IMPROVING THE TANZANIA-MOMBASA CROSS-BORDER TOMATO PRODUCT CHAIN: A STUDY OF MOMBASA TOMATO MARKET

DRAFT REPORT

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Tomato Market Study in Mombasa was commissioned by Agricultural Economics Research Institute, Wageningen University and conducted by ETC East Africa Ltd

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LIST OF ABBREVIATIONS AND ACRONYMS

CIF:	Cost Insurance and Freight
GoK:	Government of Kenya
HCDA:	Horticultural Development Authority
KACE:	Kenya Agricultural Commodity Exchange
KBS:	Kenya Bureau of Standards
KEPHIS:	Kenya Plant Health Inspectorate Services
KES:	Kenya Shilling
KTWA:	Kongowea Tomato Wholesalers Association
SMS:	Short Message Service
ToR:	Terms of Reference

EXECUTIVE SUMMARY

Introduction

1. The study of Mombasa tomato market is part of the project "Development of Commercial Field Vegetable Production, Distribution and Marketing for the East African Market". The project is implementing a pilot activity on improving cross-border tomato chains from Ngarenanyuki, Tanzania, to Mombasa, Kenya. The study was commissioned by Agricultural Economics Research Institute, Wageningen University Research Centre and conducted by ETC East Africa Ltd in the period 20th -24th May 2008.

2. The overall objective of the study was to assess the requirements, institutional setting and current supply issues of the Mombasa tomato market and to describe the supply chain logistics and characteristics.

Methodology

3. The detailed methodology comprised three main phases: (a) an inception phase that included initial discussions with the Client, literature review and preparation of field tools; (b) Market survey and discussions with various market actors; (c) and data processing, analysis and reporting.

4. During the study, one Mass market (Kongowea) and five retail markets were visited. In these markets, a checklist was used to hold discussions with randomly selected traders and with Mombasa Market Municipal Council staff (Market Master and other representatives). Further discussions were also held with Brokers and Kongowea Tomato Wholesalers Association (KTWA) Committee. Also a semi-structured questionnaire was used to collect data from 20 randomly selected "redistributing wholesalers" in Kongowea mass market.

General Market Description (Retail Markets)

5. Retail markets that sell fresh produce (vegetables and fruits) in Mombasa include Mackinnon, Sega, Mwembe Tayari and Majengo, all under the Jurisdiction of Mombasa Municipal Council. These retail markets do not have cooling facilities.

6. The retail markets operate daily and are most busy during Saturdays when most households purchase goods from the market. Retail traders in these markets rent stalls from the Municipal Council of Mombasa.

7. The retail markets are smaller in size compared to the mass market, Kongowea. They source their produce (vegetables, fruits and grains) from Kongowea mass market and retail the same to consumers (inhabitants of Mombasa). Purchased tomatoes (purchased on cash) are ferried from Kongowea to the retail markets by individual traders using hand carts, trucks and minibuses (matatus).

8. The retail traders rely on mobile phones and actual visits to Kongowea market to get market information. However, the use of mobile phones is increasingly becoming important in getting market information.

9. Tomato varieties sold in the retail markets include Money maker, Roma, Cal J and Onex among others. However, Cal J and Onex are the most preferred varieties by traders and consumers due to their long shelf life.

10. Constraints faced by traders (and consumers) in the retail markets include non-uniformity of tomato quality in tomato wooden box purchased from the mass market, hawkers who retail in the surroundings of the market, fluctuating market prices in the mass market and the lack of cooling facilities in the retail markets.

Kongowea Wholesale (mass) Market

General Market Description

11. Kongowea Market in Mombasa is the largest wholesale market in East and Central Africa. It also serves most of the surrounding districts in Coast Province that depends on it for fresh produce and other agricultural products. Diverse agricultural produce are sold in the wholesale (mass) market. These produce include fresh produce (vegetables and fruits), cereals, roots and tuber crops.

12. Everyday an average of 15,000 people visit the market to buy or sell fruits, vegetables, poultry, dried fish and other foodstuffs. Kongowea Tomato Wholesalers Association (KTWA) estimates that there are about 400 tomato traders in the market, out of whom about 180 have registered with the Association.

13. Kongowea Mass Market operates seven days a week. On a typical day the market is opened at 5.00 am and closes at 2.00 pm for cleaning and garbage removal. On public holiday and weekends (Saturday and Sunday), the market is open at 5.00 am but closes at 12.00 for cleaning and garbage removal. Saturday is considered to be the busiest trading day.

14. The market is open for trading for all members of the general public. However, traders wishing to sale their wares in the market are required to pay levies to the Council (Market gate charges).

15. Most consumers hold Kongowea mass market in high esteem. However, of notable concern to most consumers is the daily fluctuating and unpredictable price of fresh commodities (like tomatoes) in the market, which also affects prices at the retail markets.

Tomatoes at Kongowea Mass Market

16. Tomato is the dominant fresh produce in Kongowea market accounting for 44% of total fresh produce sold in the market in the period January 2007 to March 2008. The contribution of tomato to revenue generated from fresh produce in the market was estimated at 53% in the same period.

17. Tomato supplies to Kongowea market fluctuates from month to month and from season to season. In the recent past, the peak periods of tomato supply have been the months of April, July, August-September and October. The tomato supply from Kenya's side is complemented by seasonal imports from Tanzania during parts of the first quarter of the year and mainly in the second half of the year (June-December 2007).

18. The tomato segment of Kongowea market has expanded of late. The mass market has seen an increase in the number of tomato traders and brokers in the last five years. Similarly, procurement volumes of tomatoes are likely to increase in the future.

19. Traders and consumers interviewed during this study indicated their preference for tomatoes from Kenya rating them as having high quality; long shelf life and that they reach the market in good condition. Most tomatoes from Tanzania were perceived to be having short shelf life and thus, in most cases attract low prices in the wholesale market.

20. Tomatoes sold at Kongowea mass market are sourced from Kenya as well as from Tanzania. In Kenya tomatoes are purchased from Kimana, Rombo, Njoro, Ndarajani, Njukini, Taveta, Karatina, Challa, Loitoktok and Nakuru among others. In Tanzania

tomatoes are sourced from Moshi, Iringa, Ngarenanyuki, Arusha and Ngabobo (Ngarenanyuki Ward in Arumeru District) among others.

21. Farm gate prices of tomatoes are a "bargain" between the farmer and the buyer and differ from season to season, from place to place, from farmer to farmer and from one grade of tomatoes to another. During the time of the study, farm gate prices varied from KES 250-1700 per 40kg-crate of tomatoes.

22. Consumers and traders of tomatoes in Kongowea market are interested in a number of quality characteristics including tomato variety, uniformity in the unit of packaging, size of tomatoes, colour, appearance, shelf life, firmness of tomato "skin" and prices per box among others.

23. Tomato prices has been fluctuating and on the decrease in the period February-December 2007. However, there has been a general increase in tomato prices beginning January 2008 to the date of study for various tomato varieties. This trend is expected to continue into the remaining parts of the year.

24. The main tomato supply chain actors comprise farmers, brokers and collecting and distributing wholesalers and consumers. The collecting wholesalers purchase produce from farmers and transport them to the market. Brokers receive tomatoes from the collecting wholesalers (transporters) and sell the same (on behalf of producers and transporters) to "distributing wholesalers" who in turn sell to retail traders. In practice, this chain is not linear and there are a number of inter-linkages, for example farmers can also transport their produce directly to the market and brokers also buy produce directly from farmers. In this chain, transport accounts for the highest percentage of the marketing costs.

25. The study has shown that the tomato consumers are more interested in tomato varieties with long shelf life and tomato prices. However, most of them have not given a thought on pesticide residues on tomatoes as long as the tomatoes have been prepared well for the market (washed and or are attractive in appearance).

26. The predominant means of communication between traders (retailers and wholesalers) and their suppliers whether in Kenya or in Tanzania is through mobile phones. However, this is supplemented by actual visits to Kongowea market by traders in proximity to the Municipal market.

27. Bottlenecks in tomato business at Kongowea mass market in Mombasa are diverse in nature. They include the following among others:

- *Activities of brokers*: The prices of tomatoes in Kongowea market are set on a daily basis by a curtail of brokers and therefore prices fluctuates from day to day. Various proposals exist on how to minimise the activities of brokers in the chain. They include impressing upon the Mombasa Municipal Council to enact facilitating by-laws, strengthening Kongowea Tomato Wholesalers Association to play an active role in marketing and initiating and strengthening producer associations to counteract the activities of brokers in the production-marketing chain.

- *Tomato quality and packaging*: Good looking tomatoes may be heaped at the top of the box while the inside of the box may be having poor quality tomatoes (small size, short shelf life, pest infested). There is need to create awareness to farmers on the importance of tomato quality and the relationship between market quality and prices.

- *Glut of tomatoes in the Market*: Sometimes Kongowea market receives a glut of tomatoes causing a reduction in prices and profit margins. The problem of seasonal glut and depressed tomato prices can be addressed through setting up an agro-

processing industry in Mombasa, which can process tomatoes. Similarly, setting up cooling facilities in Kongowea market can help reduce tomato losses.

- *Poor road infrastructure in the tomato producing areas*: The poor road infrastructure limit mobility of produce and people, increases transport costs and damages tomatoes during transportation. Road construction and maintenance are in the domain of the Government ministry. However, when Producer Associations are initiated and strengthened, then they can lobby and advocate for road maintenance in the rural areas.

1 INTRODUCTION

1.1 Background

The project entitled "Development of commercial field vegetable production, distribution and marketing for the East African Market" has the goal of contributing to a vital rural economy of Tanzania and Kenya through the development of effective and integrated field vegetable chains for the domestic and regional markets in East Africa. The purpose of the project is to:

- Contribute to the improvement of the linkage of domestic tomato supply chains to local high segment markets;
- Contribute to the improvement of the Tanzania-Mombasa cross-border tomato product chains; and
- Assess the functioning of these supply chains and identify options for addressing observed bottlenecks

The project is implementing two pilot activities in the year 2008. These pilot activities include improving (1) the linkage of domestic tomato supply chains to local high segment markets; and (2) improving the Tanzania-Mombasa cross-border tomato product chains. This study is part of the afore-mentioned second pilot activity. The goal of this pilot activity is to improve cross-border tomato chains from Ngarenanyuki, Tanzania, to Mombasa, Kenya, by increasing substantially (10%) the productivity (physical and financial yield per unit input), the product quality and the total market volume.

Although farmers in Ngarenanyuki, Tanzania have been growing tomatoes and marketing them in Mombasa, among other market outlets, little is known about this market. A study of Mombasa tomato market was therefore conducted to bridge this knowledge gap. In particular, the objective of the study was to assess the requirements, institutional setting and current supply issues of the Mombasa tomato market and to describe the supply chain logistics and characteristics. The detailed tasks undertaken are presented in the Terms of Reference (ToR), **Appendix 1**.

1.2 Literature Review

1.2.1 Overview of fruit and vegetable sectors

Kenya's horticultural sector has received great deal of attention from local and international researchers, government and donors over the past decade due to the rapid and sustained growth of the export sector **(Jafee, 1994; Minot and Ngingi, 2002)**. However, despite its rapid and sustained growth, about 90% of all fruit and vegetable production are consumed domestically, either on-farm or through domestic markets **(Tschierley *et al*., 2004)**. Similarly, Tanzania exports a very small proportion of its fruits and vegetables and most of her fresh produce is consumed in the domestic market **(CLEAAP, 2006)**. The overwhelming dominance of the domestic market, the challenges that smallholders face to continue participation in the export sector, the possibility of more rapid growth in domestic demand, and the need for productivity growth in both production and marketing to meet this demand and protect the rural incomes of the poor producers and consumers argue for a more active focus on the potentials and constraints of the domestic market and cross-border trade with neighbouring countries.

Fruits and vegetables produced in Kenya and Tanzania are either retained on the farm, or marketed through local fresh markets, local processed markets, and fresh export markets, or processed export markets. Smallholder farmers produce the bulk of the vegetables and fruits

for the domestic market. In this review, we focus on tomatoes, which is one of the vegetables (fruit vegetable) produced in Kenya and Tanzania with a potential to improve on the rural economy of Kenya and Tanzania.

A previous study in Mombasa mass market (Kongowea) has indicated that transportation takes the highest proportion (> 60%) of the marketing costs of tomatoes (**Tschirley *et al*., 2002)**. The share of transport in marketing cost is greater in all Kenyan regions (Karatina, Oloitoktok and Taveta) than in Tanzania (Iringa). The share of the selling price accruing to producers and trader profit per crate and return to capital were also found to be higher for Kenyan side than for Tanzania side.

1.2.2 Formal border point imports and export of tomatoes

The production of tomatoes in Kenya and Tanzania is throughout the year. However, Tanzania experiences surplus supply in May to August and November to December. During these months, Kongowea market in Mombasa experiences shortage of local supply. Hence there is some seasonal importation of tomatoes from Tanzania during these periods The main border points for transporting tomatoes from Tanzania to Mombasa markets are Lunga-Lunga and Taiveta Taveta borders. In a study carried out in 2002, **Tschirley *et al*. (2004)** estimated that 78% of the tomato quantities imported into Kenya from Tanzania went to the Coastal Region of Kenya (Kongowea market) while about 18% passed through Namanga border to Wakulima market in Nairobi. In the period 2001 to October 2002, about 89,535 crates of tomatoes worth KES 63,838,143 were imported from Tanzania (all border points-Lunga-Lunga, Taveta, Loitoktok, Namanga and Isebania) into Kenya, **(Table 1.1)**. In Tanzania, collecting wholesalers source tomatoes from different sources including Iringa and Lushoto, 915 km and 715 km respectively from Mombasa.

Table 1.1: Imports of tomatoes into Kenya through Kenya-Tanzania border posts

Month	Tanzania-Kenya Border points				Total number of crates	Total value (KES)
	Lunga lunga	Taita Taveta	Namanga	Isebania		
Nov' 01	2430	1432	530	70	4462	2762633
Dec' 01	1000	859	260	38	2157	1204150
Jan' 02	0	0	0	15	15	13500
Feb'02	0	0	0	5	5	4000
Marc' 02	0	68	0	7	75	23525
April'02	0	28	0	0	28	7000
May'02	12265	1261	739	85	14350	11562477
June'02	0	2008	9460	73	11541	3574210
July'02	17400	2767	5416	8	25591	17911601
Aug'02	28109	863	358	100	29430	25433634
Sept'02	1350	95	80	130	1655	1249980
Oct '02	0	205	0	21	226	91432
Total	62554	9586	16843	552	89535	63838143

Source: Adapted from Tschirley *et al*., 2002.

The most dominant tomato variety produced from Tanzania is Money maker. It has a soft skin and a shorter shelf life when compared to Cal-J, which is produced in Kenya. Kenyan consumers have a preference for tomatoes with hard skin and a longer shelf life (for example Cal-J, Anna F1 Hybrid and Onex among others).

1.2.3 Handling of agricultural trade at border points

- **Duty concessions:** Import cargo is the levy charged on any import cargo into Kenya. Import Declaration Form fees are charged on goods that have a value of more than US$ 5,000 at a rate of 2.75% of Cost Insurance and Freight (CIF) price. The charges are guided by the First Schedule of the Customs and Excise Act (Tariff Interpretation). Although the East African Community Custom procedures are yet to be finalised, the Government of Kenya (GoK), has given Tanzania a 90% tax concession on primary agricultural produce (import cargo attracts a duty of 3.5%). With the harmonisation of custom tariffs within the East African Community Customs Union, goods to and from Tanzania and Uganda will be duty free while specific goods exported from Kenya into Tanzania and Uganda will attract some duty for five years **(Kuleiye, 2008)**.

- **Horticultural Crops Development Authority Levy (HCDAL):** The HCDA levy is a fresh horticultural import levy collected by customs department on behalf of HCDA. The charge is supposed to be one shilling (KES 1) per kg of produce. However, this has not been effected in most border points.

- **Measurements and recording:** Some of the border points between Kenya and Tanzania are not well equipped with electronic weighing machines, weigh bridges and other infrastructure, thus duties charged depends on the assessments of the Government Officers at the border points as well as declarations made by the trader/importer. The duty to be charged is then cross-checked with the First Tariffs Schedule.
- **Infrastructure:** The road network in some of the border points and their production areas is relatively poor. For example, Taita Taveta and Oloitoktok regions supply fruits and vegetables to Kongowea market in Mombasa. Yet they are connected to the rest of the country with poor roads. Horohoro, Tarakea and other border points in Tanzania also face a similar problem. The production areas have earth roads that are impassable during the rainy season. The poor road network results in losses due to wastage in the farms, deterioration of quality of produce during transportation and increased transport costs and lower profit margins.

- **Border point Agricultural Personnel:** The Governments of Kenya and Tanzania have various officers/agencies monitoring trade at border points e.g. Kenya Plant Health Inspectorate Services (KEPHIS), Kenya Bureau of Standards (KBS), and Public Health among others. The posting of Agricultural Extension Officers to monitor and record agricultural trade at the border points is not common practice at the Kenyan side of the border.

1.3 Ngarenanyuki Farmers and Mombasa Market

Ngarenanyuki is the name of a rural town North East of Mount Meru in Tanzania. Mount Meru is an active volcano located north of Arusha and 70 kilometres west of Mount Kilimanjaro. It reaches 4,566 metres in height and has fertile slopes that rise above the surrounding savannah. At an altitude of more than 1200 metres above sea level, the region has favourable growing conditions and relatively fertile loamy soils. The area also has ample water for furrow and field irrigation even during the dry season. The combination of these, factors as well as the tropical climate makes the area favourable for vegetable production all year round. The area is famous for tomato and onion production **(PPO Afriveg Report, Dec 2007)**.

The tomato growing area of Ngarenanyuki borders Arusha National Park. Ngarenanyuki tomato area is estimated to be 300 acres with two cropping cycles per year, producing a total of about 6000 metric tonnes of tomatoes annually. About 80 to 100 farmers have tomato as their main source of income. Each of these farmers grows tomatoes in about 2-4 acres.

The farmers in Ngarenanyuki market their tomatoes in the distant markets of Mombasa in Kenya and Dar Es Salaam and Zanzibar in Tanzania. The Mombasa agricultural produce wholesale market is the destination of choice for most of tomatoes produced by Ngarenanyuki farmers. A truck takes about 12 hours from Ngarenanyuki to Mombasa through Moshi (8 hours driving and 4 hours of border formalities).

Mombasa is located along the Kenyan Coast and is the second largest City in Kenya. Administratively, Mombasa is considered a district (Latitudes 3° 80' and 4° 10' S and Longitudes 39° 60' and 39° 80' E), **Munga *et al*., 2005**. The Mombasa District comprises four Divisions, namely, Island Division, Changamwe Division in the West, Kisauni Division in the North and Likoni Division in the South. The Island Division is the smallest and the most developed, while the three other sub-urban divisions are predominantly rural. The geographical coordinates of Mombasa City are 4° 3' 0" South, 39° 40' 0" East. Mombasa had a population of 665,018 persons (2,896 persons km^2) in 1999. The projected population in the year 2008 is 896,958 persons **(KNBS, 2007).** The City covers 295 km^2 (land mass of 230 km^2 and water 65 km^2). The Mombasa District is situated in the Coastal Lowlands with extensive flat areas rising gently from 8 metres above sea level to 100 metres above sea level in the West (**Munga *et al*., 2005)**. The City of Mombasa is centred on Mombasa Island, but extends to the mainland. The Island is separated from mainland by two creeks Kilindini Harbour in the South and Tudor Creek in the North.

The island is connected to the mainland to the north by the Nyali Bridge to the south by the Likoni Ferry and to the west by the Makupa Causeway alongside which runs the Kenya-Uganda Railway. The town is served by Moi International Airport, offering flights to many cities around the world. Within Mombasa, most local people use Matatus (minibuses) to move between villages and Mombasa Island. Most goods are transported using lorries/trucks.

Mombasa has a warm, tropical climate. The Mombasa District experiences variations in climatic variability attributed to South East Monsoon winds (blowing between April and September) and the North East Monsoons (October to March) and Oceanic Influence. The rains occur during the inter-monsoonal period, with the long rains starting from March to June, while the short rains occur from October to November/December. The peak rainy periods are May and October/November.

Mombasa is a major trade centre and home to Kenya's only large seaport, the Kilindini harbour (the channel is naturally deep). Mombasa is the centre of coastal tourism in Kenya and is the primary port for land locked East and Central Africa Countries such as Uganda, Rwanda, Burundi and parts of Zaire.

Figure 1.1: Location of Mombasa on the Kenyan Coast

Mombasa is seen as having a huge potential for trade. The Coast province imports more than 75 per cent of its food from upcountry (Kenya) and Tanzania. The tomatoes from Tanzania are transported in trucks from Ngarenanyuki to Mombasa. Each truck carries about 200 crates of 40kg each. It is estimated that between 30 and 50 trucks transport tomatoes into Mombasa market each week. The tomatoes produced by Ngarenayuki farmers account for about 40% of total annual fresh tomato cross border trade (Tanzania-Mombasa). The average total cross border trade of fresh tomatoes totals about 16 000 metric tonnes annually with a value of 3.8 million Euros.

1.4 Approach and Methodology

Based on the ToR and the Client's requirements, the Mombasa tomato market study was conducted using participatory methodologies which comprised a combination of literature review, visit to fresh produce markets in Mombasa and discussions with traders, Brokers and Municipal Council (market) staff and discussions with the Ministry of Agriculture Staff in Mombasa. The detailed methodology comprised three main phases: (a) an inception phase that included initial discussions with the Client, literature review and preparation of field tools; (b) Market survey and discussions with market actors; (c) and data processing, analysis and reporting. The study itinerary and persons met during the study are presented as **Appendices two and three** respectively.

1.4.1 Literature review, initial discussions and development of data collection tools

Initial discussions were held with the Client to familiarise the Consultant with the expected contents of the draft ToR. The draft ToR was later revised by the Client to its final format. The Consultant was provided with the project proposal and documentation on the "Pilot to improve the Tanzania-Mombasa cross-border tomato product chain". These documents were reviewed alongside other relevant documentation from the Internet and Kenya Daily Newspapers **(see Appendix 4)**.

Two different tools were developed for the Mombasa market study, namely a checklist and a semi-structured questionnaire **(see Appendices 5 and 6)**. Included in the checklist were topical issues on general market description and a description of the tomato mass market. The strength of the Checklist is that it allows non-directed response from the market players, allowing them to discuss freely. The semi-structured questionnaire sought to capture quantitative and semi-quantitative data. Direct observations were also used during market visits as a source of additional information on various activities carried out in the target markets and how business is conducted.

1.4.2 Market survey and discussions with market players

A list of markets in Mombasa was obtained from a literature search over the internet site (www.tradeandindustry.go.ke/documents/wm_stamping_station_jan-may03.pdf). The list was further discussed with the District Agricultural Office Mombasa and Kisauni Divisional Agricultural Office, Mombasa to identify mass markets and retail markets and how they function. At the district level, discussions were held with District Agricultural Officer and District Agribusiness Development Officer. At the Divisional level, discussions were held with agricultural officers in charge of collecting market information. These discussions resulted in the selection of the mass market and retail markets to be visited during the study. The following retail markets were visited:

- Majengo
- Sega
- Mackinnon
- Mwembe Tayari

In addition, a number of "small retail markets" operating in various estates within Mombasa were also visited in addition to a retail market in Kilifi. The Kilifi Municipal Council market receives most of its fresh produce from the mass market in Mombasa. In the retail markets, discussions were held with traders using a checklist. In addition, discussions were held with

market Municipal Council Staff (Market Masters, Headman etc). General observations were also made on fresh produce sold in the retail markets.

The one mass market, Kongowea Market, for agricultural produce that exists in Mombasa was visited. In this market, a checklist was used to hold discussions with traders selected at random, a group of Brokers, Kongowea Tomato Wholesalers Association (KTWA) and Kongowea Market Municipal Council staff (Market Master and other representatives). Discussions were also held with District Agribusiness Development Officer of the Ministry of Agriculture in Mombasa. A semi-structured questionnaire was used to capture detailed quantitative, semi-quantitative and qualitative information from 20 tomato traders (wholesalers) selected at random in the market. Data collected included general market description, data on mass market and detailed information on the mass market.

The study itinerary and persons met during the study are presented as **Appendices four and five** respectively.

1.4.3 Data processing, analysis and reporting

Data collected using the checklist was synthesised and analysed. Similarly, data collected using semi-structured questionnaire was entered into a computer using a data structure designed in MS Excel. After cleaning, the data were analysed to generate the required data tables using SPSS. The analysis was done to generate descriptive statistics. The analysed data, from the checklist and semi-structured questionnaire, were used as a basis for writing this report.

1.5 Structure of the Report

The report is structured as follows: The present Chapter One provides the background, the objectives of the assignment and the approach and methodology adopted. In response to the objectives of the study, Chapter Two deals with general market description, Chapter Three presents background information on Kongowea mass market while Chapter Four gives the details of tomato business at Kongowea Mass Market. Chapter Five finally presents the Conclusions of the study.

2 GENERAL MARKET DESCRIPTION

2.1 Fruit and Vegetable Markets

There are four main fruit and vegetable markets in Mombasa **(Table 2.1)**. The markets fall under the jurisdiction of Mombasa Municipal Council.

Table 2.1: Major fruit and vegetable markets in Mombasa

Market	Type	Location
Kongowea	Wholesale (mass)	Kisauni Division/Kisauni Constituency
Majengo	Retail	In Majengo Estate
Sega	Retail	Jomo Kenyatta Avenue
Mackinnon (Mirikiti)	Retail	Digo Road
Mwembe Tayari	Retail	Jomo Kenyatta Avenue

In addition to the major markets, there are various "small markets" operating in various estates. Examples of such markets are found in parts of Kisauni, Changamwe, Bombolulu, Shanzu, Mtongwe, Ujamaa, Jomvu, Mikindani and Chaani. These small markets are active mostly in the evenings and are operated by petty traders and kiosk owners. The market in Likoni (fresh produce) has since been closed due to court litigation between the Municipal Council and an allottee of the land on which the "market" stands.

The major retail markets in Mombasa are described in the following subsequent sections of this report while the wholesale (mass market) market is described in Chapter 3.

2.2 Retail Markets in Mombasa

2.2.1 Description

The retail markets of Mackinnon, Sega, Mwembe Tayari and Majengo are under the Jurisdiction of Mombasa Municipal Council. Mackinnon Market (*Mirkiti*) is gazetted monument. The physical location of the various markets has been presented in **Table 2.1**. The markets have various stalls (in the market building) used by traders to sell both fresh produce (vegetables and fruits) and cereals. However, no storage and or cooling facilities are available within the precincts of the market. Instead retail traders usually stock small quantities of fresh produce at a given point in time to minimize losses attributed to rotting or the short shelf life of most of the fresh produce. Each trader uses his/her assigned market stall to store unsold produce over night.

The size of the retail markets differ. For example Mackinnon has 144 stalls for selling agricultural produce and Sega 100 stalls. Majengo has about 540 "small stalls". Mwembe Tayari is estimated to have 42 stalls.

2.2.2 Market administration

In all the retail markets, trading stalls are acquired by making an application to the Municipal Council through the Market Master for the specific market concerned. The applications are open to any trader and anyone is free to apply. The Market Master forwards the application to the Town Clerk who forwards the same to the Director, Department of Social Services and Housing. A committee in this department scrutinizes the applications and approves applications. Upon approval, the applicant is required to pay a two-month deposit and

thereafter monthly rents. Only traders with stalls are allowed to sale their produce in the market.

Traders pay KES 550 monthly rent for large stalls in Mackinnon and Mwembe Tayari markets. In retail markets such as Sega and Majengo, monthly rent for smaller trading stalls range between KES 150 and 370 depending on size of trading stall. In Majengo, monthly rent of KES 180 is paid for a trading stall of 6 feet x 6 feet. A trader who is not able to pay the monthly rent fees for the stalls is procedurally supposed to be given three months notice before the stall can be reallocated to a different "trader applicant".

The retail markets are administered in a similar way. There is a Market Master in charge of the overall functioning of the market. There are also other staff like security personnel, and cleaners who are employees of the Municipal Council. In each of the retail markets traders have their own market committees and associations that look into their welfare.

2.2.3 Market regulations, opening times, busy days and hours

Market levies in the retail markets consist of monthly rent payments for stalls. The payments are made to the Municipal Council. The opening and closing times for various retail markets are presented in **Table 2.2**.

Table 2.2: Opening and closing times for retail markets in Mombasa

Market	Opening time	Closing time	Frequency of operation
Majengo	7.00 am	5.00 pm	Operates daily
Sega	*	*	Operates daily
Mackinnon	6.30 am	3.00 pm	Operates daily
Mwembe Tayari	7.30 am	6.00 pm	Operates daily

On Sundays and holidays, Mwember Tayari Market opens at 8.00 am and closes at 1.00 pm. The busiest day for Mwembe Tayari Market is Saturday when most households purchase goods from the market. Saturday is also the busiest day for Majengo Municipal Market. Mackinnon Municipal Market closes for 2 hours every day and on public holidays for cleaning.

The Mombasa Municipal Council markets are run based on the Council's by-laws. Some of the by-laws include, among others:

- Trading on stalls provided by the Council only (monthly rents required);
- Keeping cleanliness in the market. Each trader is required to have garbage bin;
- Keeping market access/passages free of goods/produce to allow for free movement of persons in the market;
- Prohibition of hawking within the market; and
- Prohibition of cooking in the trading stalls.

2.2.4 Fresh and other types of produce sold in the retail markets

The four Municipal Council retail markets sale diverse fresh produce, including vegetables and fruits. Traders operating in the markets sale different types of fresh produce for local consumption within Mombasa **(Table 2.3)**. All the retail markets sale tomatoes. Asian vegetables were found more pronounced in Mackinnon market than in other retail markets. Such vegetables include Karella, valore, Dudhi and Coriander among others.

Table 2.3: Major fresh produce and other agricultural commodities sold in the retail markets in Mombasa

Vegetables	**Fruits**
Carrots	Avocadoes
Cabbages	Bananas
Okra	Mangoes (local, Borobo, Dodo and Apple varieties)
Kales	Oranges
Green grams	Plantains
Onions (bulb and spring)	Lemons
Sweet potatoes	Limes
Potatoes (Irish)	Passion fruits
Tomatoes	Pawpaws
Brinjals (egg plants)	Pineapples
Capsicums	Watermelon
Cauliflower	**Other commodities**
Lettuce	Cassava
Peas	Maize (dry and green)
Karella	Beans (Rose coco, Mwitemania)
Cowpeas	Finger millet
Chillies (Bullet)	Sorghum
Cucumber	Greengrams
Garlic	Dolichos beans
Ginger	Groundnuts
Valori	Wheat
Karella	Soybeans
Broccoli	Spices
Indigenous vegetables	Arrow roots; and yams
Coriander	Coconuts
Onions	Butternuts
	Sweet potatoes

N/B: Asian vegetables are popular in Mackinnon Municipal Market

2.2.5 Sources and importance of tomato in the retail markets of Mombasa

The major source of tomato for retail markets is Kongowea market. Kongowea market is the only mass market (whole sale market) in Mombasa that is a source of tomatoes to the majority of the retail traders in Mombasa and neighbouring districts in the Coast province.

In Sega Market[1], a trader interviewed during this study estimated that about 10% of the stalls frequently stock tomatoes for sale on a daily basis while other traders stock tomatoes as and when the profit margins are perceived to be high. Similarly, a trader in Mwembe Tayari market estimated that about 60% of stalls in the market do stock tomatoes for sale, although some not as regularly[2]. In Majengo Municipal market, it is estimated that about 25% of the stalls do stock tomatoes for sale[3]. This figure however fluctuates depending on the perceived profitability of the tomatoes compared to other fresh produce in the market.

Further discussions with retail traders revealed that some of them prefer tomato sources from Karatina, Central Kenya due to their high quality and long shelf life. However, other

[1] Margret, a trader in Sega Market
[2] Veronica Mwiru, Mwembe Tayari Market
[3] Mary Wambui, a trader in Mejengo Market

traders do not mind selling tomato varieties from any source (Kenya/Tanzania) so long as they are of high quality (Grade 1) and have a long shelf life. A number of traders indicated that the current tomato varieties (during the month of study) being received from Tanzania do not have a long shelf life.

2.2.6 Consumers of retail produce

Consumers of retail produce, in Mombasa, are the inhabitants of Mombasa City themselves and the districts surrounding Mombasa City. Discussions held with various traders in each of the retail markets in Mombasa indicated that majority of consumers prefer high quality tomatoes (Grade 1) with longer shelf life, explaining the retail traders preference for stocking Grade 1 tomatoes. Another segment of consumers do not mind purchasing lower grades of tomatoes for immediate use (short shelf life). However, the lower grades of tomatoes are not commonly stocked by retail traders, but *kiosk* owners in the various residential estates and hawkers selling tomatoes on "hand-carts". Discussions with retail traders further revealed that price is a concern for most consumers, however, high quality tomatoes (Grade 1) with a longer shelf life, sales faster than any other quality of tomatoes even if the price is relatively high. The poor quality grade tomatoes are only purchased by consumers who need them for immediate use and not for further storage before use.

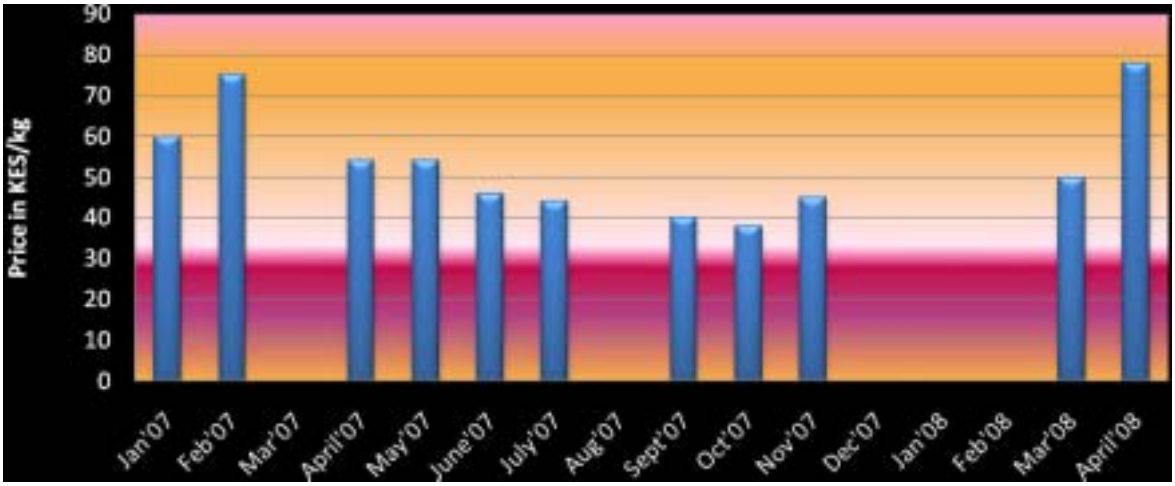
Tomato varieties sold in the retail markets include Money maker, Roma, Cal J and Onex among others. However, Cal J and Onex are the most preferred varieties by consumers due to the long shelf life. In the retail markets, the tomatoes are weighed and sold to consumers in units of "kilogram" or in *fungo (*bundle*)*. They are packaged for consumers in polythene bags.

2.2.7 Trends in tomato market development in retail markets

In the last three years, consumer quality demands have been changing towards high quality produce (Grade 1 tomatoes). Also the demand for tomato varieties with a longer shelf life like Onex is on the rise. Trends in average monthly tomato retail prices for major Municipal retail markets are presented in **Figure 2.1**. The prices of the retail tomatoes were higher in the first two quarters of the year (January to July 2007), but decreased towards the end of the year 2007.

Discussions held with traders in the various retail markets indicated that the period December 2007 to February 2008, experienced a decrease in tomato availability, thanks to Kenya's post election violence. However, volumes of tomato sold and prices were beginning to rise up again by the time of this study. The price of Grade 1 tomatoes ranged between KES 80 and 100 in the retail markets by the time of this study. However, the prices of tomatoes in the retail markets are not constant in any given month, but keep changing in line with market demand and daily prices at the Kongowea mass market.

Figure 2.1: Trends in average monthly tomato retail prices (January 2007-April 2008) for major retail markets in Mombasa



Source: Adapted from District Agricultural Office, Mombasa (Figures for Dec 2007-February 2008 not available at time of study)

2.2.8 Trends in supply chain management for retail markets

The retail traders purchase their produce from tomato wholesalers in Kongowea at the "day's price". The tomatoes are ferried from the mass market (Kongowea) to the retail markets using different means such as hand carts, trucks and minibuses (*matatus*). There are no fixed price agreements between retail traders and wholesalers of tomatoes. Most of the retail traders go in for the best quality tomatoes or the quality level that matches their price expectations. Payment is in terms of cash.

In the last three years, the major source of tomato supply to retail markets has not changed (mainly get tomatoes from Kongowea mass market). The same also holds true for means of transportation of tomatoes from Kongowea mass market to the retail market.

Retail traders in Mombasa get their information through actual visits to Kongwea mass market and by contacting wholesalers in the mass market through mobile phone. The use of mobile phones is increasingly becoming important as a means of communication and of getting to know tomato market prices. This was not so decades ago where retail traders relied mainly on actual visits to the market to get market information.

2.2.9 Tomato retail in Kilifi Municipal Market

General market description

Kilifi town is the district headquarters of Kilifi District, which neighbours Mombasa. The market does not have cooling facilities for fresh produce such as tomatoes. In terms of shelf space, the retail market is much smaller than the Municipal markets found within Mombasa City. However, the market is vibrant with different types of fresh produce as well as grains. Fresh produce sold in this retail market are similar to those found in the retail markets of Mombasa.

Market administration and regulations

The market is run by Kilifi Town Council. There is a Market Master in charge of the overall functioning of the market. The retail market opens at 8.00 am and closes at 6.00 pm every day. Acquisition of market stalls follows a similar procedure as described for the retail markets in Mombasa.

Sources of tomatoes and means of transportation

The Kilifi Municipal Market, in Kilifi town, receives most of its tomatoes from Mombasa Kongowea mass market. In the months of June-December, some of the tomatoes traded in the market partly come from Taita Taveta, Kenya. From Kongowea Municipal Market, the tomatoes, in wooden Boxes, are transported using public means (*matatus*) to Kilifi town market. The 40kg-wooden boxes are preferred. A trader pays about KES 50 per 40kg-box to transport tomatoes from Mombasa to Kilifi town market. A trader having many boxes of tomato to transport hires a pick-up from Mombasa to Kilifi. Transaction costs incurred by retail tomato traders include transport costs, Cess tax levied by the Municipal/Town Council and monthly stall rent.

Importance of tomatoes in the market

The trading stalls occupied by tomato traders were estimated at 25% of the total number of stalls available at the time of the visit. However, it is to be noted that the number of traders dealing with tomatoes fluctuates depending on the prices of tomatoes and the expected returns.

Traders interviewed in this market indicated that retail tomatoes are sold in kilograms or in *fungo* (bundle). Retail price was KES 120-150 per kilogram of tomatoes at the time of the visit. The tomatoes are packed in polythene bags for consumers. The tomatoes perceived by traders to be of short shelf life are usually sold in units of *fungo* rather than in kilogram

Consumers and quality demand

Consumers of retail tomatoes sold in Kilifi mainly come from within the urban area of Kilifi. Discussions with traders in the market indicated that most consumers like tomatoes, which are big in size and have no pest infestation irrespective of variety. However, some of the traders in the market indicated that they do not prefer stocking tomatoes from Tanzania due to their short shelf life.

2.2.10 Perceived constraints by traders and consumers in the retail markets

During the study the retail traders were asked about the constraints they face in marketing their produce. The constraints reported by the traders, are outlined below:

- Non-uniformity of tomato quality in tomato wooden box pack. The retail traders reported that some of the farmers and or brokers usually hide rotten tomatoes among good quality ones.
- Hawkers: In some of the retail markets such as Mackinnon, hawkers have been selling their fresh produce in the precincts of the market, thus denying stall owners/retail traders their customers.
- Market prices: The prices of tomatoes in the wholesale market (mass market) keep on fluctuating on a daily basis and the retail traders have no say over the wholesale market prices.

- Storage: there are no cooling facilities in the retail markets. Thus the retail traders can only stock small quantities of perishable products like tomatoes at any given time.
- Transport costs: For retailers transporting their tomatoes to other retail markets outside Mombasa, for example to Kilifi, they still have to pay Cess again to the Kilifi Municipal Council, thus increasing transport costs.

3 KONGOWEA WHOLESALE (MASS) MARKET

3.1 Market Description and Market Size

Kongowea Market in Mombasa is the largest wholesale market in East and Central Africa. Kongowea Market is situated on the North Coast shortly after the Nyali Bridge in Kisauni Constituency, Nyali Road off Mombasa-Malindi Highway. It is the only mass market in Mombasa. Similarly, it is the major source of produce for the Mombasa Municipal Council Retail Markets. It also serves most of the surrounding districts in Coast Province that depends on it for fresh produce and other agricultural products. The Kongowea Market is run by the Municipal Council of Mombasa. In the year 2004, the Mombasa Municipal Council collected about KES 51 million from various market levies **(Coast Express Newspaper, 2005)**.

The ground where the market stands is of historic nature, once being a place for slave trade. The Kongowea Municipal Market was constructed/rehabilitated and expanded with German Funding. After completion, the market was administered by German personnel before handing it over to the Municipal County Council of Mombasa. The Market has a perimeter fence, offices of the Municipal Council market staff, one main gate for receiving produce and different designated sections for selling various produce.

The market does not have cooling facilities for fresh produce. However, within the market precincts, there are designated stores (without cooling facilities) on hire by traders dealing with cereals and other non-perishable commodities. The stores are categorised as large and small, attracting monthly rent of KES 1850 and KES 2450 respectively. Although the market is a wholesale market, there is a small section of it currently being used for retailing agricultural produce, a situation which is currently a bone of contention between the wholesale traders and the Municipal Council staff. The perishable commodities like tomatoes are traded on wholesale in the “open” (unsheltered) and in the sheltered part of the market.

3.2 Number and Type of Traders in the Market

Everyday an average of 15,000 people visit the market to buy or sell fruits, vegetables, poultry, dried fish and other foodstuffs **(Coast Express Newspaper, 2005)**. During busy months (e.g. July-September; January-February), the market receives 70-120 truckloads of agricultural produce daily. During low seasons, the market receives a minimum of 50 truckloads of produce per day.

Traders within the Kongowea wholesale market are mainly Kenyans, some of whom have linkages with traders from Tanzania and Uganda. The Municipal Council by-laws do not allow for retailing in the market. However, some retail traders operate from the market precincts, paying KES 20 per day to the Council authorities. Hawkers found operating along the perimeter fence (outside the market) pay a levy of KES 50 per day.

The Chairman of Kongowea Tomato Wholesalers Association (KTWA) estimates that there are about 400 tomato wholesale traders in the market. However, only about 180 wholesales have been registered with KTWA and the Chairman is upbeat that more tomato traders will register with the Association in the near future.

3.3 Produce Traded in Kongowea Mass Market

3.3.1 Overview of produce types

Diverse agricultural produce are sold in the wholesale (mass) market. These produce include fresh produce (vegetables and fruits), cereals, roots and tuber crops **(Table 3.1)**. Most of the produce sold in the mass market are also similar to those retailed in the municipal markets in Mombasa, except for volumes and prices.

Table 3.1: Agricultural commodities sold in Kongowea wholesale market in Mombasa

Vegetables	**Fruits**
Carrots	Avocadoes
Cabbages	Bananas
Okra	Mangoes (Local, Borobo, Dodo and Apple varieties)
Kales	Oranges
Greengrams	Plantains
Onions (bulb and spring)	Lemons
Sweet potatoes	Limes
Potatoes (Irish)	Passion fruits
Tomatoes	Pawpaws
Brinjals (egg plants)	Pineapples
Capsicums	Watermelon
Cauliflower	**Other commodities**
Lettuce	Cassava
Peas	Maize (dry and green)
Karella	Beans (Rose coco, Mwitemania)
Cowpeas	Finger millet
Chillies (Bullet)	Sorghum
Cucumber	Greengrams
Garlic	Dolichos beans
Ginger	Groundnuts
Valori	Wheat
Karella	Soybeans
Broccoli	Spices
Indigenous vegetables	Arrow roots; and yams
Coriander	Coconuts
Sweet pepper (capsicums)	Butternuts
Onions	Sweet potatoes

3.3.2 Vegetables and fruits

The study examined the trends in quantities and prices of produce sold in the mass market in the last 16 months preceding the survey **(Appendices 7 and 8)**. Trends in quantity and prices of fresh produce (vegetables and fruits) are discussed in **Chapter 4** of this report.

3.3.3 Other produce sold in the market (non fresh produce)

Major cereals sold in the market include dry maize, finger millet and sorghum. Trends of quantities of cereals sold in the market have been fluctuating with low volumes in June 2007 and December 2007 to January 2008 **(Figure 3.1)**. The latter is probably due to post election violence that affected trade in most agricultural produce. Maize obtained highest prices in the month of August 2007. Prices of commodities were depressed in December 2007 to January 2008, but have started picking up in the post February 2008 period **(Figure 3.2)**.

Figure 3.1: Trends in quantities of selected cereals sold in Kongowea market (Jan 2007 to April 2008)

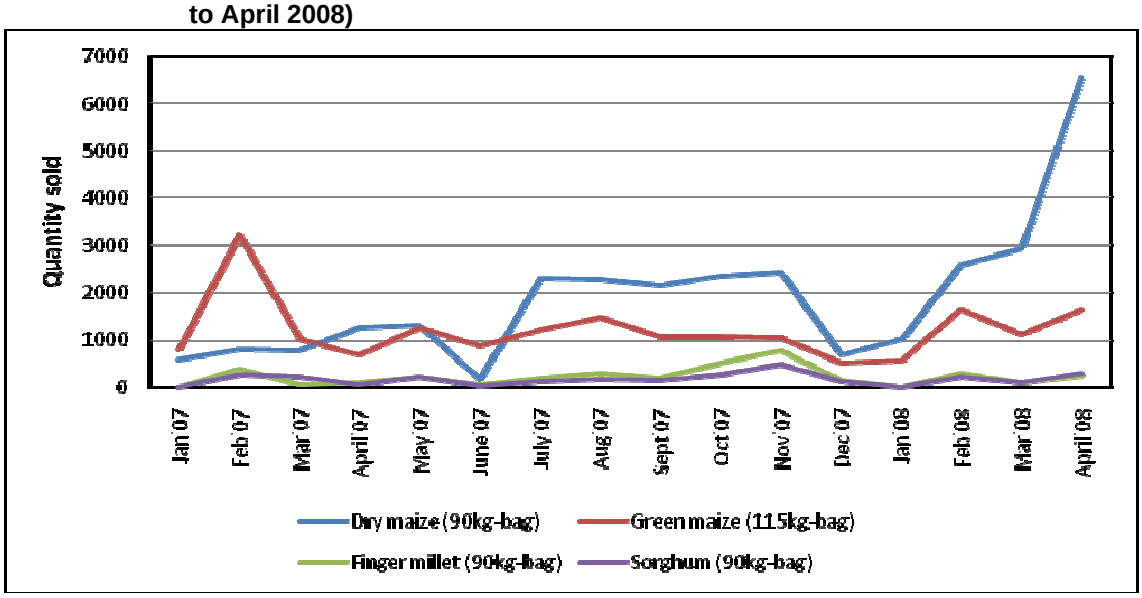
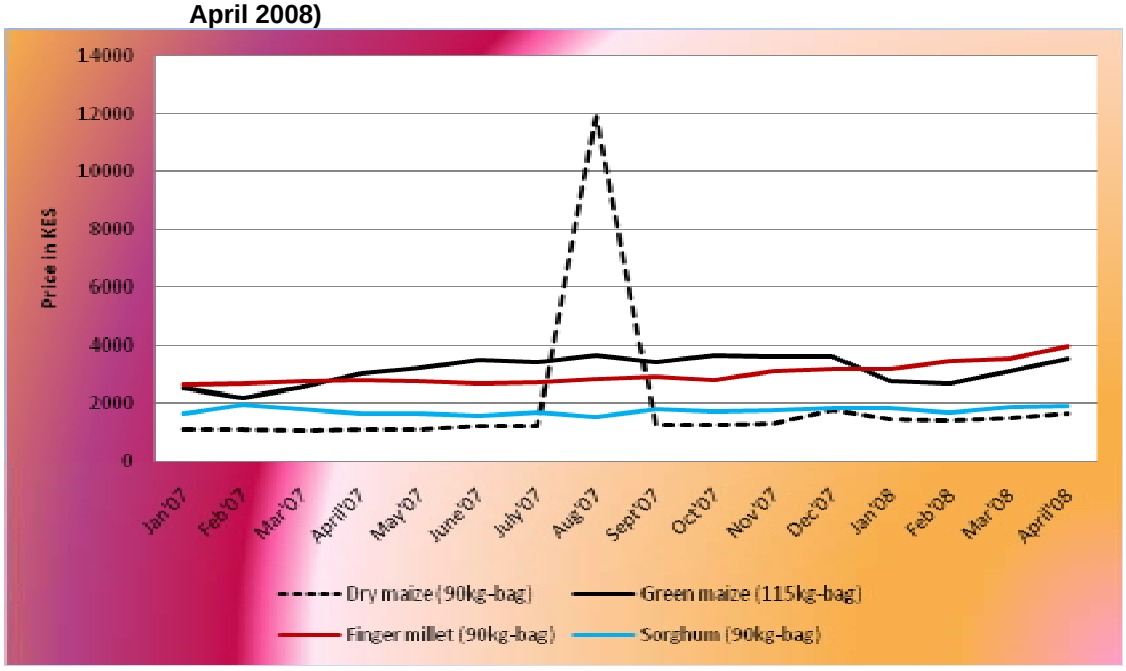


Figure 3.2: Trends in prices of selected cereals sold in Kongowea market (Jan 2007 to April 2008)



Trends in quantities and value of non-fresh produce (major cereals, pulses and grains) traded in Kongowea mass market in the period January 2007 to March 2008 are shown in **Table 3.2**. Among the non-fresh agricultural commodities, mwitemania beans had the highest share in volumes traded (34%) and revenue generated (35%). However, Rose coco beans were the second highest revenue earner followed by dry maize.

3.4 Opening Times, Busy Days and Busy Hours

Kongowea Mass Market operates seven days a week. On a typical day the market is opened at 5.00 am and closes at 2.00 pm for cleaning and garbage removal. However, discussions with traders and brokers in the market revealed that “Broker” activities usually start as early as 4.00 pm before the market gate is open. On public holiday and weekends (Saturday and Sunday), the market is open at 5.00 am but closes at 12.00 for cleaning and garbage removal. The market used to be very busy on Mondays in the previous years, but in the first quarter of this year, Saturday is considered to be the busiest trading day. On a typical trading day, the busiest trading time for tomatoes is from 5.00 am to about 11.30 am.

3.5 Administration Requirements

Kongowea mass market is administered by the Municipal Council of Mombasa. The Market has a market Master (Superintendent) in charge of overall administration of the market. The market is administered in a similar way like other Municipal Markets. There are also other staff like security personnel, inspectors and cleaners who are employees of the Municipal Council. Although, the market is administered by the Municipal Council (under Ministry of Local Government), the Ministry of Public Health has the mandate to inspect the market for its cleanliness and for ensuring that public health measures are implemented.

Traders operating in the market have got various Commodity Based Associations and committees to cater for their welfare, e.g. Kongowea Tomato Wholesalers Association (KTWA).

In principle, the market is for the general public and anyone can trade in the market (buy and sale agricultural commodities in the market). However, there are many Brokers in the market who collude to influence prices of agricultural commodities. The activities of brokers in the market are discussed in Chapter 4 of this report. The market, in particular, is designated for wholesale traders trading in "large" quantities of commodities. Traders wishing to sale their wares in the market are required to pay levies to the Council (Market gate charges).

Most traders that bring their produce to Kongowea market usually pack them in "acceptable uniform units of sale", for example wooden crates, to facilitate ease of paying levies and trade in the market. The Ministry of Agriculture of late has been advocating for standardising units of sale for agricultural commodities to minimise farmer exploitation. For example, tomatoes are required to be sold in standards of 40kg wooden crate (52 cm x 35 cm x 60 cm) or in large wooden crates of 64kg. There are also specifications for selling potatoes among others. The standardisation of units of sale is still an on-going process for various agricultural commodities produced in Kenya. However, standardisation procedures have met with some resistance from some traders.

Table 3.2: Trends in quantities and value of major agricultural non-fresh produce traded in Kongowea Mass Market (Jan 2007-March 2008)

Produce	Unit	Q1-2007	Q2-2007	Q3-2007	Q4-2007	Q1-2008	Total units traded	Quantity (MT)	Total value (KES)	% share in quantity traded	% share in revenue
Cereals		Jan-March	April-June	July-Sept	Oct.-Dec	Jan-March					
Dry maize	90kg-bag	2160	2720	6746	5473	6540	23639	2128	54328878	21.5	16.7
Finger millet	90kg-bag	430	370	689	1450	400	3339	301	9765420	3.0	3.0
Sorghum	90kg-bag	470	300	426	883	310	2389	215	4116086	2.2	1.3
Pulses/ grains											
Rose coco	90kg-bag	2280	5470	6730	4749	2600	21829	1965	75094328	19.8	23.0
Mwitemania	90kg-bag	7040	5350	9020	7199	8370	36979	3328	114067135	33.6	35.0
Cowpeas	90kg-bag	980	735	3502	4603	1133	10953	986	26652660	9.9	8.2
Green grams	90kg-bag	780	1736	3489	3604	1368	10977	988	41810456	10.0	12.8
Total								**9911**	**325834963**	**100.0**	**100.0**

Key: Q1 = Quarter 1; MT = Metric tonnes; KES = Kenya Shillings

3.6 Market Regulations

3.6.1 Market levies

The Municipal Council of Mombasa, represented by Market Master at the Kongowea market, charges levies for agricultural produce meant for sale in the market. The levy is charged per weight of the particular agricultural produce being taken into the market and not on the Grade/quality of the produce. Produce from Tanzania attracts same levies as those from Kenya at the "market gate". The market levies for agricultural commodities are collected at the gate of the market before trucks transporting the commodities are allowed in the market premises. One 40kg Wooden Box of tomatoes attracts a levy of KES 20 while a large wooden Box (64kg) carrying the same commodity attracts a levy of KES 35. The procedure for receiving produce at the gate involves making records of the following at the gate of the market:

- Vehicle registration number
- Name of the driver
- Source of the commodity carried in the truck
- Type of commodity
- Quantity of commodity carried in the truck
- Payment required (an invoice is issued)
- Payment of the levy at the Cashier office (a receipt is issued for payments made)

Assessments of the produce carried in the trucks are done by the Municipal Council staff at the gate of the market. The staff also ensures that payments are made before the trucks (with produce) are allowed inside the market. The gate charges are paid during the normal market working hours and any truck that reaches the market premises/gate outside these hours have to wait for market working hours to be cleared for entry. Once goods are paid for at the gate, no extra charges are made on the wholesale traders in the market.

3.6.2 Market hygiene

The Municipal Council of Mombasa is in charge of cleanliness and hygiene in the market. Once the market closes at the end of the business day, the Municipal Council staff clean the market and remove the garbage left behind by traders. The traders in the market are required to keep a measure of cleanliness, however, the garbage generated each day in the market is massive and garbage removal and cleanliness of the market has remained a challenge for the Municipal Market Staff. Complaints by traders in the market reached a crescendo in year 2005, when they went on mass protest against the Council on its inability to keep the market clean, remove garbage and to keep toilets clean **(Coast Express Newspaper, 2005)**. Since then, a number of hygiene measures have been implemented, but market cleanliness still remains a challenge.

3.7 Consumers and Consumer Perception on the Market

Discussions held with various consumers of produce indicated that the Kongowea mass market is considered to be the only important wholesale market in Coast Province of Kenya for agricultural produce. Other markets found in Mombasa and in the surrounding districts are mainly retail markets, most of whom receive produce from Kongowea mass market. However, of notable concern to most consumers is the daily fluctuating price of fresh commodities in the market. The fluctuating market prices of fresh commodities in the market also influence prices in the retail markets.

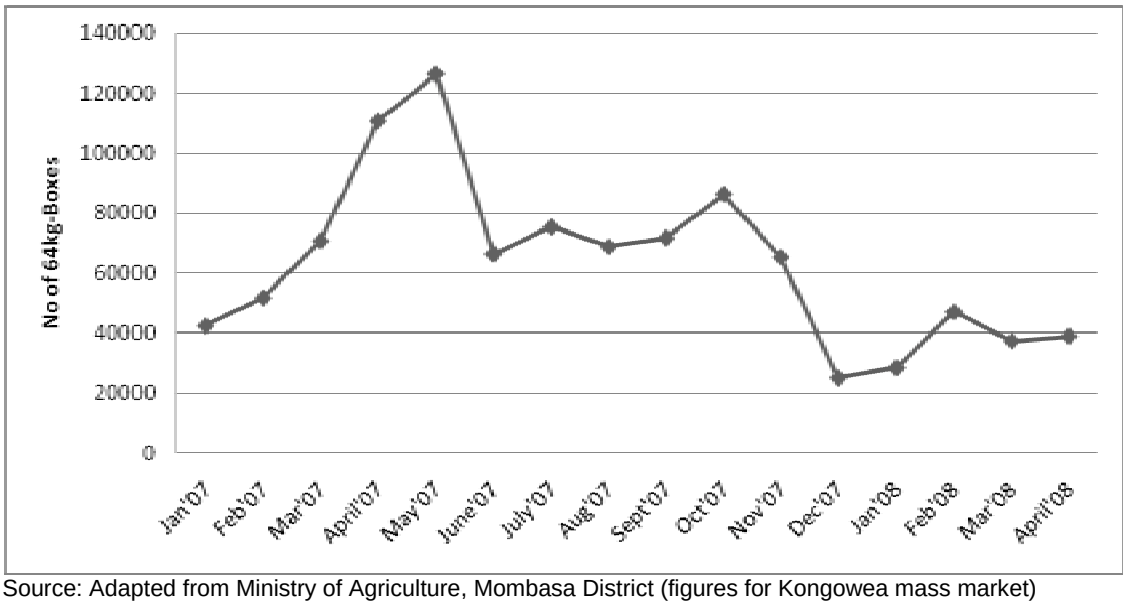
The major consumers of produce from the wholesale market are the retail traders who purchase produce from the wholesalers. The retail traders are quality focused and usually go for Grade one of tomatoes rather than poor grades.

4 TOMATOES AT KONGOWEA MASS MARKET

4.1 Trends in Tomato Volumes

This study investigated the relative importance of tomato in the fresh produce market of Kongowea **(Table 4.1)**. The results show that tomato is the dominant fresh produce in the market accounting for 44% of total fresh produce sold in the market in the period January 2007 to March 2008. The contribution of tomato to revenue generated from fresh produce in the market was estimated at 53% in the same period. Other fresh produce sold at wholesale prices include fruits, vegetables and roots and tuber crops **(Table 4.1)**. The monthly trends in volumes of tomato sold in the mass market are indicated in **Figure 4.1**.

Figure 4.1: Trends in tomato volumes sold in the market over a period of 16 months (January 2007 to April 2008)



Source: Adapted from Ministry of Agriculture, Mombasa District (figures for Kongowea mass market)

Although tomato production and deliveries to Kongowea mass market takes place throughout the year, Figure 4.1 shows that tomato supplies keep fluctuating depending on the season and or the month of the year. In the recent past, the peak periods of tomato supply (in both 64kg and 40kg crates) have been the months of April, July, August-September and October. In the second half of the year (June-December 2007), the tomato supply from Kenya's side is complemented by seasonal imports from Tanzania. However, the supply of tomatoes in December 2007 to March 2008 was partly affected by post election violence resulting in low volumes delivered to the market.

Table 4.1: Trends in quantities and value of major agricultural fresh produce traded in Kongowea Mass Market (Jan 2007-March 2008)

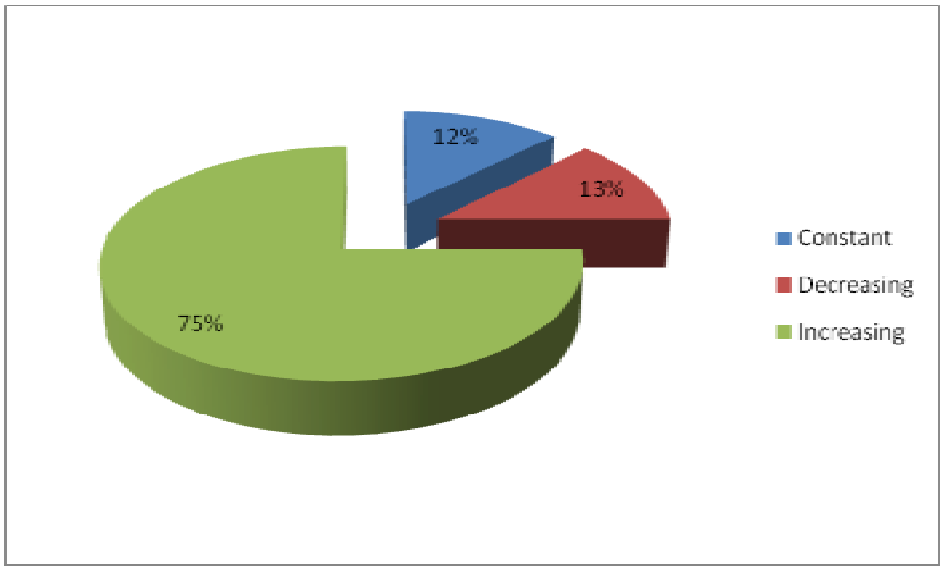
		Units Sold					Total units traded	Quantity (MT)	Total value (KES)	% share in quantity traded	% share in revenue
Crop	Unit	Q1-2007	Q2-2007	Q3-2007	Q4-2007	Q1-2008					
Roots/tuber crop											
Fresh cassava (98.8kg-bag)	98.8kg-bag	8557	2996	3035	2985	12368	29941	2958	21869738	2.1	0.7
Sweet potato (98kg-bag)	98kg-bag	2590	900	4339	3449	287	11565	1133	10675579	0.8	0.3
Vegetables											
Cabbages (126kg-bag)	126kg-bag	1192	6245	1120	1142	1093	10792	1360	21935523	1.0	0.7
Tomatoes (64kg-bag)*	64kg Box	164750	303200	215660	176480	112550	972640	62249	1641669800	43.7	53.0
Carrots (138kg-bag)	138kg-bag	3252	3780	3516	2652	2385	15585	2151	43916277	1.5	1.4
Dry onions (13kg-Net)	13kg-Net	75042	68060	124980	73157	73074	414313	5386	191011789	3.8	6.2
Kales (50kg-bag)	50kg-bag	37393	40070	40873	35420	33030	186786	9339	169520603	6.6	5.5
Potato white (130kg-bag)	130kg-bag	57830	37370	42069	32519	25346	195134	25367	494400282	17.8	15.9
Potato red (130kg-bag)	130kg-bag	22171	16475	21710	13754	21846	95956	12474	214182916	8.8	6.9
Fresh peas (51kg-bag)	51kg-bag	1971	1702	2339	4273	1534	11819	603	16832872	0.4	0.5
Brinjals (44kg-bag)	44kg-bag	1617	1356	1035	1136	947	6091	268	5033181	0.2	0.2
Cauliflower (39kg-crate)	39kg-crate	768	907	931	962	556	4124	161	7540197	0.1	0.2
Chilies (38kg-bag)	38kg-bag	889	1656	717	1130	1162	5554	211	5152280	0.1	0.2
Cucumber (50kg-bag0	50kg-bag	1066	924	611	464	357	3422	171	4514748	0.1	0.1
Lettuce (51kg-bag)	51kg-bag	1249	1310	1184	801	701	5245	267	4575293	0.2	0.1
Spring onion (142kg-bag)	142kg-bag	NR	NR	79	96	50	225	32	131526	0.0	0.0
Fruits											

		Units Sold					Total units traded	Quantity (MT)	Total value (KES)	% share in quantity traded	% share in revenue
Crop	**Unit**	**Q1-2007**	**Q2-2007**	**Q3-2007**	**Q4-2007**	**Q1-2008**					
Bananas (14kg-bunch)	14kg-bunch	10310	4530	6650	8380	7498	37368	523	12139653	0.4	0.4
Oranges (93kg-bag)	93kg-bag	22520	17829	12395	10387	7730	70861	6590	82885647	4.6	2.7
Mangoes (126kg-bag)	126kg-bag	15155	3151	1708	12147	16593	48754	6143	34665343	4.3	1.1
Lemons (95kg-bag)	95kg-bag	2397	1529	1331	405	568	6230	592	5361913	0.4	0.2
Pawpaws (54kg-bag)	54kg-box	2625	2748	2241	4067	12686	24367	1316	9110247	0.9	0.3
Pineapples (12.8kg-Dozen)	12.8kg-Dozen	33310	12655	10967	14183	25591	96706	1238	56640880	0.9	1.8
Avocados (90kg-bag)	90kg-bag	2338	5238	5912	2390	3639	19517	1757	29919118	1.2	1.0
Limes (13kg-Net)	13kg-Net	1540	971	1182	1116	1411	6220	81	3966309	0.1	0.1
Passion fruit (25kg-bag)	25kg-bag	1481	2102	789	950	720	6042	151	12736831	0.1	0.4
Total								**142521**	**3100388545**	**100.0**	**100.0**

*Figures for deliveries in 40kg wooden crates not available during the study; Q = Quarter (three months period)

Time series data on tomato volumes sold at the Kongowea market were not available at the time of the study. However, an interview with wholesale traders in the market indicated that tomato volumes sold at the market have been increasing in the last five years. This was corroborated by an affirmative response by 75% of the 20 wholesale traders interviewed **(Figure 4.2)**.

Figure 4.2: Wholesale traders perceptions on trends of tomato volumes sold at the market in the last five years (n = 20)



4.2 Tomatoes Sold per Week and Market Development

Records of daily tomato sales were not accessible from Market Master Offices during this study. However, the study interviewed 20 wholesale traders selected at random from the market to estimate weekly tomato sales. The average tomato sales per week per wholesale trader (for the 20 traders interviewed) were estimated at 110 wooden crates (40kg) to 145 wooden crates (40kg). However, there was great variability with some wholesale traders able to sale up to four truck loads of tomatoes (4 x 200 = 800 40kg-crates) per week during periods of plentiful supply while some wholesalers only able to sale 20-30 wooden crates (40kg) of tomatoes per week.

The tomato segment of Kongowea market has expanded of late. The mass market has seen an increase in the number of tomato wholesale traders and brokers in the last five years. This was corroborated by 60% of the wholesale traders interviewed during this study as well as the Kongowea Municipal Market staff.

4.3 Tomato Sources and Farm Gate Prices

Traders interviewed in Kongowea market indicated that tomatoes are sourced from both Kenya and Tanzania. In Kenya tomatoes come mainly from inland areas, but to some extent from the Coast (e.g. Taita Taveta, Kimana), as well **(Table 4.2).** Tomato varieties sold in the market include Onex, Cal J, M82, Money maker and Roma (limited quantities). A few of the wholesale traders “mix” the tomato varieties before sale in the market.

Table 4.2: Percentage distribution of wholesale traders in Kongowea market by tomato varieties sold and their sources of origin (n=20)

Kenya Source	Tomato varieties					Total
	M82	Onex	Money maker	Cal J	Mixed variety	
Kimana	7.1	5.4	0.0	0.0	0.0	12.5
Rombo	3.6	8.9	0.0	1.8	0.0	14.3
Njoro	0.0	0.0	0.0	1.8	0.0	1.8
Ndarajani	1.8	0.0	0.0	0.0	0.0	1.8
Kimana	0.0	1.8	0.0	0.0	0.0	1.8
Njukini	1.8	7.1	0.0	3.6	1.8	14.3
Taveta	0.0	1.8	0.0	0.0	1.8	3.6
Karatina	1.8	0.0	0.0	10.7	0.0	12.5
Challa	1.8	8.9	1.8	0.0	0.0	12.5
Loitoktok	3.6	7.1	0.0	1.8	0.0	12.5
Nakuru	0.0	0.0	0.0	10.7	0.0	10.7
Eldoret	0.0	0.0	0.0	1.8	0.0	1.8
Total	21.4	41.1	1.8	32.1	3.6	100.0

Tomatoes that reach Kongowea market from Tanzania are sourced from Moshi, Iringa, Ngarenanyuki, Arusha and Ngabobo (Ngarenanyuki Ward, Arumeru District) **(Table 4.3)**. Most of the tomatoes from Tanzania are money maker variety. However, Cal J and Onex are increasingly being imported from Tanzania due to their long shelf life and high demand in Kongowea market. Most tomatoes from Tanzania reach the Kongowea market in the period May-August and November-December.

Table 4.3: Percentage distribution of wholesale traders in Kongowea market by tomato varieties sold and their sources of origin (n=20)

Tanzania Source	Onex	Money maker	Cal J	Mixed variety	Marglobe	Total
Ngabobo (Ngarenanyuki Ward, Arumeru)	0.0	13.6	4.5	0.0	0.0	18.2
Moshi	0.0	17.2	4.5	9.1	4.5	36.4
Iringa	9.1	0.0	9.1	4.5	9.1	31.8
Ngarenanyuki	1.0	0.0	0.0	9.1	0.0	9.1
Arusha	0.0	0.0	4.5	0.0	0.0	4.5
Total	10.1	30.8	22.7	22.7	13.6	100.0

Traders and brokers interviewed revealed that farm gate prices is usually a “bargain” between the farmer and the buyer and differs from season to season, from place to place and from farmer to farmer. Most of the traders in the market did not wish to reveal their farm gate prices. However, the few that did indicated that there was great variability in farm gate prices for the month of May **(Table 4.4)**. For example, a group of brokers gave the farm gate buying price of tomatoes at KES 700-800 while redistribution wholesalers gave a wide range of farm gate prices **(Table 4.4)**. In general, farmers growing tomatoes in Taveta and Karatina

(Kenya) in the month of May 2008 received relatively higher farm gate prices than their counterparts in the other tomato growing areas. However, it is to be noted that the minimum farm gate price per 40kg-wooden crate can be sometimes low (KES 250-550) when there is tomato glut in the market. For tomatoes imported from some parts of Tanzania, the farm gate price can be as low as KES 200-250 per 40kg-wooden crate when there is tomato glut in the market and when such tomato varieties are perceived to be having a short shelf life.

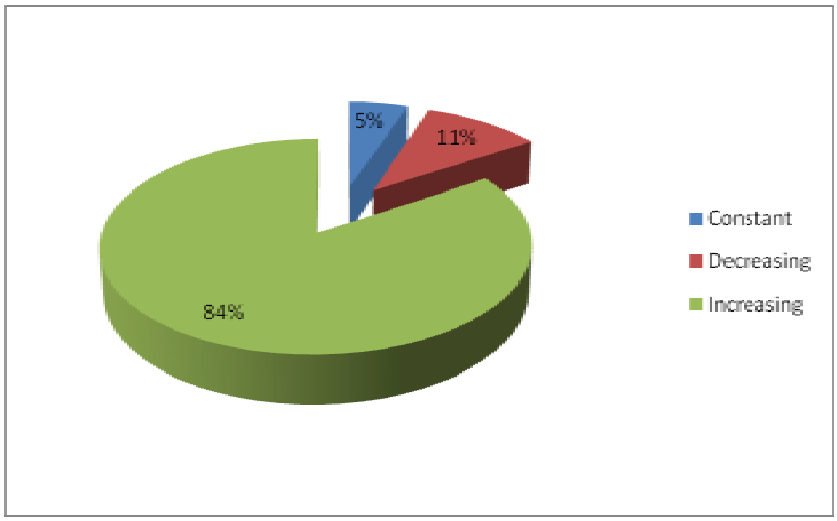
Table 4.4: Indications of tomato farm gate buying price (per 40kg-wooden box) as reported by some traders in Kongowea mass market

	Tomato source	Mean	N	Std. Deviation	Minimum	Maximum
Kenya	Kimana	991.67	6	269.103	550	1400
	Rombo	950.00	4	264.575	700	1300
	Njoro	1000.00	1	.	1000	1000
	Ndarajani	900.00	1	.	900	900
	Njukini	833.33	6	163.299	600	1000
	Taveta	1250.00	2	636.396	800	1700
	Karatina	1100.00	4	346.410	800	1600
	Challa	866.67	3	152.753	700	1000
	Loitoktok	1080.00	5	370.135	700	1600
	Nakuru	900.00	4	115.470	800	1000
	Total	**976.39**	**36**	**270.578**	**550**	**1700**
Tanzania	Ngabobo (Ngarenanyuki Ward, Arumeru District)	850.00	2	212.132	700	1000
	Moshi	875.00	4	50.000	800	900
	Iringa	716.67	3	407.226	250	1000
	Ngarenanyuki	800.00	1	.	800	800
	Total	**815.00**	**10**	**218.645**	**250**	**1000**

4.4 Expected Procurement Trends of Tomatoes

The wholesale traders were asked to estimate whether they expect their procurement trends to increase, decrease or remain constant in the near future. About 84% of the traders (n=20) were of the opinion that tomato procurement will increase in terms of volumes in the near future while 11% said that it was likely to decrease **(Figure 4.3)**. From these interviews, it is clear that tomato procurement volumes are likely to increase in the near future. This was further corroborated by discussions held with Municipal Council Market staff and tomato brokers.

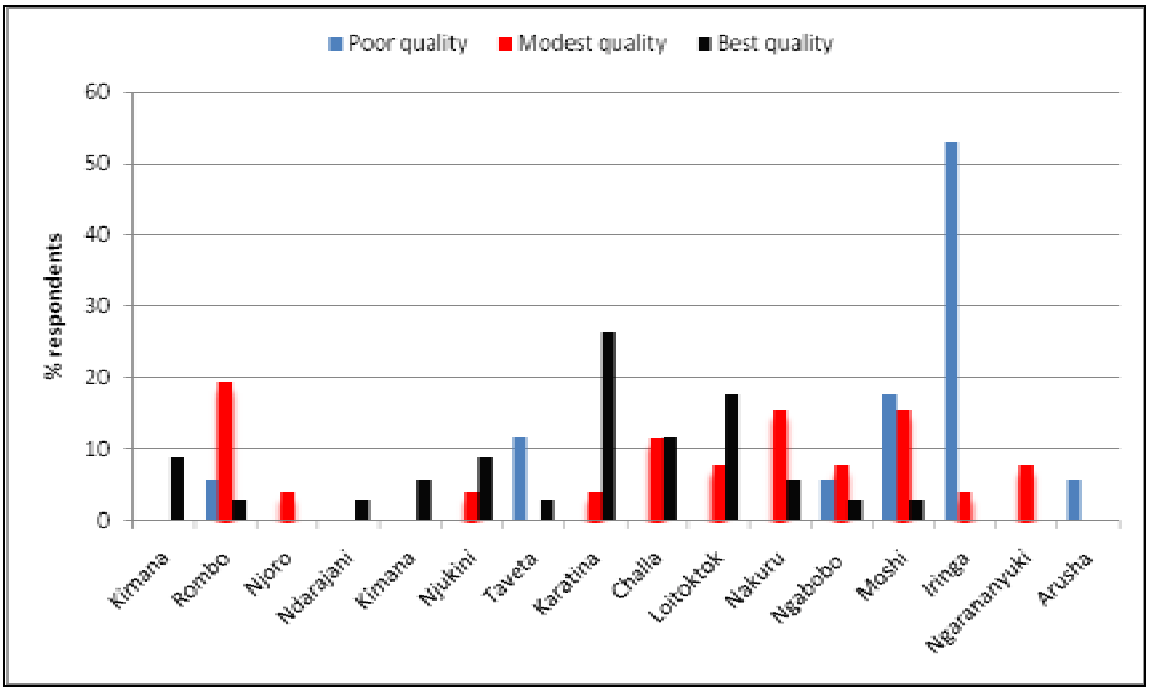
Figure 4.3: Expected procurement trends of tomatoes as reported by 20 wholesale traders in Kongowea market



4.5 Traders and Consumer Perception on Tomato Varieties and their Sources

About 20 respondents (wholesale traders in the market) were asked about their perception on tomato variety, quality and source of origin **(Figure 4.4 and Table 4.5)**. According to these traders, the best quality tomatoes and best liked varieties were obtained from Kenya and mainly from Karatina, Oloitoktok, Challa and Kimana/Njukini in that order. These areas are perceived to be growing tomatoes with long shelf life (e.g. Cal J and Onex varieties) that reach the market in good condition. Some traders in Kongowea market claims that tomatoes sourced from Karatina and Kajiado (Oloitoktok) can stay for 5-7 days without losing quality.

Figure 4.4: Percent distribution of respondents by their perception on tomato quality and source of origin



An interview with various retail traders and consumers further confirmed that tomatoes from Karatina (Nyeri District), Loitoktok (Kajiado District) and Kimana (Kajiado) are preferred. This is due to their high quality and long shelf life. Tomatoes from Tanzania were perceived to be having short shelf life and thus, in most cases attract low prices in the wholesale market.

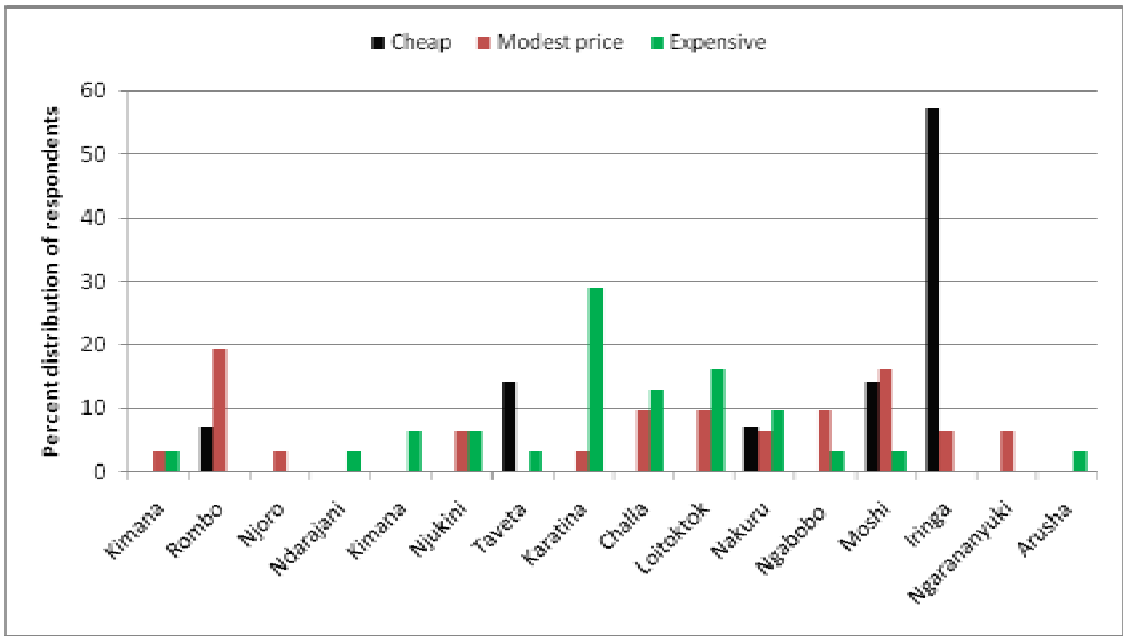
Although tomatoes from Karatina, Loitoktok and Kimana are preferred, they appear to be attracting high farm gate prices **(Figure 4.5)**. This seems to indicate that quality characteristics and long shelf life are some of the important aspects of tomatoes that traders and consumers look for besides the price.

Table 4.5: Percent distribution of respondents by their perception on tomato varieties and source of origin (n =20)

Country	Source	Poorly liked variety	Modest liked variety	Best liked variety	Total
Kenya	Kimana	0.0%	0.0%	10.0%	3.9%
	Rombo	7.1%	15.2%	3.3%	9.1%
	Njoro	0.0%	3.0%	0.0%	1.3%
	Ndarajani	0.0%	0.0%	3.3%	1.3%
	Kimana	0.0%	0.0%	6.7%	2.6%
	Njukini	0.0%	3.0%	10.0%	5.2%
	Taveta	14.3%	0.0%	3.3%	3.9%
	Karatina	0.0%	9.1%	23.3%	13.0%
	Challa	0.0%	6.1%	16.7%	9.1%
	Loitoktok	0.0%	9.1%	16.7%	10.4%
	Nakuru	0.0%	12.1%	6.7%	7.8%

Country	Source	Poorly liked variety	Modest liked variety	Best liked variety	Total
Tanzania	Ngabobo (Ngarenanyuki Ward)	0.0%	12.1%	0.0%	5.2%
	Moshi	14.3%	18.2%	0.0%	10.4%
	Iringa	64.3%	3.0%	0.0%	13.0%
	Ngarenanyuki	0.0%	6.1%	0.0%	2.6%
	Arusha	0.0%	3.0%	0.0%	1.3%
	Total	100.0%	100.0%	100.0%	100.0%

Figure 4.5: Perception on the cost of tomatoes per source



4.6 Tomato Quality, Packaging and Minimum Buying Criteria

An interview with consumers in the retail market and in the wholesale market (wholesale traders purchasing from Brokers) showed that consumers look for a number of quality characteristics including size of tomatoes, colour, shelf life and tomato varieties among others **(Box 4.1)**. Tomatoes that do not meet the desired quality standards are downgraded (low grade tomatoes) and attract low prices than high grade tomatoes.

Box 4.1: Desired quality characteristics consumers consider when buying tomatoes

1. Size of tomatoes (large size preferred)
2. Colour of tomatoes (should not be green)
3. Shelf life (long shelf life preferred)
4. Tomato variety (with regards to perceived shelf life)
5. Tomato appearance

When tomato wholesalers operating in the Kongowea market purchase tomatoes from brokers and or from "collecting wholesalers", they buy according to tomato grade. The tomato grade is a reflection of quality. Three tomato grades are recognised in the market (Grade 1, 2 and 3) and each grade has its own pricing. Grade one is highly priced followed by grade two and three in that order. At the time of the survey the following were the general wholesale prices (prices set by wholesale traders) per 40kg-wooden box of tomatoes:

- Grade one: KES 1300-2500
- Grade two: KES 900-1200
- Grade three: KES 800-1000

Grade one tomatoes represents the highest quality of tomatoes in the market in terms of characteristics presented in **Box 4.1** and **Box 4.2**. The prices of tomatoes are bargainable and are "set up by brokers" on a daily basis depending on the quantities of tomatoes received in the market. When wholesale tomatoes stay overnight without being sold, their prices reduce drastically on the next day of trading.

The quantity of tomatoes purchased by redistributing wholesalers from Brokers depends on the market demand. From the discussions with traders, it became apparent that they rarely consider pesticide residues on tomatoes as an important criterion when buying and selling tomatoes. Consumers, arguably, appears not bothered by pesticide residues as the tomatoes that reach the market are perceived to show no "visible signs" of pesticide residues.

Box 4.2: Minimum tomato buying criteria wholesale traders consider when buying tomatoes from brokers and collecting wholesalers

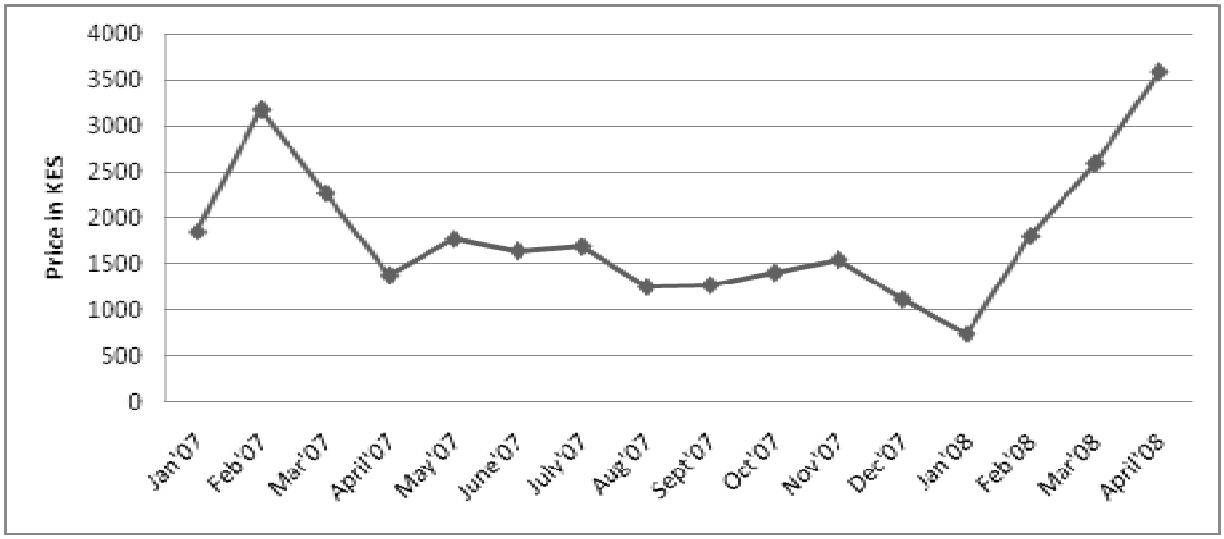
- Size of tomatoes (large size preferred); need to be uniform in the box
- One variety per box (not mixed varieties)
- Colour of tomatoes (not green)
- Not sprayed with ripener chemical
- Size of box (40kg-box and 64kg-box)
- Firmness of tomato (Hard skin)
- Package used (wooden box preferred)
- Price per box
- Market demand
- Source of tomatoes

The tomato packing materials being used in the wholesale market are wooden crates of two sizes: 40kg-wooden crate and 64kg-wooden crates. However, the small size 40kg-wooden crates are increasingly becoming popular with wholesale traders. Currently the wooden crates are purchased from banana wholesalers at a price of KES 80-100 per box.

4.7 Trends in the Development of Tomato Prices

Tomato price development for Kongowea market was studied using data obtained from Ministry of Agriculture, Mombasa District. The available data for 64kg-wooden crate of tomatoes, not disaggregated according to varieties, shows that the prices have been fluctuating from month to month. There has been a general decrease in prices from February 2007 to January 2008 **(Figure 4.6)**. The post January 2008 has seen prices rising again, probably due to short supply of tomatoes in the market following post election violence in Kenya.

Figure 4.6: Trends in tomato prices per 64-kg wooden box over 12 months period (January 2007-April 2008)



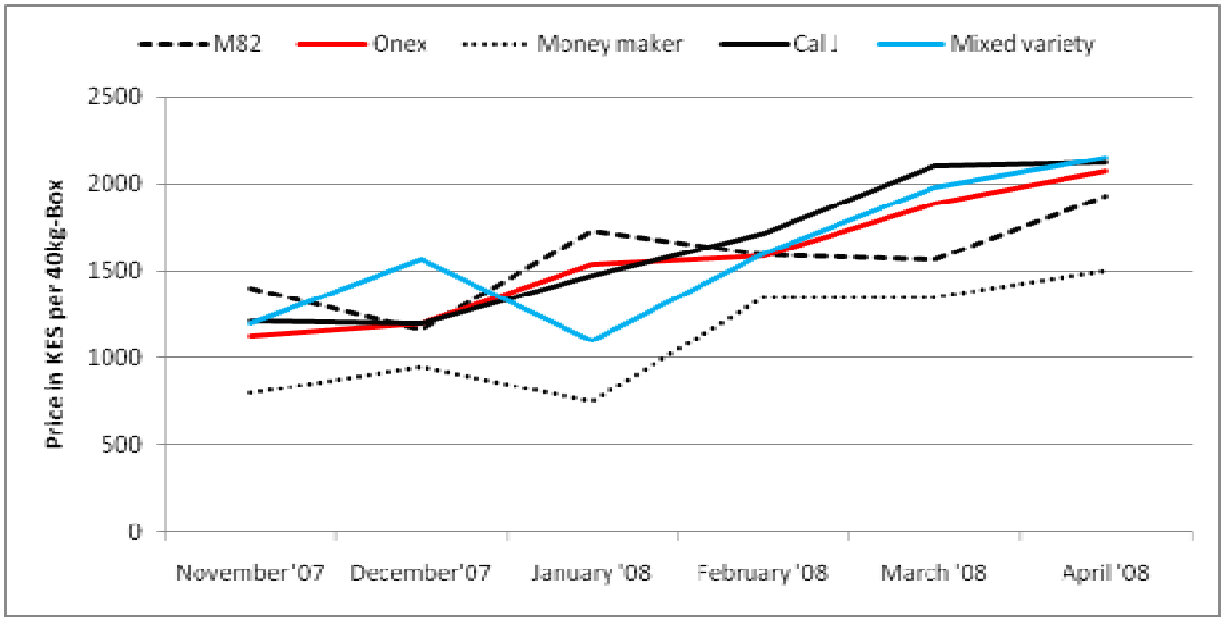
Source: Adapted from Ministry of Agriculture, Mombasa District (figures for Kongowea mass market)

Time series data for prices of different tomato varieties were not available at the time of the study. However, the study investigated trends in prices of some tomato varieties (40kg-wooden box of tomatoes) over a recall period of six months **(Table 4.6 and Figure 4.7)**. It is to be noted that Money Maker had the lowest prices in the period considered, a situation attributed to its low shelf life and low demand in the market.

Table 4.6: Average monthly prices for different tomato varieties as reported by traders in Kongowea market (Standard deviation in parenthesis)

Variety	November '07	December'07	January '08	February '08	March '08	April '08
M82	1400 (424)	1167 (416)	1733 (1102)	1600 (557)	1567 (513)	1933 (808)
Onex	1131 (390)	1200 (342)	1540 (591)	1588 (647)	1888 (770)	2075 (595)
Money maker	800 (0)	950 (71)	750 (71)	1350 (495)	1350 (919)	1500 (990)
Cal J	1217 (307)	1200 (283)	1471 (522)	1714 (437)	2100 (505)	2125 (586)
Mixed variety	1200 (0)	1567 (603)	1100 (283)	1600 (566)	1975 (608)	2150 (854)
Total	**1195 (354)**	**1218 (350)**	**1447 (604)**	**1634 (495)**	**1917 (623)**	**2052 (641)**

Figure 4.7: Trends in average monthly tomato prices per variety over a six month period



Trends in tomato prices for each variety closely resemble trends in the aggregate data (irrespective of variety) presented in **Figure 4.6**. There has been a general increase in prices of tomatoes beginning January 2008 for various varieties. In practice, tomato brokers and wholesalers in Kongowea market set tomato prices according to their Grade **(Box 4.1 and Box 4.2)**. Tomato varieties with perceived long shelf life are in high demand and Grade one of such tomatoes attract high prices and are easily sold in the market.

When asked about expected trends in price development for tomato varieties into the future, about 85% of wholesale traders interviewed (n=20) were optimistic that the prices will continue improving in the remaining parts of the year. This is especially so for Cal-J, Onex and M-82 tomato varieties.

4.8 Tomato Supply Chain Management and Market Margins

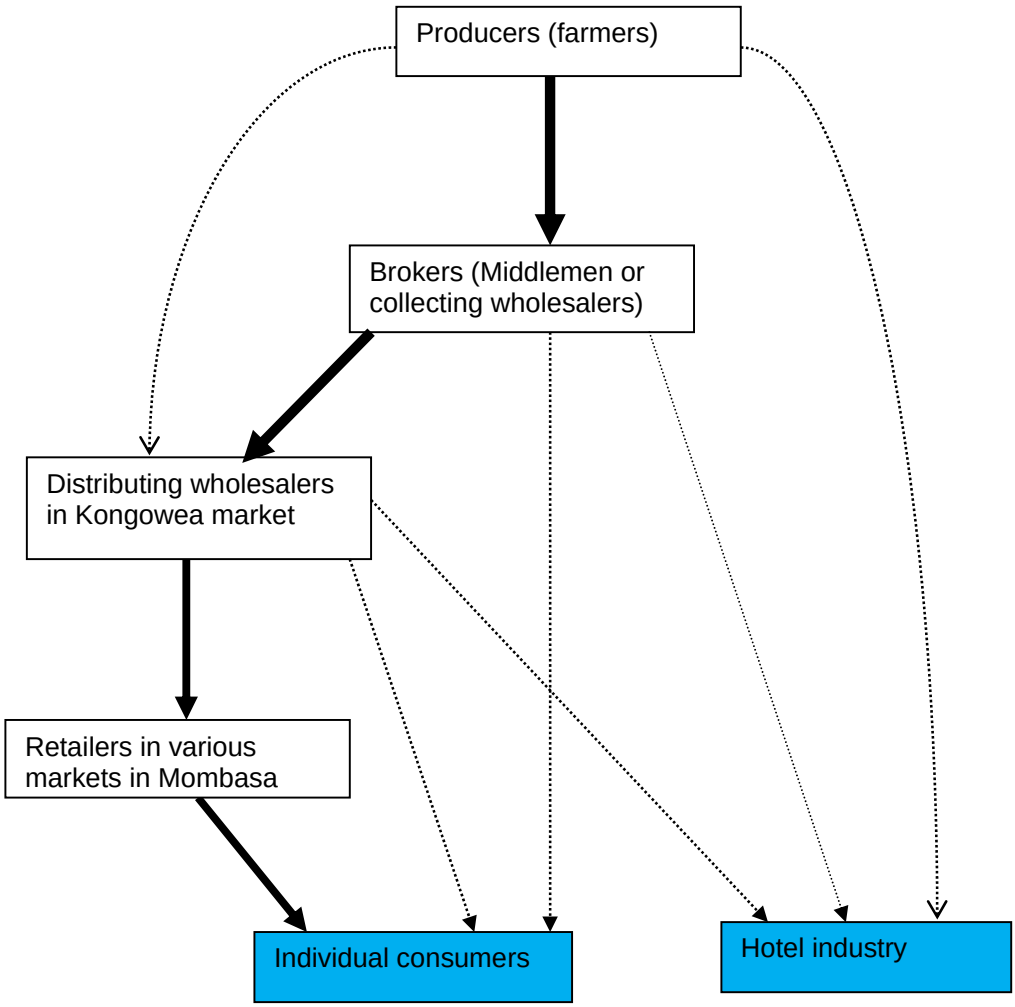
4.8.1 Tomato supply chain management

The main actors in the supply chain include farmers, brokers and collecting and distributing wholesalers **(Figure 4.8)**. In this chain, the farmers are the producers who sale to either brokers, other middlemen (collecting wholesalers) or transport the tomatoes to the market. The brokers are middlemen and their roles in the market are shown in **Box 4.3**. The "distributing wholesalers" are traders who purchase tomatoes in bulk from brokers, farmers or collecting wholesalers once the produce has reached the Kongowea market.

The existing supply chain involves groups of farmers either hiring a truck to transport their tomatoes to Kongowea market on their own, collecting wholesalers purchasing tomatoes at farm level and transporting the same to the market and or the produce is collected by agents of brokers who then transport the same to the market. Collecting wholesalers and brokers

may employ purchasing agents who work in the production areas on their behalf. The purchasing agents reduce costs by identifying produce for sale, carrying out the negotiations, accumulating, assembling and carrying out the produce to a nearby earth road for ease of collection. Once enough produce is maintained, collecting wholesalers transport the produce to the market.

Figure 4.8: Tomato supply chain in Mombasa



N/B: The size of the arrow shows the strength of the linkages

Box 4.3: Activities of Brokers in Kongowea Market

- Receive produce from either transporters (collecting wholesalers) or farmers for sale in the market
- Provide credit to some farmers depending on nature of agreements with the farmers (seeds, fertilisers, pesticides, fungicides and cash for labour inputs)
- Sometimes buys tomatoes directly from farmers
- Communicate with farmers/producers on a daily basis regarding prices in Kongowea market
- Collects produce at farm level in some cases
- Sale tomatoes on commission (KES 40-50 per crate)
- May pay market gate charges on behalf of truck transporters. The cost is later deducted from sale of produce.
- Sales to wholesalers (distributing wholesalers) in the market
- Sets prices of tomatoes on a daily basis depending on the number of trucks of tomatoes received in the market (dictates prices due to prevailing market curtail).

On reaching the market, the brokers sale the tomatoes on behalf of farmers on commission. The tomatoes are sold to "distributing wholesalers" in the market, who in turn sell to retailers or consumers. Transactions between brokers and distributing wholesalers operating in the market are cash-based. In some instances, the brokers may sale tomatoes to "redistributing wholesalers" on short term credit, but the cash is payable at the end of the trading day.

In principle anyone is free to transport tomatoes to Kongowea market and sale the same. However, in practice, there is a market curtail and collusion between brokers that hinders free trade. The survey found out that it is possible to minimise the impacts of brokerage activities (or by-pass the brokers) in the market when farmers have direct contact with some of the "distributing wholesalers" operating in Kongowea mass market.

In some parts of tomato growing areas of Kenya, the farmers have contractual agreements with brokers who sale tomatoes on their behalf. This contractual agreement includes supply of inputs for growing tomatoes, which are later deducted when tomatoes are sold in the market **(Box 4.3)**. In this case, the brokers employ their own agents who collect produce from the farmers and transport the same to Kongowea market. The names of farmers are recorded down as well as the number of crates of tomatoes produced by each farmer. After sales in the market, the farmers are paid their money minus marketing costs (transport, brokerage costs, cess charges etc). In some other instances the brokers do not have a contractual agreement with farmers, but wait for other middlemen (collecting wholesalers) or farmers to transport the produce to Kongowea market and then enter into agreement with transporters or farmers to sale produce, on commission, on their behalf. However, whether the produce is collected at farm level by agents of brokers, other middlemen (collecting wholesalers) or farmers themselves (hiring a truck), the produce collected at farm level is usually a pool from different farmers. Discussions with brokers and wholesalers in the market revealed that no single farmer has been able to provide 200-220 crates of tomatoes needed to fill one truck or one "Canter" truck (120-150 crates). On most of Kenya's tomato growing areas, a truck is filled with tomatoes from 5-10 farms.

Although the brokers are active in the supply chain, their activities in the market has neither legal backing nor approval by the Municipal Council of Mombasa within whose jurisdiction, the Kongowea market falls. One tomato seller interviewed during this period claimed that there are more brokers in the market than wholesale traders, a fact which could not be independently confirmed since brokers are not a registered entity. However, a discussion

with a group of brokers indicated that they consider themselves to be agents of farmers who cannot travel every morning to the market and therefore sale produce on behalf of farmers. In the past there has been tension about tomato "brokerage" activities in the market **(Box 4.4)**. Although the situation is improving some tension was still evident at the time of this study especially between Tomato Brokers and wholesalers (represented by Kongowea Tomato Wholesalers Association). This is because the curtail created by brokers determines the daily market prices and sometimes artificial price fluctuations.

4.8.2 Tomato marketing costs and margins

This section analyses marketing costs and margins as a measure of performance and efficiency in the production and marketing of tomatoes. The computations are based on a create (40kg) of tomatoes and discussions held with various wholesale traders and brokers in the market. Using an example from Kenya, Loitoktok, and transport accounted for the highest percentage (about 46%) of the total marketing costs **(Table 4.7)**. This had been earlier corroborated by studies carried out by **Tschirley *et al* (2004)** which indicated that transport cost account for the highest marketing cost in Kongowea market for both produce from Kenya and Tanzania. Other marketing costs include handling costs at farm level, payment of cess levies, market gate fees payments and tomato handling costs.

Box 4.4: Activities of Brokers in Kongowea Market

Tomato brokers differ at market

….Welcome to the world of market brokers who are neither farmers nor retailers but control the activities at Kongowea market and determine the prices of all farm produce.

They display a rare degree of sophistication on one hand and a tinge of thuggery on the other.

The activities of the wheeler-dealers who apply a combination of intimidation, harassment and threats, last week led to a two-day boycott of tomatoes at the market where a consignment worth more than Sh5 million went to waste.

The boycott, organised by the tomato wholesale dealers, brought to light how the lives of Coast residents are determined by the whims of a few individuals whose interest is to make huge profits regardless of whether their activities hurt the consumers or not.

Worse still, their ability to create artificial shortages to meet their objectives borders on absurdity. With mobile telephone calls, they motion their men stationed along the Mombasa-Nairobi highway to stop lorries carrying tomatoes to Mombasa in order to create an artificial shortage at the market.

The brokers who purport to represent farmers at the market usually buy off virtually all the farm produce that arrives from up-country and later sell the same to the highest bidder… Also the price of a crate of tomatoes fluctuates at the whim of the brokers...

Extract: The Nation's Coast, Wednesday, May 12, 1999

Table 4.7: Distribution of wholesale marketing costs (KES) of a crate (40kg) of tomatoes from Loitoktok (Kajiado District), Kenya

Cost items	Description	Marketing costs (KES/crate)	Share of total costs%
Empty Crate*	Crate purchased from banana sellers from Tanzania	80	18.4
Handling cost at source	Assembly and payment of agents employed by Brokers	35	8.0
	Loading	30	6.9
Transport	Transport to Kongowea mass market	200	46.0
Road Cess	Levy by Municipal Council	15	3.4
Cess fees	Kongowea market fees	20	4.6
Handling costs at market	Off-loading	15	3.4
	Brokerage commission**	40	9.2
Total marketing costs		**435**	**100.0**

*Gate fees for large tomato box (64kg) is KES 35 per box; ** Brokerage commission ranges between KES 40-50 per crate of tomato sold to wholesalers in the market.

An estimated distribution of marketing margins and trader profit for a crate (40kg) of tomatoes sourced from Loitoktok (Kenya) and sold in Kongowea market is shown in Table 4.8. The share of marketing costs in the selling price is estimated at 23% while the share of selling price accruing to producers is estimated at 52%. These figures could be variable depending on transport costs (and other costs incurred in the marketing chain) and the selling price of tomato grade in the market.

Table 4.8: Distribution of marketing margins and trader profit for a crate (40kg) of tomatoes from Loitoktok sold at Kongowea mass Market, Mombasa

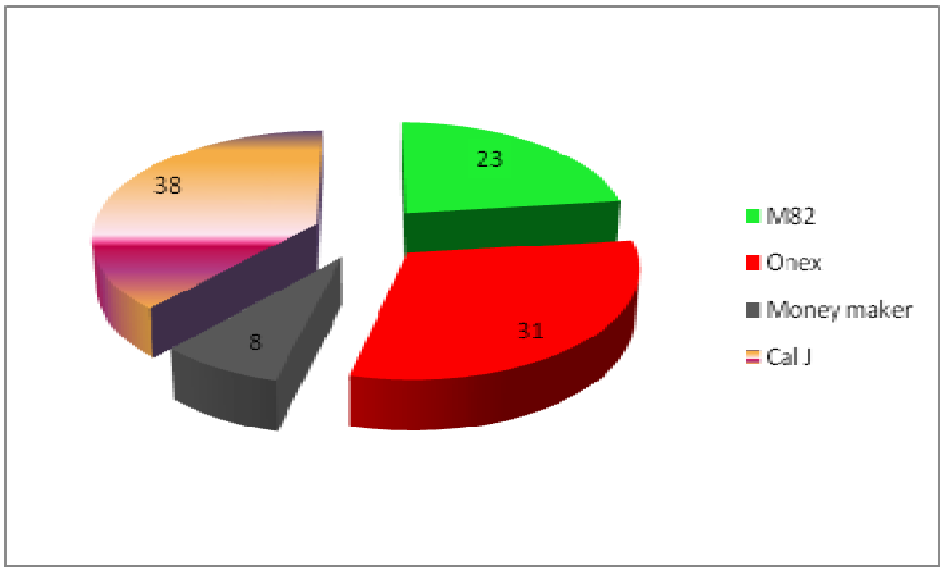
Category of values	Calculations (Kenya-Loitoktok)
Mean purchase price	980
Mean selling price	1900
Marketing margin	920
Marketing costs	435
Estimated wholesale profit	485
Share of selling price accruing to producers (%)	52
Share of marketing costs (%)	23
Share of selling price accruing to wholesalers (%)	26

Source: This study

4.9 Consumer Trends and Tomato Demand

Asked about what consumers are looking for, the tomato traders (about 95% of respondents; n= 20) replied that most consumers are interested in a particular tomato variety. These tomato varieties include Cal-J, Onex and M-82 **(Figure 4.9)**. Money maker variety is increasingly being disliked due to its low shelf life. These responses were corroborated by those of brokers and Municipal Council Staff (market staff).

Figure 4.9: Percent distribution of traders by their perception on tomato varieties that attract consumers the most



Consumers are also keen on tomato prices as reported by 90% of the traders interviewed and corroborated by discussions held with consumers. Prices influence the quantities of tomatoes sold to redistribution wholesalers, retailers and consumers. Tomatoes in Tanzania are perceived to be cheap, but of short shelf life. At the time of the survey, most of the traders and consumers interviewed preferred a level of pricing of tomatoes lower than KES 2000 per Box for Grade one tomatoes (Cal J, Onex and M-82).

Further discussions held with traders and consumers, indicated that consumers prefer tomato varieties with long shelf life irrespective of the growing area. However, in Kenya, growing areas such as Karatina, Loitoktok (Kajiado District), Kimana, Challa, Taveta, Rombo and Njukini were frequently mentioned as being associated with good quality tomatoes (long shelf life). Tomatoes from many parts of Tanzania were perceived to be having short shelf life **(see Section 4.3 and 4.5)**.

Asked about their liking for tomato packaging material, the redistribution wholesalers (those buying from Brokers) preferred the 40 kg-wooden box. Most of them noted that the smaller 40kg-wooden box of tomatoes is cheaper and sales faster than tomatoes packaged in the larger 64 kg-wooden box. Although not in the wholesale market, consumers of tomatoes from the retail markets, usually purchase tomatoes in smaller quantities packaged in polythene bags.

The question of whether consumers are interested in pesticide residues on tomatoes draw mixed responses with majority (68%) of traders interviewed expressing the fact that they had not given it a thought before. However, most of them indicated that they are interested in purchasing tomatoes that have been prepared well for the market (tomatoes already washed or kept clean).

4.10 Communication System Between Traders and Suppliers

The lack of market information represents a significant impediment to market access especially for smallholder poor farmers: it substantially increases transaction costs and reduces market efficiency. For tomato crop, the marketing chain consists of multiple middlemen, each taking a margin at every stage of the chain, and price variations in space and time are often large and erratic. To determine the prominent means of communication between traders and their suppliers, discussions were held with a group of brokers and a semi-structured interview carried out with 20 randomly selected redistribution wholesalers in Kongowea market. The predominant means of communication between traders (retailers and wholesalers) and their suppliers whether in Kenya or in Tanzania is through mobile phones. The discussions held with brokers and wholesalers further indicated that that they (redistribution wholesalers and Brokers) heavily rely on mobile phones. However, retail traders (mainly in the retail municipal markets of Mombasa) who purchase produce from Kongowea market use a mix of mobile phones and actual visit to the market since they are in close proximity to the market.

The predominant use of mobile phones as a means of getting market information is not surprising as mobile telephony is fast becoming the common means of communication in Kenya. The use of mobile telephony for providing marketing, finance and information is increasingly being piloted by various organizations. For example, Kenya Agricultural Commodity Exchange (KACE) has developed an SMS market information service branded *SMS Sokoni* in partnership with Safaricom mobile phone to enable farmers and traders access market information like commodity prices in different markets, who is buying or selling what commodity, at what prices, where and when, as well as access extension messages **(Mukhebi, 2004)**. DrumNet is piloting the provision of marketing, financial services and information using mobile phones in some parts of Kenya (http://whiteafrican.com/?p=414). Similarly Safaricom, a mobile service provider, has piloted *M-Pesa* service, which traders have been using to send and receive money on their mobile phones.

4.11 Constraints Perceived by Traders and Consumers

4.11.1 Constraints faced by traders and possibilities for addressing them

Constraints faced by traders are diverse. Discussions with wholesale traders and collecting wholesalers (traders transporting produce) in Kongowea mass market revealed that they face the following constraints:

- **Levies charged on produce**. In the past traders transporting their commodities have been required to pay many duties “on the road” during transportation. For example official cess duties to the Municipal Council and custom duties as well as non-official duties demanded by the police during road transportation. The non-official duties are increasingly dwindling, but are still a pain in the neck of many traders. Some of the traders also said that “taxation rates” at the border point (Kenya-Tanzania) are high. While taxation issues at border points are being addressed through the harmonisation of custom tariffs within the East African Community Customs Union, eliminating “unofficial taxation” on the road through corrupt Police Officers still remains a challenge.
- **Glut in tomatoes:** Sometimes Kongowea market receives a glut of tomatoes causing a reduction in prices and profit margins for the many traders that operate in the market. The glut sometimes occurs in the second half of the year, June-July-November and

sometimes in March and April. The problem of glut and depressed tomato prices can be addressed through setting up an agro-processing industry in Mombasa, which can process tomatoes during periods of oversupply. Similarly, setting up cooling facilities in Kongowea market can help reduce tomato losses. Currently there are no cooling facilities in the market.

- **Garbage removal:** Removal of garbage by Municipal Council staff remains a challenge. Within any "trading" day, a lot of garbage is generated, which needs to be removed.
- **Poor road infrastructure:** There is poor road infrastructure in the rural areas of Kenya where tomatoes are being grown. Poor roads limit mobility of farmer's products and people. It increases production cost and transportation costs which ultimately lead to high agricultural input prices and low product prices, which in turn hit the poor farmers hardest. Transport is cheaper on tarmac roads than on earth roads. Discussions with traders revealed that transport is perceived to be one of the highest marketing costs that reduce profitability of tomatoes in the Kongowea market. Due to poor roads in the tomato growing areas, trucks take many hours to reach the market. Also tomatoes get damaged during transportation. However, road construction and maintenance are in the domain of the Government ministry and may not easily be resolved at "trader level". To some extent, however, farmers and traders can also lobby for Government action and Municipal Council Intervention for road repairs and maintenance.
- **Unscrupulous farmers and brokers:** Some of the farmers, brokers and or agents of brokers are not ethical in terms of the way they pack tomatoes in the wooden box before they are transported to the market. Good looking tomatoes may be heaped at the top of the box while the inside of the box may be having low quality tomatoes. This can be addressed when wholesale traders operating in the Kongowea market inspect the wooden box of tomatoes before buying them and or by educating farmers on the need for uniform quality of tomatoes.
- **Fluctuating tomato prices and market curtail:** The prices of tomatoes in Kongowea market are set on a daily basis by a curtail of brokers operating in the market. The prices are also partly influenced by marketing forces such as the quantities of tomatoes delivered to the market on a daily basis. The fluctuating market prices imply that farmers are not able to plan well without adequate market information. Similarly, traders operating in the market easily lose out on profits suppose there is a reduction in tomato prices "within a short period of time". During this study, it was observed that prices of Grade II tomatoes can reduce from KES 1200 to KES 800 the next day when such tomatoes stay overnight. While market prices for tomatoes cannot be fixed in a liberised market environment, possibilities exist, through the Municipal Council of Mombasa, to regulate the activities of brokers and to eliminate the market curtail.
- **Unwelcome activities of brokers:** Activities of brokers in the market are perceived to be detrimental to the "free trade" operations of the market. Most of the traders in the market indicated that brokers are responsible for high tomato prices in the market, set prices at will and exploit farmers. Traders in Kongowea market suggested the following solutions, some of them wild, on how to address the problem of brokers:

    - Eliminate them from the market through legislation or impressing upon the Municipal Council of Mombasa to enact regulatory by-laws;
    - Wholesale traders to work together to minimise the activities of brokers;
    - Register brokers so that they can conduct "open and transparent business" to eliminate collusion and curtail in setting up prices; and
    - Create by-laws that prevent brokers from going to collect produce from farmers, buying produce directly from farmers and or contracting farmers.

- **Cross border trade and tomato supplies:** Some of the traders in Kongowea market perceive produce from Tanzania as contributing to oversupply of tomatoes during certain periods of the year. However, this perception could not be independently confirmed as most tomatoes from Tanzania reach Kongowea market when supply from Kenyan side is low (complimentary).
- **Retail traders' encroachment:** Tomato retailers have begun to do their business within the premises of the mass market. Policies on the mass market may need to be effected so that the market can operate as originally designated, a mass market and not partially a retail market.
- **Poor quality tomatoes:** Some of the tomatoes that reach the mass market are poor in quality (small size, short shelf life, pest infestation). The poor quality tomatoes fetch low prices. There is need to create awareness to farmers on the importance of tomato quality and the relationship between market quality and prices. At the moment the problem of low quality tomatoes is addressed by selling them as fast as possible at low or reduced prices.
- **Wooden crates:** Currently, there are no specific tomato wooden crates. The wooden crates are purchased from Banana sellers, mostly from Tanzania. Possibilities exist to make wooden crates locally with the help of local carpenters or artisans.

4.11.2 Constraints faced by consumers and possibilities for addressing them

- **Poor quality tomatoes:** Sometimes, tomatoes are mixed up in the wooden box due to unscrupulous traders and farmers who do not adhere to "good practices" of packaging. Some tomato wooden boxes have small sized tomatoes as well as large ones and are not of uniform grade or variety. There is need to set quality standards for each grade of tomatoes and to enforce the same in the market. There are attempts by the Ministry of agriculture to work out quality and packaging standards, but such standards have neither been widely adopted nor enforced.
- **Fluctuating tomato prices:** The prices of tomatoes at the Kongowea market are set daily and fluctuate from time to time. Some of the consumers interviewed during this study felt that tomato prices in the market are high. The elimination of the market curtail set up by the brokers can help re-structure tomato prices in the market.
- **Low shelf life of tomato varieties:** Some of the consumers interviewed during this study felt that some of the tomato varieties sold in the market have short shelf life while they prefer tomatoes that can stay fresh for long periods. In particular, the Hotel industry was perceived to like high quality tomatoes with long shelf life.

5 CONCLUSION

5.1. Existing Supply Chains

The study has shown that the main tomato supply chain actors in Kongowea mass market comprise the following: farmers, brokers and collecting and distributing wholesalers and consumers. Farmers who are the producers in the chain and who supply the Kongowea mass market cultivate small-holdings, are unorganized, isolated, and do not have sufficient information on market prices and commercial market opportunities. They understood the benefits of collective organization, but they lack the initiative to form producer groups. Such groups are needed to improve the producers' market position in terms of quality and quantity, as well as increase their bargaining power and leverage over traders/buyers. The farmers who supply Kongowea market are drawn from various parts of Kenya as well as from Tanzania.

In the supply chain are the traders who purchase tomatoes from farmers. The following categories of traders were identified: collecting wholesalers, brokers, distributing "wholesalers" and retail traders. The collecting wholesalers purchase produce from farmers and transport them to the market. Brokers in Kongowea market receive tomatoes from the collecting wholesalers (transporters) and sell the same (on behalf of producers and transporters) to "distributing wholesalers" who in turn sell to retail traders. The brokers sale tomatoes on commission and dictate market prices through "a broker curtail". In the chain, farmers or groups of farmers can also directly transport their produce to the market. The study found a thin line between collecting wholesalers and brokers on the Kenyan side of the supply chain as both act as "middlemen" in the chain. In some parts of tomato growing areas of Kenya, the farmers have contractual agreements with brokers who provide them with inputs, collect and transport produce to the market through agents and sale tomatoes on their behalf (farmers) for a commission. Similarly, some of the designated "distributing wholesalers" in this study have linkages (although weak) with some farmers who supply them with tomatoes for sale. Once the tomatoes have been purchased in bulk by "distributing wholesalers" they sell the same to retail traders who in turn sell the same to consumers in various retail markets. Big consumers like the hotel industry purchase their tomatoes directly from distributing wholesalers or have contractual arrangements with suppliers. At the same time, there are consumers who purchase their produce directly from the mass market rather than from the retail markets.

5.2. Major Bottlenecks in the Tomato Business at Mombasa Mass Market and Possibilities for Addressing them

Wholesale market such as Kongowea play key role in public balancing of supply and demand of tomatoes by concentrating large quantities of tomatoes (from many sellers) and distributing the same to many buyers. However, the study has shown that Kongowea mass market is not a "perfect market". The prices of tomatoes in Kongowea market are set on a daily basis by a curtail of brokers and therefore prices fluctuates from day to day. Integration of processes and activities in the supply chain to share valuable information, including market prices, demand signals, forecasts, inventory, transportation, and potential collaboration in the supply chain would contribute to farmers profitability margins as tomato trade would be based on informed choices by farmers and chain actors. Various proposals exist on how to minimise the activities of brokers in the chain, some of them radical in nature. They include minimising their activities in the market through legislation or impressing upon the Mombasa Municipal Council to enact facilitating by-laws, strengthening Kongowea

Tomato Wholesalers Association to play an active role in marketing and initiating and strengthening producer associations to counteract the activities of brokers in the production-marketing chain.

Another bottleneck in the tomato business is the tomato quality and packaging. Good looking tomatoes may be heaped at the top of the box while the inside of the box may be having poor quality tomatoes (small size, short shelf life, pest infested). The poor quality tomatoes fetch low prices. There is need to create awareness to farmers on the importance of tomato quality and the relationship between market quality and prices.

Sometimes Kongowea market receives a glut of tomatoes causing a reduction in prices and profit margins. The problem of glut and depressed tomato prices can be addressed through setting up an agro-processing industry in Mombasa, which can process tomatoes. Similarly, setting up cooling facilities in Kongowea market can help reduce tomato losses.

The poor road infrastructure in the rural areas where tomatoes are grown limit mobility of produce and people, increases transport costs and damages tomatoes during transportation. Road construction and maintenance are in the domain of the Government ministry. However, when Producer Associations are initiated and strengthened, then they can lobby and advocate for road maintenance in the rural areas.

5.3. Limitations of the Study

The study collected some useful information on the operations of both retail and the Kongowea mass market in Mombasa that can contribute to the decision making process of improving the Tanzania-Mombasa cross-border tomato product chains and linking Ngarenanyuki farmers to the Mombasa mass market . However, the study was faced with some limitations, one being the timing of the study. During the study, it appears that there were some tensions and misunderstandings between tomato brokers and tomato wholesalers in the market and although the study strived to independently interview both categories of the market actors to get a balanced picture of the market operations, it is possible that some of the views given by either of the actors, especially on farm gate prices and profit margins, could have been either an underestimate or an over-estimate. An independent study that corroborates farm gate prices and information on market linkages could help shed some more light and improve knowledge on how the tomato supply chain works.

The study was further limited in capturing time series data on tomato volumes sold in units of 40kg-wooden boxes in Kongowea market and the revenue generated. This was because records of such transactions were not accessible from the Municipal Council of Mombasa at the time of the study. However, some information on tomato volumes sold in units of 64kg-wooden box were obtained from the Ministry of Agriculture, Mombasa.

The study attempted to collect data using semi-structured questionnaires to complement the various discussions and interviews held with various tomato chain actors using a checklist. Although the semi-structured questionnaire proved useful in collecting quantitative and semi-quantitative information in a structured way, in generating interesting results and in complementing discussions held using a checklist, the random sample of 20 traders interviewed using the semi-structured questionnaire was small. Future studies are needed that involve large sample of traders.

APPENDICES

Appendix 1: Terms of Reference

Perform the Mombasa market study by literature research and visiting the markets in Mombasa to draft a report with the following general outline:

A. General market description
    a. Which fruit and vegetable markets exist in Mombasa
    b. Description of the different markets
    c. Importance of tomato at each market
    d. Major source of tomato at each market
    e. Type of consumers
    f. Trends in market development
    g. Trends in supply chain management
B. Mass market
    a. Market size
    b. Rough estimation of number of traders and type of traders
    c. Type of products sold
    d. Opening times, busy days, busy hours
    e. Administration requirements
    f. Market regulations
    g. Consumers perception of the market (what type/standard of market)
C. Tomatoes at the market
    a. How much tomatoes are sold (per day or week) in which months?
    b. Trends in tomato volumes (within and over the years)
    c. Where are tomatoes sourced from and how much per source?
        i. In Kenya
        ii. In Tanzania
    d. Expected procurement trends in the near future
    e. Traders and consumers perception of tomato per source?
    f. Type of quality, packaging, variety – related to sources, traders?
    g. Minimum and other tomato buying criteria
    h. Prices per month and tomato type
    i. Price development trend
    j. Consumer trends with respect to tomato demand
    k. Type of traders and their communication system with their suppliers
    l. Perceived problems by traders and consumers
D. Conclusions
    a. Draft existing supply chains (consumer-trader-producer)
    b. Major bottlenecks in the tomato business at Mombasa mass market
    c. Possibilities to address identified bottlenecks.
    d. SWOT analysis for Ngarenanyuki tomato farmers

Appendix 2: Itinerary

Day	Date	Activity/Organisation	Where
Monday-Tuesday	19th-20th May 2008	• Survey tool preparation; • Logistics arrangements • Literature review on Mombasa markets, Communication with project team	Nairobi
Tuesday	20th May 2008 (Evening)	• Travel Nairobi- Mombasa	Nairobi/Mombasa
Wednesday	21st May 2008	• Discussions with District Agricultural Officer and District Agricultural Business Development Officer, Mombasa • Visit to Mackinnon Municipal Council market (Retail market) • Visit to Retail markets in various Mombasa Residential Estates	Mombasa
Thursday	22nd May 2008	• Holding interviews with Kisauni Division Agricultural Office and Officer in Charge of collecting wholesale market prices for agricultural commodities • Discussions with Kongowea Municipal Market Staff • Interview wholesale traders in Kongowea Wholesale market • Visit to Retail markets in various Mombasa Residential Estates	Mombasa
Friday	22nd May 2008	• Interview wholesale traders in Kongowea Wholesale market • Interview Brokers operating in Kongowea market • Interview Kongowea Tomato Wholesalers Association Chairman • Visit to Retail markets in various Mombasa Residential Estates	Mombasa
Saturday	23rd May 2008	• Visit to Kilifi Retail market • Visit to Retail markets in various Mombasa Residential Estates	Mombasa
Saturday	23rd May 2008 (evening)	• Travel Mombasa-Nairobi	
	2nd -6th June	Data analysis and Report writing	Nairobi

Appendix 3: Persons Met

Name	Organisation	Contact
Jacinta	Mombasa District Agricultural Officer	Mombasa District Agricultural Office
Abdi Noor	Mombasa District Agribusiness Development Officer	Mombasa District Agricultural Office
Martha Wachira	Kisauni Division Agricultural Office, in charge of collecting prices in Kongowea wholesale markets	Kisauni Division Agricultural Office
Mr. Piko	Kisauni Division Agricultural Extension Officer	Kisauni Division Agricultural Office
Lucy Ndirangu	Mombasa District Agricultural Office, in charge of collecting prices in retail markets	Mombasa District Agricultural Office
	Market Master/superintendents of retail Municipal retail markets in Mombasa and Kilifi	Municipal Market Offices
	Retail traders in Mackinnon, Majengo, Sega and Mwembe Tayari Municipal markets	
	Omar Hassan (Gate Collection Fees) at Kongowea wholesale market	
	Wholesale traders and Brokers in Kongowea wholesale market	
	Retail traders in various estates in Kisauni, Likoni, Changamwe and Island Division	
Peter K. Nyaga (Chairman)	Kongowea Tomato Wholesalers Association	

Appendix 4: Literature Reviewed/Consulted

PPO Afriveg Report, 2007. Pilot to improve the Tanzania-Mombasa cross-border tomato product chains.

KNBS, 2007. Statistical Abstract. Republic of Kenya, Kenya National Bureau of Statistics.

Mukhebi, A., 2004. Reaching the poor in Rural Kenya with market information: A case study of market information system. A paper presented at the CTA Seminar 2004 on the role of information tools in food security, Maputo, Mozambique, November 8-12, 2004. Kenya Agricultural Commodity Exchange (KACE).

Kuleiye, J.S., 2008. Experience of EAC on intra trade. East African Community Secretariat, Arusha, Tanzania.

COLEAP, 2006. PIP and the Tanzanian fruit and vegetable sector (www.cleap.org/pip)

Coast Express Newspaper, Why Kongowea market is crying out for attention, Friday, April 8, 2005.

Munga,D., Kitheka, J.U., Mwaguni, S.M., Barongo, J., Massa, H.S., Mwangi, S., Ong'anda, H., Mdoe, F. and Opello, G., 2005. Vulnerability and Pollution of Groundwater in the Kisauni Area, Mombasa, Kenya. Project on Assessment of Pollution Status and Vulnerability of Water Supply Aquifers in African Cities, Mombasa, Kenya, Final Report. UNEP/UNESCO/UN-HABITAT/ECA.

Mombasa District Agricultural Office, monthly agricultural commodity price reports

Jaffee, S., 1994. Contract farming in the shadow of competitive markets: The experience of Kenyan horticulture. In: Little, P. and Watts, M. (Eds.) Living under contract: Contract farming and agrarian transformation in sub-Saharan Africa. University of Wisconsin Press, Madison, Wisconsin.

Minot, N. and Ngingi, M., 2002. Horticulture development and in Kenya and Ivory Coast, a paper prepared for the IFRI Workshop on Success in African Agriculture, 10th-12th June 2002 Lusaka, Zambia.

Tschirley, D., Muendo, M.K. and Weber, T.M., 2004. Improving Kenya's domestic horticultural production and marketing system: current competitiveness, forces of change and challenges for the future. Volume II. Horticultural Marketing. Working paper No 08B/2004. Tegemeo Institute of Agricultural Policy and Development, Egerton University, Nairobi.

Appendix 5: Checklist for Mombasa Market Study

1. General market description

1.1. Which fruit markets exist in Mombasa? (List of markets)

1.2. Which vegetable markets exist in Mombasa? (List of markets)

1.3. Description of the different markets

- Physical location and market structures
- Storage facilities
- Approximate number of traders
- Types of fresh produce sold in the market (vegetables and fruits)

1.4. Importance of tomato in each market

- Estimated shelf (space) volume occupied by tomato in the market compared with other fresh produce in the same market
- Approximate number of traders (average figures) on tomatoes on a weekly basis/market days

1.5. Major sources of tomato at each market

- Where do traders in each market source their tomatoes from?
    - Which markets, growing areas etc

1.6. Types of consumers

- Who buys the tomatoes in each market? [Local traders i.e. within Mombasa itself; traders from other markets; exporters etc?]
- Is the consumer price *focused* or *quality focused*?

1.7. Trends in market development

Trends in tomato market development in the last three years

- Shelf volume/space developments in the market
- Consumer quality demands
- Price changes/fluctuations

1.8. Trends in supply chain management in the last three years

- Suppliers of tomatoes to the martket
- Means of transportation (by suppliers) of tomatoes to the market
- Sources of information for tomatoes sold in the market
- Means of communication between tomato suppliers and sellers in the market
- Payment terms and methodologies for arranging payments between suppliers and sellers of tomatoes in the market

2. Mass market

2.1. Market size

- Estimated shelf (space) volume occupied by tomato in the market compared with other fresh produce in the same market
- Relative makert size compared to other markets in Mombasa (ranking)

2.2. Number of traders and type of traders

- Rough estimate of number of traders
- Types of traders (whole sellers, retailers, local traders within the country, traders from outside the country)

2.3. Types of products sold

- Varieties of tomatoes sold in the market
- Other products sold in the market (fresh produce, cereals, pulses etc)

2.4. Opening times, busy days and busy hours

- Opening and closing time for the market
- Important market days/busy days
- Busy market time for tomatoes

2.5. Administration requirements

- How is the market being administered? Hierarchy of market management/administration
- *What is required to be able to sell at the market?*
- *Who is able to sell at the market?*

2.6. Market regulations

- Market levies and how they are collected
- Opening and closing times
- Market regulations in terms of hygiene
- Acquisition of shelf space

2.7. Consumer perception of the market

- Perceptions on market standards (rank in Mombasa, cleanliness, responses to consumer needs etc.)
- Perception on type of the market (whole sale, retail etc.)
- Perception of market response to consumer needs

Appendix 6: Tomatoes at the Mass Market

(N/B: To be discussed with selected traders in the mass market)

Name of trader:……..

1.1. Quantity of tomatoes sold in the market

- Out of the 12 months in a typical calendar year, which specific months do we have low tomato sales?
  ……
  ……

- Out of the 12 months in a typical calendar year, which specific months do we have moderate tomato sales?

  ……
  ……

- Out of the 12 months in a typical calendar year, which specific months do we have high/peak periods of tomato sales?

……
……..

Reported sales per week during low periods (in the months specified above)			Reported sales per week during moderate periods (in the months specified above)			Reported sales per week during peak periods (in the months specified above)		
Unit of sale	Quantity sold	Average sale price	Unit of sale	Quantity sold	Average sale price	Unit of sale	Quantity sold	Average sale price

1.2. Trends in tomato volumes within and over the years

a) Trends in tomato volumes within a typical year

Trader No/Name	Jan-March	April-June	July-Sept	October-December
	First quarter	Second quarter	Third quarter	Fourth quarter

N/B: Score from 1-4 where 1 is lowest and 4 is highest.

b) Trends in tomato volumes over the years

- How has been the trend of tomato volumes in the last five years (2003-2007)

1. Constant 2. Decreasing 3. Increasing

1.3. Source of tomatoes and purchase prices at source

Source of tomatoes (Location sourced from)	Tomato variety	Unit of sale at source	Buying price (per unit) at source
Kenya			
Tanzania			

1.4. Expected procurement trends in the near future

1. Constant 2. Decreasing 3. Increasing

1.5. Sales price per month of five most important tomato varieties in the last two quarters

Month	Variety ….		Variety…..		Variety…..		Variety…..		Variety…..	
	Unit of sale	Unit Price	Unit of sale	Unit Price	Unit of sale	Unit Price	Unit of sale	Unit Price	Unit of sale	Unit Price
April ‘08										
March’08										
Feb.’08										
Jan.’08										
Dec.’07										
NoV’07										

1.6. Expected price development trends for various tomato varieties in the remaining parts of the year 2008

Tomato variety	Responses		
	1. Constant	2. Decreasing	3. Increasing
……..			
……..			

1.7. Traders and consumers perceptions on tomatoes

Source of tomatoes (Location sourced from)	Perceptions		
	Quality 1: Poor quality 2: Modest quality 3. Best quality	Variety 1. Poorly liked variety 2. Modest liked variety 3. Best liked variety	Cost of tomatoes per source 1. Cheap 2. Modest price 3. Expensive
Kenya			
Tanzania			

1.8. Tomato Quality, Packaging and Varieties

1.8.1 What quality characteristics do consumers look for?

……

……

……

1.8.2 What tomato packaging materials are being used in the market?

……

1.8.3. What tomato packing materials do consumers prefer in the market?

……

1.8.4. What criteria do you look for when buying tomatoes? (from traders)

……

……

……

1.9. Consumer trends and tomato demand

Period of tomato availability	Months in a calendar year	Consumer trend/response 1: High; 2: Low; 3: Moderate
Peak period		
Moderate periods		
Low period		

1.10. Traders and communication system with suppliers

Country of origin of trader 1: Kenya 2: Tanzania	Type of trader 1: Wholesaler 2: Retailer	Means for getting market information

Checklist for means of communication with supplier

1. Cell phones-mobile 2. Landline 3. E-mail 4. Internet 5. HF radio

6. Visit to market 7. VHF radio (Radio call)

1.11. Constraints faced by traders and possibilities for addressing them (List)

a) Constraints faced by traders

……

……

……

b) Suggestions on how to address them

……

……

……

1.12. Constraints faced by consumers and possibilities for addressing them (List)

a) Constraints faced by consumers

……

……

……

b) Suggestions on how to address them

……

……

……

Appendix 7: Trends in Quantities of Commodities Sold in Kongowea Market, Mombasa

	Unit	Jan'07	Feb'07	Mar'07	April'07	May'07	June'07	July'07	Aug'07	Sept'07	Oct'07	Nov'07	Dec'07	Jan'08	Feb'08	Mar'08	April'08
Dry maize	90kg-bag	580	800	780	1250	1300	170	2310	2280	2156	2353	2430	690	1020	2580	2940	6540
Green maize	115kg-bag	802	3223	1014	683	1256	886	1217	1492	1071	1072	1036	512	563	1656	1125	1659
Rose coco	90kg-bag	600	1040	640	2020	1300	2150	2980	2105	1645	1498	2341	910	200	1600	800	3360
Mwitemania	90kg-bag	1540	2650	2850	2300	1750	1300	2720	2870	3430	3245	2854	1100	2130	3030	3210	3250
Potato red	130kg-bag	6116	9740	6315	4850	6600	5025	9240	7015	5455	6589	4690	2475	2320	8736	10790	16340
Potato white	130kg-bag	15980	25640	16210	18100	17670	1600	17100	13790	11179	13039	11170	8310	7520	12686	5140	9060
Cabbages	126kg-bag	298	463	431	487	5471	287	363	369	388	468	438	236	207	509	377	390
Tomatoes	64kg Box	42350	51700	70700	110600	126300	66300	75300	68740	71620	86320	65220	24940	28270	46950	37330	38900
Carrots	138kg-bag	1149	1058	1045	1845	1160	775	1149	1280	1087	1192	927	533	625	980	780	552
Dry onions	13kg-Net	1640	35670	37732	18930	25965	23165	39600	49350	36030	4539	37470	31148	44796	2695	25583	39800
Kales	50kg-bag	11603	12730	13060	13210	15840	11020	12583	15130	13160	15240	12910	7270	7610	16200	9220	18310
Oranges	93kg-bag	5270	10850	6400	6335	6019	5475	3875	5830	2690	2672	5860	1855	517	3263	3950	12490
Bananas	22kg-bunch	16400	8500	12150	8020	10200	6450	6830	9150	5980	927	9735	4025	3445	8253	10020	11490
Bananas	14kg-bunch	5770	2650	1890	1560	1950	1020	1540	1700	3410	3240	2430	2710	2835	2428	2235	4390
Finger millet	90kg-bag	NR	380	50	90	230	50	193	293	203	511	784	155	NR	300	100	240
Sorghum	90kg-bag	NR	260	210	50	230	20	119	160	147	262	491	130	NR	220	90	300
Fresh peas	51kg-bag	206	730	1035	1020	519	163	235	1079	1025	2403	1420	450	501	680	353	414
Cowpeas	90kg-bag	NR	530	450	280	400	55	895	980	1627	1970	2039	594	25	688	420	150
Green grams	90kg-bag	NR	360	420	1206	280	250	718	1540	1231	1640	1603	361	70	800	498	730
Avocados	90kg-	178	760	1400	1500	2720	1018	1915	2077	1920	1182	848	360	509	1540	1590	2170

	bag																
Brinjals	44kg-bag	285	542	790	536	520	300	375	356	304	375	428	333	89	491	367	502
Fresh cassava	98.8kg-bag	2932	4020	1605	1747	736	513	686	887	1462	1135	1330	520	8916	2370	1082	1050
Cauliflower	39kg-crate	87	255	426	377	337	193	319	325	287	231	455	276	109	225	222	207
Capsicums	50kg-bag	504	639	910	693	660	465	635	648	557	823	862	552	510	772	663	642
Lemons	95kg-bag	1075	368	954	805	483	241	737	251	343	125	157	123	184	240	144	265
Limes	13kg-Net	233	612	695	328	341	302	198	475	509	519	309	288	211	566	634	698
Chilies	38kg-bag	163	335	391	355	815	486	235	102	380	362	432	336	288	394	480	1056
Mangoes	126kg-bag	3590	7735	3830	153	2475	523	1708	NR	NR	3628	6139	2380	3608	8820	4165	5313
Ngowe	25kg-basket	10115	8800	17600	24120	31922	34400	2100	NR	NR	8140	13760	4464	1456	8754	41980	2562
Passion fruit	25kg-bag	267	737	477	1610	390	102	325	230	234	288	258	404	155	346	219	270
Pawpaws	54kg-box	838	1005	782	1100	1305	343	621	835	785	1736	1666	665	805	6191	5690	5200
Pineapples	12.8kg-Dozen	2995	24540	5775	4995	3140	4520	3018	4633	3316	2778	7300	4105	9903	7293	8395	7380
Sweet potato	98kg-bag	1173	836	581	560	129	211	490	575	3274	1743	1190	516	32	221	34	37
Dolichos beans	90kg-bag	NR	227	10	70	100	55	37	108	154	274	357	108	NR	120	160	1204
Groundnuts	110kg-bag	100	850	100	311	858	100	1298	1769	1547	2253	2008	528	NR	450	400	1100
Cucumber	50kg-bag	215	363	488	421	335	168	253	141	217	209	131	124	104	188	65	135
Lettuce	51kg-bag	260	535	454	550	551	209	389	357	438	328	265	208	156	313	232	220
Spring onion	142kg-bag	NR	NR	NR	NR	NR	NR	50	7	22	58	19	19	18	18	14	40

Source: Mombasa District Agricultural Office; NR = Not reported

Appendix 8: Trends in Mean Monthly Prices of Commodities Sold in Kongowea Market, Mombasa

	Unit	Jan'07	Feb'07	Mar'07	April'07	May'07	June'07	July'07	Aug'07	Sept'07	Oct'07	Nov'07	Dec'07	Jan'08	Feb'08	Mar'08	April'08
Dry maize	90kg-bag	1063	1060	1035	1062	1073	1200	1182	11912	1230	1216	1275	1762	1440	1410	1465	1648
Green maize	115kg-bag	2518	2195	2550	3037	3213	3517	3403	3656	3423	3660	3603	3619	2738	2656	3112	3547
Rose coco	90kg-bag	3000	3093	3102	3041	3195	3213	3308	3384	3503	3266	3495	3520	4347	4536	4675	4707
Mwitemania	90kg-bag	2476	2470	2368	2457	2749	2743	3053	2969	2893	2895	3260	3530	3640	3678	4581	4673
Potato red	130kg-bag	2386	1170	1673	1848	2100	2220	2168	2358	2443	2247	2395	2515	2800	2592	2998	2847
Potato white	130kg-bag	2446	1885	2065	2349	2666	2600	2455	2659	2683	2473	2725	2918	3513	3108	3561	3512
Cabbages	126kg-bag	2806	1972	1875	1921	1751	2100	2536	2521	1918	2037	2154	2623	3050	2674	3069	3476
Tomatoes	64-kg Box	1850	3170	2265	1376	1769	1637	1685	1248	1268	1404	1543	1113	737	1802	2589	3582
Carrots	138kg-bag	2614	2003	1500	1431	1283	1300	1650	1955	1520	2078	2493	2490	24071	2350	3304	4748
Dry onions	13kg-Net	610	585	604	703	681	595	435	288	257	279	321	420	466	473	483	556
Kales	50kg-bag	1073	853	740	725	834	800	1008	802	614	625	798	1158	1200	1284	1504	905
Oranges	93kg-bag	360	888	1179	1141	1080	1043	1377	1720	1975	988	1068	1400	2050	1802	1331	1056
Bananas	22kg-bunch	227	235	248	238	255	262	262	272	286	252	253	231	280	292	263	279
Bananas	14kg-bunch	368	359	381	323	278	274	284	337	284	343	323	291	277	321	354	330
Finger millet	90kg-bag	2600	2625	2734	2750	2722	2633	2693	2784	2860	2777	3083	3150	3150	3444	3524	3960
Sorghum	90kg-bag	1600	1938	1756	1600	1612	1533	1636	1490	1775	1712	1733	1820	1820	1651	1875	1908
Fresh peas	51kg-bag	2242	1385	1139	888	1647	2100	2313	1224	1350	1406	940	1544	1890	2108	2951	3569
Cowpeas	90kg-bag	2700	2295	1948	2237	1831	1973	2110	2376	2838	2634	2373	1980	1920	2619	2868	3600
Green grams	90kg-bag	4050	3712	3330	3361	3406	4275	4128	4161	4166	3895	3560	3616	4614	3921	3293	3550
Avocados	90kg-	2000	2100	1550	1425	1400	1362	1288	1171	1333	1675	1869	1955	2127	1840	1775	1910

	bag																
Brinjals	44kg-bag	532	1173	1006	888	816	775	751	662	663	690	709	660	660	945	803	749
Fresh cassava	98.8kg-bag	671	665	589	584	711	608	732	739	740	786	826	945	839	580	787	961
Cauliflower	39kg-crate	3228	3227	1764	1706	1850	1696	1349	1570	1542	1497	1992	2068	1589	1799	1383	2239
Capsicums	50kg-bag	2223	2348	1857	2146	1735	1800	1563	2035	1819	2104	1673	1506	1188	1366	2012	2394
Lemons	95kg-bag	410	765	738	512	1079	1203	598	1492	874	1329	2239	1285	1374	1633	1923	1880
Limes	13kg-Net	654	532	486	570	712	657	693	541	615	946	913	788	948	576	456	456
Chilies	38kg-bag	1040	1286	1642	1590	523	587	1591	543	843	1112	1130	760	733	618	591	498
Mangoes	126kg-bag	686	678	1133	1225	620	543	615	NR	NR	741	524	506	600	656	1081	740
Ngowe	25kg-basket	436	600	352	483	282	227	352	NR	NR	355	498	401	462	344	310	329
Passion fruit	25kg-bag	1560	1326	2135	2310	2188	1875	2157	2169	2623	2664	2408	2570	1462	1828	2107	2174
Pawpaws	54kg-box	513	548	545	334	371	574	394	455	465	341	358	395	479	328	316	320
Pineapples	12.8kg-Dozen	593	679	728	685	542	593	490	535	403	431	585	635	474	574	470	477
Sweet potato	98kg-bag	1248	1018	820	631	860	822	851	772	791	712	671	1749	16936	1219	1250	2015
Dolichos beans	90kg-bag	4050	3463	3411	3850	3479	3132	3338	3255	3480	3331	3150	3870	4320	4129	4439	4560
Groundnuts	110kg-bag	5237	5927	5940	5920	6172	5533	5545	5366	5566	6053	6615	7041	7150	6848	7175	7985
Cucumber	50kg-bag	1593	1425	1013	769	1333	1583	1200	1590	1625	1499	1625	1688	1357	1200	2181	2420
Lettuce	51kg-bag	911	884	806	770	896	892	933	812	825	820	930	1228	887	776	990	1380
Spring onion	142kg-bag	NR	NR	NR	NR	NR	NR	786	713	561	478	478	585	513	546	565	500

Source: Mombasa District Agricultural Office; NR = Not reported