ASSESSMENT OF THE WHOLESALE-CONSUMER SEGMENT OF THE VALUE CHAIN FOR FRESH FRUITS AND VEGETABLES IN DAR ES SALAAM: A CASE OF ILALA MUNICIPAL

BY

BENEDICTO CHAKAZA COSMAS

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ABSTRACT

This study was conducted to assess the wholesale-consumer segment of the value chain for five key fresh fruits and vegetables (FFV) including tomato, dry onion, cabbage, orange and amaranth. Structured questionnaires were used to collect data which were analysed using descriptive and inferential statistics. Gross margin analysis was used to develop a preliminary estimate of gross wholesale and retail margins. Logistic regression was used to test the significance of factors that influence consumers' purchasing preferences. The most important source of FFV supply to Dar-es-Salaam market were Arumeru district in Arusha region, Lushoto in Tanga, Makambako, Kidamari and Ilula in Iringa, Matombo and Mgeta in Morogoro, Moshi rural in Kilimanjaro and Kibaha and Msanga in Coast region. The gross margins were found to vary vertically across the chain and horizontally across markets. FFV prices were found to vary significantly between supermarkets and open-air markets. Majority of consumers from both markets valued reliability, freshness, market premises, product outlook/packaging, customer services and food safety as important factors that determine their preferences about where to purchase. However, while price and tradition were valued as less important by Shoprite consumers, they were valued as important by those in other markets. Supermarkets were found to be important markets for higher income earners where as open-air markets appeared to serve all income categories but mostly low income consumers. Consumers with monthly income above Tsh. 500 000, those who valued prices and reliability as less important, market premises, product outlook and food safety as most important were found most likely to purchase FFV from supermarkets whereas those who valued freshness and accessibility as most important and market premises as less important were less likely to purchase FFV from this market. It is recommended the government collaboratively work with private sector traders to establish accepted and

workable quality grades and standards that recognize constraints that the traditional sector faces.

DECLARATION

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

_____   _____

BENEDICTO CHAKAZA COSMAS   Date

(MSc. Candidate)

The above declaration is confirmed

_____   _____

DR. E.R. MBIHA   Date

(Supervisor)

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I, indeed, remain indebted to my beloved parents, my father Cosmas Mkamba, my mother Gladness Allan Mkamba my lovely young sisters, Lydia Cosmas and Caroline Cosmas and my aunt Doroth Mkamba for their inspiration and heartfelt encouragement during my whole study period. Lastly, with my deepest sorrow, to my late grandmother who passed away on 3 June, 2007 when I was drafting this report. She is dead but will always remain with me in my heart and soul.

DEDICATION

I dedicate this work to my father Lt. Col. Cosmas Mkamba and my mother Gladness Allan Mkamba who laid my education foundation, my beloved young sisters Lydia and Caroline, my lovely aunt Doroth Mkamba and my late grandmother. Your love and care made it possible for me. God be with you, God bless you all.

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LIST OF ACRONYMS

CSF	Critical Success Factors
EAC	East Africa Community
EPOPA	Export Promotion of Organic Product from Africa
FFV	Fresh Fruits and Vegetables
FRESHMARK	Fresh Fruits and Vegetable Department at Shoprite
HEPAD	Higher Education Partnership for Agricultural Development
ISHS	International Society for Horticultural Science
MAFC	Ministry of Agriculture, Food and Cooperatives
MSU	Michigan State University
MT	Metric Ton
SPSS	Statistical Package for Social Sciences
SUA	Sokoine University of Agriculture
Tsh.	Tanzania Shillings
UK	United Kingdom
UNIDO	United Nations Industrial Development Organization
USA	United State of America
USD	United States Dollar
USAID	United States Agency for International Development
WCHR	World Conference Horticultural Research

CHAPTER ONE

1.0   INTRODUCTION

1.1   Background information

Climatic conditions in Tanzania can accommodate the production of a wide variety of fresh fruits and vegetables (FFV). According to Tanzania agricultural policy report of 1997 available at the national website, the most important fruits produced include pineapples, passion fruits, oranges, mangoes, peaches, pears, avocadoes, and bananas; key vegetables are tomatoes, spinach, amaranth, sweet potatoes and leaves, cabbages, onions, Irish potatoes, carrots, beans, and others.   While some can be produced throughout the year, the majority of these products are highly seasonal.

The main markets for FFV are the urban centres of Dar-es-Salaam, Arusha, Tanga, and Morogoro, where traditional open air markets compete with street vendors, mostly located in residential streets, as the main source for most urban dwellers. Small groceries and supermarkets such as Shoprite are also sources of FFV for urban residents.

There is great potential for growth in the production and marketing of horticultural commodities in Tanzania as urban population rises and as incomes grow. Urban markets, and their links with production areas, have a major influence on real purchasing power of urban households and real prices received by farmers. According to the 2006 revision and world urbanization prospects available at http://globalis.gvu.unu.edu/indicator, in Tanzania, high urban population growth rates, and much lower rates in rural areas are expected to lead to a 58% urban share in total population by 2030 as shown in Fig. 1: and Fig. 2: below.
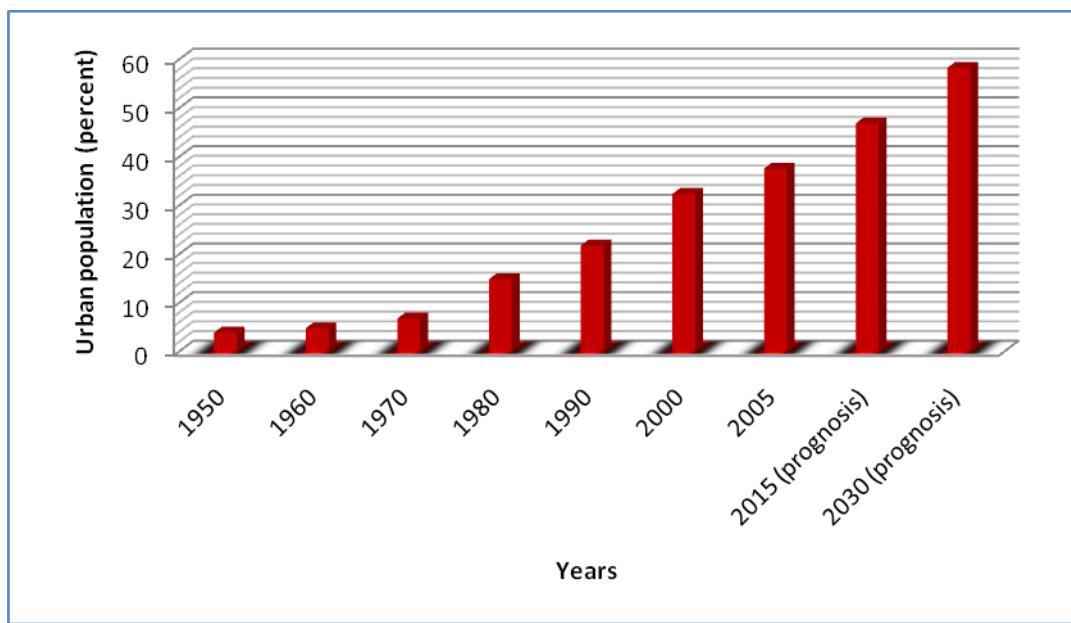
Figure 1: Projected urban share in total population in Tanzania by 2030
Source: UN common database, (2005)
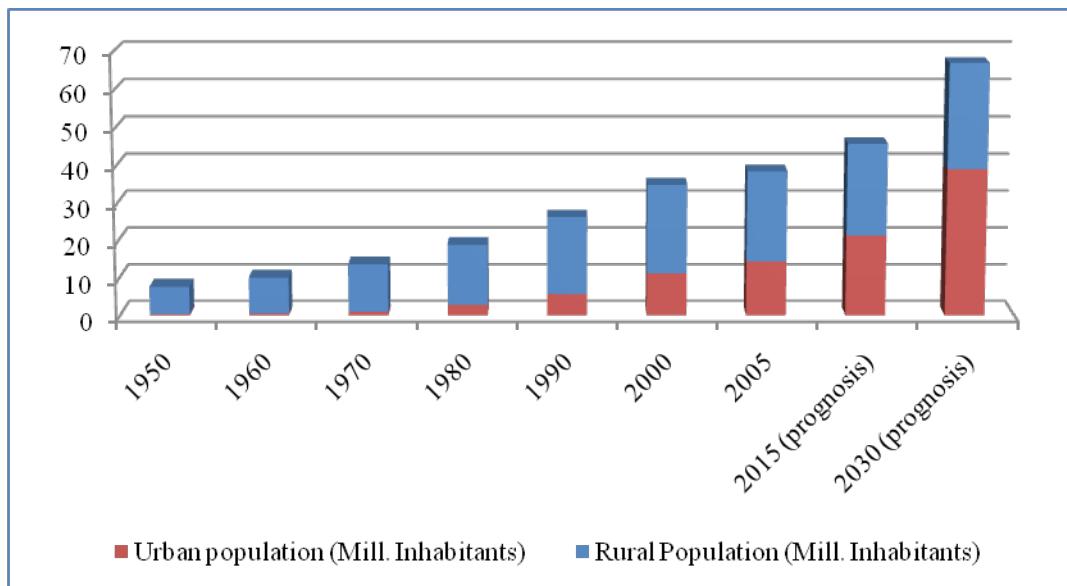
Figure 2: Projected rural and urban populations in Tanzania by 2030
Source: UN common database, (2005)

Projected urban growth rates in association with income growth is expected to bring about increase in FFV demand and therefore pose a challenge which can be considered as an opportunity to FFV producers and the industry as a whole to meet such demand.

For the industry to take advantage of such potential opportunities, investment should be made in programs to enhance FFV production and productivity throughout the value chain, and these need to be based on strategic assessment of the horticulture value chain. Understanding of the value chain and awareness of the opportunities and constraints facing the chain is vital towards increased efficiency in both production and marketing parts of the value chain.

1.2   Problem statement

Research has shown that some 60% of produced fruits and vegetables are wasted as post harvest loss in Tanzania (UNIDO, 2002). Among other constraints, lack of market is the most important complaint from both farmers and immediate buyers/wholesalers. The traditional marketing system currently is eroded by high levels of post harvest loss, seasonality of supply, unstable prices and high transaction costs. Moreover, lack of quality post-harvest handling and poor market infrastructure has also been an important factor contributing to suppliers' failure to deliver satisfactory products and services to consumers.

Given the fact that, like other parts of the developing world such as Kenya and Malawi as well as India and Nigeria, the traditional FFV market in Tanzania is dominated by the poor segment of the population including poor traders and consumers, and given the potential opportunities brought about by the projected urban growth rates, improving this sub-sector would have a significant effect on poverty reduction in Tanzania. This study therefore focuses heavily on these traditional markets while assessing the evolving role that more modern outlets such as supermarkets are playing in the system.

1.3   Justification of the study

According to household budget survey conducted by the National Bureau of Statistics of Tanzania (2002), FFV is the fourth item in Dar-es-Salaam in terms of its share (6.8%) in household food expenditure, after cereals (18.7%), meals consumed outside the home (7%), and meat (6.9%). Its share however, is expected to rise as incomes rise.

Five key FFV were selected from the list of most important FFV produced in the country in which, many traders were found trading in during the time of interview. The key FFV at the time of interview included tomato, onion, cabbage, orange and amaranthus.

The results of the study are expected to improve stakeholders' understanding of the FFV value chain and their awareness of constraints and opportunities facing the chain, consequently, enable them to respond more effectively in their positions by investing in efforts and parts of the chain that are more influential toward increased productivity. Moreover, the study will act as an informational benchmark for more pilot activities intending to take advantage of the available opportunities in the sector.

1.4 Objectives of the study

1.4.1 Overall objective

The main objective of the study is to assess the wholesale-consumer segment of the value chain of the five key FFV: tomato, onion, cabbage, orange and amaranthus so as to provide an improved understanding of the system serving Dar es Salaam, Tanzania for the design of effective programs and investment to improve chain productivity.

1.4.2 Specific objectives

- Characterize FFV marketing and distribution practices within the wholesale-retail segment of the value chain;

- Within the open air market segment of the chain, develop a preliminary estimate of gross wholesale and retail margins for selected FFV items;

- Compare FFV prices in supermarkets and open air markets and identify factors that influence consumers' preferences about where to purchase;

- Identify major factors contributing towards customer satisfaction;

- Identify the relative importance of the various types of retail outlets serving different income categories of consumers;

1.4.3 Research questions

Key research questions are:

- What are the most important sources of supply to Dar es Salaam and what are the seasonal patterns of supply from each source?

- How are profits distributed among different marketing actors along the chain?

- Is there any significant difference in FFV prices between supermarkets and open-air markets?

- What are the major factors contributing towards customer satisfaction in shopping for FFV?

- How important are different types of retail to different income categories of consumers? Do consumer income, quality of products and services, and prices have any significant influence on consumers' decision making about where to purchase

FFV?

1.5   Conceptual framework

The value chains for any agricultural product involve several interconnected stages. These range from farm input procurement to final consumption. Each stage of the chain involves different actors with different objectives, which among other factors such as sector structure determine their conduct along the value chain.

The main actors in the wholesale-consumer segment of the FFV value chain include traders on one side and consumers on the other side, as shown in Fig. 3.

Trader's major objective is to maximize profits. This can be done by investing on product quality/features and focusing on niche or quality sensitive markets, or by investing in low cost production strategies and focusing on price sensitive markets. This behaviour therefore affects trader's decisions on where to sell, when to sell and to whom to sell the products.

Consumers on the other end, assumed to be rational, strive to maximize utility given income constraints. Low income consumers are more likely to shop around for cheaper products to maximize their satisfaction. However, they may also look for some quality attributes. For higher income consumers on the other hand, non-price factors will generally be relatively more important, with quality dominating. These behaviours therefore will have an impact on consumers' decisions on where to shop.

TRADER
Where to sell
When to sell
To whom to sell

Maximize Profit

Best Quality/Feature

Minimum Cost/Best price

Quality Sensitive consumer category
- More *concern on non-price factors*

Price Sensitive consumer category
- *More concern on price*

Maximize Utility

- Where to purchase

CONSUMER
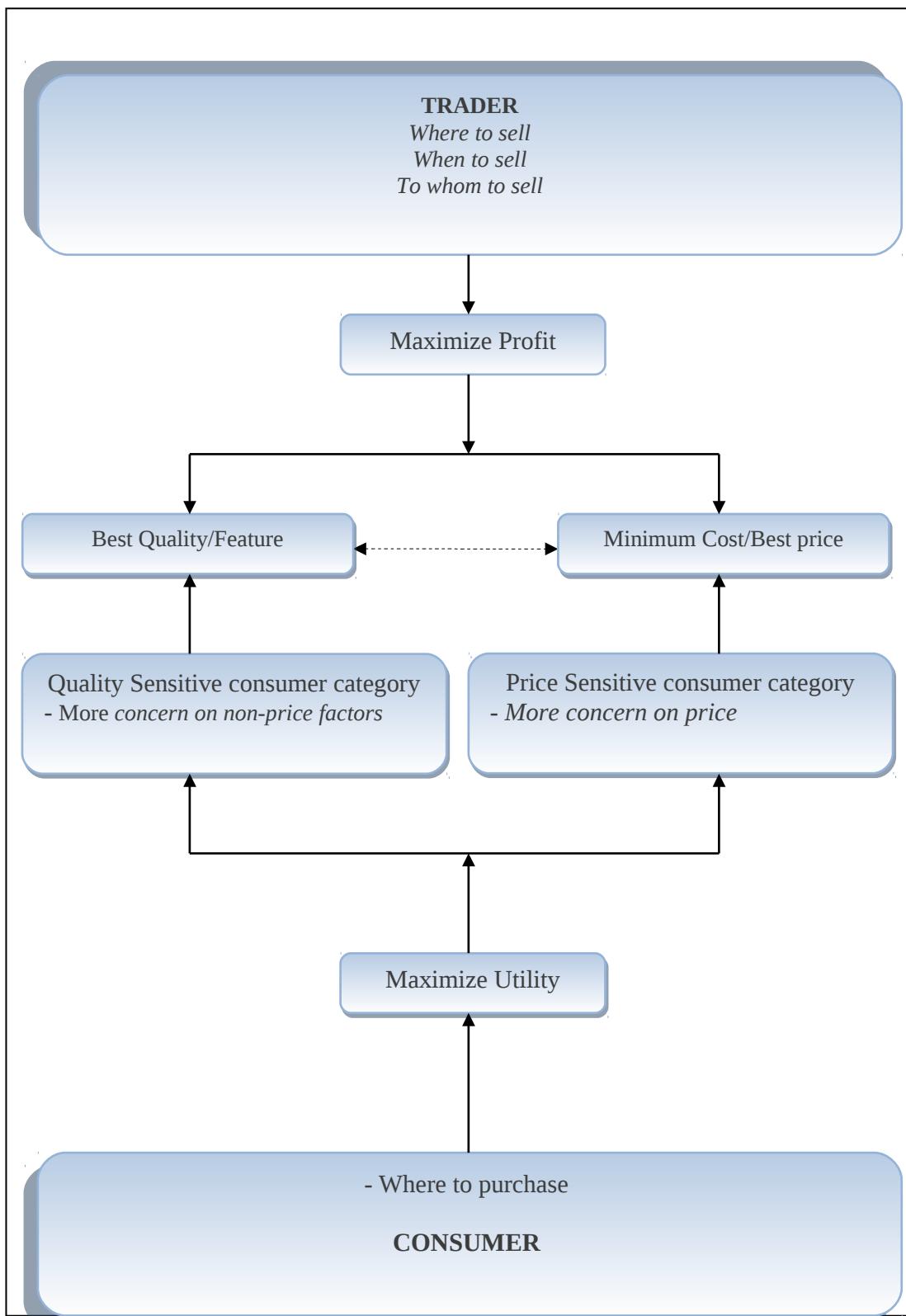
Figure 3: Conceptual framework

CHAPTER TWO

2.0 LITERATURE REVIEW

1.6   Value chain definition

Value chain describes the full range of services and activities that are required to bring a product from its conception to its end use, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use (Kaplinsky and Morris, 2001). These services involve design, production, marketing, distribution, and support to the final consumer.

Activities that comprise a value chain can be contained within a single firm or divided among different firms. Value chain activities can be contained within a single geographical location or spread over wider areas (USAID, 2006). Porter (1998) describes the value chain as system of independent activities, which are connected by linkages. Linkages exist when the way in which one activity is performed affects the cost or effectiveness of other activities." Linkages' illustrate how the single activity affects other activities, thus serving as an important source of value adding (Porter, 1985).

According to Ansari and Bell (1997), the ultimate goal of the value chain process is to manage costs so that the targeted margin will be

achieved by the active members. This is achieved by managing customer demand, by using technology effectively, by avoiding waste through using the right processes, and by being conscious of the basic functions and principles of the dynamic value chain.

1.7   Approaches used in assessing the value chain

The world of production and exchange is complex and heterogeneous, and value chains differ between and within sectors. Each chain will have particular characteristics, whose distinctiveness and wider relevance can only be effectively captured and analyzed though an understanding of the broader issues which are involved.

The approaches used in value chain assessment are addressed below. These approaches are used in a diverse number of studies, not all of which explicitly focus on value chain research. Each of these studies reflects the contingent circumstances of the research investigation, mirroring the resources available to the researchers, their skills, and probably most critically, the quality of their access to the subjects of the research. It is unlikely therefore that, any single value chain study will be able to fully utilize the diverse set of methodologies (Kaplinsky and Morris, 2001). Some of the methodologies set forth by Kaplinsky and Morris, which have been utilized by this study, are discussed below.

1.7.1   The point of entry for value chain assessment

As pointed out earlier, value chains are complex, and particularly in the middle tiers, individual actors may feed into a variety of chains. Which chain, or chains, is/are the subject of enquiry therefore very much depends on the point of entry for the research

inquiry. The following are some possible points of entry as listed by Kaplinsky and Morris (2001),

- The global distribution of income;

- Retailers/Independent buyers/wholesalers/Key producers;

- Sub-suppliers;

- Commodity producers/agricultural producers/Small farms and firms;

- Informal economy producers and traders;

- Women, children and other marginalized and exploited groups;

According to USAID (2006), firms in the value chain in Tanzania include input suppliers, producers, farmer associations, distributors, wet market wholesalers and retailers, hotels, supermarkets, exporters, international distributors and international wholesalers. This study's entry point is wholesalers, which therefore require the research to go backwards to the source of supply and forwards to retailers and final consumers.

1.7.2 Mapping the value chain

Having identified the value chain in question, the researcher has to make decisions on what to map in charting a path through complex value chains. It is likely that all value chain assessment will gain from constructing a "tree" of input-output relationships; these may include the following;

- Gross output values;

- Net output values (that is, gross output, minus input costs);

- The physical flow of commodities along the chain;

- The flow of services, consultants and skills along the chain;

- Employment, where relevant distinguishing between permanent (on payroll) and temporary (off payroll) staff, gender, ethnicity;

- Destination of sales - for example to wholesalers and retailers; concentration of sales amongst major buyers; number of buyers;

- Imports and exports, and to which region;

In the current study, the physical flow of commodities and destination of sales is used to map the FFV value chain.

1.7.3 Product segment and critical success factors in final markets

One of the distinctive features of contemporary production systems such as the current wholesale-consumer segment under study is that they tend to be "market-pulled", as opposed to the "supplier-push" nature of protected and low-competition value chains in previous decades. This puts a primacy on the characteristics of final product markets in every chain, and generally represents a high-order priority in all value chain studies (Kaplinsky and Morris, 2001).

Kaplinsky and Morris have pointed out that markets comprise a number of key characteristics that will need to be analyzed to understand value chain dynamics. According to them, markets are segmented. For example, foodstuff markets may consist of low income processed foods, convenience foods, organic foods, exotics, ethnic products and so on. Each of these markets will have its own distinctive market

characteristics, and together with market size and growth, these will need to be documented (Kaplinsky and Morris, 2001).

These market characteristics are referred to as Critical Success Factors (CSFs). Generally, in low income final markets, price will be a relatively important CSF, but it will not be unique. Customers will also require quality, differentiation and branding. In higher income final markets these non-price CSFs will generally be more important, with innovation, customization and quality dominating. In intermediate markets (for example for components), firms may feed into a variety of chains serving the needs of different final market segments (Kaplinsky and Morris, 2001).

According to Kaplinsky and Morris (2001), a useful tool for conducting analysis of CSFs is by scored responses. The first step is to undertake a limited number of pilot interviews to get a feel for the CSFs in a particular market or market segment. These will vary by sector. For example, freshness may be an issue in food products, but not in electronics or banking services. Thereafter, key respondents should be asked how important each of these CSFs are in each of the key market segments using a certain scale say 1 = not important to 7 = extremely important.

The current study uses partial CSF analysis to identify important factors that influence consumers' decision about where to purchase. These include product freshness, reliability of supply, market accessibility/location, price, market premises cleanliness, product outlook/packaging, customer services, food safety and tradition.

1.8   Value chain for fresh fruits and vegetables in Tanzania

The figure (Fig. 4) below shows the Tanzania's FFV value chain map. This study focuses on the middle part of the chain from wholesale to retail level and farther up the stream to when the products are purchased by consumers. Moreover, the study focuses mainly on the wet market retail and supermarket segment of the chain.
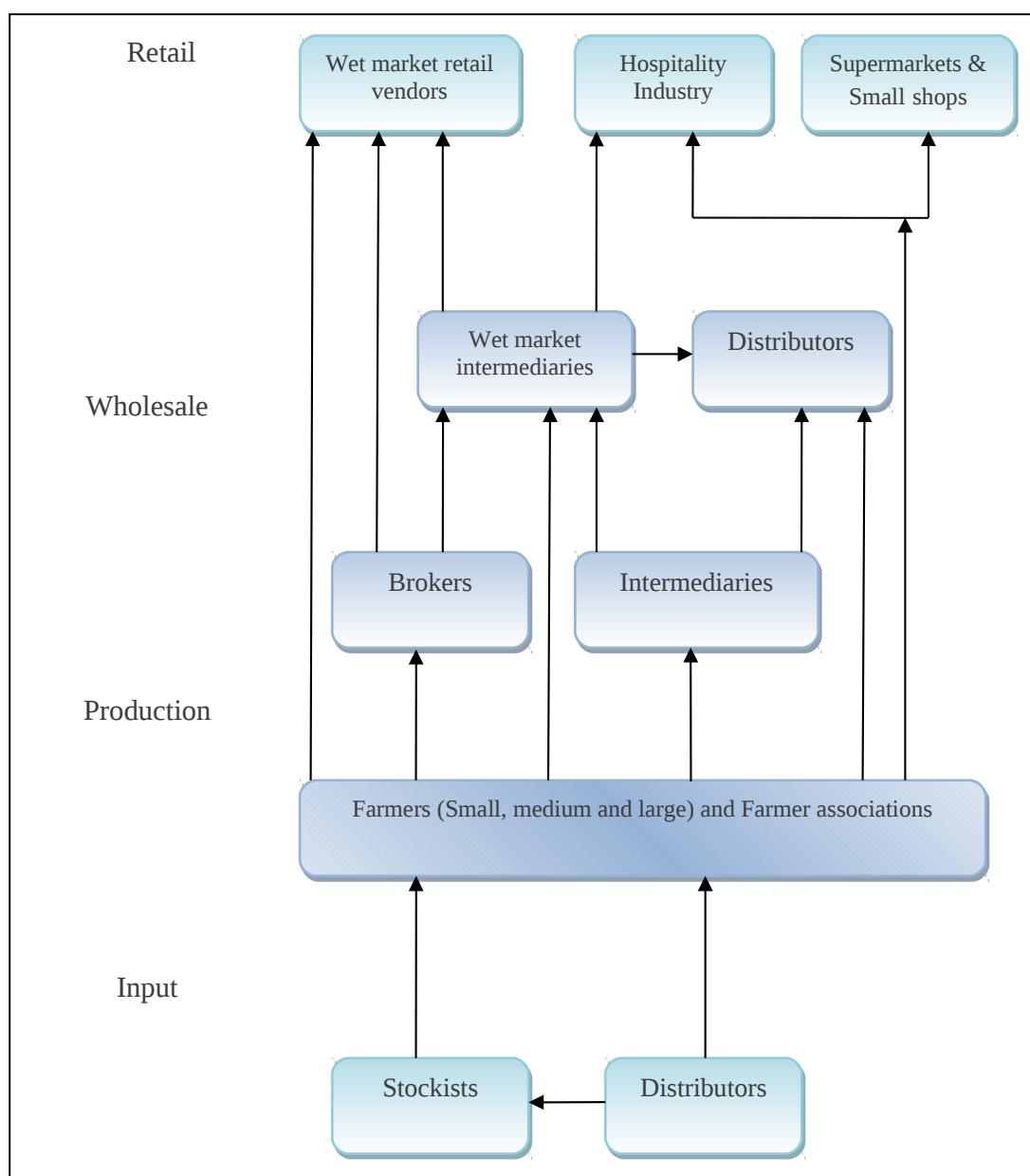
Figure 4: Value chain for fresh fruits and vegetables

As shown in the map (Fig. 4), usually, traders who buy FFV from farmers transport the produce to the market where they sell directly to consumers or to other traders. Mbelwa (1999) showed that about 70% of the FFV is marketed through rural collection points where farmers bring their produce, and wait for traders. Wholesalers buy the produce and sell it through brokers, retailers to final consumers. The marketing operations involved in the movement of fruit and vegetables include packing, assembling and physical handling, storage, transporting and selling. Ashimogo and Lazaro (1989), found that marketing channel of FFV in Morogoro district consists of producers, village intermediaries, transporters and retailers in urban markets.

Mbelwa (1999) revealed that the bulk of fruit and vegetables from Arusha, Kilimanjaro, Coast, Morogoro, Singida and Tanga regions are marketed in the urban centres of Dar es Salaam, Arusha, Moshi, Tanga, Coast, Morogoro and Singida. He further identified that Kariakoo area in Dar es Salaam is the largest market for most of the FFV from these regions and the main market participants in the FFV trade are farmers, local traders, interregional traders, brokers and retailers.

Kashuliza *et al.* (2000) found that, during the seasonal scarcity period, wholesalers procure the produce by themselves directly from the farms or buy from rural markets. At the peak season, some producers deliver their produce to urban markets where they sell to the wholesalers. According to Nyange *et al.* (2000), most wholesalers sold their produce to retailers. However, a few of them wholesaled early in the morning and retailed at the later hours of the day and some sold their produce to other wholesalers.

1.9   The role of institutions in facilitating efficient value chains

Institutions are referred to as the "rules of the game". Institutions emerge to minimize transaction costs and to facilitate market exchange. The evolution from personalized exchange to impersonal exchange, supported by legal systems that enforce contracts, is central to the process of growth and development (North and Thomas, 1973). Institutions provide for more certainty in human interaction. Institutions have an influence on people's behaviour and therefore on outcomes such as economic performance, efficiency, economic growth and development (North, 1990).

In many developing countries where laws and legal capacity to enforce them are inadequate, informal relations can substitute for courts allowing deals to be made (Greif, 1997; Hendely *et al.,* 2000) or informal institutions emerge to replace the lacking enforcement institutions (Greif, 1993; Gabre-Madhin, 2001). In other words, the poor ability to enforce contracts tends to lead to heavy reliance on personalized transactions, which keeps these transactions small, precluding the benefits (cost reductions) of economies of scale. As a result the final consumers in urban centres pay a sizable premium when buying the goods at the end of a long supply chain (Eskola, 2005).

1.10   The role of transaction costs in the FFV value chain

Transaction costs are defined as the costs of arranging a contract *ex-ante* and monitoring a contract *ex-post* or more generally the costs of running the economic system (Hubbard, 1997). Transaction costs can be classified as information, negotiation, and monitoring and enforcement costs. Information costs (*ex-ante*) relate to the costs incurred in

obtaining information relative to the undertaking of the transaction (price information, market location etc.). Negotiation costs represent the costs incurred while the transaction is being carried out. Examples of negotiation costs to include costs such as are commission costs, costs of physically negotiating the terms of exchange, and costs of drawing up formal contracts. Monitoring and enforcement costs (*ex-post*) are the costs incurred once the transaction is completed and in order to ensure that the terms agreed upon *ex-ante* are kept (Hobbs, 1997).

Information costs arise because the markets are not perfect as information is not freely available. Information is costly as it requires time, efforts and money to acquire. Lack of information increases search costs for the transacting partners (Williamson, 1989; Hobbs, 1997; Douma and Schroeder, 1991). Resources are spent to acquire information on potential contracting partners, the price and quality of the resources in which they have property rights (Eggertson, 1999) which may be in terms of personal time, travel expenses and communication costs.

Monitoring of contractual partners is designed to make sure that they abide by the terms of the contracts. Monitoring costs are related to the level of trust between the transacting partners. Trust can be build over time or broken between transacting partners. When trust is adjudged to be low, there will be a corresponding increase in monitoring costs. The higher the level of monitoring required of partners, the higher the expected costs and consequently, the more costly it is to transact among the partners (Barney and Hesterly, 1996).

1.11   The role of fruits and vegetables in the economy

1.11.1 Income generation

Fruit and vegetable production and marketing have an important economic significance in developing countries. A country case example provided by World Conference Horticultural Research (WCHR) in Vietnam in 1998 may indicate potential future trends in Tanzania. The study conducted in Vietnam indicates that much of the increased demand for fresh vegetables comes from the urban population. In particular for the more perishable species, demand significantly increased since the change from a centrally planned economy with collective systems to a market-orientated one, is being met by peri-urban production. Vegetables provide about $650 value added (returns to labour, land and management) per farm yearly for peri-urban vegetable farmers. Value added per hectare of vegetables is at least twice that of rice, providing employment for five times the number of workers despite very high labour use in rice (Jansen, 1996).

In Tanzania where increased urban demand is being met by rural production, even though incomplete, market liberalisation has opened up new opportunities for the local entrepreneurs to enter the market, increased competition among traders, and allowed for more cost effective trading and thus lower marketing margins. However, contrary to Vietnam, official market liberalisation in Tanzania has not removed informal barriers, such as poor access to credit, poor infrastructure, insufficient market information, and inability to enforce contracts in impersonal trade, which are still serious impediments for trade. (Eskola, 2005)

Improving the current situation in Tanzania may bring rural production closer to the growing urban markets as is the case in Vietnam hence reduce wastages especially for more perishable species thus attain improved FFV value chain efficiency and productivity.

1.11.2 Improvement of nutritional status

In addition to their potential to generate income for smallholder farmers and traders, fruits and vegetables play a critical role in improving nutrition by providing essential minerals and vitamins. In Malawi, for example, this has prompted the Ministry of Agriculture more vigorously to pursue research, extension and personnel training in vegetable production and post harvest handling (Mkamanga, 1990).

Urbanization and socioeconomic changes in developing countries are characterized by diets higher in energy, including vegetable oils and other fats heated under oxidizing conditions and lower in diversity in fruits and vegetables than those of rural populations. As a consequence, within the coming decades the rates of obesity, diabetes, cardiovascular disease and cancer can be expected to follow the epidemic trends already seen in Latin America (Albala *et al.*, 2001; Uauy *et al.,* 2001).

There has been an accompanying decrease in the variety of vegetable and fruit species consumed. Cultural change and urbanization

compound this trend (Chweya and Eyzaguirre, 1999). Additionally, many traditional foods are now associated with being poor or backward. The result is disruption of dietary patterns and loss of dietary diversity. Little is known about the impact of these dietary changes on human nutrition and health.

Fruit and vegetables are not only rich in calcium but also iron and vitamin C (West *et al.,* 1988). Studies conducted by West *et al.* (1988), Chweya and Eyzaguirre (1999), and Uiso and Johns (1996) revealed that leafy vegetables in general make important contributions in provitamin A, vitamin C, folate, iron, calcium, fibre and protein.

1.12   Constraints facing the industry

Several studies have revealed number of constraints facing the FFV industry in most developing countries. According to WHCR (1998), buyer surveys conducted in 228 developing countries in North Africa, Sub-Saharan Africa, Central America and Caribbean, South America, China, Near East in Asia, East and South-East Asia, South Asia, and Developing Oceania have established the importance of quality in terms of product attributes and safety, reliability of delivery and price as determining factors. The results are supported by another study conducted in New Jersey, USA by Govindasamy, *et al.,* (2002) USA asked respondents to indicate which factors among convenience, price, quality, and freshness played an important role in their decision on where to purchase. Quality and freshness were selected by 63% and 59% of the respondents

respectively. He further found that approximately 20% of the consumers valued convenience, while 16% indicate that price was the most important characteristics. Approximately 87% of the respondents indicated that availability and quality of fresh produce affected their decision on where to purchase. These results may suggest existence of some similarities of preferences among consumers in developing and developed countries.

However, most developing countries FFV markets have failed to meet the above consumers' preferences. One factor that contributes to quality deterioration is packing materials. Mbelwa (1999) found that fruits and vegetables are packed for handling and easy transportation in baskets, sacks, and wooden boxes. The commonly used type of basket is the "Tenga". Tengas are local packing materials that are made with coconut palms or bamboo splits. Sacks include gunny bags and polythene bags. The Tenga is mainly used in Tanga and Iringa regions for packing tomatoes, fresh beans and mangoes while different sized sacks are used for cabbage, carrots, cucumber and onions. Wooden boxes are commonly used in Kilimanjaro and Arusha for packing tomatoes and onions. "Tenga", gunny bags, baskets and tins are used in Lushoto districts as packaging materials

The use of poor packing materials such as cotton sacks that are much softer than wooden boxes result into loss of produce such as tomatoes that get crushed leading to heavy post harvest losses (Mbelwa, 1999). He further argues that, post harvest handling facilities are poor, and their life span is short to be used in transportation without causing much damage to fruits and vegetables.

In addition, Anandajayasekeram (1983) revealed that the FFV marketing system in most African countries is informal, quality differences are visual, transport facilities are irregular and unreliable, market information at the producer level is virtually non-existent, and the current pricing mechanism is unsatisfactory. There is a great potential to improve both the operational and the pricing efficiency of the current marketing system. Efforts directed at providing road services and maintenance, transport facilities, input supplies, market information, and encouraging marketing research are likely to yield greater benefit to the producers and the district than direct Government involvement in marketing and pricing.

A study conducted by Eskola, (2005) identified main impediments facing agricultural trade in Tanzania; the following have also impeded the wholesale-consumer segment of the FFV value chain;

Inadequate physical infrastructure such as

A) Poor road infrastructure leading to,
   o Increased cost of transportation adding to wholesaling costs hence reflected on the final retail prices;
   o Delays in transport adding up to wastage costs and;
   o Decreased size and profitability of the market;

B) Inadequate storage,
   o Loss of perishable goods;
   o Increased risk for traders;

C) Poor market infrastructure,

o Health problems for traders and consumers;

Lack of know-how and capital,

 o Lack of business skills (traders);

 o Difficulties in managing and obtaining loans to increase working capital;

  – Micro credit schemes poorly run or under-funded;

  – Problems with repayment and high interest rates;

  – Difficulty in expanding business due to lack of capita;

Weak institutional framework,

 o Poor institutional capacity to foster organisation of farmers and traders;

 o Weak legal framework to enforce contracts particularly between wholesalers and retailers such as supermarkets leading to;

  – Long supply chains between known parties;

  – Increased cost of trading;

  – Lack of standard measurement and quality;

 o Lack of market information especially for wholesale traders hence necessitates the use of market informed brokers;

 o Corruption which has stagnated markets' infrastructural development;

1.13   Opportunities facing the industry

1.13.1 Urban population growth rates

The urban areas of most developing countries have experienced a very rapid and concentrated growth creating an ever-swelling demand for food (Lynch, 1994). High urban population growth rates pose the possibility of more rapid growth in FFV domestic demand. The growth of urban population will be coupled with an increase in cash income and higher dependence on the market as a source for food rather than subsistence. In addition, urban people happen to be more informed, have more access to information, and are better educated than rural dwellers. Access to information and education are expected to raise awareness about health benefits of FFV, leading to a change in dietary preferences.

As discussed earlier in the introduction section, Tanzania's high urban population growth rates, and much lower rates in rural areas are expected to lead to a 58% urban share in total population by 2030. According to the population statistics and projection by UN common database (2005), it can be projected that, while in 2005 each rural person had to feed only 0.60 urban people, in 2030, each rural person will have to feed 1.39 people, this means each rural person will have to produce about 2.3 times more FFV in 2030 compared to 2005, assuming no growth in real per capita demand. If it is assumed that income growth drives a 1% yearly increase in real demand for FFV, then each rural person will have to produce about thrice as much FFV in 2030 compared to 2005. To achieve that total growth requires growth of 4.5% per year for 25 years. This is a challenge that poses an opportunity to FFV producers and the Nation in general.

1.13.2 Growth of niche market

1.13.2.1 Supermarket

In recent years there has been a great concern about supermarket growth in Africa and its potential impact on smallholder farmers (Reardon *et al.*, 2003). This concern is due to the reason that in most developed countries, supermarkets have dominated the retail market and similar trend is expected to occur in developing countries in the near future. According to Weatherspoon and Reardon (2003), emergence of niche markets like supermarkets has brought challenges to small farmers in developing countries. Substantial uncertainty exists, however, regarding the likely rate of growth of these outlets in Africa (Tschirley *et al.*, 2004).

A study conducted by Tschirley *et al.* (2004) in Kenya revealed that per capita incomes and urbanization are both positively associated with the growth in supermarket share of the FFV market. However, a country like Kenya where per capita income is less than half that of the lowest Latin American country, and about one-tenth that of South Africa and the wealthier Latin American countries, and with less urban share of total population, growth rate of supermarket is still uncertain considering the fact that even among the wealthier Latin American countries, supermarket shares of the FFV market are typically about 20% with 37% in Brazil considered unusually high.

In addition, the study also revealed another determinant of supermarket share of the FFV market as the ability of these firms to bring down costs and improve quality through "preferred supplier" programs and centralized procurement. Doing both is critical in a country like Kenya, where the mass of low income consumers are unlikely to pay sustained price premia for higher quality produce, and where traditional retail markets

and kiosks are well adapted to their buying habits. In this regard, the study commented that the poor physical system of grades and standards in Kenya simultaneously push supermarkets towards preferred suppliers and centralized procurement and raises the cost of instituting these systems. It is therefore still questionable as to how these procurement approaches would lower costs and improve quality in such countries like Kenya or even poorer like Tanzania.

Though current fresh produce market shares of supermarkets are very small relative to traditional channels, and although the growth of supermarkets in countries like Tanzania is still uncertain, these firms are potentially important new actors in the system and need to be included in the assessment.

1.13.2.2 Organic markets

Potential for growth of organic food demand poses an opportunity on fresh fruits and vegetables industry. According to Mwasha (2004), international trade in organic products is growing rapidly. Since the early 1960s there has been a growing market in Europe, Japan and the USA for products grown in a sustainable manner and without the use of agro chemicals. The organic market has grown from US$ 13 billion in 1998 to US$ 25 billion in 2005. This is due to the increasing environmental concerns by the consumers in these developed countries. As such, they are willing to pay premium prices for certified organic products (Mwasha, 2004).

Slowly, governments, cooperatives, NGO, as well as private companies in developing countries, have recognised the potential of organic markets and their influence on environment, health, bio-diversity and food security issues. In Tanzania for example, there are several companies involved in certified organic production and exports. These include Dabaga Vegetable and

Fruit Can Company Ltd, Matunda Mema/Kipepeo and others such as such as Kibidula which are still under conversion and not yet certified as organic.

A study conducted by Mwasha in 2004 revealed that in the year 2001/02 a total of 1722 MT of various organic products was produced in Tanzania. A total of 1594 MT (92% of total production) was exported during the same period to Germany, Sweden, Switzerland, UK and USA. In addition, a study in East Africa by Saxena (2006) revealed that organic world market grew from USD 24 billion in 2004 to USD 40 billion in 2006. It also revealed that global sales of fresh organic fruit & vegetables are increasing at 8.4 % per annum.

1.14 Factors affecting consumers' decision making

According to Bon (2001), based on data collected in Africa, including Tanzania, and South-East Asia, consumers' decisions about what and where to purchase are based on price, availability of the product on the market, and on the qualitative characteristics of the products. Traditional habits also have a very strong influence on consumer demand.

Barnes (2000) reported that, consumers value quality, prices, delivery reliability, packaging and flexibility as most important factors before making purchase decisions. Moreover, income was also pointed out as an important factor that influences consumers' decision. According to Barnes (2000), in low income final markets, price will be an important but not unique determinant of consumer decisions. Customers may also consider quality and branding. In higher income final markets these non-price factors will generally be relatively more important with quality dominating.

In addition, according to the United Nations (2004), safety, taste, freshness and quality

rank among the main factors that influence consumers' decisions about what and where to purchase. These factors may also influence consumers' decision making in other sectors as well including the FFV sector.

Summarizing, literature has shown potential demand growth of FFV in Tanzania as urban population and incomes grow. However, the industry is facing several constraints such as inadequate physical infrastructure, lack of know-how and capital as well as a weak institutional framework. These factors have acted as impediments towards meeting consumer preferences that determine their decision making about what, when and where to purchase. Literature also reveals several factors that influence consumers' preferences including quality, freshness, reliability of delivery and price. It is important to note that quality should involve not only product features but also services rendered. In addition, literature has shown that traditional markets are anticipated to continue dominating FFV marketing in developing countries like Tanzania, however, the role of supermarkets should not be ignored.

CHAPTER THREE

3.0 METHODOLOGY

1.15 The study area

Dar es Salaam was chosen as the area of study because it is the major city and most urban populated in the country. According to Tanzania population and household census (2002), the total population of Dar es Salaam was 2 487 288 residents with average annual growth rate of 4.4%. According to USAID urban profile (2000) available at USAID website, Dar es Salaam has had rapid urban growth in the last two decades. Supportively, according the Tanzania population and housing census, Dar es Salaam was found comprising about 53% of the total urban population in Tanzania followed by Arusha (6%), Mbeya, Mwanza, Morogoro and Zanzibar comprising 5% each, Tanga (4%), Dodoma, Moshi, Kigoma and Tabora with 3% each.

This suggests Dar es Salaam as the major market for fresh fruits and vegetables in the country. Kariakoo was found to be the major wholesale market in Dar es Salaam with most retail traders in the city relying on it as their major source of FFV.

Before sampling was done, other main wholesale markets were identified through secondary and primary data information from Ilala municipal and interviewed traders from Kariakoo. Buguruni, Ilala and Kisutu were identified as additional main wholesale (and retail) markets where large quantities of FFV were delivered each day.

1.16   Sampling and data collection

1.16.1 Primary data

Primary data for this study was collected through several surveys of market participants conducted in Ilala Municipal, Dar es Salaam region by using structured questionnaires.

Three surveys were conducted, wholesaler survey, retailer survey and consumer survey. Interviews with wholesalers and retailers were done to obtain data that was used to characterize the value chain and establish gross margins in different stages along the chain. At this phase, wholesale survey was conducted in two main wholesale markets in Ilala municipal, these were Kariakoo and Buguruni markets. Data on the scale of operation, seasonality of supply from different areas and prices paid/received for each type of trader as well as about the assembly process and the costs associated was collected.

The number of delivering trucks arriving at the market at the time of interview was counted and each truck was given a number. Each truck delivering products at the market was owned or rented by one or more wholesalers, sometimes referred to as first sellers who travelled with the product from upcountry regions and sold their products through an agent operating in the market to retailers at a commission. However, a single wholesaler per truck was considered in the sample. A random number table was used to draw a wholesaler sample. Five wholesalers were interviewed for each product from each of the two markets.

A retail survey was conducted in the retail section of the two main wholesale markets above since these wholesale markets have large retail sections. Two purposively selected main residential retail markets linked to these wholesale markets were also included; these were Ilala and Kisutu making a total of four markets. Ten retailer interviews per FFV item were conducted for each market. This means that a single trader was interviewed for more than one FFV item if trading in more than one. In locations where retailers were less than ten, all available retailers were interviewed (See Table 1 below). Information collected include products sold, any value added activities conducted and costs associated, whether products are packaged or not, sources of supply, volume purchased and sold as well as price paid and received.

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

Table 1: Population and sample of retail trader respondents selected

Product	Location								Total	
	Kariakoo		Ilala		Buguruni		Kisutu			
	Population	Sample	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Tomato	32	10	17	10	28	10	14	10	91	40
Dry onions	29	10	19	10	24	10	11	10	83	40
Cabbage	23	10	2	2	9	9	6	6	40	27
Orange	9	9	7	7	17	10	7	7	40	33
Amaranth	19	10	9	9	13	10	4	4	45	33
Total	**112**	**49**	**54**	**38**	**91**	**49**	**42**	**37**	**299**	**173**

Interviews with Shoprite fresh produce procurement managers was conducted with focus on getting information about procurement patterns such as how much of their FFV

supplies come from preferred supplier programs and how much come through traditional marketing channels (e.g., from brokers).

A consumer survey was also conducted whereby shoppers were interviewed every half hour emerging from the same four markets included in the retail survey, plus two Shoprite stores (Kamata and J.M. Mall branches). Number of respondents was collected depending on the availability of consumers after every half hour in a day of interview. Interviews were carried for two days in each market and one day for each Shoprite stores. This survey provided data on how often consumers purchase FFV, where they mostly purchase, their home wards, price paid in the markets they were interviewed in and the most preferred markets, as well as factors that determine their purchasing preferences.

Table 2: Consumer survey sample dis-aggregated by gender

Location	Percent respondents by gender		
	Male	Female	Total (n)
Kariakoo	0	100	33
Ilala	24	76	25
Buguruni	30	70	27
Kisutu	36	64	25
Shoprite - Kamata	66	33	6
Shoprite - J.M. Mall	66	33	6
Total	**31**	**91**	**122**

1.16.2 Secondary data

Secondary data were mainly obtained from the municipal council such as list of markets to identify the most important ones, the Ministry of Agriculture and the Ministry of Industry, Marketing and Trade, for data such as important fruits and vegetables grown in Tanzania, Non-governmental organizations particularly DAI-PESA for studies and publications on fresh fruits and vegetables to obtain an insight of the industry on production and marketing trends as well as the internet for population statistics.

1.17 Data analysis

Descriptive analysis was adopted to describe and characterize the chain; diagrams and tables were used to illustrate geographic marketing patterns and product flows, seasonality of supply, relative marketing sizes and gross margins in different stages of the chain.

Descriptive analysis such as frequencies, graphs, cross tabulation and chi-square as well as mean comparison were used to describe and analyze where consumers mostly purchase their fresh produce and compare mean prices paid and charged in different markets. Moreover, gross margins were calculated in different stages along the traditional open air market segment of the chain, starting at the wholesale level in order to measure the distribution of gross returns along the chain.

Univariate dichotomous models, such as Probit or Logit analysis models have been used frequently to model the consumer decision of whether or not to purchase a particular commodity in order to estimate the likelihood of purchasing (Han and Wahl 1998). A backward logistic regression analysis was used to analyze the factors influencing the likelihood to purchase fresh produce in a modern market. The aim was to discover the

significance of the motives that lead to differences in consumers' decision making about where to purchase, assuming that consumers behave in such a way as to maximise their utility when choosing between alternatives.

The logit model was specified as follows

$$P_i = \frac{1}{1+e^{-z_i}}$$

Where,

$$P_i = E(Y = 1/X_i) = \beta_0 + \sum_{i=1}^{k} \beta_i X_i + \mu$$

$$Z_i = f(X_i)$$

Y =   1 if a shopper preferred purchasing FFV in the modern market (such as a Shoprite and Imalaseko) and 0 if purchased elsewhere.

K =   Number of explanatory variables

Z =   logistic estimate ranging from $+\infty$ to $-\infty$

$\beta's$ $\quad\quad\quad\quad$ μ $\quad\quad\quad\quad$ P_i $\quad\quad\quad\quad\quad\quad$ E
are constants,   is the error term,   is the probability and   is the expected value.

Table 3: Model description

Predictors	Expected influence on consumer behaviour
$x_1 =$ Household income	Higher income consumers are more likely to purchase FFV from supermarkets
$x_2 =$ Consumers level of importance attached on price	Those who value price as the most important factor that influence their decision making are less likely to purchase FFV from supermarkets
$x_3 =$ Product and service quality attributes (indices include product outlook or packaging, freshness, reliability of supply, market accessibility, market cleanliness, customer services and food safety)	Consumers who value quality attributes and services as most important factors that determine their purchase decision making will more likely purchase FFV from supermarkets
$x_4 =$ Gender	Male consumers are more likely to purchase FFV from supermarkets

1.18 Data limitation

i.   Poor record keeping among traders as well as scepticism in provision of
     information. Some traders were reluctant to provide information. A substantial
     amount of time was used to explain to respondents about objectives of the study
     and repeating questions at late stages of the interview to capture missed or
     suspicious responses.

ii.   Secondary data on fruits and vegetables marketing especially those concerning the traditional open-air market segment of the chain in Tanzania was too limited. Most of the literature did not reflect the actual situation in Tanzania but revealed realities in different countries whose marketing challenges and opportunities might be different.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

1.19 Social economic characteristics of the respondents

1.19.1 Traders

The results summarized in Table 4 indicate that in all four markets studied, a large majority of both wholesalers and retailers are male. This is probably because, in most poor to average income Tanzanians' families, men are in charge of family businesses involving cash transactions while women are in charge of taking care of their homes and children and therefore spending most of their times at home. In addition, access to capital might be another reason for this pattern since women, especially in developing countries, have limited access to means of production and support services such as credit as compared to men.

Traders' mean age was found to be 35 years with an average of 11 years of experience in FFV business ranging from a minimum of 9 years to 15 years. Older and experienced traders were found at Kisutu with mean age of 38 years compared to 35 in other markets and 15 years of experience compared to less than 11 years in other markets. In addition, it was found that a large proportion of traders were not associated with any trading organisation as shown in Table 4 below. Only 41% were found to be members of one or more trading organisation(s). However, a larger percentage of traders at Kariakoo and Kisutu were found to be members of at least one trading organization. This is probably because Kisutu and Kariakoo markets have infrastructure that allowed establishment of

organizations' offices thus bringing services closer to their members and making it easier for particular organizations to attract new members in those markets. On top of that Kisutu is closer to Kariakoo than are the other two markets, and since most organizations' office headquarters are located at Kariakoo, it could be another advantage for Kisutu traders.

Table 4: Socio economic characteristics of wholesale and retail FFV traders

Location	Type of respondents	Percent respondents by gender		Total Count	Mean age (years)	Experience in business (Years)	Trading organisation Membership (%)	
		Male	Female				Member	Non
Kariakoo	Wholesalers	88	12	25	33	11	56	44
	Retailers	82	18	49	34	10	65	35
	Sub Total	84	16	74	34	11	62	38
Buguruni	Wholesalers	80	20	20	34	9	25	75
	Retailers	67	33	49	38	11	22	78
	Sub Total	71	29	69	36	10	23	77
Ilala	Retailers	100	0	38	36	11	18	82
Kisutu	Retailers	84	16	37	38	15	54	46
	Grand Total	**83**	**17**	**218**	**36**	**11**	**41**	**59**

This suggests the need to provide business training to small traders about the importance of social capital in improving their efficiency and participation in the market by creating a more sustainable supply environment, which will at the end improve customers' loyalty as well as improving their power to demand for public services from respective authorities and organize well infrastructure in their respective markets. This can be done by improving capacity of existing organization to serve distant located traders by organizing smaller groups that may not necessarily run an office in their respective market premises but can be served collectively and efficiently.

Most interviewed retail traders (64%) engaged in other income generating activities such as running shops, selling charcoal, fast food businesses known as "Mama/Baba Lishe",

and selling other food item other than the selected ones, such as coconuts, rice and other FFV like peas, avocados, lemons, pineapples, sweet potatoes and leaves, Chinese leaves, Irish potatoes, carrots, watermelons tangerines and mangoes. The reason for diversification is probably that most of the items sold are highly seasonal and cannot be relied upon as a sole source of income to cater for the basic needs during the whole year.

1.19.2 Consumers

Most purchasers were found to be females who comprise 75% of the respondents where as male shoppers were 25%. Sixty nine percent of the interviewed respondents, and 84% of the female respondents, indicated that they were responsible for their household's day-to-day purchases. Only 29% of male respondents were found to be primarily responsible for food purchases in their household.

Pearson Chi-Square = 30.729

Significance = 0.000
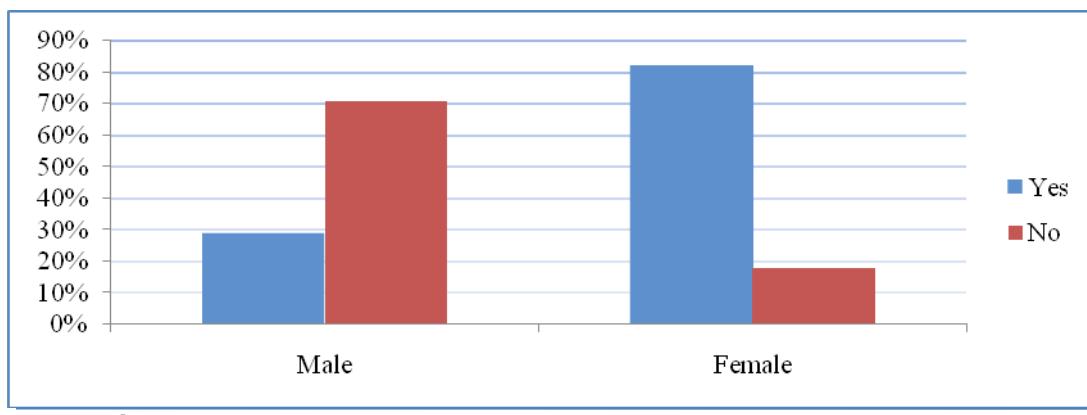
Figure 5: Gender of respondent against person responsible for food purchases
Table 5 below shows that only a small proportion of male shoppers (13%) were unemployed compared to 31% of female shoppers. However, a large proportion of

women were formally employed or self employed which might have played an important

role of reducing income gap between males and females.

Table 5: Shoppers employment status dis-aggregated by gender

Location	Percent respondents by gender	
	Male	**Female**
Unemployed	13	28
Formal salaried employed	39	35
Informal salaried employed	13	9
Self employed (Formal business)	23	24
Self employed (Informal business)	12	1
Students	0	3
Total number of respondents (n)	**31**	**76**

Table 6: Shoppers type of employment across Shoprite and other markets

Type of employment	Percent respondents by markets			Total (n)
	All markets	**Shoprite**	**Other markets**	
Unemployed	21	0	23	25
Formal salaried	32	83	26	39
Informal salaried	9	0	10	11
Formal business (self employed)	21	17	21	25
Informal business (self employed)	4	0	4	5
Student	2	0	2	2
Total (% respondents)	88	100	86	107
Missing (% respondents)	12	0	14	15
Total Count (n)	**122**	**12**	**110**	**122**

Table 6 indicates that all the respondents at the Shoprite were either formally employed

or run formal businesses. The difference across type of employment in other markets

was not so clear. For instance, although 23% of those found in other markets were

unemployed, more than 45% were either formally employed or run formal businesses. In

addition 14% were employed or run business informally. This suggests that other

markets like open-air markets, street vendors and shops were important source of FFV

for all types of employment categories.

1.20   Fresh fruits and vegetables marketing and distribution practices

1.20.1   Overview of FFV wholesaling and retailing in Dar es Salaam

Fig. 8: shows a channel map for horticultural produce flowing into Kariakoo and Buguruni markets. The map distinguishes between small, medium, and large flows of produce. Classification of the size was based on qualitative information collected from interviewing FFV wholesalers and retailers in selected markets.

Smallholder sector was found to dominate the market as shown in Fig. 6: It was found that 13% of retail traders sourced their products directly from the farm and among them, more than 95% were supplied by smallholder farmers where as 89% of wholesalers relied on small farms as their main source of supply.
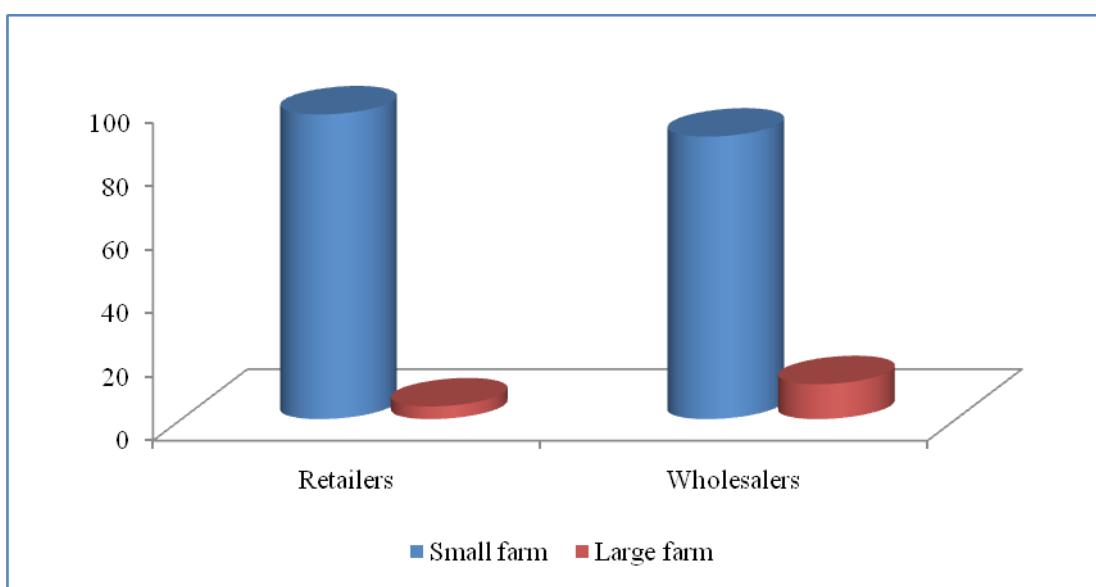
Figure 6: Percent of small and large farm share of supply for selected FFV

Wholesale markets are the hubs around which the marketing system operates; retail traders source nearly all their produce from these markets as indicated in Fig. 7: Farms were the most important source of amaranths for the retailers. This is probably because of the high perishability of amaranths, which cannot withstand more transactions without losing quality before reaching their destination market.
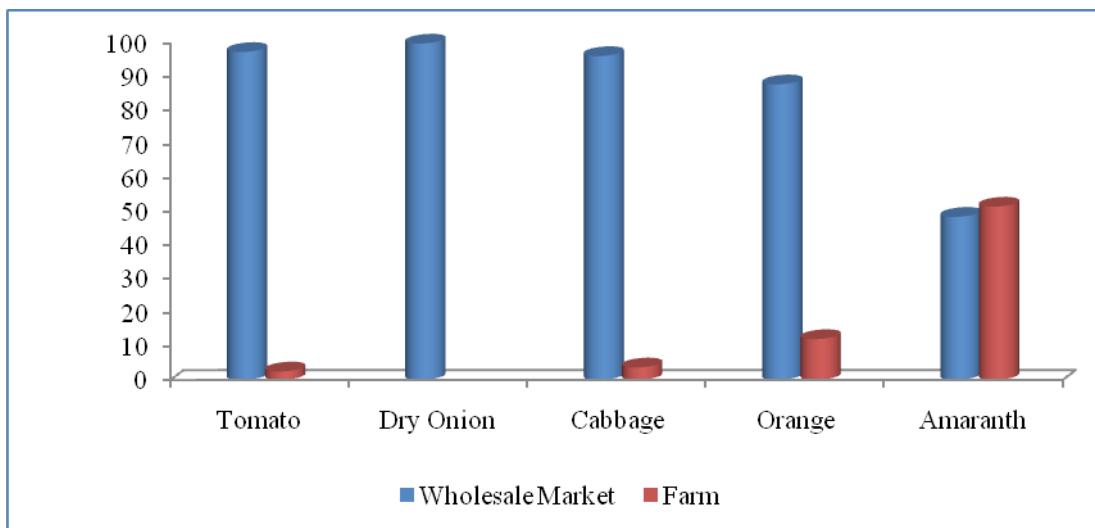
Figure 7: Main retail-level sources of supply for selected FFV

Figure 8: Simplified channel map of Dar es Salaam FFV system

Production

Wholesale

Small Farms

Large Farms

Neighbouring Countries

Tomatoes
Dry Onions
Cabbages
Oranges
Amaranths

Amaranth, Oranges, Cabbages, Tomatoes

Tomatoes, Cabbages, Oranges, Amaranths

Oranges

Wholesale Markets (Kariakoo and Buguruni)

Open air retail markets | Supe:

Small flow   Medium flow   La

cal supply of fresh fruits and vegetables
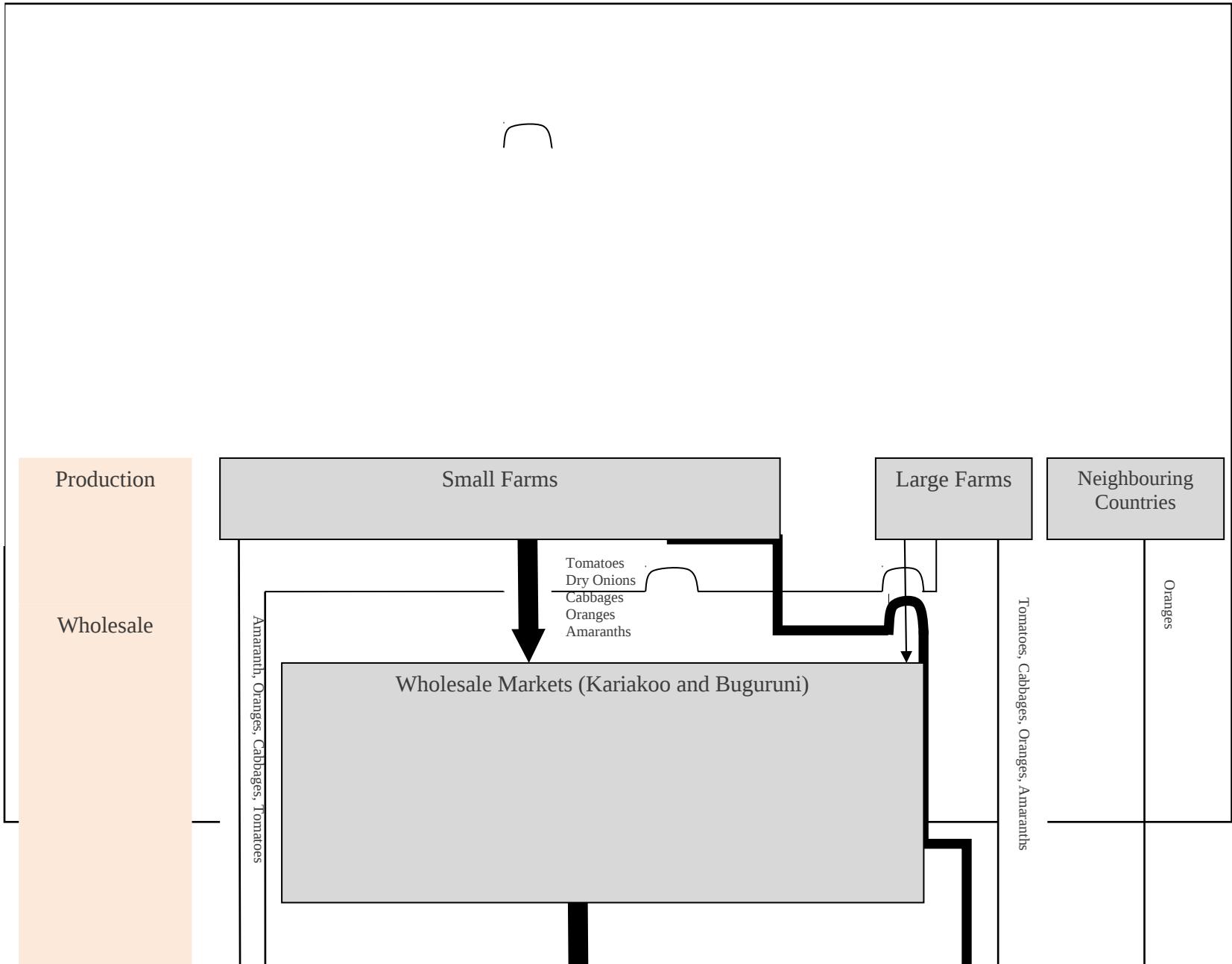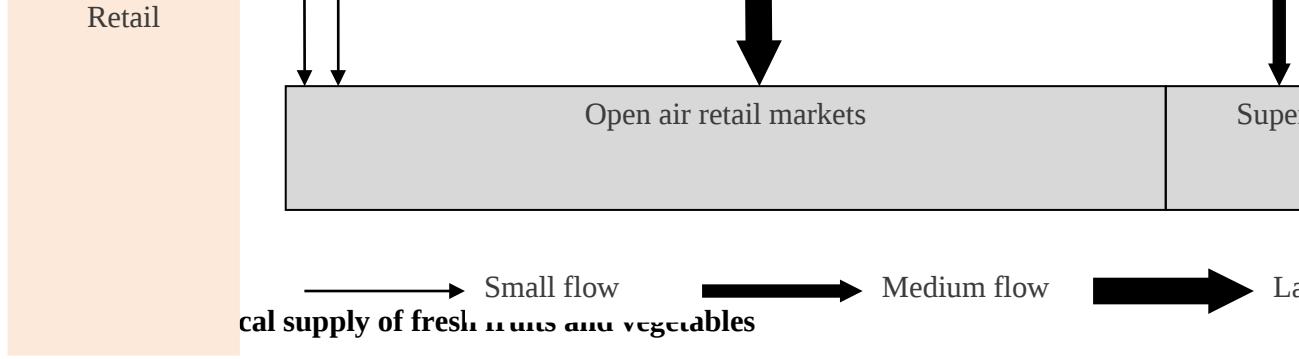
The results revealed that at the time of interview Iringa was the largest supplier of tomatoes to Dar es Salaam markets followed by Morogoro and Kilimanjaro (Moshi) as shown in Fig. 9: Most dry onions were coming from Arusha, Kilimajaro, Morogoro and Iringa. Arusha was also the major supplier of cabbages followed by Tanga, Kilimanjaro and Iringa. Most oranges were sourced from Tanga and Pwani. Morogoro was also found to be another source of oranges to the market. Dar es Salaam was the only source of supply of amaranths to this market. This is probably because amaranth is highly perishable and difficult to be transported from longer distances without major degradation of its quality and freshness. In addition, there are many amaranth growers in Dar es Salaam outskirts growing it all year round hence be able to supply the market at any time of the year.
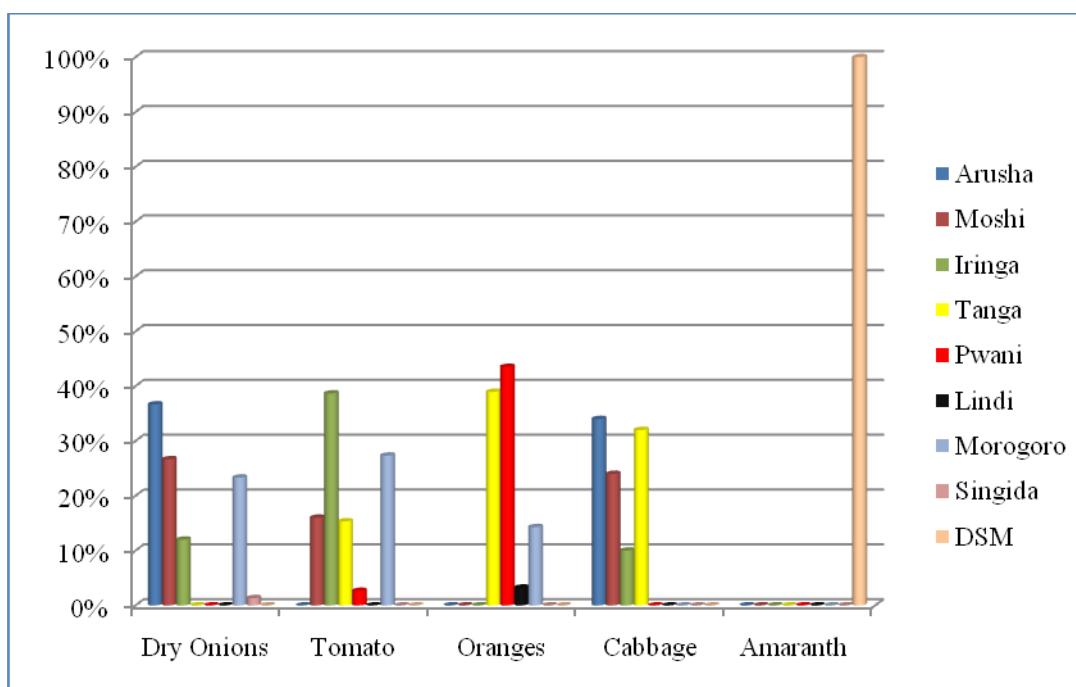
Figure 8: Percent regional share of supply for selected FFV to Ilala markets

1.20.3 Seasonality of supply for fresh fruit and vegetables

The seasonality of supply of the selected FFV items was determined using information obtained from qualitative interviews with wholesalers in Kariakoo and Buguruni markets. The respondents were for each produce asked to score from 0 to 3 (0 denoting no supply, 3 highest supply) the supply of produce to the markets for each month of the year. They were also asked to give indications of the main sources of supply for each particular period. The scores from the five interviews for each produce item were averaged to derive the overall monthly supply assessment.

Tomato shows almost constant supply throughout the year although more or less like double peak supply in one calendar year with little supply in the months of May to August when most tomato were mainly sourced from only one region of Morogoro. During high seasons of October to April, Iringa, Moshi and Tanga were found to be the major suppliers of Tomato to the city.

Dry Onion shows a similar seasonal pattern to tomato. Supply is high from August to January then declines through June before starting to pick-up again in July. Little is supplied in April to June with Singida being most important source during this period. Iringa, Moshi and Arusha were the major suppliers in late and early months of the year whereas Morogoro was the major supplier in the mid to late months of the year

Cabbage seasonality of supply in Dar es Salaam is broadly comparable to that of tomato and dry onions. Supply is high from August to October and lower around May to June. Cabbage to Dar es Salaam is mostly supplied from Moshi, Arusha, Iringa and Tanga throughout the year.

The seasonality of orange supply is different from all the three vegetables above. The supply is very low in January to March, picking up in April, reaching its peak around May to June before declining gradually to December. Tanga, Pwani and Morogoro were found to be the major supplier of oranges to Dar es Salaam.

Amaranth supply shows substantially less seasonal variation in Dar es Salaam market. As was discussed earlier, the major source of amaranth for Dar es Salaam market is its own outskirts. Since amaranth is grown almost throughout the year, there have been witnessed a sustainable supply of amaranth to the market.
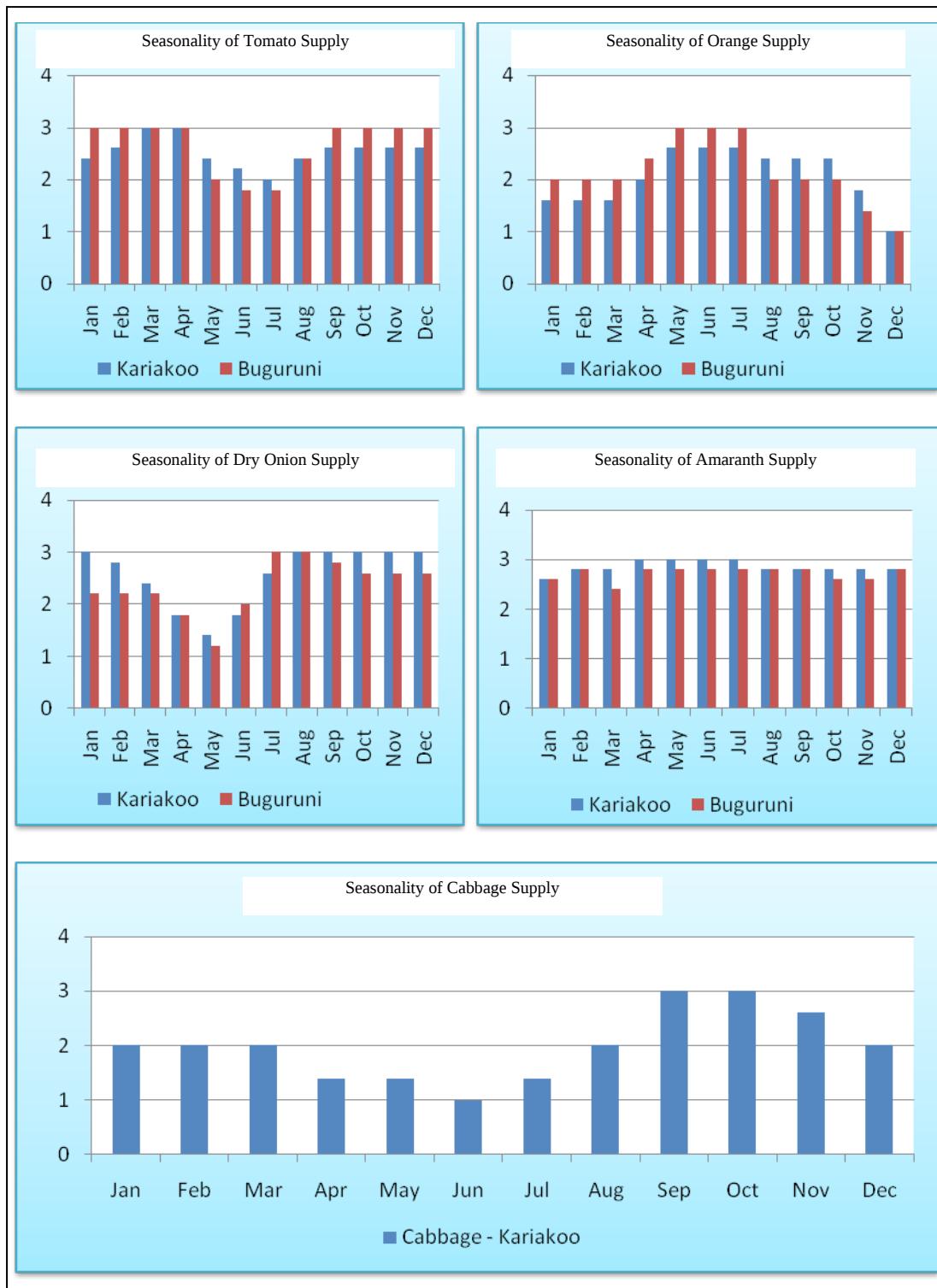
Figure 9: Seasonality of supply

1.20.4 Market maps

1.20.4.1 Rural-wholesalers market maps

Below are maps showing most important sources and seasonality of supply for selected FFV in Kariakoo and Buguruni wholesale markets whereby wholesalers were asked to mention four most important sources of supply, two during high supply and the other two during low supply seasons, in the order of importance. The market map for amaranth was not included since it had only one source of supply throughout the year, which was Dar es Salaam.

Dry onions

It was found that Arusha and Moshi were important source of dry onions for Buguruni traders followed by Iringa and Morogoro with medium flows where as in addition to Arusha and Moshi, Morogoro was also an important source for Kariakoo traders while Iringa was medium. Singida was another source especially in times of scarcity of supply in other regions.
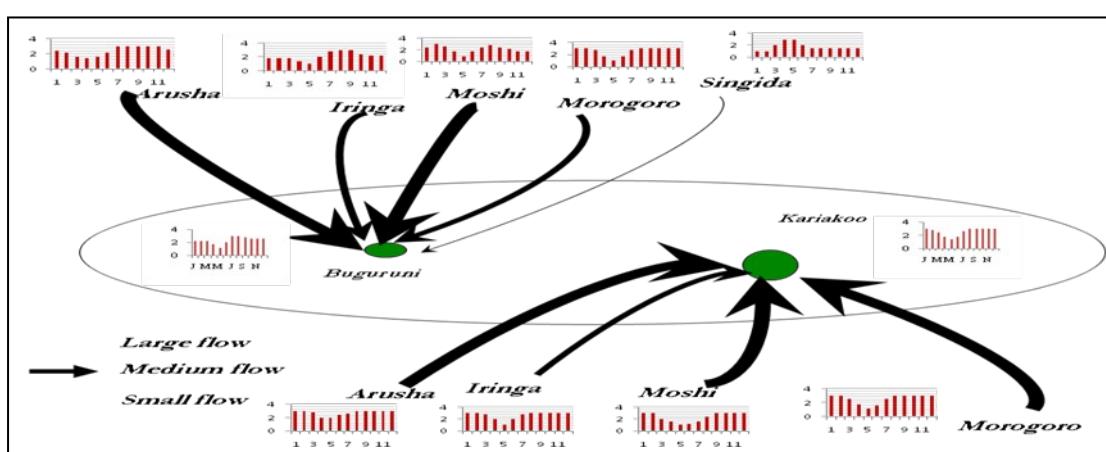
Figure 10: Rural-Wholesaler Market Map for Dry Onions

Tomato

The most important sources of tomato for traders in both market were Iringa and Morogoro followed by Moshi and Tanga. Pwani was another source of supply mentioned by a few traders at Buguruni. Morogoro was found to be the most important source of tomato during the middle of the year whereas other regions were important mainly late in the year towards early the following year; Morogoro thus serves to stabilize supply to the market over the course of the year.
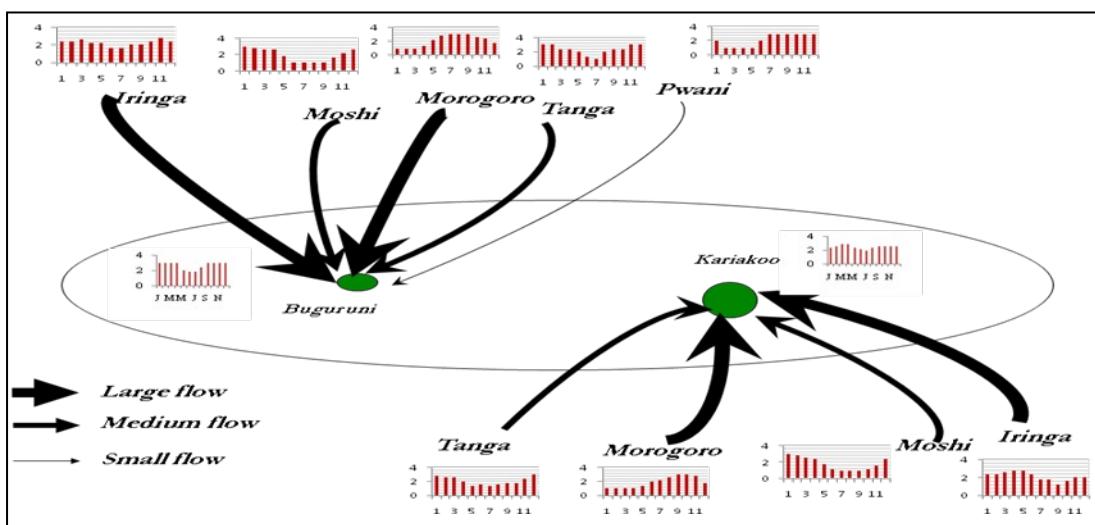
Figure 11: Rural-Wholesaler Market Map for Tomato

Oranges

Tanga was the most important supplier of oranges to both markets whereas Pwani was also found an important source particularly for Buguruni traders especially from mid to late in the year. Morogoro was another source of supply to both markets followed by Lindi where some traders mentioned it as important source of supply especially in low seasons of early months of the year.
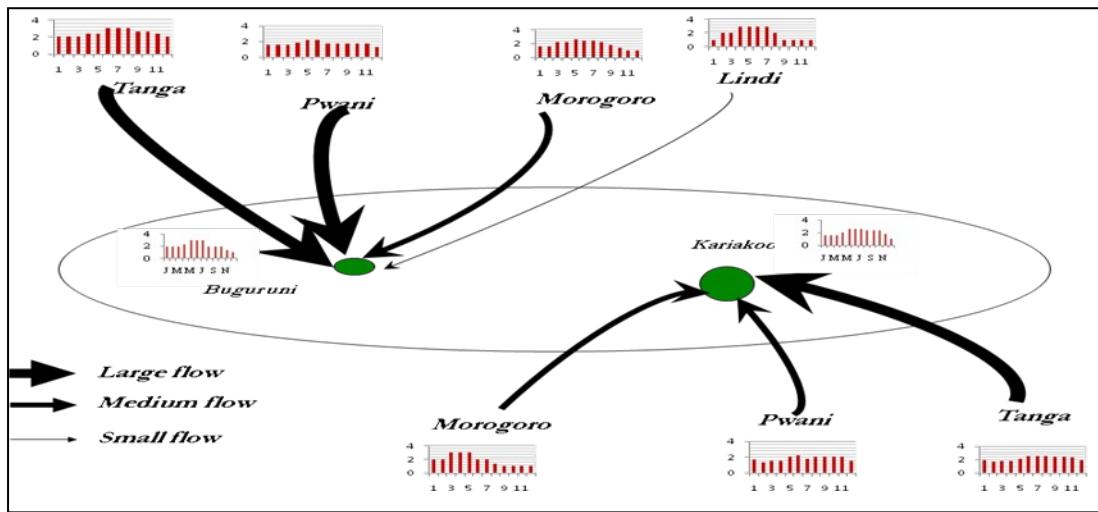
Figure 12: Rural-Wholesaler Market Map for Oranges

Cabbages

Tanga and Arusha were the largest suppliers of cabbages to Dar es Salaam followed by Moshi and Iringa. Although Moshi was not as important a source of supply as Arusha and Tanga during the high season, it was most important during the low season, especially in the mid of the year. At the time of interview there was no cabbage wholesaling at Buguruni market. In general, Kariakoo was found the sole wholesale markets for cabbages in Dar es Salaam.
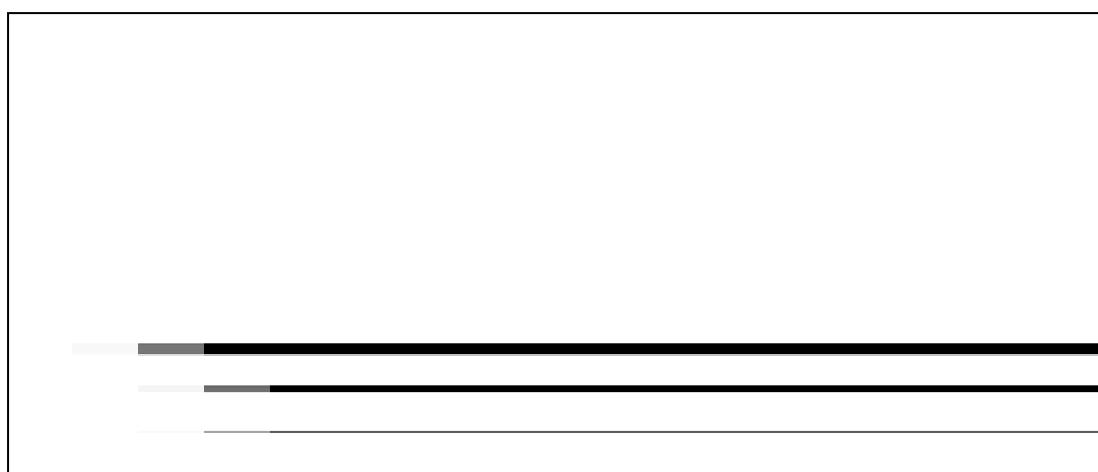
Figure 13: Rural-Wholesaler Market Map for Cabbages

1.20.5 Influence of seasonality in geographical supply of FFV

Results summarised in the maps above indicate that most crops were supplied throughout the year although with some variations in different months. Some crops have shown larger variation such as oranges, cabbages and to some extent dry onions. However, given variation in rainfall patterns across regions during the year, it was expected that, while the regional shares of supply might be changing across the year, the sources of supply will most likely remain the same. Table 7 below indicates sources of supply during high and low seasons for the selected FFV.

Table 7: Source of FFV supply in different seasons of the year

Product	Source of Supply			
	High Season		Low Season	
	Largest supplier	Second largest	Largest supplier	Second largest
Dry Onions	Arusha	Moshi	Morogoro/Iringa	Singida
Tomato	Iringa	Morogoro	Morogoro	Moshi/Pwani
Oranges	Tanga	Pwani	Morogoro	Pwani/Lindi
Cabbages	Tanga	Arusha	Moshi	Iringa
Amaranth	DSM	DSM	DSM	DSM

As discussed earlier, Arusha and Moshi were the largest suppliers of dry onions especially during peak seasons whereas during low seasons, FFV traders relied most on Morogoro and Iringa.

Iringa and Morogoro were the main sources of tomato during peak seasons. However, Morogoro was also the main supplier during low seasons as well as Moshi and Pwani. This is probably because the season starts earlier in Morogoro as compared to other tomato producing areas such as Iringa, Moshi and Tanga.

In additional, Tanga was the largest supplier of oranges followed by Pwani whereas Morogoro was the largest during low supply followed by Pwani and Lindi. Again, Tanga was the largest supply of cabbages during high seasons followed by Arusha whereas Moshi was the largest followed by Iringa during low supply seasons. As revealed earlier in this study, Dar es Salaam urban farmers were the only source of Amaranth to the city throughout the year.

In general, during the time of interview, Kariakoo was found to be the major source of produce for most traditional retailers as shown in Fig. 15: and Table 8. This is probably because Kariakoo market was the first destination for most of the products and therefore, while the products are still fresh, the price is more likely to be lower than in other markets hence attracting more customers. On top of that, availability of a wide range of products at Kariakoo might be another factor that attracts more customers.

Buguruni was an important source of orange supply since most orange wholesalers preferred Buguruni than Kariakoo. Bureaucracy and poor delivering and unloading infrastructural arrangement at Kariakoo market discouraged wholesalers to operate at this market. Unloading trucks at Kariakoo market was done inside the market causing long queues leading to chaos and time consuming unloading procedures. As a result many wholesalers shifted to Buguruni hence making it as the most important orange delivering market. Temeke stereo was also an important source of oranges for traditional retailers. This market was not included in the assessment because it is located outside the scope of this study.

Next to Kariakoo, Ilala was among the major sources of tomatoes for traditional retailers probably because of the distinguished tomato packaging. Most tomatoes wholesaled at Ilala were packed in crates/wooden sacks, which seem to keep quality much better in terms of product storability and visual appearance than "Tenga" which was used in other markets. This might be the reason that attracts most tomato retail traders especially from Kisutu where middle to higher income consumers were also found shopping more frequently.
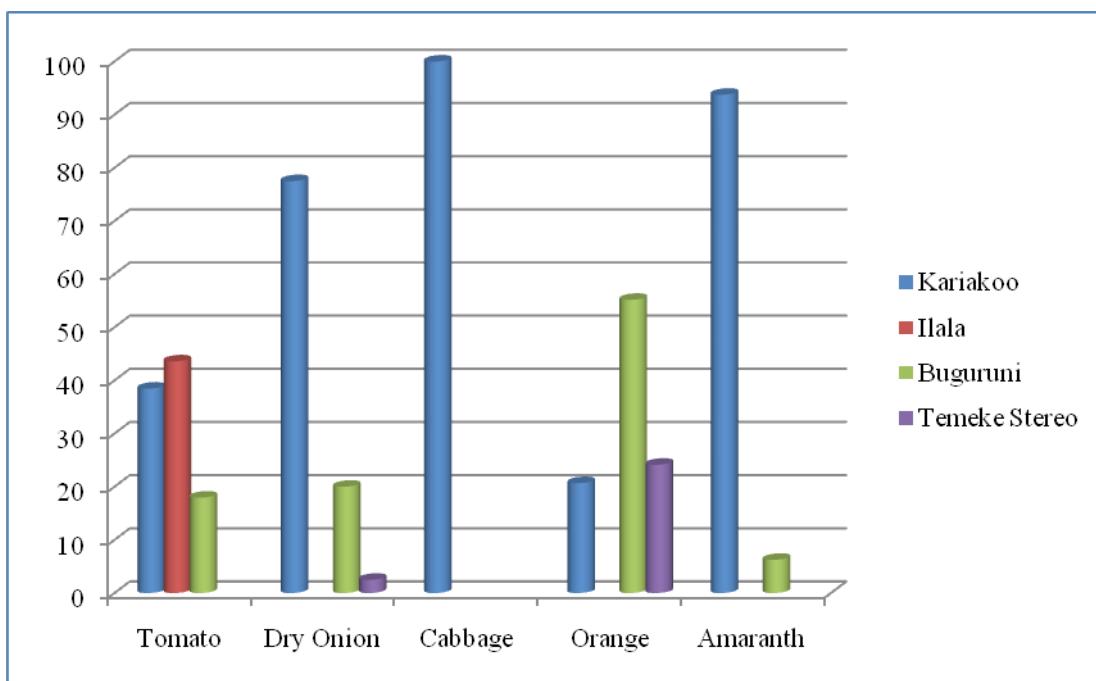
Figure 14: Percent share of supply for selected FFV to Dar es Salaam retail markets

Table 8: Retailers main sources of supply

Location	Percent Source of supply			
	Kariakoo	Ilala	Buguruni	Temeke Stereo

		Product				
Kariakoo		Tomato	90	10		
		Dry Onion	100			
		Cabbage	100			
Chi-Square	20.38	Orange	57			43
Asymp. Sig.	0.01	Amaranth	100			
		Total	**91**	**2**		**7**
Ilala		Tomato		100		
		Dry Onion	100			
		Cabbage	100			
P-Value	57.71	Orange	14		43	43
Asymp. Sig.	0.00	Amaranth	100			
		Total	**50**	**32**	**9**	**9**
Buguruni		Tomato	11	11	78	
		Dry Onion	20		80	
		Cabbage	100			
P-Value	28.66	Orange			100	
Asymp. Sig.	0.00	Amaranth	50		50	
		Total	**33**	**3**	**64**	
Kisutu		Tomato	50	50		
		Dry Onion	90			10
		Cabbage	100			
P-Value	39.33	Orange	17		66	17
Asymp. Sig.	0.00	Amaranth	100			
		Total	**69**	**14**	**11**	**6**

Table 9: Most common wholesale markets in different seasons of the year

Product	Source of Supply			
	High Season		Low Season	
	Common market	**Second most**	**Common market**	**Second most**
Dry Onions	Kariakoo	Mabibo	Kariakoo	Mabibo
Tomato	Ilala	Kariakoo	Kariakoo	Ilala
Oranges	Buguruni	Temeke	Buguruni	Farm
Cabbages	Kariakoo	None	Kariakoo	None
Amaranth	Kariakoo	Farm	Kariakoo	Farm

Results summarized in Table 9 above show small seasonal variation in supply of FFV from different wholesale markets in the city. While Kariakoo was found to be the most common source for dry onions, cabbages and amaranth in both high and low seasons, Buguruni was found to be most common source of oranges in the two seasons whereas Ilala and Kariakoo were most common source of tomatoes in high and low seasons

respectively. Kariakoo was the most common during low supply season probably because during the season most tomato wholesalers sourced their products from Morogoro region where "Tenga" was the main packing material hence gave traders, who preferred wooden boxes/crates as packing media, no choice but to purchase from Kariakoo where the price of "Tenga" was most likely to be cheaper due to high competition than the 'Tenga" sold at Ilala.

According to Shoprite's Freshmark manager, the major sources of FFV supply are both large and small farms through local wholesalers/transporters contributing more than 50% of annual FFV supply, and preferred suppliers who supplied an estimated 25% of the produce annually. The remaining proportion of fruits is being imported annually especially oranges from South Africa.

1.20.6 The role of Agents/Brokers in wholesale markets

The use of brokers by first sellers appears to depend on the type of FFV being traded. Tomato, dry onions and cabbages are predominantly sold through brokers while orange and amaranth did not (Fig. 16). As it can be noted tomato, dry onions and cabbages were transported from longer distances and probably tired wholesalers, who normally travelled with their produce, preferred using brokers so that they have sufficient time to rest and at the same time take advantage of experienced and informed brokers in particular markets.
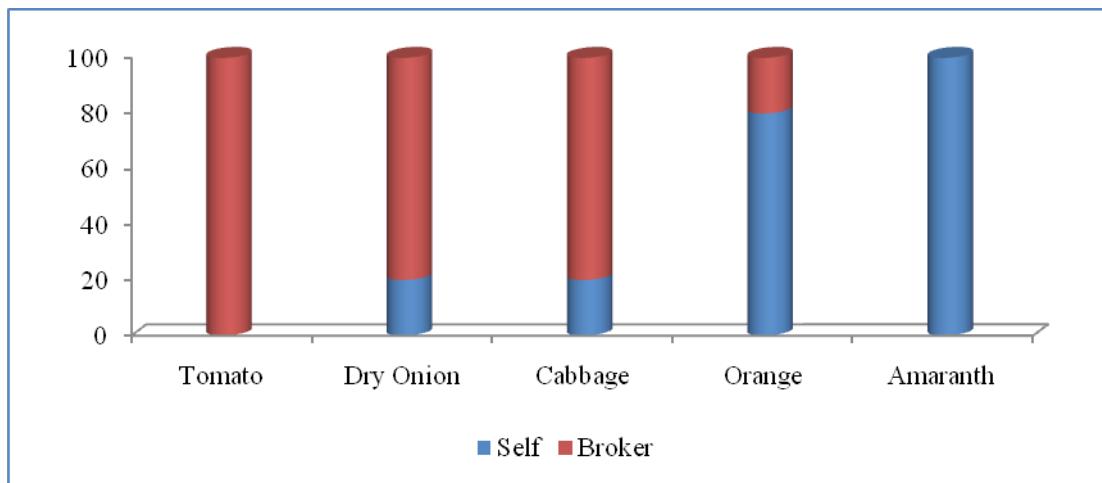
Figure 15: Frequency of selling through brokers

However, the role of agents or brokers in wholesale markets is a contentious issue in many countries. Some traders showed appreciation for the level of services provided by the agents whereas others complained especially about the habit of such agents of adding price mark ups, which they took for themselves without the seller's knowledge, in addition to the commission they agreed. However, still there is the need to consider the level of service provided by the agents as long as sellers receive some value in the form of higher price or shorter waiting time at the market. Average broker's fee was found to be 5% of the selling price.

1.21 FFV gross margin analysis

Gross margins presented below are sub-divided into two components, the gross margin that assumed purchase price as the only cost and the one that was obtained after deducting major costs incurred by most FFV traders.

1.21.1 Gross margin at wholesale level

Gross margin data presented below revealed the picture at the time of interview which is subject to change as a result to seasonality of supply that influences prices and number of actors involved in the chain.

a) Tomato

A Tenga, a basket made of bamboo and filled with soft straw in the bottom, is a common unit of sale for tomato in both Kariakoo and Buguruni. However, a crate, a wooden box like structure roughly equivalent to 0.6 of a Tenga, is another widely used unit of sale, especially in Buguruni.

At wholesale level, the average gross margin per Tenga of tomato was estimated to be 16 975 Tsh. A Tenga at Kariakoo was estimated to yield a margin of 16 917 Tsh. whereas a crate in Buguruni yielded 8 600 Tsh. per unit (Table 10). It was found that both Kariakoo and Buguruni wholesalers received similar gross margins per kg (70%). However, the gross margin after deducting major costs was found higher for Kariakoo traders (44%) as compared to Buguruni traders (32%).

Table 10: Tomato wholesale gross margin analysis

Unit	Kariakoo (n=5)	% of selling price	Buguruni (n=5)	% of selling price
	Tenga		**Crate**	
Purchase price/unit (Tsh)	7 083	30	3 700	30
Selling price/unit (Tsh)	24 000	100	12 300	100
Gross margin/unit (Tsh)	16 917	70	8 600	70
Broker fee (Tsh)	1 500	6	1 200	10

Loading Cost (Tsh)	400	2	340	3
Transport costs (Tsh)	4 350	18	3 050	25
Value adding costs (Tsh)	-		-	-
Unloading costs (Tsh)	-		-	-
Gross margin after deducting major costs (Tsh)	10 667	44	4 010	32
Average unit weight (kg)	71		48	
Gross margin/kg (Tsh)	238	70	179	70
Gross margin/kg after deducting major costs (Tsh)	150	44	84	32

The difference in profit margins might be contributed by broker fees, loading and transport costs which are all much higher per kg in a crate than in a Tenga. Transport cost is higher apparently because distance is longer since extra transport costs were incurred by wholesalers in ferrying the products from Kariakoo (as this was the first delivery point for most wholesalers) to Buguruni. But broker fees and loading costs are higher (per kg) per crate probably because of the economy of scale of working with larger units, especially in loading.

b) Dry onion

The most common unit of sale for dry onion wholesalers was 170 kg cotton bag for both Buguruni and Kariakoo (Table 11). Wholesalers at Kariakoo were found to receive higher return (15%) as a percent of selling price per kilogram of dry onion than those in Buguruni (12%). The difference might be due to higher purchase price and lower selling price in Buguruni.

Table 11: Dry onions wholesale gross margin analysis

Item	Kariakoo (n=5)	% of selling	Buguruni (n=5)	% of selling

		price		price
Unit	170 kg bag		170 kg bag	
Purchase price/unit (Tsh)	43 600	63	47 800	71
Selling price/unit (Tsh)	69 100		67 200	
Gross margin/unit (Tsh)	25 500	37	19 400	29
Broker fee (Tsh)	2 000	3	1 500	2
Loading Cost	1 700	2	2 100	3
Transport costs	11 600	17	8 067	12
Value adding costs	-		-	
Unloading costs	-		-	
Gross margin after deducting major costs (Tsh)	10 200	15	7 733	12
Average unit weight (kg)	175		174	
Gross margin/kg	146	37	111	29
Gross margin/kg after deducting major costs	58	15	44	12

c) **Cabbage**

Cabbage was found to provide an average return of 11% as a percent of selling price per kg of cabbage sold. Cabbage was the least profitable product to wholesalers as compared to the rest. The common unit of sale for wholesalers was a bag of 120 cabbages, weighing on average about 150 kg. A bag of cabbage yielded an average return of Tsh 4954. Kariakoo was found to be the sole supplier of cabbages to other retail markets in Dar es Salaam (Table 8). This is probably because of its cost advantage due to large volumes deliveries and traded per day as compared to other markets.

Table 12: Cabbages wholesale gross margin analysis

	Kariakoo (n=5)	% of selling price
Unit	120 units bag	
Purchase price/unit (Tsh)	25 143	54
Selling price/unit (Tsh)	46 200	
Gross margin/unit (Tsh)	21 057	46
Broker fee (Tsh)	1 875	4
Loading Cost	1 371	3
Transport costs	12 857	28
Value adding costs	-	-
Unloading costs	-	-

Gross margin after deducting major costs (Tsh)	4 954	11	
Average unit weight (kg)	150		
Gross margin/kg	140	46	
Gross margin/kg after deducting major costs	33	11	

d) Orange

The common unit for orange wholesaling was per orange basis whereby the number of oranges will be counted out from the truck as per retailer's order. Oranges provided a return of 10 Tsh. each. Average returns per kg of orange was found to be 58 Tsh. Buguruni wholesalers received a higher average return (31%) per kg of orange than those in Kariakoo (22%) as indicated in Table 13. This is probably due to low purchase price paid by Buguruni traders who most of them seemed to have re-allocated themselves from Kariakoo markets due to several infrastructural and tax collection problems facing Kariakoo market. The re-allocated traders may probably have a better knowledge of the cheaper sources of supply and negotiation capabilities due to their experience in the sub-sector. In addition, as more traders re-allocated from Kariakoo, competition is reduced at this market while stiff competition is being introduced at Buguruni. As a result it may have reduced the bargaining motive for Kariakoo traders while making bargaining necessary for Buguruni traders.

Table 13: Oranges wholesale gross margin analysis

	Kariakoo (n=5)	% of selling price	Buguruni (n-5)	% of selling price
Unit	Unit		Unit	
Purchase price/unit (Tsh)	21	56	16	46
Selling price/unit (Tsh)	38	100	35	100
Gross margin/unit (Tsh)	17	44	19	54
Broker fee (Tsh)	0.25	1	1	3
Loading Cost	1	3	1	3

Transport costs	7	18	6	17
Value adding costs	-	-	-	
Unloading costs	-	-	-	
Gross margin per unit after deducting major costs (Tsh)	8	22	11	31
Average unit weight (kg)	0.16		0.17	
Gross margin/kg	105	44	112	54
Gross margin per kg after deducting major costs	53	22	64	31

e) Amaranth

A bunch weighing 0.36kg on average was found to be common wholesaling unit in both Kariakoo and Buguruni markets. Buguruni traders were found to receive higher gross margins compared to those in Kariakoo. Unlike the case for oranges where competition is shifting to Buguruni and the possibility that wholesalers may exercise their greater bargaining power, stiff competition that existed in Kariakoo market may have caused higher wholesalers' purchase price due to the reason that farmers themselves have better knowledge of the market hence be in better bargaining position. Few wholesalers in Buguruni hence low competition may be advantageous under these conditions.

Table 14: Amaranth wholesale gross margin analysis

	Kariakoo (n=5)	% of selling price	Buguruni (n=5)	% of selling price
Unit	Bunch		Bunch	
Purchase price/unit (Tsh)	31	46	27	41
Selling price/unit (Tsh)	68	100	65	100
Gross margin/unit (Tsh)	37	54	38	59
Broker fee (Tsh)	-	-	-	-
Loading Cost	-	-	-	-
Transport costs	5	7	3	5
Value adding costs	-	-	-	
Unloading costs	-	-	2	3
Gross margin per unit after deducting	32	47	33	51

major costs (Tsh)			
Average unit weight (kg)	0.36		0.29
Gross margin/kg	102	54	132	59
Gross margin per kg after deducting major costs	88	47	115	51

1.21.2 Gross margin at retail level

a) Tomato

Return per kg of tomato was found to be 226 Tsh. Average gross returns per kilogram at retail level were found comparable to those of wholesalers. Tomato retailers received an average return of 36% per kg as compared to 38% received by tomato wholesalers.

Table 15: Tomato retail gross margin analysis

	Kariakoo		Buguruni		Ilala		Kisutu	
Unit	**kg**	**%**	**kg**	**%**	**kg**	**%**	**kg**	**%**
Purchase price/unit (Tsh)	290	51	256	39	307	50	453	64
Selling price/unit (Tsh)	569	100	663	100	614	100	710	100
Gross margin/unit (Tsh)	278	49	407	61	307	50	257	36
Loading costs (Tsh)	-	0	-	0	-	0	-	0
Transport costs (Tsh)	-	0	27	4	-	0	13	2
Value adding cost (Tsh)	-	0	-	0	-	0	-	0
Unloading cost (Tsh)	10	2	21	3	28	5	10	1

Wastage (Tsh)		58	10	78	12	67	11	30	4
Gross margin after deducting major costs (Tsh)		210	37	281	42	213	35	203	29

Buguruni retailers were found receiving higher returns as percent of selling price per kg (42%) followed by Kariakoo (37%), Ilala (35%) and Kisutu (29%). This is probably due to higher purchase price paid by Ilala and Buguruni traders who preferred crates to "Tenga". However, the use of Tenga might be reflected on wastage costs which were higher in Buguruni and Kariakoo where most traders preferred Tenga as their purchasing unit. Unexpectedly, wastage cost was also higher in Ilala which suggests that other factors than the use of Tenga alone were also contributing to higher wastage costs such as poor market infrastructure. Kisutu was relatively well infrastructure compared to the rest.

b) Dry onion

At retail level, the return per kilogram of dry onion was 138 Tsh. This was greater than what was received by dry onion wholesalers (51 Tsh.) A kilogram of dry onion sold provided an average return of 25% which was higher than what was received by dry onion wholesalers.

Table 16: Dry onion retail gross margin analysis

	Kariakoo		Buguruni		Ilala		Kisutu	
Unit	kg	%	kg	%	kg	%	kg	%
Purchase price/unit	61		70		76		67	

(Tsh)	331		385		438		461	
Selling price/unit (Tsh)	545	100	550	100	580	100	683	100
Gross margin/unit (Tsh)	214	39	165	30	142	24	222	33
Loading costs (Tsh)	-	0	-	0	-	0	-	0
Transport costs (Tsh)	-	0	-	0	14	2	1	0
Value adding cost (Tsh)	-	0	-	0	-	0	-	0
Unloading cost (Tsh)	10	2	4	1	10	2	4	2
Wastage (Tsh)	36	6	50	9	58	10	3	.47
Gross margin after deducting major costs (Tsh)	168	31	111	20	60	10	214	31

However, the small difference in average returns between wholesalers and retailers may be due to low returns at Ilala market. This is probably so because Kariakoo, Buguruni and Kisutu retailers were found to receive larger returns (31%, 20% and 31% respectively) per kg as compared to those received by wholesalers at Kariakoo and Buguruni markets (15% and 12% respectively). This might imply that retailers have relatively more market power than wholesalers only that Ilala retailers were less efficient than their counterparts in other markets. Higher wastage that was realized by Ilala retailers may favour this reason.

c) Cabbage

The most common unit of sale for cabbage at retail level was a single head of cabbage. However, another unit was a packet of sliced cabbage. This was the only product with added value, achieved by retailers slicing and packing them in polythene packets. A head

of cabbage yielded a return of 164 Tsh. whereas a packet yielded 111 Tsh. An average return per kilogram of whole cabbage was 92 Tsh. leading to a 46% return per kg whereas the return per kilogram of sliced cabbage was 184 Tsh. yielding a return of 55% as percent of selling price per kg. Like the case of dry onion, while Kariakoo, Buguruni and Kisutu retailers received more than double the returns received by wholesalers, Ilala retailers were found losing 0.01 Tsh. per kg of whole cabbage sold. Again, this might have been contributed by a 22% wastage realized by Ilala retailers compared to an average of 3% in other markets.

Kariakoo retailers received higher gross margins compared to other markets. This might be due to the reason that purchase prices were lower at Kariakoo which was the first destination and the only source of cabbage for other retail traders from other markets. Although the selling price was higher in Kisutu, retailers at this market paid higher purchase prices as compared to those in other markets. This is probably due to the reason that Kisutu retailers were most likely willing to pay higher for good quality cabbages since this market attracts middle to higher income consumers probably because of the relatively better market infrastructure as compared to other open air markets. The quality of cabbages may be reflected by the lower average wastage cost incurred by Kisutu retailers compared to others except those in Kariakoo.

Table 17: Cabbage retail gross margin analysis

	Kariakoo		Kariakoo		Buguruni		Ilala		Kisutu	
Unit	Unit	%	Packet	%	Unit	%	Unit	%	Unit	%
Purchase price/unit (Tsh)	207	54	82	41	253	51	396	79	444	60
Selling price/unit (Tsh)	386	100	200	100	497	100	500	100	742	100
Gross margin/unit (Tsh)	179	46	118	59	245	49	104	21	298	40
Loading costs (Tsh)		0		0		0		0		0

	-		-		-		-		-	
Transport costs (Tsh)	-	0	-	0	12	2	-	0	10	1
Value adding cost (Tsh)	-	0	-	0	-	0	-	0	-	0
Unloading cost (Tsh)	1	.2	1	0	9	2	-	0	3	.44
Wastage (Tsh)	0.5	0.1	7	3	14	3	109	22	12	2
Gross margin after deducting major costs (Tsh)	178	46	111	55	210	42	(5)	(1)	273	37
Average unit weight (kg)	2		1		2		3		2	
Gross margin/kg (Tsh)	93	46	197	59	101	49	41	21	147	40
Gross margins/kg after deducting major costs (Tsh)	92	46	184	55	87	42	(2)	(1)	135	37

d) Orange

Orange provided a return of 19 Tsh. per unit. Return per kilogram was found to be 82 Tsh. and average return as percent of selling price was found to be 29%. Orange retailers' gross returns as percent of selling price were comparable to those of orange wholesalers averaging 26%.

The results summarized in Table 18 below indicate that Buguruni retailers received low gross margins than their counterparts in other markets. This is probably because Buguruni was the main destination of orange wholesalers inducing stiff competition hence lower prices. On top of that, since retailers from other markets relied on this market as the major source of oranges, many retailers at Buguruni market also wholesaled and therefore bulk selling may have contributed to lower prices charged by Buguruni retailers.

Table 18: Orange retail gross margin analysis

Unit	Kariakoo		Buguruni		Ilala		Kisutu	
	Unit	%	Unit	%	Unit	%	Unit	%
Purchase price/unit (Tsh)	30	59	18	66	42	58	46	54
Selling price/unit (Tsh)	51	100	27	100	73	100	84	100
Gross margin/unit (Tsh)	21	41	9	34	31	42	39	46
Loading costs (Tsh)	2	3	-	0	-	0	-	0
Transport costs (Tsh)	2	3	-	0	1	2	0	0
Value adding cost (Tsh)	-	0	-	0	-	0	-	0
Unloading cost (Tsh)	0.05	0	0	0	-	0	1	1
Wastage (Tsh)	2	4	6	21	3	4	7	9
Gross margin after deducting major costs (Tsh)	16	31	3	12	27	36	30	36
Average unit weight (kg)	0.22		0.20		0.22		0.26	
Gross margin/kg (Tsh)	94	41	46	34	140	42	148	46
Gross margins/kg after deducting major costs (Tsh)	71	31	17	12	121	36	117	36

e) Amaranth

Amaranth retailers received less returns per kilogram as compared to wholesalers. On average, a kilogram of amaranth yielded 94 Tsh. to retailers compared to 102 Tsh. received by wholesalers. A return per shilling was 37% for retailers as compare to 49% for wholesalers. Most amaranth wholesale traders in Kariakoo and Buguruni were also

retailing and therefore the difference in profit margins may not be a good indicator of market power. However, the difference in profit margins may be a result of high retail costs especially due to wastage, which was found to comprise an average of about 14% of the selling price in the four retail markets.

As in the case of amaranth wholesaling, stiff competition that existed in Kariakoo market may have lead to lower gross margins for Kariakoo retailers as compared to other retailers. Low competition at Buguruni may have contributed to low retail purchase prices hence enabled retailers at this market to charge lower prices thus encouraged bulk selling hence high stock turnover which may have reduced average wastage costs to as low as 5% as compared to other markets where an average was found to be about 17%.

Table 19: Amaranth retail gross margin analysis

Unit	Kariakoo		Buguruni		Ilala		Kisutu	
	Bunch	%	Bunch	%	Bunch	%	Bunch	%
Purchase price/unit (Tsh)	33	43	24	42	46	46	39	40
Selling price/unit (Tsh)	78	100	58	100	100	100	96	100
Gross margin/unit (Tsh)	44	57	33	58	54	54	58	60
Loading costs (Tsh)	-	0	-	0	-	0	-	0
Transport costs (Tsh)	2	4	5	9	1	1	8	9

Value adding cost (Tsh)	-	0	-	0	-	0	-	0
Unloading cost (Tsh)	.36	0	-	0	-	0	-	0
Wastage (Tsh)	17	22	3	5	18	18	12	12
Gross margin after deducting major costs (Tsh)	24	31	25	44	35	35	37	39
Average unit weight (kg)	0.35		0.28		0.39		0.29	
Gross margin/kg (Tsh)	126	57	118	58	139	54	198	60
Gross margins/kg after deducting major costs (Tsh)	68	31	89	44	90	35	129	39

1.22 FFV price comparisons

Determination of prices of the five FFV items in traditional markets and supermarket for comparison was achieved through the analysis of retailer survey data for markets and getting prices from two Shoprite branches. The prices for tomato and dry onion were quoted per kg whereas cabbages and oranges were quoted per unit and amaranth per bunch. Four samples were weighted in order to determine the average price for the items quoted per kg.

Table 20: Average FFV prices per purchase source in Dar es Salaam

			Item		
Location	Tomato (Tsh)	Dry Onion (Tsh)	Cabbage (Tsh)	Oranges (Tsh)	Amaranth (Tsh)
Kariakoo	569	545	410	51	78
Ilala	614	581	500	73	100
Buguruni	663	550	497	27	58
Kisutu	710	683	742	84	96
Shoprite	1125	1380	1000	180	120
Total	**637**	**625**	**537**	**62**	**82**
F-value	**8.61**	**59.05**	**8.87**	**15.96**	**7.34**

Significance level	0.00	0.00	0.00	0.00	0.00

The prices difference was statistically significant across markets with highest prices realized at the supermarkets. Prices found at the supermarkets were 30-60% higher than those in traditional markets. The price differentials between supermarkets and open air markets are comparable to those found in other countries. A study conducted by Tschirley *et al,* (2004) in Kenya revealed similar price patterns where supermarket prices were 15-60% higher than those among traditional retailers. This help to explain the dominance of the traditional sector in the FFV retailing especially, though not exclusively, among lower and middle income consumers.

1.23 Major factors contributing towards customer satisfaction

CSF analysis was used to identify factors that are more important in determining customers' purchasing preferences. These include product freshness, reliability of supply, market accessibility, price, market premises cleanliness, product outlook/packaging, customer services, food safety and tradition. Respondents were asked to rank these factors using a scale of 1 (less important) to 3 (very important). Fig. 17: and Fig. 18: below indicate the distribution of respondents according to their satisfaction criteria for consumers interviewed at Shoprite and those in other markets respectively.

Reliability of supply was valued as a very important factor by the majority (91%) of respondents interviewed at the Shoprite. More than half of these respondents valued product freshness, market premises, product outlook or packaging, customer services and food safety as either important or very important factors. Although more than half

also valued market accessibility as either important or very important, a large percentage (36%) valued it as less important that less likely influences their decisions about where to purchase FFV. Majority of consumers in Shoprite valued price and tradition as less important factors. These results suggest that consumers interviewed from Shoprite are more of product and service quality sensitive than prices sensitive who are therefore likely to be higher to middle income category consumers.
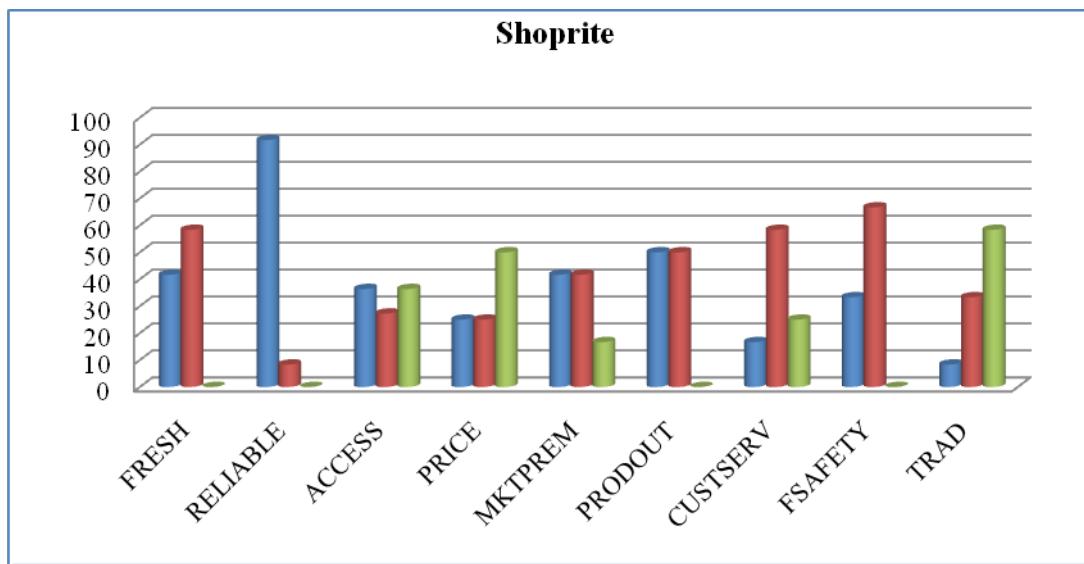
Figure 16: Major factors contributing towards Shoprite's customer satisfaction
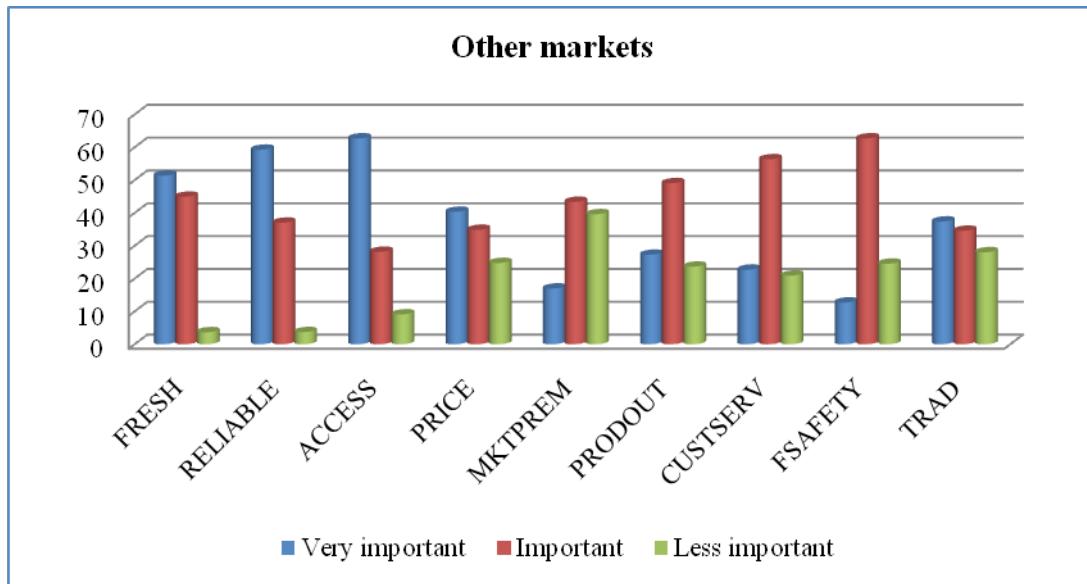
Figure 17: Major factors contributing towards customer satisfaction in other markets

On the other hand, consumers from other markets such as open-air markets and street vendors valued freshness, reliability of supply, accessibility and prices as very important factors that determined their decision preferences. More than half valued customer service, food safety and tradition as either important or very important which is similar to those who valued product outlook/packaging and market premises although for these factors, a large proportion of about 24% and 39% respectively valued them as less important ones. This is an indication that consumers at this end are more of price sensitive hence may be more likely to look around for cheaper products. However, they also valued some quality attributes although might not be as willing to pay premium prices for quality products as those in Shoprite. Consumers with these characteristics are more likely to range from middle to low income.

1.24 Importance of various retail outlets serving different income categories

As summarized in Table 21 below, about 86% of the respondents purchased FFV from open air markets in the week before the interview followed by shops which was mentioned by 79% of the respondents, supermarkets (54%), street vendors (52%) and groceries such as Imalaseko which was mentioned by 48% of the respondents.

Table 21: Respondents purchases during the past week

Location		Responses		Percent of Cases
		N	Percent	
Past week FFV purchase(a)	Supermarkets e.g. Shoprite	66	18	54
	Grocery/Mini-supermarkets e.g. Imalaseko	32	9	48
	Shops	100	27	79
	Open air markets	105	28	86
	Street vendors	63	17	52
	Other e.g. direct from farms	3	1	3
Total		**392**	**100**	

Table 22 summarizes income profile by where consumer shopped the last week before interview. The results indicate that the majority of consumers who shopped from supermarkets and groceries were the richest category with income more than 500 000 per month. Shops, open air markets and street vendors seemed to serve all the three categories of consumers with lower and middle classes being the majority. The majority of those who purchased direct from the farms were the poorest probably because they are most likely to be located near the farms in peri-urban areas.

The results support the idea that higher to middle income consumers are more likely to shop at the supermarkets and groceries because of their concerns on quality of products and services rather than prices while lower income categories who are more likely to be price sensitive would shop in other markets like open air markets, street vendors or small shops located near residential areas.

Table 22: Income Profile by Where the Consumer Shopped Last Week

	Household income category, %		
Past week FFV Purchase	Less than 75 000	Between 75 000 - 500 000	More than 500 000
Supermarkets e.g. Shoprite	12	27	61
Grocery/Mini-supermarkets e.g. Imalaseko	25	31	44
Shops	36	33	31
Open air markets	34	35	31
Street vendors	40	31	24
Other e.g. direct from farms	67	33	0
Total number of respondents per income category	**37**	**41**	**42**

The data and idea presented above is supported by the results summarized in Table 23 and 24 below which shows that the majority of consumers interviewed at the Shoprite (76%) mentioned supermarkets as their preferred shopping centres of FFV where as 69% of those interviewed in open air markets mentioned traditional open air markets as their preferred source of FFV while 22% mentioned supermarkets as their favourite sources.

In addition, 60% of the richest consumer category mentioned Shoprite and groceries as their most preferred sources. However the results revealed that, open air market is preferred by all consumer categories although it was the poorest category whose majority (92%) showed preferences in shopping at this market node followed by middle income (61%) and the richest (38%).

From the data and discussion above, it can therefore be generalized that, open air market was the most important source for all categories of consumers. However, as income rises, some consumers shift their preferences to modern markets such as Shoprite.

These findings are comparable to those in previous researches (Reardon and Neven, 2004; Tschirley and Ayieko, 2005) where it was found that more than a decade after Shoprite first entered the Zambian market, traditional marketing system retains a dominant position in FFV retailing. Their findings revealed that traditional sector is highly adaptable; various types of open air markets serve nearly all types of consumers.

Table 23: Most preferred markets by Shoprite and other markets consumers

	Shoprite respondents		Other markets respondents	
	Frequency	**Percent**	**Frequency**	**Percent**
Open-air markets	1	8	76	69
Supermarkets	9	76	24	22
Grocery/Mini-supermarkets	0	0	8	7
Street vendor	1	8	2	2
Other e.g. Shamba etc	1	8	0	0
Shops	0	0	0	0
Total	**12**	**100**	**110**	**100**

Table 24: Household monthly income category against most preferred market

Household income category	Most preferred market, %					
	Shoprite	**Imalaseko Grocery**	**Openair market**	**Street vendor**	**Other e.g. shamba etc**	**Total**
Less than 75 000	3	0	92	5	0	37
Between 75 000 - 500 000	29	7	61	3	0	41

More than 500 000	48	12	38	0	2	42
Total respondents per market	33	8	75	3	1	120
Pearson Chi-Square						32.012
Asymptotic significant (2-sided)						0.000

There were no respondents who mentioned small shops as their most preferred source although most of the respondents purchased FFV from this market during the past week. This is probably because shops may be important source for immediate needs as most of them are located around residential areas and are sometimes operating until late hours that households may shop only to cater for immediate needs although it may not necessarily be a preferred source.

1.25 Logistic regression

A backward logistic regression method was used to analyse factors that influence the likelihood of consumers purchasing FFV from a supermarket. The dependent variable equals one if the respondent mentioned supermarkets as their most preferred source of FFV and zero if they mentioned other markets. Only the first model, which includes all the predictors, and the last best model chosen through several iterations are presented below.

Table 25: Logistic model (All predictors included)

Variable	B	S.E.	Sig.	Exp(B)
Freshless	12.368	4679.965	0.998	235227.445
Freshmost	-3.017	2.260	0.182	0.049
Reliableless	9.842	7.240	0.174	18815.059
Reliablemost	1.022	2.522	0.685	2.779
Mktaccessless	2.713	3.608	0.452	15.080

Mktaccessmost	-6.169	2.989	0.039	0.002
Priceless	7.963	4.007	0.047	2873.764
Pricemost	0.604	1.923	0.754	1.829
Mktpremless	-3.277	1.838	0.075	0.038
Mktpremost	4.214	2.877	0.143	67.601
Prodoutless	-23.639	6642.937	0.997	0.000
Prodoutmost	4.763	2.050	0.020	117.136
Fsafetyless	-1.783	5.483	0.745	0.168
Fsafetymost	7.036	3.335	0.035	1136.987
Tradless	0.605	1.634	0.711	1.832
Tradmost	0.718	2.864	0.802	2.050
Gender	-0.462	2.254	0.838	0.630
Poorest	-3.196	5.265	0.544	0.041
Richest	4.906	2.895	0.090	135.053
Constant	-4.408	4.168	0.290	0.012
Test statistics				
-2 Log likelihood statistics				22.739
Cox & Snell R-Square				0.664

Variable name	Description
Freshless	Dummy for product freshness whereby 1 = less important and 0 = all others
Freshmost	Dummy for product freshness whereby 1 = most important and 0 = all others
Reliableless	Dummy for reliability of supply whereby 1 = less important and 0 = all others
Reliablemost	Dummy for reliability of supply whereby 1 = most important and 0 = all others
Mktaccessless	Dummy for market accessibility whereby 1 = less important and 0 = all others
Mktaccessmost	Dummy for market accessibility whereby 1 = most important and 0 = all others
Priceless	Dummy for price factor whereby 1 = less important and 0 = all others
Pricemost	Dummy for price factor whereby 1 = most important and 0 = all others
Mktpremless	Dummy for market cleanliness factor whereby 1 = less important and 0 = all others
Mktpremost	Dummy for market cleanliness factor whereby 1 = most important and 0 = all others
Prodoutless	Dummy for product outlook/packaging whereby 1 = less important and 0 = all others
Prodoutmost	Dummy for product outlook/packaging whereby 1 = most important and 0 = all others
Fsafetyless	Dummy for food safety whereby 1 = less important and 0 = all others
Fsafetymost	Dummy for food safety whereby 1 = most important and 0 = all others
Tradless	Dummy for tradition factor whereby 1 = less important and 0 = all others
Tradmost	Dummy for tradition factor whereby 1 = most important and 0 = all others
Gender	Dummy for gender whereby 1 = female and 0 = male
Poorest	Dummy for income category whereby 1 = income less than Tsh 75 000 and 0 = all others
Richest	Dummy for income category whereby 1 = income more than 500 000 and 0 = all others

Table 26: Logistic model (Best model chosen after 11 iterations)

Variable	B	S.E.	Sig.	Exp(B)
Freshmost	-2.85	1.445	0.049	0 .058
Reliableless	6.77	3.744	0.071	866.542
Mktaccessmost	-5.86	2.588	0.024	0.003
Priceless	6.84	2.644	0.010	931.829
Mktpremless	-3.29	1.644	0.045	0.037
Mktpremost	4.13	1.978	0.037	62.336
Prodoutmost	4.94	1.745	0.005	139.555
Fsafetymost	5.81	2.546	0.023	332.589
Richest	4.53	1.958	0.021	92.501
Constant	-3.24	1.695	0.056	0.039
Test statistics				
-2 Log likelihood statistics				26.455
Cox & Snell R-Square				0.654
96.7% of the cases are classified correctly				

According to the logistic regression results above, being in the richest category of a consumer was found to have a positive significant effect on the likelihood of purchasing FFV from supermarkets. The result suggests that, with other variables held constant, the highest income category of consumers were more than 92 times more likely to purchase FFV from supermarkets than other categories. Other income categories were not statistically significant and therefore not included in the model. It is further revealed that, consumers who valued price as a less important factor before making purchase decisions were more likely to purchase FFV from supermarkets. As described earlier, this is probably because these customers are more concerned with non-price factors and are willing to pay premium prices for quality products and services.

In addition, consumers who valued product outlook/packaging as very important are more than 139 times more likely to purchase FFV from supermarkets than those who valued the factor as important or less important holding other factors constant. Similarly, those who valued food safety and market premises as most important were found to be

332 and 62 times respectively more likely to shop for FFV in supermarkets than those who valued the two factors as important or less important. On top of that, those who valued market premises as less important were found significantly less likely to shop from supermarkets as compared to those who valued this factor as most important or important.

Contrary, consumers who ranked freshness and market accessibility as most important were found less likely to purchase FFV from supermarkets while those who valued reliability of supply as less important were more likely to purchase FFV from supermarkets than those who valued the factor as most or important. This is probably because it was easy to find fresh products in markets which are easily accessible as Kariakoo, Buguruni and Ilala which means those who would value freshness and market accessibility as most important would be willing to shop at these markets at cheaper prices. This reason might also hold for those consumers who valued reliability of supply as most or important since cheap and fresh products are more reliably supplied in open air markets than in supermarkets.

Other factors such as gender and tradition were found less significant in influencing consumers' decision about where to purchase and were not included in the model.

CHAPTER FIVE

5.0   CONCLUSION AND RECOMMENDATIONS

1.26   Conclusion

This report has provided an understanding of the FFV value chain in Dar es Salaam market from the wholesale to consumer level. It has identified actors operating along this segment of the value chain including the role played by brokers, and addressed, though to a lesser extent, the small but emerging role of supermarkets.

The most important sources of tomato supply to Dar es Salaam market were found to be Iringa and Kilimanjaro where as dry onions and cabbages were mostly supplied from Arusha and Iringa. Tanga, Coast and Morogoro were found to be important sources of oranges where as Dar es Salaam was the sole source of Amaranth to this market. All produce items were found to be seasonal except amaranth, which was produced and sold all year round, and to some extent tomatoes.

The profit margins were found to vary vertically across the chain and horizontally across markets. In general, retailers were found to receive higher returns than wholesalers in many products including tomato, dry onion, cabbage, and orange. Amaranth wholesaling was found to be more profitable than retailing. It was also revealed that most wholesalers sold their produce through brokers. This was especially important for produce transported long distances, as relying on urban brokers with a wider consumer network, paying an average fee of 5% of the wholesale price, shortened the wholesaler's waiting

time at the market.

This study also revealed that there was a significant difference in FFV prices between supermarkets and open air markets. Prices were 30-60% higher in supermarkets than in open air markets, which might explain the dominance of open-air markets in FFV retailing in Dar es Salaam.

The findings have also revealed that most consumers interviewed at the Shoprite valued reliability of supply, product freshness, market premises, product outlook or packaging, customer services and food safety as either important or very important factors. Although more than half also valued market accessibility as either important or very important, a large percentage (36%) valued it as less important. Majority of consumers in Shoprite valued price and tradition as less important factors however.

Similarly, consumers from other markets such as open-air markets and street vendors also valued freshness, reliability of supply, customer services, market accessibility and food safety as very important factors that determined their decision preferences. However, contrary to those interviewed at Shoprite, majority of consumers from open air market valued price and tradition as either most important or important factors.

Supermarkets were found to be important markets for the higher income consumer category and to some extent middle income group whereas low income consumers and a majority of middle income category relied mostly on open air markets. Higher income consumer category, those who valued price and reliability of supply as less important and those who valued market premises, product outlook and food safety as most

important factors were found to have positive statistical significant effect on consumer decision making about purchasing FFV from supermarkets. However, those who valued product freshness and market accessibility as most important and market premises as less important were found less likely to shop for FFV from supermarkets.

1.27 Recommendations

The empirical results provide useful information for both supermarkets and local traders considering available opportunities and challenges. Empirical findings indicate that highest income category of consumers has a significant positive effect on the likelihood of purchasing FFV from supermarkets. However, open air markets were found to serve almost all income categories especially lower and middle income groups. Given the possibility of income growth and urbanisation, the positive effects of higher income on the likelihood of purchasing FFV from the supermarket implies that the size of the market in terms of consuming households still has the potential to grow. However, the open air market is expected to continue dominating the FFV market in Tanzania unless supermarkets develop ways that will give them economic edge to compete more efficiently with open air markets especially in price terms.

Opportunity for supermarkets can be looked in a way that it can take advantage of higher to middle income consumers' preferences in early stages of market growth in order to reap long-term gains. However, it is a challenge for local traders to develop strategies to satisfy these groups such as improving customer services, hygiene, improving market infrastructure and keeping market premises clean as well as packaging to improve product outlook. This can be met by forming groups or trade organisations, which could

develop and coordinate customer service standards, packaging and hygienic standards and ensure clean markets' physical conditions as well as improving their collective power of demanding for public services from municipal councils such as improvement of market infrastructures.

However, this can be possible if the formation of such groups and organisations will be coupled with training so that traders understand the degree and specific mechanisms of quality differentiation in order to design a more formal system of grades and standards that is workable and that can increase transparency and create a dynamic of constant quality improvement. This should also be coupled with other trainings on good governance, management and record keeping skills to ensure satisfactory services to their members

Results of this study also indicate that generally, consumers in Dar es Salaam are price-conscious especially those who preferred shopping at the open air markets which was found to serve almost all income consumer categories. It was found that consumers who valued price as most important were less likely to purchase FFV from supermarkets. Therefore, competitive pricing and trade service activities are still effective market strategies to capture this market. This is a challenge for supermarkets to develop ways that will enable them compete more effectively. This can be done through establishing relationships with local traders and producer. These relationships should aim at ensuring tight coordination that will lower transaction costs, hence make it possible to outsource most of supplies locally which will in turn lower trading costs and hence prices.

However, this will only be possible under favourable institutional framework, which will support the formation of strong traders' and producers' associations and other representative bodies to enhance capacity building and to bargain for fairer terms of trade as well as strong legal framework that will simplify negotiating trade agreements and enforcing the existing contracts.

More researches are required however, that will identify useful specific investments in the FFV value chain in Tanzania and which will improve the overall performance of the chain particularly on how improvements in simple value added services such as vegetable slicing, fruits drying, packaging and customer services could influence the chain.

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APPENDICES

Appendix 1: Questionnaire for consumers

Hello. We are from the Sokoine University of Agriculture. We would like to take about 15 minutes of your time to ask you some questions about your food purchase habits. We will not record your name. All information that we collect will be used only for research purposes, and will remain strictly confidential. Would you be willing to do this?

1. Location   **LOC**

    1= Kariakoo   2 = Ilala
    3= Buguruni   4 = Kisutu
    5 = Shoprite – Kamata   6 = Shoprite – J.M. Mall
    7= Imalaseko

2. Interview Number   **ID**

3. Date of Interview   Day   **DAY**

                                                                          Month   **MONTH**

4. Time of interview (*hhmm*)   **TIME**

5. Gender of Interviewee (1=male, 2=female)   **GENDER**

6. In what year were you born?   **BORN**

7. Please describe your household   **HHOLD**

        1=myself only   3=myself, spouse, and others (children &/or others)   2=myself and my spouse

8. What is your position in your household?   **RELATION**

        1=head of hh   2=spouse of head of hh   3=other

9. Did you make these purchases for your household, or only for yourself?   **FORWHOM**

        1=for my household   2=for myself only

10. Are you the person primarily responsible for food purchases in your household? (1=yes, 2=no)   **RESPON**

    PURCHASES

    Please indicate which of the following items you purchased today in this market/supermarket

Item	Did you purchase this item today in this market/ supermarket? 1=yes 2-=no	Is this where your household MOST OFTEN purchases this item? 1=yes 2=no, I usually purchase it elsewhere	If your household MOST OFTEN purchases this item elsewhere, please indicate where: 1=in a Shoprite 4=in an open air market 2=in a grocery 5=from a street vendor 3=in a shop 6=other (specify)
FOODTYPE	**PURCH**	**MOST**	**WHEREMST**
1 Maize meal			
2 Bread			
3 Any other staple (rice, cassava, sorghum, etc.)			
4 Salt, sugar, cooking oil, etc.			
5 Any fresh meat (beef, chicken, pork, lamb, etc.)			
6 Eggs			
7 Any dairy product (milk, cheese, yoghurt, ...)			
8 Any beverage (other than milk)			
9 Any canned good			
10 Any fresh fruit			
11 Any Fresh vegetable			
12 Any NON-FOOD item			

What reasons makes you prefer the above market? Rank 1 as less important, 2 as important and 3 as very important

FOODTYPE	REASONS								
	Product freshness	Reliability of supply	Market Accessibility	Price	Physical cleanliness of market premises	Product Outlook	Customer services	Food Safety	My tradition
	FRESH	**RELIABLE**	**ACCESS**	**PRICE**	**MKTPREM**	**PRODOUT**	**CUSTSERV**	**FSAFETY**	**TRAD**
10 Fresh fruit									
11 Fresh vegetable									

Are there any other reasons than those mentioned above? If yes please mention and give ranks
10 _____

11 _____

CHECKLIST OF FFV ITEMS PURCHASED IN THIS LOCATION TODAY

Now we would like to know the specific fresh fruit and vegetable items that you purchased

Item	Did you purchase this item today? 1=yes 2=no	Was the item bagged or loose? 1=bagged 2=loose	Was the item sliced (or otherwise processed) or whole? 1=sliced/processed 2=whole	Price paid in the most preferred market per kg equivalent	Item	Price paid in the most preferred market	Did you purchase this item today? 1=yes 2=no	Was the item bagged or loose? 1=bagged 2=loose	Was the item sliced (or otherwise processed) or whole? 1=sliced/processed 2=whole
ITEM	**PURCH**	**BAGLOOSE**	**WHOLE**	**PRICE**	**ITEM**	**PRICE**	**PURCH**	**BAGLOOSE**	**WHOLE**
1 Tomato					15 Sweet Pot. Lvs				
2 Rape					16 Pumpkin				
3 Cabbage					17 Spinach				
4 Dry Onion					19 Carrots				
5 Spring onion					21 Amaranths				
6 Green maize					23 Chinese leaves				
7 Okra					**Other veg. (please specify)**				
8 Cucumber					51 Oranges				
9 Local eggplant					52 Mangoes				
10 Exotic eggplant					55 Watermelon				
11 Irish potato					56 Tangerines				
12 Green beans					57 Pineapple				
13 Pumpkin leaves					60 Apple				
14 Cassava leaves					**Other fruits. (please specify)**				

11.   What is your estimate monthly income?

      1 = Less than 75 000   2 = Between 75 000 – 500,000   3 = More than 500 000   **INCCAT**

12. During the past week, have you or anyone in your household purchased any fresh fruit or vegetables from the following outlets: (1=yes, 2=no)

      A Shoprite   **SHOPRITE**

      A small supermarket   **GROCERY**

      A shop   **SHOP**

      An open air market   **MARKET**

      A street vendor   **VENDOR**

      Any other type of seller (*specify type of seller:* _____)   **OTHER**

13. Do you or does anyone in your household own a car?: (1=yes, 2=no)

      CAR

14. In what ward do you live (*write the ward:* _____)   **WARD**

15. Please describe the type of employment you have   **EMPLOY**

      1=unemployed   4= formal business (self employed)
      2=formal salaried employment   5= Informal business (self employed)
      3=informal salaried employment   6=other (*specify:* _____)

16. If you are NOT the head of household, please describe the type of employment of the head of household   **HEADEMP**

      1=unemployed   4= formal business (self employed)
      2=formal salaried employment   5= Informal business (self employed)
      3=informal salaried employment   6=other (*specify:* _____)

Appendix 2: Questionnaire for retailers

1.	Location		**LOC**	

        1 = Kariakoo   3 = Buguruni
        2 = Ilala   4 = Kisutu

2.	Trader Number		**ID**	
3.	Date of Interview	Day	**DAY**	
		Month	**MONTH**	
4.	Gender of respondent (1=male, 2=female)		**GENDER**	
5.	In what year were you born?		**BORN**	
6.	In what year did you first start working as a marketeer?		**START**	
7.	Are you a member of any marketing/trader organization? If yes please mention		**MEMBER**	

        1 = Yes   2 = No

Checklist of FFV Items Sold

Item	Is the trader currently selling this item? (1=yes, 2=no)	Is the trader adding any value? (1=yes, 2=no)	Is the marketeer currently selling this item in LOOSE form? (1=yes, 2=no)	Is the marketeer currently selling this item in PLASTIC BAGS? (1=yes, 2=no)	Item	Is the trader currently selling this item? (1=yes, 2=no)	Is the trader adding any value? (1=yes, 2=no)	Is the marketeer currently selling this item in LOOSE form? (1=yes, 2=no)	Is the marketeer currently selling this item in PLASTIC BAGS? (1=yes, 2=no)
ITEM	SELL	VALUEADDED	LOOSE	BAGGED	ITEM	SELL	VALUEADDED	LOOSE	BAGGED
1 Tomato					19 Carrots				
2 Rape					21 Amaranths				
3 Cabbage					23 Chinese leaves				
4 Dry Onion					**Other veg. (Please specify)**				
5 Spring onion									
6 Green maize									
7 Okra					51 Oranges				
8 Cucumber					52 Mangoes				
9 Local eggplant					55 Watermelon				
10 Exotic eggplant					56 Tangerines				
11 Irish potato					57 Pineapple				
12 Green beans					60 Apple				
13 Pumpkin leaves					**Other fruits (please specify)**				
14 Cassava leaves									
15 Sweet Pot. Lvs									
16 Pumpkin									
17 Spinach									

7.	Is the marketeer selling any other food or non-food items? (1=yes, 2=no) (*If yes, please list them below*)	OTHITEM

Additional FOOD item sold	Additional NON-FOOD item sold
FOODITEM	**NFOODITEM**

Information on Last Purchase of Key FFV Items

Item	When did you last purchase this item?		Did you purchase it in a market, or at a farm? 1=market 2=farm	If purchased at a market, what market?	If purchased at a farm, was it a small farm or large farm? 1=small 2=large	In what units did you purchase the item?	How many of these (*purchase units*) did you purchase?	In what units are you selling the item? (*Indicate most common*)	How many of these (*sales units*) do you get out of each purchase unit?	How much money do you expect to get out of selling each (*purchase unit*)	What price did you pay for each of these (*purchase units*)?
	Day	Month									
ITEM	**DAY**	**MTH**	**MKTFARM**	**MARKET**	**FARM**	**PUNIT**	**NPUNIT**	**SUNIT**	**UCONVER**	**TOTZKW**	**PPUR**
Tomato											
Dry Onion											
Cabbage											
Orange											
Amaranth											

Item	Item	In purchase location						In sales location			
		What did you pay per unit in loading costs in purchase location?	At what price are you selling each of these (*sales units*)?	Any other fees or costs (if paid one total cost, answer below)	Weight of the (*sales unit*) (*4 samples, each weighed in grams*) *For oranges, weigh 3 each time if sold by the unit* (TSH)	If you paid transport cost per unit of product, what did you pay?	If you paid any levies along the way, how much per unit?	If there is any value adding activity conducted, how much did it cost? (TSH)	Now thinking about the PAST WEEK, how many (*purchase units*) of this product have you sold within this market?	What did you pay in unloading/transport costs per unit	Again thinking about the PAST WEEK, how much of this product has gone to waste? (*Measured in units of sales unit*)	If you paid any fees other than broker fees, how much did you pay per unit?
											Any other costs paid in sales location? (TSH)
ITEM		ITEM	PSELL	WGT1	WGT2	WGT3	WGT4		QTWEEK		WASTE
ITEM	Tomato	LOADCOSTPUR		ANYFEEPUR		TRANCOSTPUR	LEVY	VALUEADCOST	UNLOADCOSTSL	OTHERFEESL	OTHERCOSTSL
Tomato	Dry Onion										
Dry Onion	Cabbage										
Cabbage	Orange										
Orange	Amaranth										
Amaranth											

Market Codes (MARKET)

1 = Kariakoo	4 = Other
2 = Ilala	
3 = Buguruni	

Purchase Unit Codes (PUNIT)

1 kg	4 Crate	7
2 unit	5 25 kg bag	8
3 10 kg bag	6 50 kg bag	

Sales Unit Codes (SUNIT)

1 kg	11 bunch
2 unit	12 packet
10 pile	

1.	If you paid fuel in addition to other transport costs, what was your total fuel cost to bring these items to market? (TSH)	FUEL	
	If you paid vehicle rental (did NOT pay transport per unit), what was your total vehicle rental cost for these items?	VRENT	
	If you paid a fixed fee in PURCHASE location, how much did you pay? (TSH)	FEEPUR	
	Any other costs in PURCHASE location (total cost over all product)	OTHERPUR	
	If you paid a fixed total levy along the way, how much did you pay?	LEVY	
	If you paid a fixed fee in SALES location, how much did you pay? (TSH)	FEESALES	
	If there is any value adding activity conducted, how much did it cost? (TSH)	VALUEADD	
	Any other costs in SALES location (total cost over all product)	OTHERSALE	

Appendix 3: Retailers' seasonality survey

1.   Location   **LOC**

        1= Kariakoo   3= Buguruni
        2= Ilala   4= Kisutu

2.   Product   **PROD**

        1 = Tomato   4 = Orange
        2 = Dry Onion   5 = Amaranth
        3 = Cabbage

Appendix 4: Questionnaires for wholesalers

Trader Number	Please list the months of the HIGH season	Please list the months of the SCARCE season	For the HIGH season, please indicate:		For the SCARCE season, please indicate:	
			The market where you MOST OFTEN obtain the product	The NEXT MOST COMMON market for obtaining the product	The market where you MOST OFTEN obtain the product	The NEXT MOST COMMON market for the product
ID	**HIGH**	**SCARCE**	**MOSTHIGH**	**SECONDHIGH**	**MOSTSCARCE**	**SECONDSCARCE**

Hello. We are from the Sokoine University of Agriculture. We would like to take about 10 minutes of your time to ask you some questions about the fresh produce that you are selling today. We will not record your name. All information that we collect will be used only for research purposes, and will remain strictly confidential. Would you be willing to do this?

		Location	**LOC**	
		1 = Kariakoo Market 2 = Buguruni		
		Seller Number	**ID**	
		Date of Interview Day	**DAY**	
		Month	**MONTH**	
		Time of interview (*hhmm*)	**TIME**	
		Gender of seller (1=male, 2=female)	**GENDER**	
		In what year were you born?	**BORN**	

		In what year did you first start selling in this market?	**START**		
		Are you a member of any marketing/trader organization? If yes please, mention 1 = Yes 2 = No	**MEMBER**		

Information on FFV items being sold today

Item	Quantity being sold		Origin		Did you produce this product, or did you buy it from others? 1=produced all 2=produced & bought 3=bought all	If purchased at a farm, was it a small farm or large farm? 1=small 2=large	During the harvest season, about how often do you sell this product in this market?	If you purchased any of this product, what average price did you pay? (*Per sales unit*)	Are you selling this yourself, or through a broker? 1=self 2=broker	What price are you receiving? (*If through a broker, indicate the price the broker will pay to the seller after his fee*)	If you are selling through a broker, what fee are you paying to the broker (*Tsh. per sales unit*)
	Qt	Unit	Region	District							
ITEM	**QT**	**UNIT**	**REGION**	**DISTRICT**	**PRODBUY**	**FARM**	**HOWOFTEN**	**PURPRICE**	**BROKER**	**PRICE**	**BROFEE**
Tomato											
Dry Onion											
Cabbage											
Orange											
Amaranth											

	In purchase location				In sales location			
Item	What did you pay per unit in loading costs in purchase location?	Any other fees or costs (if paid one total cost, answer below)	If you paid transport cost per unit of product, what did you pay? (TSH)	If you paid any levies along the way, how much per unit?	If there is any value adding activity conducted, how much did it cost? (TSH per unit)	What did you pay in unloading/transport costs within this market? (TSH per unit)	If you paid any fees other than broker fees, how much did you pay per unit?	Any other costs in sales locatio (TSH)
ITEM	**LOADCT**	**PURFEE**	**TRANCT**	**TRANLEVY**	**VADDCT**	**UNLOADCT**	**SALEFEE**	**ANYCOS**
Tomato								
Dry Onion								
Cabbage								
Orange								
Amaranth								

1.	If you paid fuel in addition to other transport costs, what was your total fuel cost to bring these items to market? (TSH)		FUEL	
	If you paid vehicle rental (did NOT pay transport per unit), what was your total vehicle rental cost for these items?		VRENT	
	If you paid a fixed fee in PURCHASE location, how much did you pay? (TSH)		FEEPUR	
	Any other costs in PURCHASE location (total cost over all product)		OTHERPUR	
	If you paid a fixed total levy along the way, how much did you pay?		LEVY	
	If you paid a fixed fee in SALES location, how much did you pay? (TSH)		FEESALES	
	Any other costs in SALES location (total cost over all product)		OTHERSALE	

Sales Unit Codes (SUNIT)

1 kg   11 bunch
2 unit   12 packet
10 pile

Frequency of sales codes (HOWOFTEN)

1 = nearly every day   2 = a few times a week
3 = a few times a week   4 = a few times a month
5 = once a month   6 = other (specify)

Appendix 5: Wholesalers' seasonality survey
Seasonality calendar for _____

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
For each month, indicate 0= no supply to this market, 1=low supply to this market, 2=medium supply, 3=high supply											

Now, we would like to know, over the past 12 months, the main geographical sources of supply

Largest supply source during high supply season	Region	REG1	
	District	DIST1	
Second largest supply source during high supply season	Region	REG2	
	District	DIST2	
Largest supply source during low supply season	Region	REG3	
	District	DIST3	
Largest supply source during low supply season	Region	REG4	
	District	DIST4	

Seasonality calendar for _____

Region	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	For each month, indicate 0= no supply to this market, 1=low supply to this market, 2=medium supply, 3=high supply											
1												
2												
3												
4												