets for 2010 include among others, growth rates for crop farming and livestock sub sectors of 10% and 9% respectively; food crops production of 12 million tones and a secured and facilitated marketing for agricultural products (URT, 2005).

The ASDS aims at creating an enabling and favourable environment for improved productivity and profitability in the agricultural sector and increasing farm incomes to reduce rural income poverty and ensure household food security.

It pinpoints the following areas as key for poverty alleviation: increasing agricultural productivity and profitability; encouraging agricultural sector investment and diversification; enhancing public-private partnership (PPP); improving access to services and markets; and encouraging/sensitizing farmers to shift from reliance on subsistence to commercial oriented farming while ensuring household food security (URT, 2005).

Under the Public Sector Reform Programme the role of ministries is currently stipulated as that of facilitating the development of market-based economy in which the LGAs and private sector play a critical role. The public sector is expected to play two key roles: to invest in production, processing and marketing and to provide agricultural support services including research, extension, training, inputs and information services (URT, 2005).

There are also a number of other key relevant public policies including: the Trade policy (2002) which aimed at transforming the economy in a period of five years (i.e., 2002 to 2007) from an inefficient supply constrained economy into a competitive export-led economy; the Cooperative development policy (2002) which stipulates its overall objective as that of facilitating the growth of economically viable and effective member-based cooperatives; and the Draft agricultural marketing policy (2005) which aims at modernizing agricultural marketing by enhancing market access through the promotion of value-adding activities for both domestic and international market (URT, 2005).

2.8 Border trade in oranges between Tanzania and Kenya

The border trade between Tanzania and Kenya has, from 2004 been expanding from one year to another. The most common routes through which oranges are exported to Kenya

include the border areas of Horohoro (in Tanga region) and Namanga (in Arusha region) (DALDO, 2006). The monthly quantities of orange exported through the Horohoro border post are presented in Table 1 and those passing through the Namanga border are given in Table 2.

Table 1: Oranges exported to Kenya through Horohoro in metric tones (2004-06)

Month	Years		
	2004	2005	2006
January	30.70	0	20
February	0	0	20
March	5	22.60	43.50
April	13	5	4
May	8.80	0	0
June	2	0	0
July	0	20	100
August	0	40.70	70
September	56.50	0	55
October	0	32.90	20
November	0	39.80	147.80
December	0	8	60
Total	116.50	168.70	540.30

Source: Customs and Excise Office, Horohoro border (2007).

The quantities of orange exported through the Namanga border post have increased by five folds for the period from 2004 to 2006 while those exported through the Horohoro border have increased by four folds. This suggests that the flow of market information between the Muheza main market and border traders has been improving with time. This also reflects the growth of annual demand for oranges in Nairobi and the rest of markets in Kenya.

Table 2: Oranges exported to Kenya through Namanga in metric tones (2004-06)

Month	Years		
	2004	2005	2006
January	0	150	10
February	0	90	10
March	0	0	0
April	0	0	90
May	32	0	84
June	146	0	230
July	92	220	230
August	0	40	510
September	55	380	540
October	150	20	785
November	0	30	248
December	160	20	140
Total	635	950	2 967

Source: Customs and Excise Office, Namanga border (2007).

2.9 Approaches to the analysis of marketing efficiency

2.9.1 The value chain analysis

The concept of 'value chain analysis' is defined by Kaplinsky and Morris (2000) as the "full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use." These activities include designing, production, marketing and support to get the final product or service to the end consumers.

The concept of 'value chain analysis' is sometimes used interchangeably with that of 'sub-sector analysis.' Other authors however make a distinction between the 'sub-sector analysis' - which examines all the firms, channels and markets related to a specific product or service and 'value chain analysis' - which focuses on a single vertical chain of firms leading to a particular consumer market (Schmitz, 2005). The latter also includes

additional analytical elements beyond the former analysis such as inter-firm cooperation, governance and geographic coverage that extends to global markets.

The 'value chain analysis' is also quite often used by development agencies to identify how small enterprises can play a larger and more lucrative role in a particular value chain and how a value chain's structure or characteristics can be changed to better include and benefit both small enterprises and other enterprises. It is increasingly used to help develop a competitiveness strategy for a value chain or industry (Schmitz, 2005). In this study, the definition of value chain as given by Kaplinksy and Morris (2000) is adopted in the analysis.

2.9.2 The commodity supply chain

Commodity supply chain describes the connections between different enterprises involved in the design, production and marketing of a finished product (Gereffi *et al.*, 1994). Mudhin (2003) defined commodity supply chain as a value addition process whereby a commodity is processed or manipulated in whatever way in an effort to add value to it as it goes along the commodity chain to the final user. Commodity supply chain entails tactical interventions at the critical nodes of the commodity to develop the commodity production, services and marketing both at the same time. The commodity chain involves all the institutions that are involved in production, post harvest storage, processing, research and development and marketing of respective high value commodities (Mudhin, 2003). ITF (2003) named the commodity chain as value chain and describe it as sector level analysis of each link in the 'chain of activity' from the time when the product or service is only an idea to the time when it is disposed off after use.

By breaking the process of producing a commodity and bringing it into the hands of a consumer into several components parts or nodes, commodity chains permit the analysis of social relations within each node. Commodity chain can be divided into two types: producer driven and buyer driven (Gereffi *et al.*, 1994). Commodities requiring heavy capital and technology investments and controlled by companies with key technologies and production facilities are producer driven. On the other hand, production of buyer driven commodities is usually labour intensive and retailers and brand name companies exercise key governance functions. This study concentrated on the buyer driven chain in the marketing of oranges.

2.9.3 The situation of fruits and vegetables supply chains in Tanzania

Marketing of horticultural crops (fruits and vegetables) has several features compared to other agricultural crops. Because of their high perishability, seasonality and bulkiness, fruits and vegetables require special care and attention in providing form, time and space utilities. This special care and attention requires capital intensive and technological advancement (Salum, 2002). In Tanzania, marketing of horticultural produce has never been under control of the government. It has been and continues to be entirely conducted by private sector and operates as a free market where the laws of supply and demand regulate price (Nyange *et al.*, 2000). Usually, traders who buy horticultural crops from farmers transport the produce to the market where they sell them either directly to consumers or to other traders. Salum (2002), when studying factors influencing the marketing efficiency in Morogoro municipality and Morogoro rural district discovered that, the existing market chain is not specific. There are some retailers who make their purchases directly from the producers and sell them to consumers while some retailers buy

fruits and vegetables from wholesalers and sell them to consumers in the municipal markets. According to MOAFC (1999), the bulk of fruits and vegetables from Arusha, Kilimanjaro, Coast, Morogoro and Tanga regions are marketed mainly in urban centers of Dar es Salaam, Arusha, Moshi, Tanga, Coast and Morogoro. Kariakoo is the largest market for most of the horticultural produce from these regions and main market participants in the fruits and vegetables trade are farmers, local traders, interregional traders, brokers and retailers. Furthermore, Kashuliza *et al.* (2000) when studying the fruits marketing in Tanzania found that, during scarcity period, wholesalers procure the produce by themselves from the farms or buy from rural assembly markets. At the peak of the season, when there is over supply of fruits, some producers deliver their produce to urban markets where they sell to the wholesalers. There are also middlemen who buy fruits from producers and sell them in urban markets to wholesalers.

2.9.4 Market margins

Market margins are generally defined as price difference between two market levels (Tomek and Robinson, 1991). Margins could also be referred to as the difference between selling and buying price (Nyange, 1993). The easiness to understand and forecasting the ability of rational variants for the operational structure of an enterprise or individual farmer is the most important advantage in the use of market margin models. The main disadvantage of the models relates to their inability to take into account the costs involved in the market chain.

2.9.5 Gross margin (GM)

Gross margin (GM) may be defined as the difference between total revenue and total variable costs (Mlulla, 2003; Msangi, 2000). The size of gross margin depends on the

services provided, market structure, perishability of the product as well as the distance between producers and consumers. The size of gross margin may also be influenced by market information especially for short-run margins.

The GM models are very useful in cases where some data, for example profits of firms, are hard to collect. Just as important, calculations of depreciation have very often been difficult to undertake due to the ambiguity nature of estimating the lifespan of fixed assets, appreciation and salvage values in many firms, thus necessitating the use of GM models rather than the normal profit margin models.

The fundamental advantages of the GM analysis as an economic tool include its easiness to understand and utilize the logical interrelations of economic and technological parameters and its ability to forecast rational variants for the operational structure of an enterprise or individual farmer. The major limitation of the gross margin analysis is that, smallholder farmers are not only confined to profit maximization but they have other objectives to achieve. The inability of the model to take into account variations of fixed costs within or among enterprises is another disadvantage. The GM analysis requires proper records such as input costs, quantities sold and prices received (Msangi, 2000).

In Tanzania, a number of studies have employed the GM model. Examples include the study by Mlulla (2003) who assessed the operation of border trade in northern Tanzania and Philip (2001) who studied the economics of medium scale sugarcane producers in Morogoro. The model was also employed by Silomba (2000) who evaluated the performance of bean marketing in Kigoma region.

The importance of estimating market margins springs from the fact that, intermediary market participants are very often reported to receive low shares of the total market margins. Lazaro and Ashimogo (1989) in their study of the marketing channels for horticultural products between Morogoro District and Dar es Salaam city for example, show that market margins were the highest for truckers who delivered the product to the city for wholesale. Transport costs contributed about 37% to 40% of the total costs along this channel. The profit margin ranged from 25% to 27% of the produce prices.

Similarly, Nyange (1993) in his study of the economics of vegetables in Arumeru District (Arusha region) shows that the highest margins were accrued by retailers – with hawkers receiving higher margins than other retailers. To a large extent this was expected since hawkers provide more services for delivering products closer to consumers. Nyange (1993) reported further that the truckers' margins were larger than margins at wholesale level with transport costs constituting about 30% to 35% of the total costs from producer to wholesale markets.

CHAPTER THREE

3.0 STUDY APPROACH AND METHODOLOGY

3.1 Overview

This chapter consists seven sections. Section 3.2 represents the description of the study area, section 3.3 represents the conceptual framework for the study, and section 3.4 presents the major sources of data for the study. Sections 3.5 and 3.6 present the sampling procedures for the study and design of the survey instruments respectively. Section 3.7 presents the approaches used for data analysis.

3.2 Description of the study area

The study was conducted in Muheza District, which is one of the eight Districts of Tanga Region. The District is the largest producer of oranges in the region and in Tanzania as a whole.

3.2.1 Location

Muheza District is located in Tanga region. It is bordered with Tanga Municipality to the North, Korogwe District to the South, Kenya to the East and Handeni and Pangani Districts to the West. It has a total area of 4 922 square kilometers. The District has six divisions, 35 wards and 174 villages..

3.2.2 Climate

The climate of the District is humid and hot with bimodal rainfall. Short rain season occurs between October and December while long rain season occurs between March and June.

The District is dominated by undulating land particularly in the eastern part, where the Usambara Mountains are found.

3.2.3 Ethnicity and demography

The District has three major tribes, namely the Digo, Sambia and the Bondei. There are also other minority ethnic groups comprising less than 35% of the total population. According to the National Population and Housing Census report (2002), the District has a total population of 297 423, out of which 139 750 are females and 139 673 are males - constituting a total number of 62 183 households.

3.2.4 Economic activities

The main economic activity in the study area is agriculture involving production of both cash and food crops. The cash crops are sisal, coconut, black pepper, tea and oranges, and the major food crops include banana, cassava and maize. There are also a few households who keep livestock (e.g. cattle, goats and local chicken) to complement crop farming. A few (less than 1%) of the population are civil servants working for the Muheza District council.

3.3 Conceptual framework for the study

The conceptual framework for the study is presented in Figure 1. From the figure, the two pertinent actions (i.e. institutions and private sector actions) affect chain actors' in the sense that nature of the business and institutions involved favour one group of people leaving others out (e.g. literates Vs illiterates, men Vs women and rich Vs poor). This is due to the nature of business environment involved, which affects things like costs,

regulations and requirements. These attributes are in form of education, sex occupation and wealth. Equivalently, actions by private sector and institutions have impact on the costs incurred on the production and marketing of oranges. For example, if the process is too bureaucratic, the costs involved in the process become high, and management and coordination of the chain become difficult, which lead to some unnecessary wastage of meager profit among chain actors.

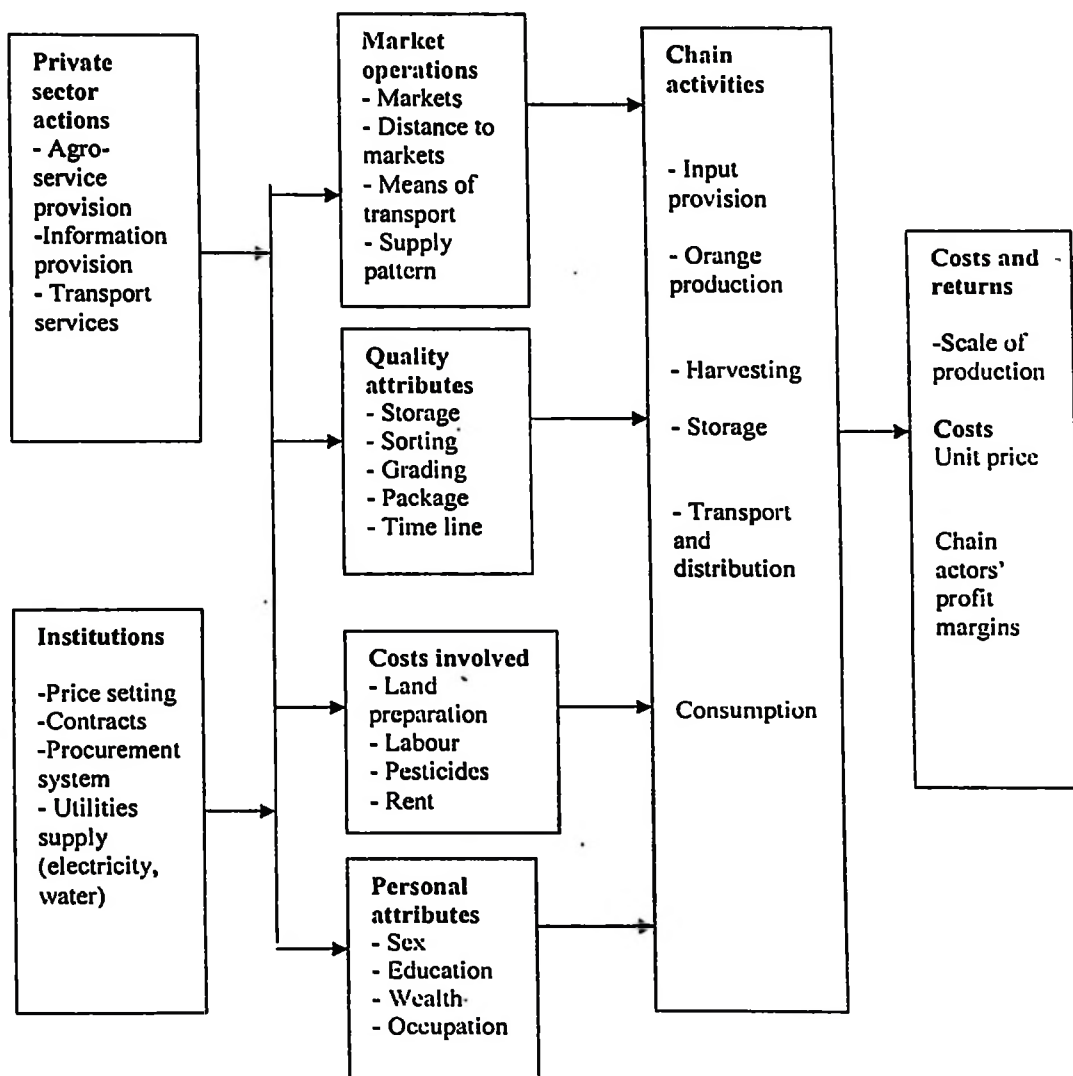


Figure 1: Conceptual framework for the study

Moreover, private sector action (companies providing agricultural inputs) and institutions (like Food Safety Requirements and Standards) affect quality attributes. This is due to the fact that things like provision of pesticides, seedling; and storage facilities, sorting, grading and meeting timeline depends on the capacity of the sector performing a task and institutions governing the process. Market operations, quality attributes, costs incurred and chain actors' attributes do influence chain activities performed. These range from input provision and oranges production to oranges consumption. Activities made here determine if oranges will be transported to the place of demand at the right time or not. Chain activities carried out lead to the determination of scale of produce traded, chain actors' profit margins and the unit price at each node of the marketing chain. The market operations, private sector actions, public sector actions like policies and regulations, and institution, affect the efficiency of the chain and hence profit margins attained. This study focuses on the whole chain- from factor input procurement, production, marketing and distribution of oranges.

3.4 Data source

Both primary and secondary data were used in this study. Secondary data (e.g. annual production at the national level and currency exchange rates) were obtained from the Ministry of Agriculture, Food Security and Cooperatives (MOAFC) and (BOT) respectively. Secondary data on phytosanitary taxes, customs and excise duties were obtained from the Namanga and Horohoro border posts (customs and excise offices) in Arusha and Tanga regions respectively. These data were used for calculating the market margins and gross margins for truckers and wholesalers who operate in the main markets in the cities of Nairobi, Dar es Salaam, Tanga and Arusha. The primary data were obtained

through survey of various oranges market participants along villages – Muheza channel. The data were used in addressing objectives (a) and (b) of this study.

3.5 Sampling procedures

The target population for the study constituted market participants in Muheza District as well as truckers and wholesalers of oranges who operate in the main markets of Dar es Salaam, Arusha and Nairobi cities. The sampling units for the study were orange producers, middlemen, truckers, wholesalers and retailers, from whom information such as buying and selling prices, costs, quantities produced as well as quantities sold and consumed at home were collated.

3.5.1 Sampling procedure for producers

Participatory Rural Appraisal method (PRA) methods (in particular wealth ranking) were applied as a footing step to the study. This helped to identify wealth groups that would act as sampling frame for the study. In addition, the PRA exercise also served to generate general information such as those related to the common problems and constraints facing orange producers and marketing in the study area.

The wealth ranking exercise was conducted in all of the nine sample villages and 6% of the total households were chosen in each village for the interview at the producer level. The wealth ranking exercise eventually resulted into identification of three wealth groups: “rich”, “medium” and “poor” using indicators of wealth which were agreed during the Focused Group Discussions conducted in the sample villages (Table 3).

Land ownership was identified as one of the most important determinants of wealth where the determining factors were total area owned and cultivated. The type of house was another important factor determining the wealth of a family.

Table 3: Indicators for wealth ranks among households in Muheza District

Assets	Wealth category		
	Rich	Medium	Poor
Natural capital: Land owned	10 ha or more	6 – 10ha	1 -5ha
Type of the house	Most built of concrete bricks and iron sheets. Some built of mud bricks and iron sheets.	Most built of mud bricks and iron sheets. Some built of mud, woods and iron sheets	Most built of mud, wood with roofs made of thatch grasses.
Human capital: Education	Primary level or above.	Primary level.	Less than primary level or no education at all.
Physical and financial capital: Means of transport owned	Own bicycles, but some own motorcycles and/or cars.	Own bicycles.	May or may not own bicycles.
Human capital: Labour	Hire labour	Hire labour seasonally	May or may not sell labour
Amount of income earned from other sources than orange farming:	> Tshs 200 000/year	Between Tshs 100 000 and 200 000/year	Between Tshs 0 and 100 000/year

According to the explanation given by participants in the wealth ranking exercise, farmers classified as “rich” were characterized as owning good houses, most of which were made of concrete blocks and were roofed with corrugated iron sheets and a small proportion own houses made of incinerated (burned) mud blocks and roofed with corrugated iron sheets. In the “medium” category, most farmers owned houses of varying conditions - including those which were made of burned mud bricks and roofed with corrugated iron sheets; and those made of mud and wood stokes but roofed with corrugated iron sheets. The poor category represented farmers whose houses were made of mud roofed with iron sheets or thatches.

The amount of income earned from other sources than orange farming was also an important factor determining the wealth of a household in the study area. Some of the farmers classified as “rich” have earned huge amount of money from other sources of income such as retail shops for consumables, government employment and dairy cows. The type of means of transport owned by the household was another indicator of wealth in the study villages. While a farmer in the “rich” category may have a bicycle, or even a motorcycle and/or car, most of the farmers in the medium wealth category owned bicycles, where, in the “poor” category a few farmers may also own bicycles.

A two-stage stratified sampling was then applied whereby the villages were classified into three strata based on their distance from the Muheza central market. From each stratum, three villages were chosen and eight farmers were selected at random from the chosen villages.

3.5.2 Sampling procedure for other market participants

Other participants in the value chain for orange - the wholesalers, truckers, middlemen, pickers and retailers were randomly selected from different markets. The sample size for each category of these participants was established based on their total number in the respective markets - the figures of which were obtained from registers provided by market masters. The proportions of sampled producers per village as taken from the markets are presented in Table 4 and those of other participants are presented in Table 5 – summing up to a total sample size of 122 market participants who were interviewed in this study.

Table 4: Distribution of sample sizes for producers at the Muheza market

Distance from Muheza market (km)	Village	Sample size
1 – 7	Kilulu	8
	Kibanda	8
	Enzi	8
	Sub-total	24
8 – 15	Mkanyageni	8
	Kicheba	8
	Kibaoni	8
	Sub-total	24
16 – 23	Mtindiro	8
	Kwabada	8
	Kwabota	8
	Sub-total	24
	Total	72

To complement the information gathered from the interview with various market participants, other key informants (including officials from the Muheza District Council and rural extension officers) were also interviewed. The actual field work (i.e. the pre-survey and main survey), was conducted during the months of January, February and March in 2007. The researcher and one trained enumerator were involved in administering the questionnaires for the market participants in Muheza District. As shown in Table 4, the

survey was carried out in nine villages namely: Kilulu, Kicheba, Enzi, Mkanyageni, Kibanda Kibaoni Mtindiro, Kwabada and Kwabota.

Table 5: Distribution of sample sizes for other participants at Muheza market

Market	Market participants	Sample size
Muheza	Wholesalers	5
	Middlemen	10
	Retailers	10
	Truckers	10
	Sub-total	35
Dar es Salaam	Wholesalers	5
Arusha	Wholesalers	5
Nairobi	Wholesalers	5
	Sub-total	15
	Total	50

3.6 Design of the survey instruments

In order to address the objectives of the study, a structured questionnaire was designed to collect data from market participants. The data gathered included information on the actors in the value chains (i.e. actors in the supply chain and outlet markets); buying and selling prices for oranges; costs; as well as quantities produced and sold per annum. The minimum and maximum prices and quantities produced/traded were also recorded.

3.7 Data analysis

3.7.1 Descriptive analysis

The descriptive analysis of data involved the use of central measures of tendency including the means and percentages to describe the general characteristics of producers and participants in the value chain for orange in the study area. Diagrams were also used to

describe the existing marketing channels as identified during the study. The specific approaches used in the analysis are presented in the following sub-sections.

3.7.2 The Gross Margin (GM) approach

The GM approach was used to assess the marketing efficiency and compare margins at different levels of the value chain for orange, including the GM accrued by producers in Muheza, wholesalers in the cities of Tanga, Dar es Salaam, Arusha and Nairobi, retailers and truckers using different routes. Since in this study, value chains are analyzed with respect to sequence of production activities involved and the distribution of earnings and margins, the choice of GM as an analytical tool is justifiable. Moreover, GM is chosen as a useful analytical tool in assessing the contribution of income from orange to total household income.

Gross Margin (GM) of a producer/trader is obtained by subtracting Total Variable Costs (TVC) from Total Revenue (TR) as follows:

$$GM_i = TR_i - TVC_i$$

Where;

GM = Gross margin

TR = Total Revenue

TVC = Total Variable Costs

i = 1-n trader/producer

The TR (Total Revenue) was obtained by multiplying number of oranges sold by price of unit orange in (Tshs). Total variable costs were obtained by summing up all the variable

costs the i^{th} producer/trader incurred. The GM percentages were expressed on the basis of TR as follows:

$$GM = (TR - TVC/TR)*100).$$

3.7.3 The value chain analysis

The value chain analysis was used to identify the processes involved from producer to consumers; analyze profitability in each process; and specify what does and what doesn't add value from the producer's and trader's perspectives. The results of analysis in this case were also used to identify the 'opportunity windows' for improving the value chain for oranges in the study area.

3.7.4 Limitations to the study

While the interview generally showed a high level of cooperation and generosity for the side of producers in the sample villages and markets a few problems were encountered. In some cases farmers were not available at the time of interview. This was however, addressed through either repeated visits by the researcher or selecting another farmer with more or less similar socio-economic characteristics using the criteria deducted from the wealth ranking and PRA exercises in general.

For some actors (the truck drivers and conductors in particular) getting enough time to be interviewed was somehow a big problem as many of them were always busy with their trade deals. It was however arranged that the interviews for this particular category of actors be done in the evening hours when they were free and have parked their trucks.

Some actors (e.g. the middlemen) were very skeptical in providing some important information such as the actual costs they incur in procuring one orange-full truck, probably due to a common misconception that the interview may, in the near future, end up with detrimental effects on the side of their business – which is a sign of existence of unfair trade between farmers and middlemen. An attempt was however made to explain clearly to them that the information had nothing to do with detrimental effects but was meant for academic purposes only. The quantification of total output for producers included the value of marketed output as well as the one of home consumption. Although relatively a small proportion of orange produce was consumed at home (compared to that which was traded), the quantity of own household consumption needs to be taken into consideration in the analysis. However, the choice of appropriate price for the oranges consumed at home was difficult, but this was done by using the current market prices for oranges. In addition, non-cash costs such as family labour were not easy to assess. It is generally not recommended to use the minimum wage, as it is a distorted price. If field labour requirements are generally accurately evaluated, family labour devoted to management of farming activities is generally neglected. Young (1996) suggests using a percentage of the gross income (5% in the case of staple crops), which has been also adopted in this study.

In addition, the study was limited in terms of scope, details and time. The bulk of collected data depended on the actors' ability to recall. The conversion of units was also a bit incredulous, some actors used local units e.g. locally made baskets (*Tenga*) which were not standardized, and in some cases they tended to mix up the units. However, the researcher had to consult the available secondary data/estimates on local units (particularly for volume and weights). A remarkable difficulty was also experienced in aggregating

household income because participants did not keep records of their income. Some participants had difficulties in recalling as to how much and which months they sold their products or purchased other goods and services.

The major limitation of the GM model relates to its assumption that farmers aim at profit maximization. This is not always the case particularly for most smallholders in the developing countries who are not only confined to profit maximization but have other objectives to achieve. Ideally, the analysis of marketing efficiency that could capture the various goals that farmers intend to achieve and the resulting spill-over effects would require the use of complex models such as the Stochastic Economic Models that assess the marginal value of a product at different levels of its value chain – while taking into account the different sources of risks (e.g. social, political and economic risks – including the risks related to climate and price variability). Yet, under situations of paucity of information – as in most agricultural production systems in developing countries - the GM model has wide application.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the results of analysis and discussion of the existing orange value chain in the study area; its performance and contribution of income from orange to total household income as well as the problems and constraints facing orange producers and other actors in the value chain. The chapter starts with a general analysis of the socio-economic characteristics of interviewed households.

4.2 Social-economic characteristics of household heads

The social-economic profiles for the sample households were characterized by an array of attributes of farming practices and other economic activities. These activities were analyzed to get a thorough understanding of the general socio-economic profiles of the different actors in the value chain for oranges and individual behaviours of the actors. Attitudes of the actors with regard to the operation of existing value chain, ownership of farms, decision making on production aspects and the contribution of family labour to households were among the aspects that were evaluated. The subsequent subsections present an analysis of the socio-economic profiles of the sample households in terms of sex, marital status and age as well as the education level of the head of household.

4.2.1 Sex of the head of household

As shown in Table 6, male-headed households constituted 79.1% and female-headed households were 20.8% of the total sample households.

Table 6: Sex of head of household

Sex	Frequency	%
Males	57	79.1
Females	15	20.8
Total	72	100.0

This observation is not uncommon in most African countries because traditionally, many families are headed by males. Means of production such as land, capital and labour, and the decision on what and how much to produce are mostly made by males where females and the rest of the family members are involved in the implementation process especially on the aspects of labour. Most heads of household will however also listen to members of households before making their final decisions.

4.2.2 Marital status

About 80% of the heads of household were married; 5.6% reported as unmarried; 8.33% reported as separated or divorced and 7% were widows (Table 7).

Table 7: Marital status for the head of household

Marital status	Frequency	%
Unmarried/single	4	5.6
Married	57	79.1
Divorced/separated	6	8.3
Widow	5	7.0
Total	72	100.0

4.2.3 Age of the respondents

Out of all the sample households, 66.7% of the heads of household were in the age group of 17 – 50 years while 33.3% were aged above 50 years (Table 8). This implies that more than half of the heads of household were in the active age for production activities.

Table 8: Age of the head of household

Age group	Frequency	%
Below 17	0	0
17 – 50	48	66.7
Above 50	24	33.3
Total	72	100.0

4.2.4 Level of education for the head of household

The levels of education for the heads of household are presented in Table 9. Sixty-eight percent of the heads of households attained primary education; 13.9% had secondary education and 4.1% had tertiary education (i.e. education above secondary school up to university level). About 14% of the heads of households had education levels of below primary school.

Table 9: Education level for the head of household

Education level	Frequency	%
Below primary education	10	13.9
Primary education	49	68.0
Secondary education	10	13.9
Tertiary education	3	4.1
Total	72	100.0

One important argument can be made concerning the statistics in Table 9: with more than 86% of the heads of household having either primary education level or above, the implication is that most of the heads of household can be trained on various production aspects such as application of inputs, proper harvesting practices and record keeping, means of adding value to the crops they grow etc., - with minimal difficulties. It is also possible to educate them on financial aspects such as savings and credit societies as well as access to other financial services and markets. However, the major problem lies on the lack of proper financial and marketing institutions that can facilitate this opportunity.

4.3 Performance of the value chain for oranges in Muheza District

4.3.1 The value chain

The value chain for oranges in Muheza District can be described as falling under two categories, namely; the major and the minor value chains. In the first category, the producers sold their oranges to wholesalers at Muheza market as well as to the wholesalers from distant cities such as Dar es Salaam, Moshi, Arusha and Nairobi, either directly or through middlemen. It was found that over 75% of orange farmers sold their produce through middlemen while 24% sold directly to the wholesalers. In this category, the means of transport were lorries/trucks. The wholesalers sold the produce to respective retailers who finally sold the produce to the final consumers. The second category involves producers who sell their produce directly to Muheza wholesalers and retailers without via middlemen. In this category the means of transport are pickups and bicycles (Figure 2). As the produce moves along the chain from the producers to the consumers, there are various interactions. The first interaction occurs between the producers and the middlemen based in Muheza town and those located in the distant cities. In this interaction, it is the middlemen who play the key role in the sense that, the main activities such as picking/harvesting, assembling, sorting and counting are done under the supervision of the middlemen in the presence of the producers. To make it more clear, the word 'supervision' means that the pre-mentioned activities are done by casual labourers hired by neither the producers nor wholesalers but the middlemen. Finally, the producers receive money for their produce through middlemen. However, there are some situations where the middlemen transport the produce directly to distant wholesalers based on pre-arranged contracts made between the two actors (the middlemen and the wholesalers). In this case the truckers are paid by the middlemen and not the wholesalers.

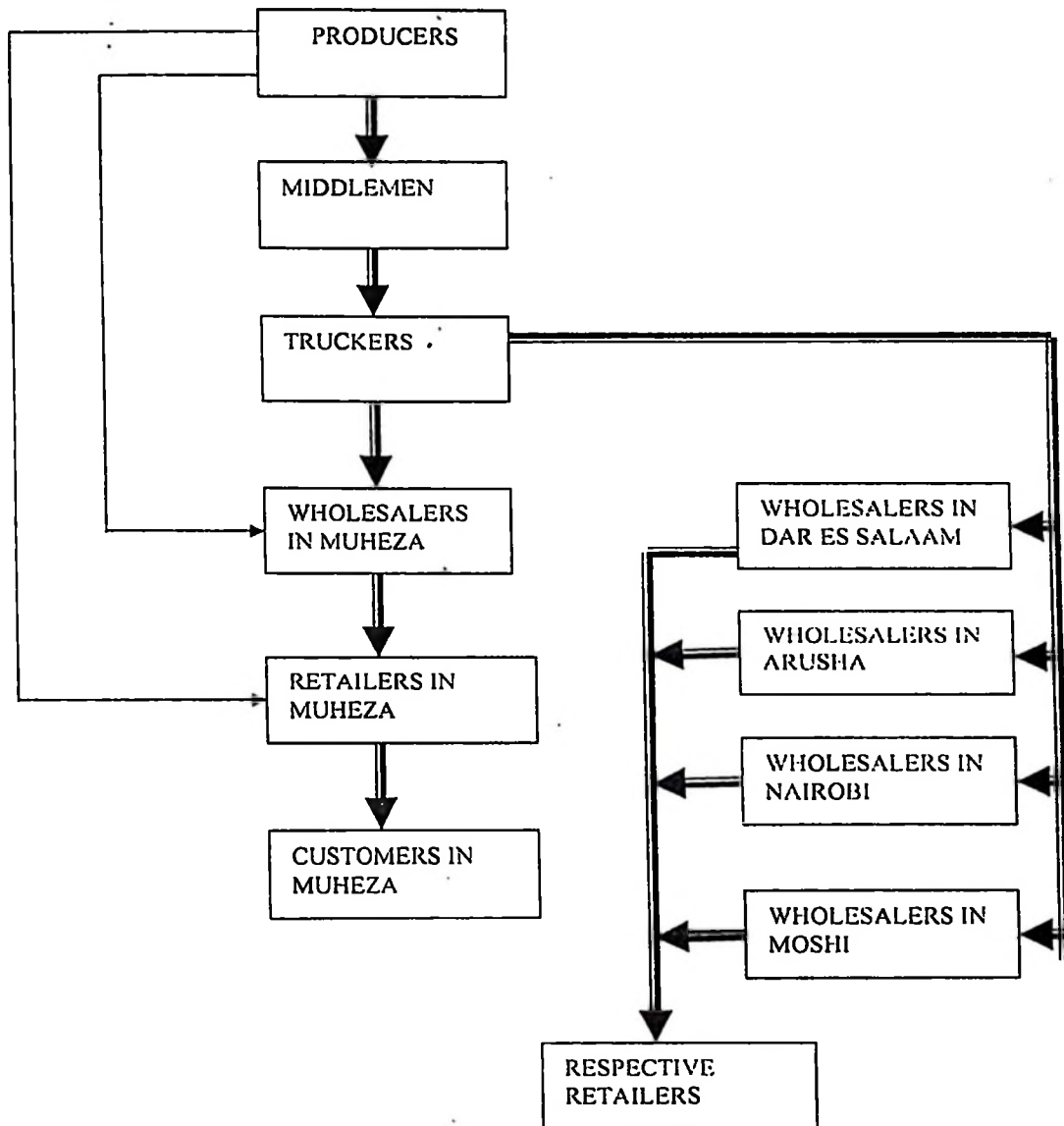


Figure 2: The value chain for oranges in Muheza District, Tanga

==== Major channel

_____ Minor channel

Another interaction occurs between the middlemen, truckers and the wholesalers based in Muheza town. In this interaction, the middlemen sell the excess produce to the wholesalers

in the Muheza market. According to the observations done by the researcher, the quantity of the produce sold to the wholesalers is the combination of the excess produce after fulfilling the distant wholesalers' orders and the quantity obtained as a result of cheating the producers during counting. Here, the role of the truckers is to transport the produce to the Muheza market based on some agreements with the middlemen. However, the transport charges paid to the truckers by the middlemen could not be established by the researcher.

The third interaction occurs between the producers, pickups owners, wholesalers and retailers based in Muheza. In this case, the main activities such as harvesting, assembling and sorting at farm level are done by the producers. However, the wholesalers and retailers re-sort and re-grade the produce upon arrival at the market before selling it to the respective outlets. The role of the pickups owners is to transport the produce from the producers to the market. There are also some few cases whereby the producers transport the produce directly to the wholesalers/retailers using own bicycles.

The final interaction occurs between the wholesalers and retailers based in Muheza town and various customers some of whom are passengers traveling to different destinations. In this case, the wholesalers sell their produce directly to the retailers who finally sell to the customers. The retailers carry the produce in polythene bags or bamboo reed baskets. In this interaction, no means of transport are involved because the wholesalers are located at short distances from the retailers, so the latter simply transfer the produce on foot. It should be noted that the last two modes of interaction occur along the minor channel while the rest occur along the major channel.

4.3.2 Market operations and linkages

The market operations involved in the two categories of the orange value chain in Muheza District include harvesting (picking), assembling, loading, transporting, off loading, packaging, storage and selling. Sorting takes place in two stages. The first stage takes place at the farm level before the truckers/wholesalers pay the producers for the quantity agreed upon between the two sides. Sorting by size and wholesomeness is done by pickers under supervision of the middlemen and the wholesaler, in the presence of the producer. The second stage takes place at the retail level. The sorting is also based on size and wholesomeness. This enables the retailer to identify the defected fruits and thus correct payment to the supplier. It also enables the retailer to set up selling price.

Packaging materials used are bamboo reed baskets, polythene bags and coconut tree leaves. The first two are used for transporting the produce to wholesalers and retailers based at the Muheza central market. The third type of materials are used to cover the inner walls of the lorries or trucks which transport the produce to distant markets such as those in Dar es Salaam, Moshi, Arusha and Nairobi.

The produce is assembled in designated areas in the villages where truckers and wholesalers come to buy. Lorries and pickups are the most common means of transport used. There are also a small number of producers who supply their produce directly to the wholesalers and retailers at the Muheza market using own bicycles. While pickups and bicycles are the common means of shipping the produce to the Muheza central markets, lorries/trucks are commonly used for transporting the produce to distant markets. Loading and unloading are done manually. In Muheza, Dar es Salaam, and Arusha markets there

are no modern storage facilities but traders store their produce in open raised stalls. The produce is kept off the ground to allow air circulation, thus reducing the rate of deterioration.

4.3.3 Producers and market linkages

Over 70% of producers sell their produce to wholesalers through middlemen, while twenty-five percent sell their produce to both wholesalers and retailers (Table 10).

Table 10: Classification of farmers according to selling channels

Mode of selling	Number	%
Sold through middlemen	53	73.6
Sold directly	19	26.3
Total	72	100.0

This arrangement can be associated more with imperfect marketing knowledge - farmer's knowledge on market is relatively more limited than that of the subsequent actors in the value chain. Very often farmers rely on subjective sources (the middlemen), who have established a longer chain identified to consist of the following four levels:

- (a) "Junior middlemen" based in the villages,
- (b) "Senior middlemen" based in the villages,
- (c) "Junior middlemen" based in Muheza town, and
- (d) "Senior middlemen" based in Muheza town.

The "junior middlemen" are local middlemen (traders) famously called "*madalali wadogo*" in Swahili, and "senior middlemen" constitute a relatively more established group of middlemen locally dubbed "*madalali wakubwa*." The major difference between "junior middlemen" and the "senior middlemen" is that, the latter have relatively larger

working capitals and have more experiences in trading than the former. Market information tends to flow downwards from the main Muheza market to the producers in the following manner: After they have communicated with wholesalers who land at Muheza town, the urban senior middlemen send to the rest of the middlemen, the information about the quantity required by a particular wholesaler. The rural-based middlemen go to negotiate with the producers about the quantity to supply and buying price per fruit. When an agreement is reached, the information is sent back to the urban wholesalers. The next step is to negotiate with pickers (harvesters) on picking and collection costs. Finally, the work of harvesting and assembling begins and the wholesaler negotiates with truckers on the transport charges.

4.3.4 Middlemen and market linkages

In Muheza, the middlemen play four important roles in the value chain for orange. The first role is to negotiate with the wholesaler about wholesale prices. The second role is to negotiate with the producer on producer prices. The third role is to negotiate with the pickers (harvesters) on picking, collection, sorting and loading charges, while the fourth role is to negotiate with the truckers on transport charges (but this occurs when the middlemen receive orders to supply a certain quantity of oranges in distant markets like Dar es Salaam, Arusha and Nairobi). In this case, the distant wholesalers make some kind of contractual arrangement with the Muheza middlemen to supply them with the produce. The communication between middlemen and wholesalers and among middlemen themselves is facilitated mainly through mobile phones and motorcycles.

4.3.5 Wholesalers and market linkages

Most wholesalers at Muheza town sell their produce to retailers. However, some agents were hired by wholesalers to sell the produce to passengers at the Muheza main bus station. The oranges were sold in perforated plastic bags, each containing between twenty and thirty-five oranges. This means that the wholesalers sell some quantities of oranges directly to the final consumer, through hired agents.

4.3.6 Truckers and market linkages

Truckers transport the produce to the Muheza market and distant markets such as those in Dar es Salaam, Moshi, Arusha and Nairobi. The majority of wholesalers who are based in Muheza are supplied by truckers. A few wholesalers however, are supplied by pick-ups and cyclists. But, it should be noted that the produce supplied by truckers is normally not the property of the producer/farmer but the consignment of the Muheza senior middlemen. In other words, the amount supplied to Muheza wholesalers is the combination of the excess produce which is purchased by the middlemen after fulfilling the distant wholesaler's order, and some quantities obtained by cheating the farmer when counting. A few producers however, transportation their produce to the Muheza main market (for sale to wholesalers and/or retailers) using their bicycles.

4.3.7 Retailers and market linkages

It was found that all the retailers sell their produce to consumers. Consumers include on-board bus passengers, waiting passengers, drivers and other market traders. Most of the oranges are sold when peeled, ready for immediate consumption.

4.3.8 The producer- middlemen - wholesaler linkage

- (a) In the producer – middlemen - wholesaler linkage selling of oranges is done in two ways: The trade between middlemen and producers located between 1 and 15 km from the Muheza market (Table 11). In this trade, three stages and four levels of middlemen are involved in a season. The stages include: trading taking place at the beginning of the season, the peak and towards the end of season. The middlemen levels involved include the “junior” and “senior” middlemen based in the villages; and the “junior” and “senior” middlemen based in Muheza town.
- (b) The trade between middlemen and producers located between 16 and 23 km from the Muheza market (Table 12). In this category of trade, two stages of trading and two levels of middlemen are involved. The two stages involved are the peak and the end of the season and the middlemen levels are the junior middlemen based in Muheza town and the senior middlemen based in Muheza town.

Table 11: Orange trade - category (a)

Participants	Prices (Tshs/orange)		
	Stage 1	Stage 2	Stage 3
PR – JMM ₁	5	8	10
JMM ₁ - SMM ₂	6	10	13
SMM ₂ - JMM ₃	8	11	16
JMM ₃ - SMM ₄	9	13	18
SMM ₄ - WS	12	17.5	22.5

PR: Producer
 JMM₁: Junior middlemen based in the villages
 SMM₂: Senior middlemen based in the villages
 JMM₃: Junior middlemen based in Muheza Town
 SMM₄: Senior middlemen based in Muheza town
 WS: Wholesaler

Table 12: Orange trade - category (b)

Participants	Prices (Tshs/orange)	
	Stage 1	Stage 2
PR – SMM ₄	17.5	37.5
SMM ₄ – WS	22.5	45.0

PR: Producer
 SMM₄: Senior middlemen based in Muheza town
 WS: Wholesaler

4.4 Prices and gross margins

This sub-section presents the results of analysis and discussion of the performance of the value chain for orange in Muheza (in terms of price differences and gross margins at different levels of the chain).

4.4.1 Prices

The statistics given in Table 13 show that there was a significant difference between the average producer price and retail price per orange in the study area (cf. Tshs 15.75 and 60.50 per orange respectively).

Table 13: Price (Tshs) differences among different market types

Market level	Price per orange (Tshs)	% difference
Farm gate	15.75	0
Wholesale	40.00	152
Retail	60.50	51
Overall		284

The price differences between producers and subsequent traders as shown in Table 13 may serve to explain the imperfections that exist in the value chain for oranges in the study with the former actors being most exploited category in the value chain. The differences in the latter group reflect cost differentials – particularly resulting from transport charges. The

transport costs ranged from Tshs 1.70 to 11.50 per orange depending on the means of transport used (Table 14).

Table 14: Marketing costs for wholesalers in the Muheza main market

Means of transport	Marketing cost	Tshs per unit	% Vs Total
Bicycle	Transport	1.70	31.0
	Rent	0.50	9.0
	Packaging material	3.30	60.0
	Total	5.50	100.0
Pickup	Transport	2.73	41.8
	Rent	0.50	4.5
	Packaging material	3.30	46.3
	Total	6.53	100.0
Truck	Transport	11.50	75.00
	Rent	0.50	3.30
	Packaging material	3.30	21.70
Total		14.95	100.00

4.4.2 Gross margins for producers

The gross margins for producers, retailers and wholesalers are presented in Tables 15, 16 and 17 respectively. Producers earned the lowest margins, ranging from 89 550 to 459 362 Tanzanian shillings per annum, while retailers accrued the highest gross margins ranging from 1 090 210 to 3 427 550 Tshs per annum. The range for wholesalers' margins was from 1 843 160 to 2 091 138 Tshs per annum.

Table 15: Gross margins for producers in the Muheza main market

Village	Distance (Km)	TR (Tshs)	TVC (Tshs)	GM (Tshs)	GM (%Vs TR)
Kibanda	3	510 750	287 537	223 212	43.7
Kilulu	5	1 035 750	576 387	459 362	44.0
Enzi	7	354 625	206 312	148 312	41.8
Kicheba	10	314 250	181 062	133 187	42.4
Mkanyageni	12.5	252 000	162 450	89 550	36.0
Kibaoni	14	508 437	270 150	238 287	47.0
Mtindiro	16	895 000	537 062	357 937	40.0
Kwabada	19	743 750	457 937	285 812	38.0
Kwabota	22	847 125	483 800	363 325	43.0
Minimum		252 000	162 450	89 550	36.1
Maximum		1 035 750	576 387	459 362	47.0

Selling season was also a major factor determining the level of gross margins for retailers.

As shown in Table 16, the margins were higher during the low season than in the peak season. During the low season retailers tend to charge higher prices because of low supplies for the produce.

Table 16: Gross margins for retailers in the Muheza main market

Season	TR (Tshs)	TVC (Tshs)	GM (Tshs)	GM (%Vs TR)
Peak	8 713 950	5 226 400	3 427 550	39.3
Low	2 965 000	1 630 900	1 090 210	45.1

The low gross margins for wholesalers can be attributed to high transport costs for the produce (Table 17). The results of analysis showed that wholesalers obtained the highest margins when supplied by pickups and lowest when supplied by truckers. As discussed elsewhere in the preceding sections, truckers sell oranges which are in excess of the consignment ordered by the distant wholesalers. So they tend to charge relatively higher prices than those charged by their counterpart traders who use pickups to transport their produce. Pickup haulers, on the other hand, are not concerned much with selling the produce to the wholesalers because their prime role is to transport the produce from the

villages to the market. Since the wholesalers purchase the produce directly from the farmers, the buying prices are relatively lower than those offered by truckers, so more profit is possible.

Table 17: Gross margins for wholesalers in the Muheza main market

Supplier market	TR (Tshs)	TVC (Tshs)	GM (Tshs)	GM (% Vs TR)
Pickups	5 021 555	3 178 395	1 843 160	36.7
Bicycles	5 579 505	3 674 351	1 905 154	34.2
Truckers	6 509 423	4 418 285	2 091 138	32.1
Minimum	5 021 555	3 178 395	1 843 160	32.1
Maximum	6 509 423	4 418 285	2 091 138	36.7

4.4.3 Gross margins for wholesalers in city markets

The results of analysis for the gross margins accrued by wholesalers in the cities are shown in Table 18. In the domestic market, the wholesalers in Tanga obtained the highest gross margins (Tshs 1 905 154 per trip), followed by wholesalers in Dar es Salaam (Tshs 802 050 per trip and wholesalers in Arusha (Tshs 342 376 per trip). These results indicate that profit margins were inversely related to distance from the producer to the market, mainly due to increasing transport costs - as the produce was moved from producers to the market place.

Table 18: Wholesalers' gross margins by city

City	TR (Tshs)	TVC (Tshs)	GM (Tshs)	GM (% Vs TR)
Arusha	2 027 175	1 708 125	342 376	16.7
Dar es Salaam	2 792 400	1 990 350	802 050	27.7
Tanga	5 579 505	3 674 351	1 905 154	34.5
Nairobi	10 203 000	2 323 250	6 449 450	77.2

For the border trade the results of analysis showed a different pattern. Despite the greatest distance they covered, the Nairobi market wholesalers earned the highest gross margins (Tshs 6 449 450 per trip). This can largely be attributed to the difference between the two countries' currencies (Appendix 8.9) and higher prices for the produce in the Kenya side. During the study, the exchange rate for the Kenyan shilling against US\$ was higher than that of Tanzania, and it has been increasing from year to year. The Nairobi wholesalers purchase oranges at Muheza in Tanzanian shillings and sell the produce in Nairobi using Kenyan shillings which makes them get super profits.

4.4.4 Profit margins for truckers

The gross margins for truckers by route are summarized in (Table 19). The gross margins for truckers also increased with distance from producing areas. Truckers using the Muheza-Dar es Salaam route obtained the lowest gross margins while those using the Muheza-Nairobi route earned the highest gross margins. The gross margins were largely determined by transport costs – the longer the distance to the market of destination the higher the transport costs. Other factors included the time spent in transporting the produce, risk involved en-route and the magnitude of costs incurred by the truck upon returning. Overall grading by size and packaging at wholesale level and peeling at retail level played a key role in adding value to the produce.

Table 19: Truckers' gross margins by route

Route	TR (Tshs)	TVC (Tshs)	GM (Tshs)	GM (% Vs TR)
Muheza – Dar	400 000	247 633	152 367	38.1
Muheza – Arusha	460 000	280 967	179 033	39.0
Muheza - Nairobi	880 000	370 017	509 983	42.1

4.5 Contribution of income from orange farming to total household income

The results of analysis for sources of household income among farmers involved in orange production showed that the contribution of income from orange production to the total household income was Tshs 255 443 - equivalent to 50.5% (Table 20). When compared with figures reported by previous researchers, this percentage is relatively higher (c.f. percentage of about 46 reported by Mlulla, 2003). The reason for large share (percentage) of income from orange farming in the total household income can be attributed to the growth of a lucrative border trade in orange between Tanzania (Tanga region in particular) and Kenya (specifically in Nairobi). The trade is in particular transpiring through the Horohoro border customs post (in Tanga region) and the Namanga border customs post (in Arusha region). The amount of oranges which crossed the Horohoro border customs post has increased from 116.5 tones (in 2004) to 540.3 tones (in 2006) - equivalent to an increase of 78% for that particular period.

Table 20: Sources of income for farmers

Source	Annual income (Tshs)	%
Orange production	255 443	50.5
Maize production	156 180	30.9
Coconut production	46 615	9.2
Livestock	22 400	4.4
Formal employment	17 000	3.4
Other minor sources	7 775	1.5
Total	505,413	100.00

Likewise, the amount of oranges that crossed the border to Kenya through the Namanga border post has increased from 635 tones (in 2004) to 2967 tones (in 2006) - equivalent to an increase of 78%. The growth of the cross-border trade in orange has also led to increased number of middlemen activities that transmit market signals to orange producers

in Muheza District and thus inducing them to concentrate on orange production activities (see also in Lamb, 2002). This trend could be attributed to the emergence of some local co-operative societies in recent years, for orange farmers. The establishment of these societies has been facilitated by an NGO known as DAIPESA which performed its activities in various regions of the country including the Tanga region, from 2002 to 2006. These organizations were found to be very active in the Mtindiro, Kwabada, Kilulu and Kwabota villages – and overall these villages were comparatively having wealthier farmers than the other villages covered in this study. One of the tasks of these organizations is to advocate/bargain for better selling prices for the farmers produce and as such, they have succeeded to a great extent to sell their oranges at higher prices than other villagers.

Other sources of income for the Muheza farmers apart from orange production include production of other crops such as coconuts, banana, pineapples, maize and jackfruits. Some of the farmers are also engaged in off-farm activities such as employment in the public sector; carpentry and investment in small business like retail shops and groceries.

4.6 Problems and constraints facing orange producing farmers

The problems and constraints which face the orange farmers as identified during the study are:

- (a) **Asymmetry market information:** The value chain for oranges and other agricultural products in Muheza and in many other rural areas in Tanzania can generally be characterized as suffering from the syndromes of imperfect market information. In most cases, farmers are the major victims - ending up by selling their produce at

lower prices while the middlemen take advantage of the situation and they make super profits out of it.

- (b) **Lack of bargaining power:** The producer prices for orange in Muheza District, like for many other agricultural products in the rural areas of developing countries are to a large extent dictated by traders or middlemen who purchase their produce. Very often, farmers have no choice other than accepting the middlemen's offer because they can not afford transporting their products to other markets which offer lucrative prices – and in most cases their products are ready for sale when they have serious cash needs.
- (c) **Theft:** During informal discussions, it was also noted that there are some incidences whereby wicked pickers steal oranges from farmers' farms when picking and then hide them elsewhere for sale (usually to unfaithful middlemen who want to buy oranges at lower prices).
- (d) **Loss of earning due to cheating:** This happens during counting before the farmer hands over the produce to the middlemen and finally to the wholesaler. Some middlemen conspire with the pickers who are also involved in the counting exercise, to confuse the farmer. While taking the advantage of the farmer's low ability to count speedily, and the farmer's eagerness to receive the money, the pickers can steal a substantial number of oranges from the farmer. For example, counting is done in a two-unit scale, that is, 0, 2, 4, 6, 8, 10 etcetera - when the count reaches for example, ninety, the counter may be very tricky to proceed to sixty-two instead of ninety-two. This may cause the farmer to lose about 10 to 15% of the total produce.

- (e) **Selling of immature oranges on contract:** In some cases farmers are obliged to sell their fruits while immature, only a few weeks after flowering. At this stage, the fruits have sizes of less than 0.5 cm in diameter. It was found that 42% of the farmers sold their oranges right after flowering. This occurs when the farmer is in need of emergency cash and there are no alternative sources of this cash apart from orange trading largely – a survival mechanism during the off seasons. In such a case the farmer has to sign a contract with the middleman whereby, the latter purchases the fruits at immaturity stage. Normally the price at which the farmer sells the produce is low and dictated largely by the middleman. In this case the price was reported to be as low as Tshs 5 - 7 per fruit. The middleman will normally harvest and sell the fruits to wholesalers at maturity stage at relatively higher prices ranging between Tshs 20 and 25 per fruit – prices which are over and above the producer prices by 72% - 75%. In this way the farmer ends up losing a huge proportion of income by selling his/her produce at immaturity stage.
- (f) **Improper harvesting practices:** As discussed earlier in chapter four, the harvesting or picking and collection of oranges are normally not done by the producers themselves but by casual laborers who are employed by the middlemen. The fact that the pickers are paid according to the number of fruits harvested, they strive to harvest as many fruits as possible per unit time so as to earn more money. In so doing, harvesting and collection exercises are sometimes done very recklessly. The result of this recklessness is to end up with some of fruits being bruised and/or crushed. The pickers may also harvest premature and/or too small-sized fruits. All the oranges

with such characteristics are considered as of low quality and are therefore left to the farmer by the buyer denying the farmer of the opportunity to earn more money.

- (g) Disease infections and pests: These, however, rarely cause physical losses but in most cases render the fruits to be of low quality with poor physical appearance and hence low marketability.
- (h) Poor access to financial capital: Farmers are facing serious problems related to access to capital to improve their production levels and practices (e.g., adequate financial resources to enable them purchase herbicides and spraying equipments, afford to hire reliable means of transport and access more favourable markets). The possibility of carrying out alternative income generating activities is also limited by lack of capital. As a result, some of the farmers depend solely on income from oranges production and the same dependency also explains why the poor farmers may be forced to sell their produce at immaturity stage when emergence cash needs occur.
- (i) Pre-conceived ideas: Some of the farmers have pre-conceived ideas on certain production activities. It was learnt, during the research, that some farmers have strong belief that it is not their tradition to carry out certain production activities such as livestock keeping. This reduces the chances of subsidizing the income obtained from orange production.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

This chapter presents the conclusions and recommendations that emanated from the study.

The conclusions and recommendations are specifically based on the results of the study.

5.2 Conclusion

5.2.1 The value chain for oranges in Muheza District

This dissertation benefited from a study which was conducted in Muheza District in Tanzania between end of 2006 and mid 2007. The overall objective of the study was to assess the performance of the value chain for oranges in the District and come up with recommendations for improvement. The specific objectives of the study were to identify the existing value chains for orange in the study area; assess the performance/contribution of income from orange to total household income; and identify the problems and constraints facing the value chain for orange in the study area.

The value chain for orange in Muheza District constituted a number of actors including the middlemen who, to a greater percentage, dominated the trade. The middlemen's chain could generally be described as falling under four levels: the junior and senior middlemen based in Muheza town, and the junior and senior middlemen based in the villages. The value chain was characterized as suffering from the syndromes of asymmetric information particularly at the base of the chain. The flow of market information to producers was poor where most of the farmers relied on subjective sources. For example, a farmer may

observe a large number of trucks moving through the villages and conclude that there is high demand for the produce while this might not necessarily be a good indicator. Information about market price reaches the farmers through middlemen and wholesalers at the time when purchasing agreements or contracts were met. For that matter, the prices offered to farmers by the middlemen were normally at a very low side.

Although market liberalization has increased the size of the market (more traders from Kenya have entered the market), farmers have not benefited much from this market due to lack of competitiveness and their low bargaining power in the market. Some actors and in particular the middlemen played more than one role in the chain. Some middlemen were involved in the production activities as well as in trading of the produce acting as both producers as well as middlemen benefiting from sales of oranges they produce and through their involvement in the trade as middlemen.

This chain could be shortened with a result of increased profits for the producers. This could be possible if and only if the producers can have enough capital and get access to reliable market information and more important perhaps is if they could sell their produce directly to wholesalers instead of using the middlemen. Alternatively, some arrangements could be made which motivates the middlemen to specialize in a particular segment of the chain. Of course this is also not an easy task as it requires establishment of an effective institutional framework which facilitates it and sets up some rules of conduct and standards for each level of actors.

Overall the results of analysis in this study have shown that traders from Kenya gain higher margins than their counterpart traders in the Tanzanian side mainly because of low

domestic prices for the produce and the differences in the currencies between the two countries. This again provides some insights of market imperfections particularly at the base of the supply chain for oranges. The prices offered can be generally seen as not reflecting the opportunity costs of the resources that are locally used for producing oranges. Unless this snag is addressed, the nation, and in particular the producers, will continue to be losers in this trade. Alongside the same perspective, the current move to revive the East African Community is also unlikely to benefit the poor orange farmers in Muheza unless this problem is addressed.

5.2.2 Contribution of income from oranges production to the total household income

Income from oranges production contributes about 51% of the total household income. The remaining percentage of household income comes from production of other crops such as maize, coconuts, jackfruits, and banana. Other sources of income include dairy cattle keeping and off-farm activities such as formal employment, carpentry and small business (e.g. kiosks, retail shops and groceries). This suggests that orange production is the major source of income for oranges farmers in Muheza District. Improvement of the market chain for oranges may therefore lead to increased producers' profit and thus help lifting the poor orange farmers in Muheza out of poverty.

5.2.3 Problems and constraint facing orange farmers

The major problems and constraints related to the value chain for oranges in Muheza District spring mainly from inefficiency in the value chain and lack of alternative sources of income for producers which may help subsidize income from orange farming. Poor

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APPENDICES

Appendix 1: Questionnaire administered to orange producers (farmers)

A. BASIC INFORMATION

Questionnaire number-----

1. Date-----

2. District-----

3. Division-----

4. Village-----

5. Farmers' name----- Age-----

6. Gender: 1 = Male ()
2 = Female ()7. Marital Status:
1 = Single ()
2 = Married ()
3 = Divorced ()
4 = Widow ()
5 = Temporary separated ()

8. Farmer's years in farming-----

9. Farmers level of education:
1 = No education ()
2 = Adult education ()
3 = Primary education ()
4 = Secondary education ()
5 = Others (specify) ()

10. House hold composition

Age group	Males	Females
Below 17years		
17 – 50 years		
Above 50 years		

B. CROP PRODUCTION INFORMATION

11. Do you own the entire land you are currently using for crop farming activities?
1 = Yes () 2 = No ()
12. If yes, how was the land obtained?
1 = Bought () 2 = Inherited () 3 = Rented () 4 =
Given by village government ()
13. Have you ever hired land for crop production? 1 = Yes () 2 = No ()
14. If yes, what was the rent of hiring one acre of land? Give value in Tshs.....
15. What is the total farm size of land used for crop farming activities by the house hold?
16. What is the total size of the land (in acres) used for orange farming activities by the house hold-----
17. What is the average orange tree per acre-----?
18. What is the average fruit per tree-----?
19. How much did you produce (oranges) in the last three seasons?

	Year		
	2004	2005	2006
Oranges			
Area (acreage)			
Yield per acre (unit)			

20. Apart from oranges what were the other food and cash crops grown by the household?
Indicate the volume of each crop obtained after harvest in the last three seasons.

Cash crop	Year					
	2004		2005		2006	
	Acreage	Yield(units)	Acreage	Yield(units)	Acreage	Yield(units)
Pineapple						
Coconut						

Food crop	Year					
	2004		2005		2006	
	Acreage	Yield(units)	Acreage	Yield(units)	Acreage	Yield(units)
Maize						
Legumes						
Banana						

C. MARKETING OF THE PRODUCE

21. What are the market outlets for your produce (oranges)?
- 1 = Wholesalers ()
- 2 = Retailers ()
- 3 = Truckers ()
- 4 = Hawkers ()

5 = Others. ()

22. At what stage do you market your produce (oranges)?

1 = Flowering stage (). If at this stage, in which years 2004 (); 2005 (); 2006 ()

2 = Premature ()

3 = Matured stage ()

D. HOUSEHOLD INCOME

23. Out of the crop produce, which one did you sell, amount and at what price in the last three seasons?

Crop	Year					
	2004		2005		2006	
	Quantity(units)	Price/unit	Quantity(units)	Price/unit	Quantity(units)	Price/unit
Oranges						
Sisal						
Coconut						
Maize						
Legumes						

24 What are the other sources of income and the amount of Tshs obtained from each source?

E. OFF-FARM ACTIVITIES

25. Apart from crop farming activities, what other activities bring income into you house hold? And how much did you get in the last three years?

Source of income	2004 (Tshs)	2005 (Tshs)	2006 (Tshs)
Formal employment			
Small business			
Lumbering			
Masonry			
Selling local brew			
Others (specify)			

F. LABOUR AND OTHER INPUTS USE

26. If hired labor was used, indicate cost per operation (Tshs) per acre.

Activity/Operation	Crop				
	Frequency	Oranges	Banana	Maize	Legumes
Land preparation					
Planting					
Weeding					
Pruning					
Fertilization and spraying					
Harvesting					
Transporting					
Marketing					
Other					
Total					

27. Did you purchase any inputs for farming? 1 = Yes () 2 = No ()
If yes, indicate the inputs, costs and the major crops.

Oranges:

Input	2004		2005		2006	
	Amount/ha	Unit price	Amount/ha	Unit price	Amount/ha	Unit price
Tractor						
H/hoes						
Fertilizers						
Herbicides						
Insecticides						
Others						
Total						

Maize:

Input	Year					
	2004		2005		2006	
	Amount/ha	Unit price	Amount/ha	Unit price	Amount/ha	Unit price
Seeds						
Fertilizers						
Herbicides						
Insecticides						
Others						
Total						

Legumes:

Input	Year					
	2004		2005		2006	
	Amount/ha	Unit price	Amount/ha	Unit price	Amount/ha	Unit price
Seeds						
Fertilizers						
Herbicides						
Insecticides						
Others						
Total						

G. RECORD KEEPING AND MARKET ACCESSIBILITY

28. Do you keep records? 1 = Yes () 2 = No ()
29. If yes, what records? 1. Quantity produced () 2 sold () 3. Costs () 4. Sales ()
30. By experience, what are the barriers behind domestic market accessibility?

- 31. Are you interested in selling your produce in foreign markets?
1 = Yes () 2 = No ()

32. If yes, what factors do you think hinder the entry into foreign trade?

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix 2: Questionnaire administered to traders

Retailers in Muheza market

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Market-----

3. Name of the Respondent-----

B. SOURCES OF THE PRODUCE

4. Indicate the source and the price you pay in purchasing the produce

Supplier market	Years					
	2004		2005		2006	
	Price (units)		Price (units)		Price (units)	
	Low season	Peak season	Low season	Peak season	Low season	Peak season
1.Producer						
2.Wholesaler						
3.Trucker						

C. QUANTITY OF PRODUCE HANDLED

5. Indicate the quantity of produce (oranges) you normally handle during the low and peak seasons.

Season	Years					
	2004		2005		2006	
	Quantity (units)		Quantity (units)		Quantity (units)	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Low						
Peak						

D. MARKET OUTLETS AND PRICES

6. Indicate market outlet where you sell your produce and prices you receive.

Outlet market	Years					
	2004		2005		2006	
	Price (units)		Price (units)		Price (units)	
	Low season	Peak season	Low season	Peak season	Low season	Peak season
Consumer						
Others						

E. MARKETING COSTS

7. Indicate the expenses you incur in selling your produce (oranges)

Item	Cost (Tshs)					
	2004		2005		2006	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Transport						
Labor						
Market fee						
Tax						
others						

8. Do you own/operate means of transport? 1 = Yes () 2 = No ()
If yes, indicate the type of transport, ownership and capacity.

Type of transport	Ownership		Capacity (give units)
	Own	hired	
Pushcarts			
Donkey/oxen drawn carts			
Bicycle			
Tricycle			
Pick-up			
Truck			
Others (specify)			

Appendix 3: Wholesalers in Muheza market

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Market-----

3. Name of the Respondent-----

B. SOURCE OF THE PRODUCE

4. Indicate the source and the price you pay in purchasing the produce

Supplier	Buying price (Tshs/fruit)			
	Peak		End of season	
	Minimum	Maximum	Minimum	Maximum
Bicycle				
Pickup				
Lorry trucker				

C. QUANTITY OF PRODUCE HANDLED AND SELLING PRICES

5. Indicate the quantity handled and prices received

Trading period (months)		Quantity handled/week		Selling price (Tshs/fruit)	
Peak	End of season	Peak	End of season	Peak	End of season

D. MARKETING COSTS

6. Indicate the expenses you incur in selling your produce (oranges)

(a) Transport costs

Transport means	Quantity/trip (#)	Cost per trip (Tshs)		
		2004	2005	2006
Bicycle				
Pickup				
Lorry truck				

(b) Packaging materials cost

Type of materials	Capacity (oranges per bag)	Price per bag (Tshs)		
		2004	2005	2006
Plastic bags				

(c) Market costs

Type of costs	Cost (Ths per month)		
	2004	2005	2006
Rent			
Levy			
Tax			
Others			

Appendix 4: Wholesalers in Arusha main market

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Market-----

3. Name of the Respondent-----

B. SOURCE OF THE PRODUCE

4. Indicate the source and the quantity of produce supplied

Supplier	Quantity per consignment (number)		Time taken to sell a consignment (days)		Loss per consignment (%)	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Producer						
Trucker						
Middlemen						

C. BUYING AND SELLING PRICES

5. Unit of trading: a: single fruit () b: kilogram () c: bags () d: others ()

6. Indicate the buying and selling prices

Year	Buying price per unit (Tshs)			Selling price per unit (Tshs)		
	Low season	Peak	End of peak	Low season	Peak	End of peak
2004						
2005						
2006						

D. MARKETING COSTS

7. Indicate the expenses you incur in selling your produce (oranges)

Item	Cost per consignment (Tshs)		
	Year		
	2004	2005	2006
Market levy			
Off-loading			
Other costs			

Appendix 5: Wholesalers in Kariakoo market, Dar es Salaam

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Market-----

3. Name of the Respondent-----

B. SOURCE OF THE PRODUCE

4. Indicate the source and the quantity of produce supplied

Supplier	Quantity per consignment (number)		Time taken to sell a consignment (days)		Loss per consignment (%)	
	Min	Max.	Min	Max	Min	Max
Producer						
Trucker						
Middlemen						

C. BUYING AND SELLING PRICES

5. Unit of trade. a: single fruit () b: kilogram () c: bags () d: others ()

6. Indicate the buying and selling prices

Year	Buying price per unit (Tshs)		Selling price per unit (Tshs)	
	Minimum	Maximum	Minimum	Maximum
2004				
2005				
2006				

D. MARKETING COSTS

7. Indicate the expenses you incur in selling your produce (oranges)

Item	Cost per consignment (Tshs)		
	Year		
	2004	2005	2006
Market tax per day			
Market levy per day			
Off-loading per truck			

Appendix 6: Wholesalers in Nairobi central market

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Market-----

3. Name of the Respondent-----

B. SOURCE OF THE PRODUCE, BUYING AND SELLING PRICE

4. Indicate the source the produce, buying and selling price

Year Supplier		Quantity per trip		Buying price (Tshs/fruit)			Selling price (Ksh/bag)	
		Min	Max	L/peak	Peak	E/peak	Min	Max
2004	Trucker							
2005	Producer							
2006	M/man							

D. MARKETING COSTS IN TANZANIA

5. Indicate the expenses you incur in selling your produce (oranges)

(a) Phytosanitary tax at Muheza (Tshs/truck).....

(b) Transport charge

Year	2004	2005	2006
Tshs/tip			

(c) Allowances for both driver and conductor

	2004	2005	2006
Kshs/day			
Tshs/day			

(d) Custom and excise duties at Namanga border

		2004	2005	2006
Tz side (Tshs/truck)	Inn			
	Out			
Kny side Tshs/truck)	Inn			
	Out			

E. MARKETING COSTS IN TANZANIA

6. Indicate the expenses you incur in selling your produce (oranges)

(a) Tax upon arrival at Nairobi market

	2004	2005	2006
Kshs/truck			
Tshs/truck			

(b) Additional tax until the produce is finished

	2004	2005	2006
Kshs/day			
Tshs/day			

(c) Labour charge (Off-loading and repacking)

	2004	2005	2006
Kshs/truck			
Tshs/truck			

(d) Packaging materials cost

	2004	2005	2006
Kshs/bag			
Tshs/bag			

(e) Minimum time for selling one truck.....

(f) Maximum time for selling one truck.....

(g) Loss per truck (%).

7. Do you export the produce at Nairobi? 1 = Yes () 2. = No ()

8. If Yes, indicate the countries to which you export.....

.....
.....

Appendix 7: Truckers in Muheza

Name of the Enumerator-----

Date: -----

A. IDENTIFICATION

1. Questionnaire Number-----

2. Name of the Respondent-----

B. TRANSPORTATION COSTS

3. Indicate the earnings and expenses you incur in selling transport services

Year	Route	Fuel/trip (l)	Price/l (Tshs)		Oil cost (Tshs)	Labour costs (Tshs)	Earning (Tshs)
		To & from	Min	Max			
2004	Mhz-Dar						
	Mhz-Ars						
	Mhz-Nrb						
2005	Mhz-Dar						
	Mhz-Ars						
	Mhz-Nrb						
2006	Mhz-Dar						
	Mhz-Ars						
	Mhz-Nrb						

THANK YOU VERY MUCH FOR YOUR COOPERATION

Appendix 8: Boarder trade data**Appendix 8.1: Buying price per orange at Muheza (Tshs)**

Year	Price
2004	10, 30, 40
2005	20, 30, 45
2006	20, 40, 60

Appendix 8.2: Selling price at Nairobi main market (Kshs/250 oranges)

Year	Prices
2004	2000 – 2500
2005	2300 – 2800
2006	2500 – 3000

Each bag contains 250 oranges

Capacity of one truck: 55000 – 60000 oranges

5. Loss after selling: 3 – 7%

6. Costs

Appendix 8.3: Transport charges (Tshs/truck)

Year	2004	2005	2006
Charge	550 000	660 000	890 000

(A) Phytosanitary Tax at Muheza District (Tshs): 30000/truck

(B) Custom and Excise duty at Namanga boarder

On Tanzanian side: Inn: 15\$

Out: 4\$

On Kenyan side: Inn: 16\$

Out: 16\$

Appendix 8.4: Equivalence (Tshs)

		Year		
		2004	2005	2006
Tanzanian side	Inn	17 500	17 700	20 000
	Out	4 200	4 700	5 400
Kenyan side	Inn	16 800	18 800	21 600
	Out	16 800	18 800	21 600

Source: Customs and excise department of Tanzania (2007)

Appendix 8.5: Market Tax upon arrival at Nairobi

Currency	Year		
	2004	2005	2006
Kenyan shillings	4 300	4 400	4 400
Tanzanian shillings	62 350	70 400	74 800

Appendix 8.6: Market tax per day for the period the produce stays in the market

Currency	Year		
	2004	2005	2006
Kenyan shillings	250	270	300
Tanzanian shillings	3 700	4 320	5 100

Source: Survey data (2007)

- (C) Minimum time for selling one-truck full: 1 day.
Maximum time for selling one-truck full: 7 days.

Appendix 8.7: Packaging labor charge

Currency	Year		
	2004	2005	2006
Kenyan shillings	1 200	1 400	1 500
Tanzanian shillings	18 200	22 400	25 500

Source: Survey data (2007)

Appendix 8.8: Allowance for the truck driver and conductor

Currency	Year		
	2004	2005	2006
Kenyan shillings	480	550	600
Tanzanian shillings	7 000	8 000	10 200

Source: Survey data (2007)

Appendix 8.9: Exchange rates: US\$ against Tshs and Ksh against Tshs

Year	TShs		
	2004	2005	2006
Currency			
US\$	1 050	1 180	1 350
Kenyan shilling	14.5	16	17..50

Source: Bank of Tanzania (2006)

Appendix 8.10: Oil prices per litre (Tshs)

Year	2004	2005	2006
Price per litre	750	980	1250

Source: Survey data (2007)

Appendix 9: World orange producing countries (million 40.8kg boxes)

Country	Production (1980/89)	%	Production (2002/03)	%	Delta (%Δ)
Brazil	265.61	27.70	367.00	25.10	38.00
US	165.51	17.20	240.25	16.40	45.20
Israel	219.58	22.90	263.60	18.00	18.90
Mexico	32.45	3.40	94.07	6.40	39.70
China	8.55	0.10	116.35	7.50	992.60
Others	266.84	27.80	388.92	26.60	54.20
Total	958.55	100.00	1463.50	100.00	

Source: Phillipez and Fernando (2004).

Appendix 10: World oranges export trade: The leading countries (million 40.8kg boxes)

Country	Year			
	2001	2002	2003	2004
US	128 907	73 299	125 000	124 956
Brazil	1 250 000	1 135 000	1 195 000	1 186 000
Israel	37 000	40 000	30 000	36 000
Mexico	30 710	9 900	16 900	18 879
China	2 848	3 406	3 600	3 310
Morocco	2 800	3 233	3 120	2 929
South Africa	12 960	13 000	12 000	14 000
Japan	0	0	0	0

Source: Phillipez and Fernando (2004)

Appendix 11: World oranges import trade: The leading countries (million 40.8kg boxes)

Country	Year			
	2001	2002	2003	2004
US	1 021 224	1 006 499	1 099 665	1 065 000
Brazil	15 000	18 000	18 000	17 600
Israel	48 000	45 000	35 000	46 000
Mexico	4 000	4000	4 000	4 200
China	34 488	42 117	52 646	50 000
Morocco	1 600	1 600	16 250	15 897
South Africa	14 600	13 100	12 600	14 800
Japan	96 829	96 775	97 000	99 120

Source: Phillipez and Fernando (2004)

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