

**INCLUSION OF SMALL-SCALE PRODUCERS IN DYNAMIC LOCAL AND  
REGIONAL MARKETS**

**BY**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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## ABSTRACT

This study was conducted to investigate the inclusion of small-scale producers in dynamic local and regional markets. To do so, the study provides a micro level survey. The survey was conducted on fruit and vegetable farmers, traders and supermarket operators along three districts namely Kinondoni, Ilala and Temeke in Dar es Salaam region. The Specific objectives were to (a) describe the current market structure for small-scale fruit and vegetable farmers (b) Assess various farmers' marketing chains for fruit and vegetable (c) To determine the potential of training to small scale fruit and vegetable farmers access to niche market (d) To examine the role of education level to small scale fruit and vegetable farmers access to niche market. The hypothesis to be tested states as follows (a) There is no significant different between various farmers' chain for fruit and vegetable marketing chain (b) Training does not have influence on fruits and vegetables farmers' access to niche markets (c) Education levels for fruit and vegetable farmers have no impact on niche market accessible. Results reveal that the trade was uncompetitive with a seller concentration ratio of 50.4% and 60.2% for tomatoes and mangoes respectively. Implying oligopolistic behaviors in the market. The intermediary traders linking producers and urban market traders to access to niche markets which implies uncompetitiveness of the market. The results reveal 58% of the land used for production is through renting. This can be one of the limitations for producers to access niche markets. Only 5% of the farmers sell processed products such as juices and used packages of low quality mainly plastic materials such as nylon packets. It shows that, 33.3% and 36.7% of tomato and mango traders respectively used colour and 25% and 21.67% of tomatoes and mangoes traders respectively used rottenness of the produce as the quality measures respectively. However, those methods alone would not guarantee safety of the products.

## DECLARATION

I, JAMES SIMON, do hereby declare to the senate of Sokoine University of Agriculture that this dissertation is my own original work and that it has not been submitted for a degree award at any other University.

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James Simon  
(MSc Candidate)

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Date

The above declaration is confirmed

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Date

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## **DEDICATION**

This dissertation is dedicated to my beloved parents Simon Theodore Malya and Anna Masakaya Malya who made the foundation of my academic career.

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## ABBREVIATIONS

AVRDC	-	Asian Vegetable Research and Development Centre
BoT	-	Bank of Tanzania
BUA	-	Balanced Utilization Approach
C	-	The index of concentration for each respondents (Tsh)
CGIAR	-	Consultative Group on International Agricultural Research
CIAT	-	International Center for Tropical Agriculture
CIMMYT	-	International Maize and Wheat Improvement Center
EU	-	European Union
EurepGAP	-	European GAP
FAO	-	Food and Agriculture Organisation
FARMESA	-	Farmer Level Applied Research Methods for East and South Africa
FDI	-	Foreign Direct Investment
FPA	-	Focal Point Approach
GDP	-	Gross Domestic Product
GM	-	Gross margin
HOSCO	-	Household Supplies Company
IFAD	-	International Foundations for Agriculture Development
IIFT	-	Indian Institute of Foreign Trade
INIBAP	-	International Network for Improvement of Banana and Plantain
IP	-	The total output of the industry
IRRI	-	International Rice Research Institute
MAC	-	Ministry of Agriculture and Cooperatives



MALDO	-	Municipal Agriculture and Livestock Development Officer
NALERP	-	National Agriculture and Livestock Extension Rehabilitation Project
NARC	-	National Agriculture Research Council
NBS	-	National Bureau of Statistics
NGO	-	Non Governmental Organization
NMB	-	National Micro Finance Bank
PnP	-	Pick and Pay
RTC	-	Regional Trading Company
SACCOS	-	Saving and Credit Cooperative Societies
SG 2000	-	Sasakawa Global 2000
SHERFP	-	Southern Highlands Extension and Rural Financing Project
SIDA	-	Swedish International Development Agency
SNAL	-	Sokoine University of Agriculture National Library
SPSS	-	Statistical Package for Social Scientist
SSA	-	Sub Saharan Africa
SUA	-	Sokoine University of Agriculture
TANSEED	-	Tanzania Seed Company
TASAF	-	Tanzania Social Action Fund
TR	-	Total revenue
TVC	-	Total variable cost from each respondent (Tsh/month)
UA	-	Urban Agriculture
URT	-	United Republic of Tanzania
USAID	-	United States Agency for International Development
WARDA	-	Africa Rice Center

- WHO - World Health Organization
- XP - The aggregate output of a certain number of the largest enterprises,  
in monetary or volumetric terms

## CHAPTER ONE

### 1.0 INTRODUCTION

#### 1.1 Background Information

Production of High value products (fruits and vegetables) has increased continuously on a global scale, much of this growth has been concentrated in Latin America and China. Area expansion has been largest in China, but farmers in other regions of the world have also found it profitable to expand production of horticultural produce at the expense of the cereal area (Weinberger and Lumpkin, 2005). Investment in the high value crops like fruits and vegetables is gaining importance in developing countries (Mudhin, 2004).

For example, In East Africa horticultural crops have become Kenya's main agricultural export. Horticulture exports have grown rapidly in recent years, exceeding Kenya's traditional crops, Coffee and Tea coffee export in 1999 and 2003 respectively. A study in Kenya that sampled small-holder farmers who produced for export found that net farm incomes were five times higher per family member compared to smallholder farmers who did not grow horticulture products (Weinberger and Lumpkin, 2005). In Tanzania, most high-value products have been expanding from about US\$ 9m in 1999 to US\$14m in 2004. Fresh vegetables export values rose more than fivefold in last four years (Ashimogo, 2007).

Generally, for fruits and vegetables the expansion of area has been larger than yield increases, in contrast to cereals, where growth in yields has usually been larger than area expansion. This increase in produce area is due both to increasing domestic and international demand. However, the miniscule or negative response in yields of horticultural produce indicates a need for research investment. Horticulture crops, in

general, are more knowledge and capital intensive than staple crops (Kumar and Mahajanshetti, 2006).

Small-scale fruits and vegetable producers delivering to traditional markets can improve their profit margin by strategically directing their production either to the export market or to high-value domestic market which may include supermarkets, mini supermarkets, upper-class hotels and other tourism related businesses. The export market bears considerable risks as it is highly demanding and volatile. For example, exporting to the EU market increasingly requires compliance of private standards such as EurepGAP (Zoss and Pletziger, 2007). The certification is often very costly and associated with a lot of paperwork. In Tanzania quality is generally assessed by visual judgment and is often within the responsibility of the supply-chain purchasing manager. The example of a supermarket chain showed that besides quality the criteria of supply reliability in terms of timely delivery and sufficient volumes are crucial factors for a sustainable business relation.

In this arrangement, however, risks are fully borne by suppliers because, interested suppliers must first bring test samples to high value markets and subsequent supplies depend on sales of the test samples. In addition, advance financing is never practiced and payments to local suppliers are only effected after the produce has been sold. For fresh fruit and vegetables the major forces are: heavy reliance on the Dar es Salaam urban market which consumes over 50% of urban consumption, thereby determining traded volumes, prices, and quality standards; irrigation technology; and market access by farmers close to major consumption areas (Ashimogo, 2007).

## 1.2 Problem Statement and Justification of the Study

In spite of a large and expanding market in urban areas of Tanzania to absorb vegetables and fruits produced, marketing functions such as assembling, grading, transport and others seem to lag behind the production and the expanding demand for vegetables and fruits. This problem has been further magnified by the uncertainty of supply and price of vegetables and fruits in the market, risks that in turn affect the decision-making process of market participants. It's therefore essential to ascertain the levels of efficiency in the market. This can be achieved by evaluating cost and price spreads at different levels of the market chain, such as: farm gate, trucking, wholesale and retail level. Understanding price and supply fluctuations and their trends in the market could partly minimize market risks (Wien *et al.*, 1990).

A more serious problem concerns the huge losses of fruits and vegetables due to their perishability. Post-harvest losses of vegetables vary greatly among commodities, production areas and seasons. It is estimated that between 20 to 50% of crops are lost in the varied steps from farmer to consumer (Kader, 2003). A study in Brazil found that an average of 200g/capita/day were lost in fruits and vegetables between harvest and consumption (Fehr and Romao, 2001). Reducing post-harvest losses would make diversification into fruits and vegetable production less risky and more attractive for small-scale farmers. Available literature indicates that over 35% of agricultural products produced in most countries in Africa are lost as post-harvest losses and only 20-25% of the produce is marketed (Yumkella *et al.*, 1999). Post-harvest losses can be as high as 60% for cabbage and tomato, 50% for head lettuce and cauliflower, 30% for bell pepper and 17% for Chinese cabbage in South East Asia (Bhatti, *et al.*, 1993).

In Tanzania, post-harvesting losses of food is undoubtedly one of the main causes of food deficits. A study conducted by the commonwealth secretariat (1997) indicated that between 40% and 80% of an estimated production of 2.75 million tons of fruits and vegetables produced in the country are lost as post-harvest losses due to lack of efficient and effective post-harvesting handling techniques such as processing and preservation facilities. For example the study done by Mathooko *et al.* (2000) found that post-harvesting losses of fruits and vegetables in Dar es Salaam, Chalinze, Morogoro and Dodoma markets were quite high and varied between 65% and 80%.

Several studies have been conducted on the horticultural crops sector in Tanzania. Some of these studies include Kamugisha (2006) who analysed the supply chain for green bean in Tanzania; Silomba (2000) who studied structure and performance of bean marketing system in Tanzania, Nyange *et al.* (2000) who studied on the fresh fruit marketing in Tanzania, and Hawasi (2006) who analysed processing, marketing and demand for processed fruits and vegetables in Tanzania.

Niche Marketing proximity is a major incentive for the intensification of any farming system or change of system to more profitable ones (Danso *et al.*, 2002). Agriculture produce that is not consumed is either processed or marketed through various channels (Yoveva *et al.*, 2000). Much of the fruits and vegetables produced are for own consumption with occasionally surpluses sold into the local urban markets. Different studies show that women play a major role in fruit and vegetable niche markets in urban, peri-urban and rural areas (Danso *et al.*, 2002; Potutan *et al.*, 1998). Fruits and vegetables niche marketing knowledge is a key determinant of profit maximization. Most small-scale fruit and vegetable producers lack such knowledge which impedes their access to the niche

markets or may prevent them from producing for the niche markets (Drechsel and Kunze, 1999).

Thus an adequate research for fruit and vegetable niche markets is required in order to generate useful information for extensionists, researchers, planners and others involved in the activities of this sub-sector. This study aims at assessing factors influencing small-scale fruit and vegetable farmers' inclusion into dynamic local and Regional markets. Dynamic local and regional markets are those niche markets which are found within and outside the country respectively. For example, supermarkets, mini-supermarkets, upper classic hotels and tourist related business (Zoss and Pletziger, 2007).

### **1.3 General Objectives**

The general objective of this thesis is to provide an assessment of factors which influence small-scale fruit and vegetable farmers' inclusion into local dynamic and regional markets.

### **1.4 Specific Objectives**

- (i) To describe the current market structure for small-scale fruit and vegetable farmers.
- (ii) To assess various farmers' marketing chains for fruits and vegetables.
- (iii) To determine the potential of training to small scale fruit and vegetable farmers access to niche markets.
- (iv) To examine the role of education level to small scale fruit and vegetable farmers access to niche markets.

### **1.5 Hypothesis**

- (i) There is no significant difference between various farmers' marketing chains for fruit and vegetable.
- (ii) Training does not have influence on fruit and vegetable farmers' access to niche markets.
- (iii) Education levels for fruit and vegetable farmers have no impact on niche markets accessible.



## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Definition of Fruits and Vegetables**

Fruit is defined botanically as the ripened ovary of a seed-bearing plant that contains the seed(s) (IARC, 2003). By this definition, zucchini, tomatoes, peppers, peapods, and even the seedpods of the deciduous trees are fruits. Fruit is more commonly defined as the sweet, fleshy, edible part of plants that contains the seed(s), excluding the non-sweet examples such as those listed above. Vegetables are broadly defined as the edible portion of a plant (excluding fruit and seed), such as the roots, tubers, stems, and leaves. A more common definition excludes crops such as sugarcane and sugar beet, as well as starchy root crops such as cassava, yams, and taro. The Food and Agriculture Organization (FAO) defines fruits and vegetables to include nuts, pulse, sugar crops, and starchy root crops. White potatoes are included, but not sweet potatoes, cassava or yams. Sweet bananas are included but not cooking bananas, recognizing that the classifications are somewhat arbitrary.

#### **2.2 Horticultural Export Trends from Sub-Saharan Africa**

Reports indicate that the annual value of internationally traded fruits in 2003 was US\$26.4bn compared with US\$18.3bn in 1993. Out of this trade, Sub-Saharan Africa's share of this is relatively small, totaling US\$489m (Graffham, 2007). During the same period exports of "non-traditional" tropical fruits such as mangoes, papayas and pineapples almost doubled to US\$ 2.6bn (excluding bananas). Growth of temperate fruits (e.g. apples, stone fruit) and traditional subtropical fruits (e.g. bananas, and citrus) was modest. International trade in fresh vegetables during the decade increased from US\$11.5bn to US\$18.7bn, with the fastest growth being in the category of chilies, green peppers and

green beans. SSA has become an important source for these and other vegetables and exports totaling US\$390m. Kenya is said to be a dominant supplier, with vegetable exports worth US\$160m in 2004.

### **2.3 Pre-conditions for Inclusion of Small-Scale Producers in Dynamic Local and Regional Horticultural Markets**

For small-scale producers to be included in dynamic local and regional markets, a number of key points have been reported by Graffham *et al.* (2007) in countries of SSA. In a study on trends in the horticultural export sector from Sub-Saharan Africa, Graffham (2007) points out that a number of Sub-Saharan African countries have capitalized on the growing demand for high value horticultural products in developed country markets although their market share remains modest. He further points out that even a small expansion of horticultural exports can have significant local economic and social benefits as well as securing foreign exchange although he does not rule out the fact that demanding private sector standards have increased the costs of compliance for producers and have impacted upon the opportunities for small-scale producers' participation at the higher value end of the horticultural export trade. In order for small-scale producers to comply with private sector standards, Graffham is of the view that they should form partnerships with primary marketing organizations (typically large producers/exporters) and the development and application of procurement systems which meet private sector standards' requirements.

In Kenya, Nyoro and Ngugi (2007) reported that there are market changes taking place in sub- sectors of fruits and vegetables and meat, including poultry at national, regional and international levels. The key drivers of market changes are consumer "pull", policy "push", urbanization, commercial opportunity, food standards, foreign investment, tourism, changing urban habits, environmental awareness and social welfare. The standards set by

local private sector and the international markets are more or less the same as those in other SSA countries. They point out that small-scale farmers will be able to meet the conditions of the high value dynamic markets and compliance to private standards such as that of EurepGAP if they acquire technology, financial capital, human capital, organization and support to collective marketing. The authors point out further those small-scale farmers may pool meager resources together and this may enable them to accumulate funds for capital investments. Collective marketing would benefit farmers through reduced cost from economies of scale and would improve their bargaining power. By organizing themselves into groups such as cooperatives or producer organizations, the farmers can obtain credit facilities to enable them to purchase technologies necessarily to successfully adhere to the stringent quality and safety standards demanded by the dynamic markets. They can also benefit from information, training and start-up funds provided by public and private sector development initiatives.

In Mozambique despite a growing economy and an expanding middle class, the agri-food sector has yet to respond. There remains a heavy import dependency in key high-value sectors, in particular in the dairy and poultry sectors (Nair and Coote, 2007). These authors state that for small-scale producers to link with markets, they need to be supported as out-growers or through support for farmer group formation and co-operatives. Currently, new models of small-scale producer participation in markets are being piloted in Mozambique.

In Zambia, the agri-food system is changing in response to a number of factors both internal and external to Zambia. Hichaambwa and Haantumba (2007) identified the following factors as being responsible for such changes: domestic policies such as market liberalizations, regional integration and foreign direct investments (FDI). These are said to

have brought private companies and corporations into the supply chains of most agricultural products. Moreover, Zambia is a signatory to regional and international trade organizations, which opens its border to regional and international trade. The entry of large firms especially in food retail and processing, has been accompanied by increasing concentration of the processing and retail sectors of the food chain and hence problems related to governance issues. The new food systems evolving from this affect the small-scale farmers and small to medium-scale enterprises. The increased involvement of supermarkets has opened up opportunities for local small and large-scale farmers and processors. However, stringent quality and consistent supply requirements tend to exclude small-scale producers from participating in these supply chains. Thus the authors suggest the following to help small-scale horticultural farmers access to supermarkets in Zambia: investment in quality and grades and standards, and a consistency in supply of produce; factors that call for capacity building of small-scale farmers in production, post-harvest and marketing skills.

According to Ashimogo and Greenhalgh (2007), agriculture in Tanzania will continue to play a dominant role, with the main potential lying in diversification from traditional exports to higher value crops and an increasing private sector role in commercial agribusiness. This structural shift needs to safeguard multiplier effects from other linkages. The constraints facing the sector include outdated production technology leading to high production costs. Capacity utilization in processing is also low. Other constraints include lack of finance, inadequate institutions (e.g. weak cooperative unions), lack of entrepreneurial skills, and weak contractual arrangements. In relation to marketing chains the following are characteristics: the marketing chains are generally fragmented, with small-scale farmers locked out of retail markets and bearing the highest risks.

According to the two authors above, factors influencing change in modern retail and wholesale chains and related agribusiness in Tanzania are market demand, technology barriers to entry, input supply, and profitability of different niches, risks and policy environment. For fresh fruit and vegetables the major forces are: heavy reliance on the Dar es Salaam urban market which consumes over 50% of urban consumption, thereby determining trade volumes, prices and quality standards; irrigation technology; and market access by farmers close to major consumption areas. Unfavorable climate, high freight charges, skilled manpower shortages, and failure to meet agricultural standard limits profitability.

#### **2.4 Quality and Standards**

Demanding private sector standards have increased the costs of compliance for all producers and specifically impacted upon the opportunities for small-scale producers' participation at the higher value end of the horticultural export trade. An example is EurepGAP code for production of fresh fruits and vegetables, which was started in 1996. This has impacted both positively and negatively to small-scale producers in SSA.

High value markets increasingly influence the structure of the agri-food system and dictate the conditions for small farms and firms to sell agri-food products (Reardon *et al.*, 2003). Quality and reliability demands of high value markets often act as barriers to participation in the trade chain by small-scale producers and exporters. The participation of small-scale producers in global fruit and vegetable trade is also affected by the increasing attention that food quality and safety are receiving in food trade, coupled with an expansion in the number of non-tariff measures that developed countries apply to agricultural products. Recent research in other regions such as Latin America, shows that, while these changes

provide great opportunities for some suppliers to broaden and deepen their markets and raise their income, for others especially smaller farmers and firms, they imply huge challenges and the risk of exclusion from the transforming food economy (Reardon and Berdeque, 2002).

### **2.5 Post- Harvest Facilities**

Outputs of all agriculture commodities produced in the field have to undergo a series of operations such as threshing, transportation, processing, storage and exchange before they reach consumer, and there are appreciable losses of outputs during these stages of their handling. The sum quantity of outputs lost in these operations at all of these stages is referred to as “post harvest losses” Kumar *et al.* (2006). In perishable crops like fruits and vegetables, proper and scientific storage, packing transport and handling technologies are not adequate and hence, considerable amount of produce is wasted. The vegetable crops because of their moisture content are inherently more liable for deterioration in quality and quantity especially under tropical conditions. Moreover, they are biologically active and carry out transpiration, respiration, ripening and other biochemical activities, which contribute for deterioration in quality of the produce. Post-harvest losses in vegetables during post-harvest operations due to improper handling and storage are enormous. Gauraha (1997) reported that the post-harvest loss in vegetables ranges from 5.42 per cent in the case of bottle gourd to 32.64 per cent in the case of tomatoes. Post harvest loss can occur in the field, in packing areas, in storage, during transportation and in the wholesale and retail markets. Severe losses occur because of poor facilities, lack of know-how, poor management and improper market facilities or due to careless handling of the producers by farmers, market intermediaries and consumers. It is, therefore, important that post-harvest practices be given as much attention as production practices.

Horticultural production, particularly in hot wet tropical environments is severely constrained by post-harvest losses which reduce profits to farmers and marketers. Horticultural crops are often highly perishable, restricting the ability of producers to store them to cope with price fluctuations. Available information indicates that post-harvest losses can be as high as 60% for cabbage and tomato, 50% for head lettuce and cauliflower, 30% for bell pepper and 17% for Chinese cabbage in South East Asia (Bhatte, *et al.*, 1993). Reducing post-harvest losses would make diversification into vegetable production less risky and more attractive.

Post-harvest related quality losses also reduce opportunities for export revenues. Vietnam, for instance has experienced declining export revenues for fruits and vegetables during the first quarter of 2004. The export revenue for fruits and vegetables was US\$30 million, only 2/3 of the value for the same quarter in 2003. This decline was attributed to low quality of export goods, which was due to poor storage and outdated post-harvest technologies (Socialist Republic of Vietnam, 2004). Participation in international markets requires relatively sophisticated marketing, information and transportation networks. Successful competition requires quality control, product standardization, and to some future markets, traceability. The development of the post-harvest sector includes improving pre- and post-harvest processing technologies, as well as developing and improving market information systems that include information on emerging technologies.

## **2.6 The Rise of Supermarkets**

The rise of supermarkets in Africa since the mid-1990s is transforming the food retail sector. Supermarkets have spread fast in Southern and Eastern Africa, already proliferating beyond middle-class big-city markets into smaller towns and poorer areas. International

supermarket chains and large processors are becoming the main buyers of fresh horticultural products and small-scale farmers need to be trained and organized to meet the challenge of supplying these international players (Weatherspoon and Reardon, 2003). Supplying supermarkets presents both potentially large opportunities and big challenges for producers.

Supermarkets are no longer just niche players for rich consumers in the capital cities of the countries in regions. The rapid rise of supermarkets in these regions in the past five to ten years has transformed agrifood markets at different rates and depth across regions and countries. Many of those transformations present great challenges even exclusion from small farms, and small processing and distribution firms, but also potentially great opportunities (Reardon *et al.*, 2003). Development models, policies, and programs need to adapt to this radical change.

Supermarkets' procurement systems involve purchase consolidation, a shift to specialized wholesalers, and tough quality and safety standards. To meet these requirements, producers have to make investments and adopt new practices. This is hardest for small producers, who risk exclusion from dynamic urban markets increasingly dominated by supermarkets (Weatherspoon and Reardon, 2003). There is thus an urgent need for development programmes and policies to assist them in adopting the new practices that these procurement systems demand.

The most recent venue for supermarket take-off is in Africa, especially in Eastern and Southern Africa. South Africa is the front runner, with roughly a 55% share of supermarkets in overall food retail and 1700 supermarkets for 35 million persons. The great



majority of that spectacular rise has come since the end of apartheid in 1994 (Reardon *et al.*, 2003). The rapid rise of supermarkets in Africa is made possible by urbanization and the rise of the middle class in countries such as Kenya and South Africa. However it goes well beyond those drivers, because supermarkets are extending into poor neighborhoods of large cities and towns all around the developing world. Through format adaptation and efficient procurement systems, the new trend in the region is ‘supermarkets for the poor’, a diffusion and extension of supermarkets away from being mere luxury top-end niches to being mass market merchandisers (Weatherspoon and Reardon, 2003).

Tanzania provides an example of an East African country where supermarket growth was taking off in the late 1990s and early 2000s, under investment pressures from South Africa and Kenya as well as a dynamic internal retail sector. In the 1980s, the Tanzanian government ran public sector retail operations, Regional Trading Companies (RTCs) and the Household Supplies Companies (HOSCOs). These companies were privatized in the late 1980s and early 1990s (at the same time as a similar liberalization was taking place in the public retail sector in Zambia and China). Replacing them were a proliferation of private mini-markets and small groceries, in the mid- to late 1990s. However, in the late 1990s, the supermarket sector began to develop quickly, and with urbanization conditions similar to those in Kenya, a similar growth of supermarkets followed (Shop rite, 2002; Business Day, 25 November 2002; Winter-Nelson, 2002). Following the 1990s series of macroeconomic reforms and the liberalization of FDI (a factor that is usually key in starting a supermarket sector ‘take-off’), Shop rite and PnP (Pick and pay) entered in 2000. Shop rite bought the PnP stores in 2002. In addition, there are two domestic (Tanzanian-based) chains, Imalaseko and Shoppers’ Plaza both of which are expanding. The apparent

opportunity for growth in Tanzania has led many supermarket chains to view the country as an important emerging market.

## **2.7 Global Fruits and Vegetables Consumption**

Fruits and vegetable consumption has clear health and nutrition benefits. Fruits and vegetables are a relatively cheap source of essential micronutrients and they are protective against chronic diseases. The vast majority of consumers however are unaware of the health benefits of consuming fruits and vegetables in abundance, even in developed countries (Subar and Nayga, 1995). In the United States, health awareness and the knowledge of the fruits and vegetable servings recommended per day have been associated with greater fruit and vegetable intakes.

Other important factors include taste and preferences, and having developed the habit of eating these products during childhood. Several demographic factors such as female gender, age, education, income and non-smoking status are also associated with greater fruit and vegetable intake in this population (Subar *et al.*, 1995; Nayga, 1995). The worldwide supply of fruits and vegetables per capita has increased continuously since 1961. In 2002 the global per capita supply of fruits and vegetables was 173 kg, i.e. 112 kg of vegetables and 61 kg of fruits. However the availability of fruits and vegetables is unevenly distributed. Only a small minority of the world's population consumes fruits and vegetables equal to or greater than the recommended intake of 400 g per day (156 kg per year).

Consumption is highest in the developed world at around 200 kg per capita. Asia, which had lower fruit and vegetable supplies per capita than Africa throughout the 1960s to

1980s, has recently enjoyed high production growth rates. In 2002, approximately 180 kg per capita per annum were available. In vegetables, the developing countries of Asia now have similar supply rates as developed countries. The lowest levels of supply are recorded for developing countries in Africa where there are only 106 Kg of fruits and vegetables produce available per capita, half of the developed world rate. Such aggregated supply figures do not adequately reflect the large disparities that exist within regions and within countries. A study by Pomerleau *et al.* (2004) indicates that wide variations in intake exist between gender and different age groups. For example, estimated intake levels are lowest for women in the age group 15-29 in certain countries of Latin America (Argentina and Mexico), Europe (Estonia, Lithuania) and Russian Federation and South Asia (India and Bangladesh) at 54 kg, 72 kg and 73 kg, respectively. Such low levels of fruit and vegetable consumption in some parts of the world have devastating health effects. It is estimated that insufficient fruit and vegetable intake causes some 2.7 million deaths each year, and belong to the top 10 risk factors contributing to mortality (Ezzati *et al.*, 2002). In order to stimulate fruit and vegetable consumption, the World Health Organization (WHO) and the United Nations (FAO) jointly announced a fruit and vegetable promotion initiative in 2003. With the exception of Sub Saharan Africa (SSA), where average annual growth in per capita supply of horticulture produce was negative between 1971 and 2000, all other regions experienced growth in per capita fruit and vegetable supply at rates outstripping growth rates over decades and have been particularly rapid in the last decade, 1990 to 2000. The growth of worldwide per capita vegetable supply has been of 1.8% against 1.2% for fruit.

## 2.8 Marketing Chains for Fruits and Vegetables

Fruit and vegetable growers have always faced dynamic, rapidly changing markets because of underlying factors such as consumer tastes and preference, weather patterns, regulatory legislation, insect/disease infestations production costs, and marketing logistics (Hall *et al.*, 2006). In addition, evidence suggests that significant changes in marketing structure are occurring in fresh fruits and vegetables industry in that the flow of produce from farm to consumer follows a different path than it once did. Rather than making heavy use of the wholesale terminal markets, retailers (large ones in particular) are purchasing a larger portion of fruits and vegetables directly from shippers. Farms and supermarkets alike are expanding, while it appears that the wholesaler sector is decreasing in size.

Urban wholesale market places continue to play a key role in the domestic horticultural marketing system as the dominant sources of supply for open-air retail markets, kiosks, and small stores. The largest supermarkets are attempting to by-pass these markets. Each relies primarily on brokers and secondarily on direct procurement with an assortment of contracted commercial farmers and some organized small-and medium-size farmers Weatherspoon *et al.* (2004). It is known that brokers obtain some of their produce in wholesale markets, though details is lacking on the volume and specific commodities that they tend to procure in this manner. The largest supermarket chain state that they intend to phase out brokers over the next five years as they develop their “preferred grower” programs (Jairath, 1996). Whether in fact they are able to supply will depend on whether these systems are able to provide appreciably better quality produce at comparable prices to the traditional system. Collecting wholesalers do also sell directly to professional retailers in the market. The distinction between the various actors is to some extent artificial because at the end of the day wholesalers often sale produce that they have left

over directly to consumer, thus taking the role of retailers. The trading system is very flexible.

In view of the considerable potential of fruits and vegetables sector from the production (supply) side as well as from the consumption (demand) side, it is imperative to examine the various linkages that facilitate/constrain the performance of this sector. The role of infrastructural facilities including credit facilities in promoting horticulture ventures is widely acknowledged (IIFT, 1997; Chand, 1996; Jairath, 1996). The perishability of the produce coupled with seasonality in production and the distance between production and consumption centres warrants an effective linking of producers and consumers through strong marketing support. This necessitates infrastructural facilities such as motorable roads, regulated markets, cold storage, refrigerated transport, grading, packing, processing facilities, credit support, marketing informations research and development.

## **2.9 Urban Fruits and Vegetables Production**

Defining urban agriculture (UA) is problematic because of the varying contexts in which it takes place, the resources involved, and the people undertaking it. For instance, Tinker (1994, p. x) defines UA “as the growing of food crops and fruits and also the raising of animals, poultry, fish, bees, rabbits, snakes, guinea pigs, or other stock considered edible locally”. Smit *et al.* (1996, p. 1) give a broad definition “as an industry that produces, processes, and markets food and fuel....on land and water dispersed throughout the urban and peri-urban area...” Yet, Mougeot (1994, p. 1) defines UA as the “production of food and non-food plant and tree crops and animal husbandry (livestock, fowl, fish, and so forth), both within (intra-) and fringing (peri-) built-up urban areas”

Increasing commercialization of the urban fruits and vegetables production sector is fueled not only by growing export markets, but also by increasing domestic demand. In a study comparing elasticities for different food commodities and across countries, Seale *et al.* (2003) showed that low-income countries have relatively high expenditure and own-price elasticities for fruits and vegetables, indicating that demand in developing countries for these products will change more than income increases or price reductions. Demand is expected to increase especially in urban areas, which are considered to be the most dynamic food markets in developing countries due to increasing urban populations and incomes (Weatherspoon and Reardon, 2003).

Urban fruits and vegetables production, a subset of Urban Agricultural also differs globally and plays a crucial role in most urban dwellers' house food security. Vegetables supply essential micro-nutrients in human nutrients that act as preventive agents to several ailments. Increase Fruits and vegetables production may improve food security, and offer employment opportunities and income to urban dwellers, especially women who form a substantial proportion (Mlozi, 1998). UA is helping millions of people out of extreme poverty and is improving health and nutrition of urban dwellers across the globe. Similarly, vegetables are important for "the diversification of nutrients, provide better balanced diet, vitamins and minerals; can also be used as traditional medicine. They have also curative and preventive measures against diseases, and reduce the monotony of nutrition" (Hang, 1994). UA is boosting the economies, enhancing the environmental and strengthening food supplies of cities in developed and developing countries and is becoming the prime source of income for the dwelling populations of the world's cities.

Surveys in Africa show that out of ten, two to three urban families are farmers, one fifth to three of the city area in agriculture, and one sixth to one third of the adult job holders are working in agriculture (Smit, 1995). In addition to Africa's quasi-urban planning and haphazard town development, with few exceptions in South Africa, growing of fruits and vegetables is common in the not built house plots, road side, in the valleys, in backyards, front-yards and towns' open space. Globally, there seems to be an increase in urban agriculture ... as cities grow, the urban agriculture industry expands to feed the new citizens (Smit, 1995). In Latin America, for instance, local and national governments and the newly legitimate NGOs embrace UA. Smit (1995) reports that in Moscow, the number of families practicing agriculture increased from 20% to 65% between 1970 and 1990, and "as cities grow the urban agriculture industry expands to feed the new citizens" (Smit, 1996:33).

In Tanzania, for instance, urban fruits and vegetable production is carried out in three spatial environment systems: the peri-urban, open space, and home-gardens. Several studies on fruit and vegetable production show that open spaces mainly produce fruit and vegetables for sale while the back yard gardens are for home consumption (Stevenson *et al.*, 1994; Jacobi and Amend, 1997; Mlozi, 1998). Globally, it seems that horticultural production in cities and towns is constrained by factors such as: lack of sufficient inputs; inadequate research findings to produce technical packages; financial constraints facing growers; lack of suitable, high yielding and disease resistant varieties/species; lack of organized marketing systems; thieves, lack of storage facilities; and lack of extension advice to gardeners.

## **2.10 Fruits, Vegetables and Gender Equity**

Often poor and landless women have been able to capitalize on new labor market opportunities associated with production or processing of high value horticultural products (McCulloch and Ota, 2002). Working women are often the major beneficiaries of the convenience associated with processed horticultural products. In Africa and Latin America, high-value crop exports are female intensive industries, with women dominating most aspects of production and processing. In Chile, Ecuador, Guatemala, Kenya, Mexico, South Africa, and Zimbabwe, evidence suggests that women occupy at least 50% or more of the employment in these industries.

Women play an important role in various production activities for example in producing, harvesting and marketing the crops. However, their involvement varies by type of activity, it is most important for harvesting and bringing the product to the market, while weeding, which is also considered to be a typical women's activity, is actually mostly shared between men and women (Chweya and Eyzaguirre, 1999; Price, 2003). Men's involvement is particularly high in irrigation and pesticide application. Also, hired labor is undertaken nearly exclusively by men. As a whole, more activities were recorded for men alone than for women alone, and joint work as a family (either adults only, or together with their children) was also recorded more frequently than women's work alone. The reason for the relatively large share of male activities may be that many of the crops assessed are being marketed. Women's role may still be more important as far as collection activities of fruits and vegetables are concerned. However, female involvement is important and that women farmers have to be involved in the selection process of new and improved varieties.



Similarly, in nearly all developing countries, women dominate the marketing of horticultural crops and products in traditional markets. To capitalize on the unique opportunities to bring financial and nutritional benefits of horticulture to women, gender-based donor support should help women access educational opportunities and technical information and should consider women's roles and needs in culturally-specific food systems, emphasize research on women's participation in small-scale production for export; include comparative research on gendered dimensions of horticultural production across regions and market levels; and document women's particular constraints and opportunities in the horticultural sector (Dolan and Sorby, 2003).

### **2.11 Fruits, Vegetables and Diversification**

Many factors are behind the present push for diversification of cereal-based cropping systems all over the world. Foremost is a concern for sustainability in the continuous cereal-cereal rotation (Cassman and Pingali, 1993). Other considerations are diversification of risk, income, and food, and enhanced efficiency of farm resources. Crop diversification is also getting a pull from consumers who now show a greater awareness of the advantages of diversifying a cereal-based diet with vegetables, fruits, livestock products, and seafood (Pingali, 1992). Declining rice prices and shortages of water, due to deteriorating irrigation infrastructure, reduced profitability of irrigation investment, and/or competing water demand for domestic use (Rosegrant and Pingali 1994), are driving farmers to replace rice with more water efficient crops.

All of these factors provide impetus for the expansion of fruit and vegetable cultivation. Vegetables in the cropping system can help break the pathogen cycle in cereal-cereal rotations. And integration of leguminous vegetables, such as mungbean, can improve the

productivity and profitability of the cereal-cereal system (Ali, 1998; Ali *et al.*, 1997). Vegetables utilize water most efficiently in terms of both production and economic efficiency (Ali, 1999), and vegetable production engages more labor of vulnerable population groups, such as women and children (Braun *et al.*, 1989; Wann *et al.*, 2000). Evidence is provided that suggests replacing rice with vegetables can generate additional income and employment. Across-country variation in the proportion of vegetable to cereal area suggests both potential and limitation for diversification. It is as high as 28% in East Asia (excluding China), but as low as 3-5% in South and Southeast Asia.

These variations are mainly due to differences in economic conditions, such as input and output prices, access to markets and price information, and risk-covering policies, and physical factors, such as climate, irrigation, erosion, drainage, soil chemistry, and topography. Some marginal improvements have been made in diversifying Asian cereal-based systems. In 1980, the vegetable growing area was equivalent to only 4.5% of the cereal-growing area; by 1993 this figure had risen to 6.3%. The increase is more prominent in East Asia, mainly due to expansion in vegetable area 45% and reduction in cereal area 10% (Braun *et al.*, 1989; Wann *et al.*, 2000). Small gains were also made in South Asia, but the proportion remained almost stagnant in Southeast Asia. Increase in the value of vegetable production relative the value of cereal production has been quite dramatic. In Asia as a whole, the proportion almost doubled from 17% in 1980 to 30% in 1993. The change was pervasive, mainly due to increases in vegetable prices relative to cereals.

Environmental factors can limit diversification of agricultural production systems. For example, uplands already have quite a high degree of diversification, while hot, humid lowland tropics are environmentally unsuitable for vegetable cultivation. Generally,

temperature, in particular high night temperature in tomato (Peet and Willits, 1993), and flooding (Midmore and Poudel, 1996) limit vegetable cultivation. However, technologies that help overcome these environmental stresses are available, and depending upon vegetable prices and physical factors, harsh environments can be ameliorated. For example, vegetable farmers on the periphery of Bangkok build and maintain ditches and dikes (called *sorjan* systems) to manage flooding in vegetable fields. Similar systems are used to grow year-round vegetables in China (Plucknett *et al.*, 1981) and in Indonesia (Pingali, 1992).

Technologies, such as hydroponics for the tropics, are also available (AVRDC, 1995). Planting chili on raised (40cm versus 20cm) and narrow (1 m versus 1 .5m) beds can improve plant survival and total fruit yield in the rainy season (AVRDC, 1992). Grafting of tomato on eggplant rootstocks improves flood survival and enhances yield many-fold; combining raised beds, fruit set hormones, and simple plastic rain shelters increases tomato yield three-fold (AVRDC, 1993). These technologies are expensive to install, operate, and maintain, and require high management skills.

Thus, they are economically viable only when vegetable supplies are limited and prices are high. Modifying these technological solutions so that they become economically viable for a wider range of environments is a continuous challenge for vegetable researchers. In the dry season in the irrigated lowlands, it is relatively easy to switch to vegetable crops. However, sometimes entire irrigation structures need to be rehabilitated (water flow-rate at the head, irrigation canals, channels and drainage, field slope, etc.) to make rice fields suitable for vegetable cultivation (Moya and Miranda, 1989).

## **2.12 Neglect of Fruits and Vegetables Research**

Historically, the attention of development policymakers is and has been focused on staple grains. Since the 'Green Revolution' was initiated in the 1950s, vastly more resources have been channeled into the improvement of staple grains compared to horticulture crops. Between 1968 and 1996, the United States Agency for International Development (USAID) was one of the largest donors to the international agricultural research centers dealing with the staple crops rice, wheat and maize (IRRI, WARDA and CIMMYT). Over this 29-year period, USAID provided US\$213.58 million to these three centers (27% of all USAID core contributions), while centers focusing on tropical fruits and vegetables (INIBAP and AVRDC) received US\$18.80 million (2.4%), less than one-tenth as much (Alex, 1997).

Recently, the Consultative Group on International Agricultural Research (CGIAR) has expressed more interest in horticulture research, and research on high value crops has been identified as a system priority (CGIAR, 2004)<sup>1</sup>. Still, research investment into horticultural research remains woefully inadequate. In 2002, the CGIAR system invested US\$118 million on research for cereals, 37% of all CGIAR expenditures (CGIAR, 2003). In contrast, during that same year CIAT<sup>2</sup>, INIBAP, and AVRDC together invested US\$15.7 million for fruit and vegetable research (CIAT, 2003; INIBAP, 2003; AVRDC, 2003), roughly 13% of what was invested into cereal crops. These research investments do not adequately represent the value of horticultural crops. The world's five largest producers of rice, wheat and maize are China, USA, India, Indonesia and Brazil. Even in these five large cereal producing countries, the value of fruit and vegetable production as compared to all cereal production is 85%, 105%, 55%, 59% and 91%, respectively. On a global level, the

value of all fruits and vegetables traded is more than double of the value of all cereals traded.

All over the world, the area under food grains is under pressure from more profitable horticultural crops. The increases in total volumes of fruits and vegetables traded worldwide have been dramatic. But while trend lines are impressive, the magnitudes are inadequate to supply minimally nutritious diets and to have a major impact on poverty alleviation in the developing world. Much more political and financial attention must be given to research in horticultural systems if increasing numbers of poor farmers are to benefit from the potential of this silent revolution.

### **2.13 Agricultural Input Supply**

Several surveys of farming systems in Tanzania have observed that poor supply of inputs to farmers is the most limiting factor to agriculture productivity (Mlambiti, 1985). The supply of agriculture inputs is a private sector operation and the Government has remove subsidies on agricultural inputs. The removal of subsidies, coupled with high market costs has lead to a drastic increase in prices of important agricultural inputs such as fertilizers, agro-chemicals and improved seeds. The increase in prices of inputs has led to a decrease in their use by small and medium scale farmers. Although medium scale farmers have a greater potential to address the effect of liberalization compared to smallholders, the unfavorable policy environment *i.e.* agriculture policy that focused small scale farmers, in which they have been operating for more than three decades, has limited their ability to compete in an increasingly liberalized economy.

The problem of access to agricultural inputs has been compounded by the collapse of cooperatives which were supplying the inputs on credits. In the livestock sub-sector, essential inputs such as veterinary drugs, vaccines, acaricides, land development equipments and implements, pastures seeds, fodder plant materials, commercial feeds and improved livestock breeds have a limited supply (URT, 1999). Thus this study seeks to find out ways in which small-scale fruits and vegetables farmers can benefit from appropriate policy recommended by this study.

#### **2.14 Rural Financing**

Credit is emphasized because of the importance of the agricultural sector in the Tanzanian's economy. Agriculture contributes about 60% of the gross domestic product (GDP) in the country. It also contributes 60% of the national exports earnings, and employs over 80% of the Tanzanian populations (World Bank, 1999). It is estimated that smallholders' production under labor intensive farms with low production technology accounts for more than 75% of the total agricultural production in the country.

The present era of globalization is accompanied by a high rate of technological innovation derived from science and engineering, aimed at increasing efficiency in production. The vast array of suppliers, in terms of modern machines, agrochemicals, storage facilities and services that support modern-day farming require large sum of capital (Doll, 1984). In this regard, advanced farming is not different from other businesses in that it also depends on capital markets. Medium scale farmers, given their narrow capital base, need to have access to credit facilities. The survival of medium scale farmers will depend on their ability to expand by increasing their land holdings, capital investments particularly in technology and more efficient use of labor inputs.

Modernising agriculture require the purchase of new inputs, which are produced off the farm. To buy these additional inputs the farmers must have accumulated savings e.g. have ready access to a source of external capital such as credit. Credit has been considered necessary for farmers with little capital of their own as a means to access improved agricultural technology (Erhardt, 1999). Farmers and policy makers have often identified lack of access to credit as a significant constraint to agricultural production in developing countries (James, 1995). As a way of supporting farmers, the government of the United Republic of Tanzania established a number of credits schemes to provide financial resources to the agricultural sector. Various non-governmental organizations (NGOs) initiated similar support schemes. These were thought to be sound policy strategies to the capital deficiency on the side of smallholder farmers. Unfortunately, most of the schemes proved to be inappropriate as far as the beneficiaries were concerned (James, 1995).

This is also true in Tanzania where the Government initiated several programs to improve the agricultural sector through supporting smallholder farmers. Just like experiences of other developing countries, despite all the efforts made, the Tanzanian agricultural sector is inefficient and fails to act as an engine for economic growth (URT, 1999). Failures of such support programs are normally and very simplistically attributed to the programme design, i.e. mainly faults on the supply side.

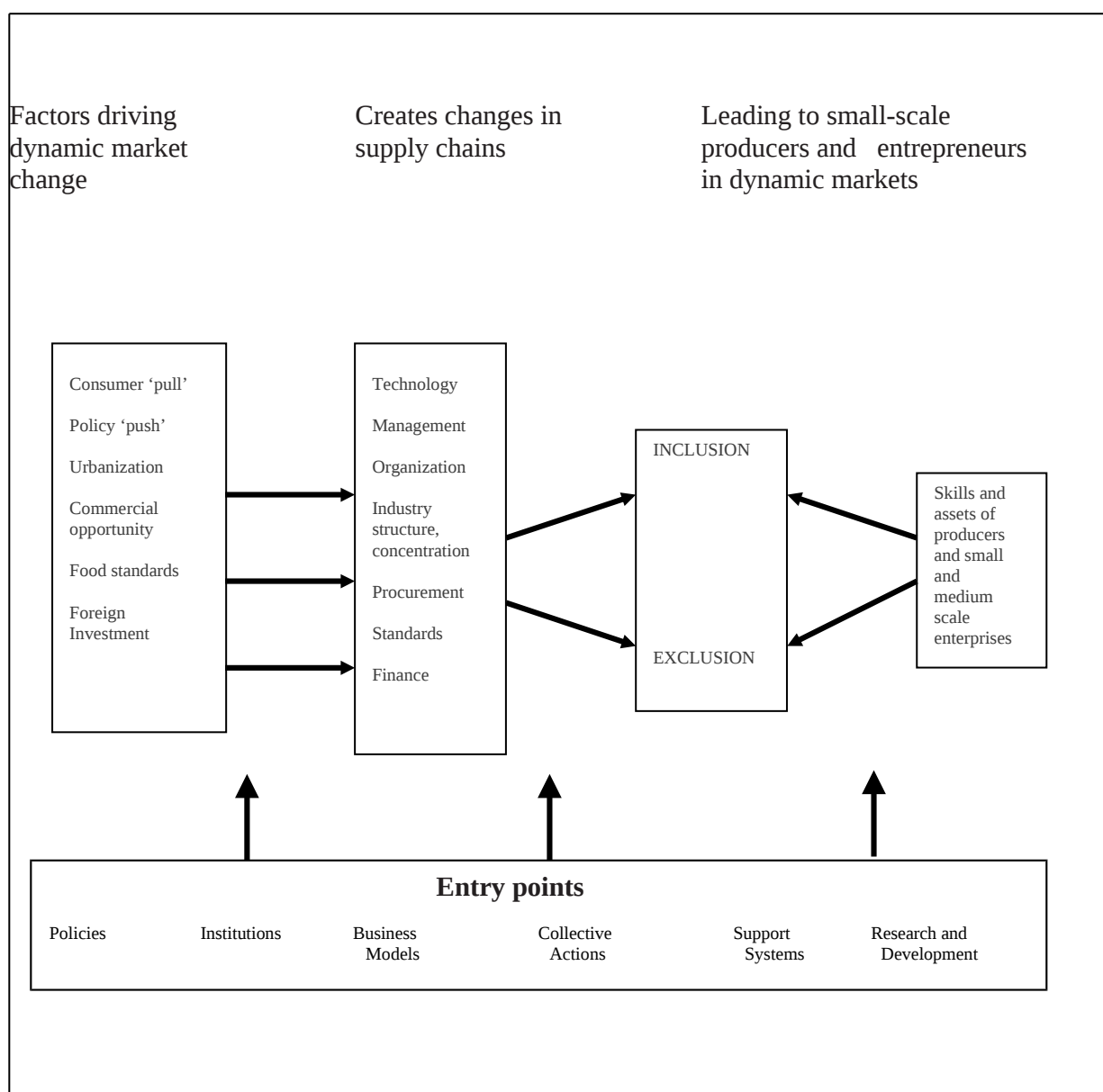
## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Conceptual Framework**

The framework to this study is within the market theory which is centered on the market accessibility of small-scale fruits and vegetables producers to the niche markets. Accessibility to niche markets is a function of various interrelated factors which include: consumer pull, policy push, commercial opportunity, food standards, institution support (finance, farmer organizations, cooperatives, research and advisory services) and foreign investment. These factors collectively are expected to create changes in the supply chains of the commodities in question if profit is to be realized through technology and management improvement as well as procurement and quality standard adherence which in turn will lead to small scale producers' access to niche markets.





**Source:** Modified from (Graffman *et al.*, 2007). *Regoverning markets*, April 2007

**Figure 1: Conceptual Framework for Analyzing Fruit and Vegetable Farmers' Accessibility to Niche Markets.**

### **3.2 Study Area**

Dar es Salaam is located approximately 88 kilometers south of the equator along the East African coast, between latitudes 6° 34' and 7° 10' south of the equator and 1393km<sup>2</sup> or 0.2 % of the total land in Tanzania, where 448 km<sup>2</sup> is reserved for city expansion while 945 km<sup>2</sup> is known as green belt area suitable for both Agricultural and livestock keeping. The region is composed of three administrative districts, namely, Kinondoni, Ilala and Temeke. According to the 2002 National Population Census, Dar es Salaam is the third region from Mwanza and Shinyanga regions in terms of total population. It has a total population of 2 497 940 people which is 7.2% of the total population of Tanzania. Out of its total population, 1 236 863 are males and 596 264 are females. The average household in the region is 4.2 persons (URT, 2003). In addition the region has highest population density of 1793 person per km<sup>2</sup> in the country, growing at an average of 4.3% per annum based on the 1988 National Population Census (URT, 2003). In response to this, the population statistics suggest that the region has adequate potential demand for fruits and vegetables. Other major forces include heavy reliance on the Dar es Salaam urban market which accounts for over 50% of urban consumption, thereby determining traded volumes, prices, and quality standards; irrigation technology; and market access by farmers close to major consumption areas (Ashimogo, 2007). Main fruits and vegetables grown in Dar es Salaam region are oranges, mangoes, pineapples, papaya, bananas, lemons, okra, eggplants, cabbages, onions, spinach, and tomatoes (Ministry of Agriculture and Co-operatives and Food Security, 2000).

### **3.3 Sampling Procedures and Sample Size**

The sample size was based on the Farm Level Applied Research Methods for East and South Africa (FARMESA) experience (See Matata *et al.*, 2001) which contend that 80-120

of samples size is adequate for social-economic studies in Sub Saharan Africa. A total of 151 respondents were sampled for interview. Stratified sampling was used to select respondents in the study area. These include fruits and vegetables farmers, traders and supermarket operators. From there a simple random sampling was used to select eighty-one farmers and sixty traders. In selecting respondents from supermarkets, a proportion sampling was used to select ten supermarket operators because they are few supermarkets in the study areas.

**Table 1: Sample size by respondents in the study area**

Sex	Farmers	Traders	Supermarket operators	Total
Male	45	35	6	86
Female	36	25	4	65
Total	81	60	10	151

### 3.4 Source of Data

#### 3.4.1 Primary data

Primary data was obtained through different three structured questionnaire interviews with farmers, traders and supermarket operators (Appendices 1, 2 and 3). The questionnaires were designed to collect qualitative and quantitative data on fruits and vegetables marketing chain from farmers, traders up to supermarket level.

#### 3.4.2 Secondary data

Secondary data were obtained from Sokoine University of Agricultural Library (SNAL), Kariakoo market, National Bureau of Statistics (NBS), Municipal Agriculture and Livestock Development Officers (MALDO) from the three districts i.e. Kinondoni, Ilala and Temeke, Bank of Tanzania (BoT), and the Ministry of Agricultural, Food and Cooperatives. There were no formal questionnaires for the secondary data. Instead,

discussion guides were prepared before hand and took place between the respective authorities of the data source and the researcher.

### **3.5 Data Collection Instruments**

Three different structured questionnaires were used as tools for data collection from farmers, traders and supermarket operators. These questionnaires consisted of both open and closed-ended questions.

### **3.6 Data Processing and Analysis**

#### **3.6.1 Qualitative data analysis**

##### **3.6.1.1 Descriptive statistics**

Descriptive statistics such as frequency, cross-tabulation, means, variances, maximum, minimum and standard deviations of some critical values were used to describe the general characteristics of the data. These included production technologies used, problems faced by the farmers during production, post harvest handling such as storage, processing, transportation and market related data as information, prices and institution support particularly credit accessibility, NGOs support, extension services and policies. Chi-square test was used to test for the significant differences at  $p = 0.01$  and  $0.05$ .

#### **3.6.2 Quantitative data analysis**

##### **3.6.2.1 Buyers concentration index**

To attempt objective number (i), concentration ratio was used to assess market structure which determined number and sizes of different enterprises for the tomatoes and mangoes marketing which provided some degree of market concentration. The market concentration as formulated by Khol and Uhl (1985, p.187) is given by

$$C_t = (MR_t / TR_t) \times 100$$

Where;

$C_t$  = Seller index of concentration for tomato farmer

$MR_t$  = Revenue accrued by four biggest tomato producers who sold their product to the urban traders.

$TR_t$  = Total Revenue accrued by all tomato farmers who sold their product to the urban traders.

$$C_m = (MR_m / TR_m) \times 100$$

Where;

$C_m$  = Seller index of concentration for mango farmer

$MR_m$  = Revenue accrued by four biggest mango producers who sold their product to the urban traders

$TR_m$  = Total Revenue accrued by all mango farmers who sold their product to the urban traders

As a rule of thumb, a four enterprises ratio of 50% or more is indicative of a strong oligopolistic industry; of 33-50% a weak oligopoly, and less than that, an unconcentrated industry.

### 3.6.2.2 Gross margins

To address objective (ii), Gross Market Margin Analysis was employed to determine the various margins between small-scale tomato and mango farmers. Data on prices and costs obtained at different stages in the marketing were used to obtain farmers' gross Margins and price comparison at different marketing chain.

$$GM = TR - TVC$$

Where:

- GM = Gross Margin obtained from tomatoes and mangoes from each respondents (Tsh/month)
- TR = Total Revenue obtained from fruits and vegetables sold from each respondents (Tsh/month)
- TVC = Total Variable Costs obtained from tomatoes and mangoes from each respondents (Tsh)

### 3.6.2.3 Regression analysis

The logistic model specification proposed by Gujarat, (1995) was used to answer objectives (iii) and (iv) which were to determine the potential of training and examine the role of education level to small-scale fruit and vegetable farmers' access to niche markets.

$$P_i = E\left(Y = 1 \mid X_i\right) = \frac{1}{1 + e^{-(\beta_0 + \beta_i X_i)}}$$

$P_i$  can be transformed as

$$L_i = \ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \beta_i X_i + \varepsilon$$

Where;

$\frac{P_i}{1 - P_i}$  is referred to as odds ratio which showing the probability that Y is taking the value of (1= Farmer to be included in niche market and 0 otherwise)

Y= Dependent dummy variable (1= Farmer to be included in niche market and 0 otherwise).

$L_i$  = Is the log of the odds ratio or the value of the regressand (Y) or logit.

$\beta_0$  and  $\beta_i$  = Are elasticity

X= is the explanatory variable.

$P_i$  = Probability that the farmer will be included into niche market.

$1 - P_i$  = Probability that the farmer will be excluded into niche market.

$i = 1, \dots, 7$

$e$  = Natural logarithm

$\varepsilon$  = Error term

The Empirical modal is specified as

$$Y = \alpha + \beta_1 PRC + \beta_2 TRA + \beta_3 LAND + \beta_4 EDU + \beta_5 REC + \beta_6 AGE + \beta_7 QNTY + \varepsilon$$

Where;

Y= Access to niche markets dummy (1 for access and 0 if not access)

$\alpha$  = Intercept to be estimate

$\beta_1, \dots, \beta_7$  = Parameter estimates

PRC = Price of the product (Tsh)

TRA = Training of respondent dummy (1for getting training and 0 if not get training)

LAND = Access to land dummy (1 for Bought and rented and 0 for inherited)

EDU= Education level of the respondent

REC=Record keeping dummy (1 if keeping records and o if not keeping records)

AGE =Age of respondent

QNTY=Quantity sold (kg)

$\alpha$  = Error term

## CHAPTER FOUR

### 4.0 RESULTS AND DISCUSSIONS

#### 4.1 Overview

This chapter presents findings and insights to the study. The first section deals with respondents' general characteristics for small-scale fruits and vegetables farmers, trades and supermarket operators in three districts, namely, Kinondoni, Ilala and Temeke in Dar es Salaam region. The second section deals with factors influencing small-scale fruits and vegetables farmers' access to niche markets. It captures information on problems faced by respondents during the production period, agricultural input requirements, source of land owned, production technology used, mode of transport used, the role played by some institutions to provide financial supports, extension services, farmers organizations and finally, records keeping by respondents during production and marketing activities. The third section reports on the problems encountered by respondents during marketing. It captures information on problems faced by small-scale fruit and vegetable farmers and traders during marketing and quality assessment.

The fourth section deals with the products preferred to be sold by supermarkets. It deals with reasons for selecting imported products by supermarkets and problems encountered by small-scale fruit and vegetable farmers. The fifth section deals with marketing chain for fruit and vegetable farmers. It captures information on gross margin analysis and price comparison for tomato and mango farmers at different trade nodes. The sixth section deals with seller concentration index for tomato and mango farmers and the last portion deals with regression analysis for fruit and vegetable farmers.



## 4.2 Respondents General Characteristics

### 4.2.1 Age distribution of respondents

The distribution of respondents according to age is presented in Table 2. The table shows that majority 41% and 42% of farmers and traders respectively had the age between 31 and 45 years. 32% and 39% of farmers and traders respectively fall in the group of less than 31 years of age. Implying that the two groups were within the active working age group and have power to produce. For supermarkets, majority of the operators 80% had the age range of between 15 and 45 years.

**Table 2: Age distribution of the respondents**

Age group	Farmers		Traders % of respondents		Supermarkets		All	
	n	%	n	%	n	%	n	%
Years								
15-30	26	32.1	23	38.3	4	40.0	53	35.1
31-45	33	40.7	25	41.7	4	40.0	62	41.1
46-60	19	23.5	12	20	2	20.0	33	21.9
Above 61	3	3.7	0.0	0.0	0.0	0.0	3	2.0
Total	81	100.0	60.0	100.	10.0	100.0	151.0	100.0
				0				

Domination of supermarkets' respondents by this age group is due to the fact that supermarkets are among the busiest places and hence their employees, particularly the sales personnel, have to be young and active. 24%, 20% and 20% of farmers and traders and supermarket operators respectively have the age between 46-60 years. This group represents people who are leaders and administrators.

### 4.2.2 Sex of Respondents

The distribution of respondents by sex is presented in Table 3. The results show that 56% and 58% of farmers and traders respectively were men. This is due to the fact that, the

capital invested required is high and women have limited access to credit and agriculture enterprises. Also their level of illiterate is high as compared to men

**Table 3: Distribution by sex of respondents**

Sex	Farmers		Traders		Supermarkets		All	
	n	%	n	%	n	%	N	%
Male	45	55.6	35	58.3	6	60.0	86	57.0
Female	36	44.4	25	41.7	4	40.0	65	43.0
Total	81.0	100.0	60.0	100.0	10.0	100.0	151.0	100.0

#### 4.2.3 Level of Education

Results in Table 4 show that respondents in all categories had attained primary education. This implies that education was found to be an important aspect in managing their business.

**Table 4: Level of education of respondents**

Level of education	Farmers		Traders		Supermarkets		All	
	n	%	n	%	n	%	n	%
No formal education	15.0	18.5	6.0	10.0	0.0	0.0	21	13.9
Primary education	56.0	69.1	38.0	63.3	1.0	10.0	95	62.9
Secondary education	10.0	12.3	16.0	2.7	8.0	80.0	34	22.5
Above secondary	0.0	0.0	0.0	0.0	1.0	10.0	1.0	0.7
Total	81	100.0	60.0	100.0	10.0	100.0	151	100.0

An interesting observation with regards to education level of the respondents is that the proportion of respondents who did not have formal education was greater in the small-scale fruits and vegetables farmers' category 19% than in the rest of the categories of the respondents. This group represents small-scale fruits and vegetables farmers who were found in peri-urban areas of Dar es Salaam. Another interesting observation is that the supermarkets' respondents had primary education and above. This is because operations in

supermarkets demand competence in business management and working languages including English and Kiswahili.

### **4.3 Factors Influencing Small-Scale Fruits and Vegetables Farmers Access to Supermarkets**

#### **4.3.1 Problems faced by the farmers during production activities**

Table 5 shows that 59% of fresh fruit and vegetable farmers had a lack of capital during production activities. Modernizing agriculture requires the purchase of new inputs, which are produced off-the-farm. To buy these additional inputs the farmers must have accumulated savings or have ready access to a source of external capital such as credit. Credit has been considered necessary for farmers with little capital of their own as a means to access improved agricultural technology (Erhardt, 1999). Farmers and policy makers have often identified lack of access to credits as a significant constraint to agricultural production in developing countries (James, 1995).

**Table 5: Problems faced by the farmers during production activities**

Problems	Numbers	% of respondents(n=81)
Lack of capital	60	58.8
Insufficient markets	7	6.9
Theft of fruits/ vegetables	6	5.9
High input costs	25	24.5
Price uncertainty	4	3.9
Total	102	100.0

#### **4.3.2 Post-harvest practices done by farmers before selling the products**

Results in Table 6 shows that majority of small-scale producers 95% sell unprocessed products (fruits and vegetables). Only 5% sell processed fruits and vegetables products such as juice. A majority of small-scale producers who process their products prior to

selling use packages of low quality mainly plastic materials such as nylon packets. This could be due to lack of capital to invest in processing and packing.

**Table 6: Post-harvest practices for fruits and vegetables done by farmers**

Practices	Numbers	% of respondents(n=81)
Washing	55.0	46.2
Processing and packing	6.0	5.0
Sorting	31.0	26.1
Grading	4.0	22.7
Total	119.0	100.0

Since a majority of small-scale producers did not process and pack their products, it is not surprising that they did not access supermarkets where mainly processed and packed products were sold. Poor quality of packages limits small-scale producers' access to supermarkets because supermarkets prefer well-packed and value added ingredients and products for convenience of handling and offering high quality services preferred by customers which can easily be available on a self-service basis.

#### 4.3.3 Source of land for small-scale fruits and vegetables farmers

Results in Table 7 show that most of the farmers in the study area do not own land for fresh fruits and vegetable production. It shows that 58% of the land used for production is rented.

**Table 7: Source of land for small-scale fruit and vegetable farmers**

Source of land	Number	% of respondents (n=81)
Bought	16	19.8
Rented	47	58.0
Inherited	18	22.2
Total	81	100.0

This can be one of the limitations for producers to access high value markets because they cannot produce in larger quantities so as to maintain a constant supply which is one of the supermarket conditions if a farmer is given a chance to do so.

#### **4.3.4 Production technologies used by small-scale fruit and vegetable farmers**

Table 8 shows that only 9% and 11% of respondents use organic manure and fertilizers respectively during production activities. The increase in price of inputs had led to a decrease in their use by small-scale fruit and vegetable farmers.

**Table 8: Production technologies used by farmers**

Production technologies used	Numbers	% of respondents(n=81)
Irrigation	71	27.6
Pesticides/ herbicides	68	26.5
Thinning/ weeding/fertilizer	29	11.3
Hand hoe	66	25.7
Organic manure	23	8.9
Total	257	100.0

The problem of access to agriculture inputs has been compounded by the collapse of cooperatives, which were supplying the inputs on credit. Several surveys on farming systems in Tanzania have observed that poor supply of inputs to farmers is the most limiting factor to agriculture productivity (Mlambiti, 1985). The supply of agriculture inputs is a private sector operation and the Government has removed subsidies on agriculture inputs. The removal of subsidies, coupled with high marketing costs has led to a drastic increase in prices of important agricultural inputs such as fertilizers, agro-chemicals and improved seeds.

### 4.3.5 Mode of transport by market participants

The results in Table 9 shows that 33% of small-scale fruit and vegetable farmers transport their products by using bicycles while 26% on foot. This is because these farmers sell their products within short distance from their farms. Results in Table 9 also indicate that transportation by using vehicles was 73% of the traders to transport fruits and vegetables from the point of procurement to the selling place.

**Table 9: Mode of transport by markets participants**

Mode of transport	Farmers		Traders	
	n	% of respondents	n	% of respondents
Bicycle	27.0	33.3	9.0	15.0
Public transport	12.0	14.8	12.0	20.0
Hired vehicles	6.0	7.4	32.0	53.3
Own vehicles	2.0	2.5	0.0	0.0
Head carrying	21.0	25.9	0.0	0.0
On foot	13.0	16.0	7.0	11.7
Total	81.0	100.0	60.0	100.0

This mode of transportation (vehicles) was used by larger traders who transport their products to urban markets located at long distance from the point of production. Those traders also acted as middlemen between farmers and other traders who were located at city markets such as Kariakoo.

### 4.3.6 Farmers' institution support

#### 4.3.6.1 Farmers support for credits/ loans

Table 10 and 11 show that only 10% and 33% of small-scale fruit and vegetable farmers received credits and extension services respectively. A majority of the small-scale fruits and vegetables farmers did not belong to any organization such as co-operative societies. The increases in income is expected basing on the argument that provision of credits

facilities alongside other support services enables farmers to adopt improved production technologies and thus enhance their productivity. Credit moves the budget constraint outwards by enabling them to purchase capital assets from which an income is expected (Hulme, 1996).

**Table 10: Farmers support for credits/ loans**

Institutions supports	Numbers	% of farmers(n=81)
Get loans	8.0	9.9
Do not get loans	73.0	90.1
Total	81.0	100.0

#### 4.3.6.2 Farmers extension services availability

**Table 11: Farmers' extension services availability**

Extension services	Numbers	% of farmers(n=81)
Get extension services	27.0	33.3
Do not get extension services	54.0	66.7
Total	81.0	100.0

#### 4.3.6.3 Farmers organization

Table 12 shows that only 30% of the farmers were members of co-operative societies. This is due to the reasons that in most places in the study area there were no co-operative societies. Due to lack of co-operatives, farmers were deprived of potential benefits of co-operatives such as sharing of capital and expertise such as training, access to credits, strong bargaining power and access to the markets. Farmers' organizations and co-operative societies have a crucial role in assisting the participation of small-scale farmers in the marketing through collective bargaining, provision of market informations, bulking and transportation of products to distant markets.

Due to lack of training services on fruits and vegetable production, they have been producing low quality products that failed to compete with imported horticultural products.

**Table 12: Farmers organization**

Farmers organization	Numbers	% of farmers(n=81)
Member	24.0	29.6
Not member	57.0	70.3
Total	81.0	100.0

#### 4.3.6.4 Farmers' record keeping

Table 13 shows that only 24% of the farmers have a tendency of keeping records. This proportion is very small as considering to the importance of records keeping. It shows that it is very difficult for farmers to know whether they operate on profit or loss.

**Table 13: Farmers' record keeping**

Records keeping	Numbers	% of farmers(n=81)
Keep records	19.0	23.5
Do not keep records	62.0	76.5
Total	81.0	100.0

### 4.4 Problems Faced by Respondents during Marketing

#### 4.4.1 Problems faced by fruit and vegetable farmers and traders during marketing

Table 14 shows that low fruits and vegetables prices were the major problem encountered 28% and 40% of farmers and traders respectively. Also, high competition in marketing activities was a constrain affecting 22% and 28% of farmers and traders respectively in the three districts, namely, Kinondoni, Ilala and Temeke. Therefore, in order to improve marketing of fruits and vegetables the problem of low prices needs to be addressed. This can be done by adding value and improving shelf life of products. Also in order to reduce



marketing competition among participants, the government should formulate source and availability of markets not only within but also outside the country.

**Table 14: Problems faced during marketing by respondents**

Problems	Farmers		Traders	
	n	% of respondents	n	% of respondents
Seasonal suppliers	6	7.4	4	6.7
Unreliable buyers	9	11.1	2	3.3
Price uncertainty	23	28.4	24.0	40.0
High competition	18	22.2	17.0	28.3
Untrustworthy customers	14	17.3	1.0	1.7
Product deterioration	11	13.6	8.0	13.3
High marketing costs	0.0	0.0	4.0	6.7
Total	81.0	100.0	60.0	100.0

#### 4.4.2 Quality Assessment

##### 4.4.2.1 Quality assessment by fruit and vegetable traders before purchasing

In quality assessment stage, tomatoes and mangoes were chosen as the sampled crop to represent other crops because there were so many. Fore example water melons, cucumbers, lemons, mangoes, papaya, pine apples, oranges, passions were represent fruits while tomatoes, amaranthus, spinach, cabbage, carrots, onions, okra, coconuts, and hot paper were present vegetables. There were several methods used by most of the fruit and vegetable traders as quality measures before purchasing their products. These were by looking appearance of the products among others ripeness, softness, rotten, bruises, colour and smell. This is because most traders did not have capital to buy quality control equipments.

**Table 15: Quality measures before procuring fruit and vegetable by traders**

Quality measures	Mangoes		Tomatoes	
	Numbers	% of respondents	Numbers	% of respondents
Smell	5	8.3	3	5.0
Ripeness	10	16.7	6	10.0
Softness	4	6.7	8	13.3
Rotten	15	25	13	21.67
Bruises	2	3.3	3	5.0
Colour	20	33.3	22	36.7
Fungal attack	4	6.7	5	8.3
	60	100.0	60	100.0

Table 15 shows that 33% and 37% of mango and tomato, 25% and 22% of mango and tomato traders used colour and rotten of the products respectively as the quality measures. All of these methods were employed to test the appearance quality of the products. However, those methods alone would not guarantee quality of the products. This resulted into low quality products that failed to access supermarkets.

#### **4.4.2.2 Types of handling vessels used by traders**

Methods used to maintain hygienic handling of fresh fruits and vegetables by traders are reported in Tables 16. Majority 38%, 80% and 78% of oranges, mangoes and bananas used containers, sisal sacks and polythene bags respectively as means of fruits storage while 31%, 67% and 62% of spinaches, amaranthus and okra respectively used buckets and polythene bags as means for vegetables storage. These methods were not always reliable or health precautions.



Table 16 shows that, traders did not use cooling systems such as refrigerators and freezers to preserve their products. This was because most of small-scale fresh fruits and vegetables traders did not have enough capital to buy cooling system instruments as mentioned earlier and the market channel not well developed to supply. This further shortened the shelf life of their products which reduced the number of products deterioration and hence made them inaccessible to supermarkets.

#### **4.5 Products Preferred to be Sold by Supermarket Operators**

Table 17 shows that, 70%, 50% and 50% of cabbage, spinach and carrots vegetables from Kinondoni, Ilala and Temeke supermarkets respectively were imported. It further indicates that, 80%, 100% and 100% of apples, pears and egg plant from Kinondoni, Ilala and Temeke respectively were imported. Table 18 indicates that, 28% of customers prefer imported products because of high hygienic quality. The results further show that 24.1% of supermarket reported that high standard conformity and constant supplies for preferring to sell imported fruits and vegetables.



#### 4.5.1 Reasons for selling imported products to customers by supermarket operators

Table 18 also indicates that 14% of supermarkets reported that another reason for selling imported products was due to high nutritional quality. This means that customer preferences for fruit and vegetable products in the supermarkets were largely influenced by quality of the products which could be hygienic, nutritional or packing in quality.

**Table 18: Reasons for selling imported products to customers by supermarket operators**

Reasons	Number	% of respondents(n=10)
High standard conformity	7	24.1
High hygienic quality	8	27.6
High nutritional quality	4	13.8
Low price	1	3.4
Regular/Steady supply	7	24.1
Fresh produce	1	3.4
Long shelf life	1	3.4
Total	29	100.0

Therefore, if small-scale producers and processors need to access supermarkets, quality of products should be given a priority. Small-scale producers have failed to access supermarkets because of high competition from imported fresh fruits and vegetables producers in terms of the quality of their products.

#### 4.5.2 Problems encountered by supermarket operators in small-scale fruit and vegetable farming

Among major weaknesses facing small-scale fruit and vegetable farmers in their quest to have access to niche markets is that they produce in small quantities which cannot fulfill some of the requirements of supermarkets. 28% of these weaknesses are given on Table 19. This include: bad agricultural practices, lack of land owning, lack of economies

of scale, lack of strong horticultural policy, lack of target funding, poor supporting services, lack of entrepreneurial skills and lack of investment.

Table 19 shows also that 24% of managers of different supermarket reported poor hygienic, operational as well as quality control problems. Most fruit and vegetable products supplied to supermarkets did not meet the required standards and quality. It is due to combination of such factors as lack of production inputs, an appropriate agriculture technology that the small-scale fruits and vegetables farmer is unavailable to move out the poverty trap. The report on table 19 further indicates that 19% of fruit and vegetable farmers are not time conscious and the way they used to pack their products is very poor. All of them are key barrier to enter to supermarkets.

**Table 19: Problems encountered by supermarket operators in small-scale fruits and vegetables farming**

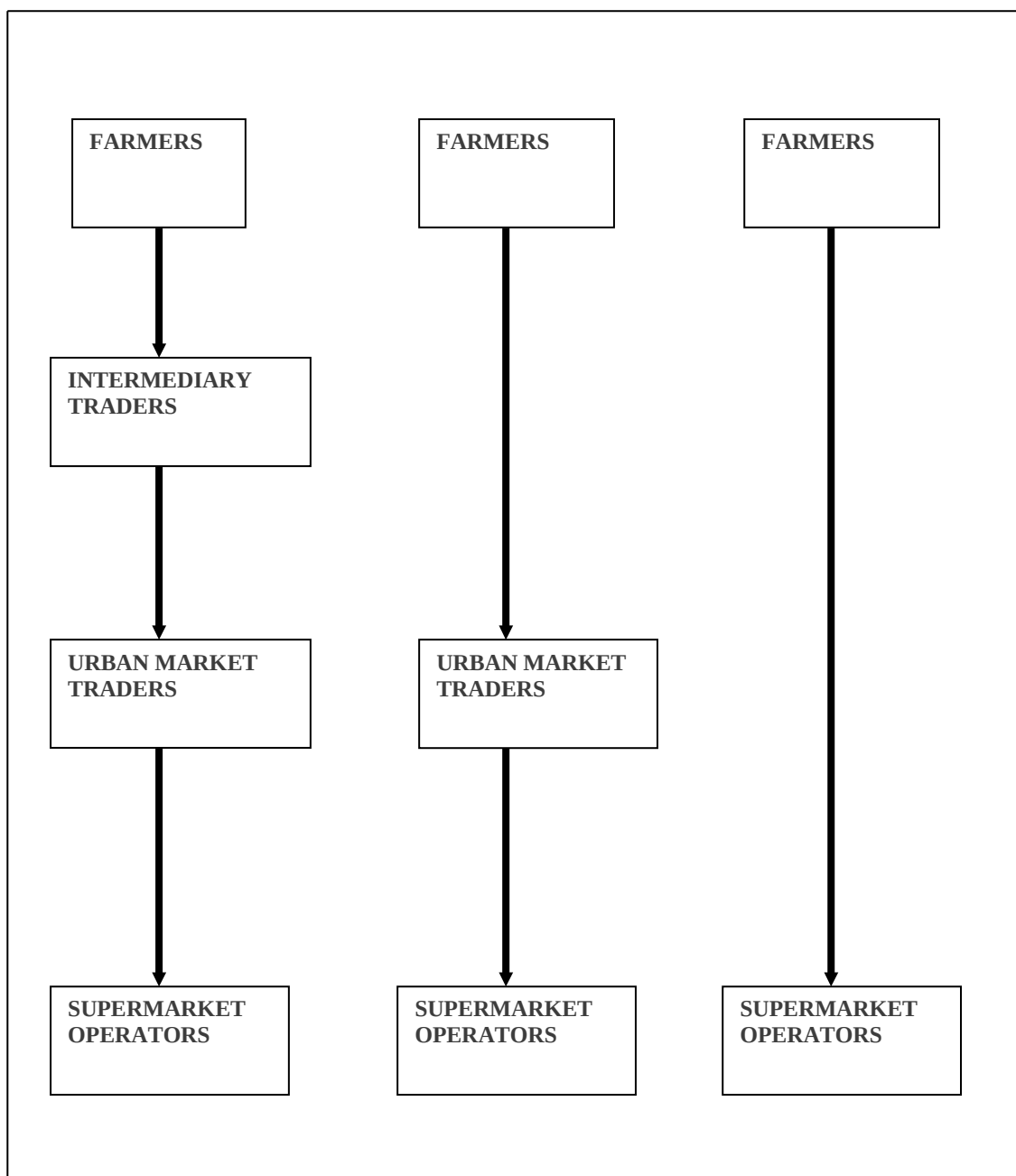
Problems	Count	% of respondents(n=10)
Not time conscious	8	18.6
Poor hygienic and quality	10	23.3
Not sufficient suppliers	12	27.9
Packaging system is very poor	8	18.6
Transport problems	5	11.6
Total	43	100.0

#### **4.6 Marketing chains for tomatoes and mangoes in the three districts of Dar es Salaam region**

In the fruits and vegetables marketing chain in the three Dar es Salaam districts, namely, Kinondoni, Ilala and Temeke, main participants were small-scale farmers, traders and supermarket operators. Majority of the small-scale farmers sold their products at home directly to consumers and fruit/vegetable intermediaries. They are the primary marketers selling mostly to the Fruit/ vegetable intermediaries. Fruit/ vegetable intermediaries are sometimes referred to as “Auctioneers”. These auctioneers identify farmers who have

products to be sold. They are more informed as compared to farmers and they are the one who have linked with urban markets traders in Dar es Salaam city. They possess' bicycles, motorbikes and cars. They also have mobile phones to facilitate their business. Urban market traders are the other participants in this trade. These traders stay at big markets in town waiting for fruits and vegetables consignment from fruit and vegetable intermediaries. In case of big supermarkets such as shoprites, they buy fruits and vegetables direct from farmers, Intermediary and urban traders.





**Figure 2: Market Chains for Fruits and Vegetables in the Three Districts of Dar es Salaam Region.**

#### **4.6.1 Gross margin analysis for tomatoes and mangoes at different farmers' nodes**

In calculating gross margins (See Appendices 6 and 7), tomatoes and mangoes respectively were selected to be sampled crop under three different farmers' channels. For example farmer who sold their tomatoes and mangoes to intermediary traders, urban traders and supermarket operators.

##### **4.6.1.1 Gross margin analysis for tomato and mango farmers**

Gross margin for tomato and mango farmers were calculated and compared (See Appendices 6 and 7). For example, a farmer who sold to supermarket operators had a gross margin of 569 128 Tsh for tomatoes and 58 548.5 Tsh for mangoes respectively. A farmer who sold tomatoes and mangoes to the urban traders had a gross margin of 271 520.2 Tsh for tomatoes and 35 959.1 Tsh of mangoes respectively. A farmer who had sold tomatoes and mangoes to intermediary traders had a gross margin of 147 671.4 Tsh of tomatoes and 25 686.53 Tsh of mangoes respectively. It can be observed thus, that the longer the market chain, the lesser the gross margin of the producer (See Fig. 2). Producers, who sold their tomatoes and mangoes to supermarket operators, had the shortest channel. Those who sold to urban traders had a relatively longer channel, where as those who sold to intermediary traders had the longest chain.

In Table 20 gross margin mean difference for farmers of tomatoes at different nodes are shown and later compared. The T-test is aimed at testing how farmers marketing channels for tomato differ from one another in the study area. The farmer to intermediary traders was significantly different from farmer to urban traders at ( $P < 0.05$ ), farmer to urban traders was significantly from farmer to supermarket at ( $p < 0.00$ ) and farmer to intermediary traders was significantly from farmer to supermarket operators at ( $p < 0.00$ ).

**Table 20: Results for comparison of different tomato farmer marketing channels' gross margin mean differences**

Marketing channels	t	Df	G/M mean Difference	Std error of difference	Sig (2 tailed)
Farmer to Intermediary traders vs (147,671.4) Farmer to urban traders (271,520.2)	3.288	28.473	123,848.93	37,672.34	0.03*
Farmer to urban traders vs (271,520.2) Farmer to supermarket (569,128)	4.212	31.62	297,608.08	70,655.02	0.00**
Farmer to Intermediary traders vs (147,671.4) Farmer to supermarket (569,128)	6.825	20.244	421,457	61,749	0.00**

\*\*Significant at 0.01

\*Significant at 0.05

In Table 21 gross margin mean difference for farmer of mangoes at different nodes are shown and later compared. The farmer to intermediary traders was significantly different from farmer to urban traders at ( $P < 0.00$ ), farmer to urban traders was significantly from farmer to supermarket operators at ( $p < 0.00$ ) and farmer to intermediary traders was significantly from farmer to supermarket operators at ( $p < 0.00$ ).

**Table 21: Results for comparison of different mango farmer marketing channels' gross margins mean differences**

Marketing channels	t	Df	G/M mean Difference	Std error of difference	Sig (2 tailed)
Farmer to Intermediary traders vs (25,686.53) Farmer to urban traders (35,959.1)	6.405	30.78	10 272.57	1 813.136	0.00**
Farmer to urban traders vs (35,959.1) Farmer to supermarket (58,548.5)	5.457	26.603	22 589.4	4 139.77	0.00**
Farmer to Intermediary traders vs (25,686.53) Farmer to supermarket (58,548.5)	8.583	20.083	32 861.97	3 828.58	0.00**

\*\*Significant at 0.01

In addressing specific objective (ii) that is “To assess various farmers’ marketing chains for fruit and vegetable” there was a null hypothesis that “There is no significance difference between various farmers’ marketing chains for fruit and vegetable”. Since there have been statistical difference in mean difference gross margins at ( $p < 0.01$  and  $p < 0.05$ ) under different farmers’ marketing chain arrangements, the null hypothesis is rejected and the alternative hypothesis is accepted, that, there is different between various farmers’ marketing chain for fruits and vegetables in the study area”.

#### **4.6.1.2 Price comparison and marketing margins along the tomatoes and mangoes supply chain**

Average prices at different nodes are presented in Table 22 and 23 for tomatoes and mangoes respectively. For example, from producers, intermediary trade, urban market trade and supermarket node. The price was lowest at the farm level and highest at supermarket level for both tomatoes and mangoes. This complies with the cost based pricing method in which prices are determined by the costs incurred in production. At the farm level only production costs were incurred where as at intermediary trade stage costs of assembling and transporting from farm to urban market traders plus a small profit increased prices. These auctioneers identify farmers who have products to be sold. They are more informed and educated as compared to farmers and they are the one who have linked with urban markets traders in Dar es Salaam city. They possess’ bicycles, motorbikes and cars.

At the urban marketing trade place, costs of transporting, storage and marketing of tomatoes and mangoes increased price. Urban market traders are well organized and experienced in tomato and mangoes business. They stayed at big Market cities and waiting

for consignment. At supermarket level, costs for transport, storage in bulk quantity and marketing were so high which explained why the marketing margin was relatively higher compared to all other marketing nodes.

Prices were high during February and October when the amount of tomatoes and mangoes delivered to the market is small. On the other hand, prices were low during November and January when the quantity of tomatoes and mangoes delivered to the local market were relatively large. During these months, the rate of deterioration increases due to high rain fall and infestation from fungal associated diseases. The price and quantity delivered to the market complied with the demand theory at which, prices vary inversely with the quantity handled in the market

**Table 22: Price comparison and marketing margin along the tomato supply chain**

Marketing node	Price (Tsh/kg)	Marketing margin	Producer share (%)
Producers	380		
Intermediary traders	482	102	79
Urban market traders	603	122	63
Supermarket operators	817	214	47

From Table 22 and 23, marketing margins were found to be 102 Tsh/kg for tomatoes and 50 Tsh/kg for mangoes at intermediary trade, 122 Tsh/kg for tomatoes and 78 Tsh/kg for mangoes at urban market trade and 214 Tsh/kg for tomatoes and 176 Tsh/kg for mangoes at supermarket node respectively. Producer's share was distributed as shown in Tables 22 and 23 both for tomatoes and mangoes respectively. Producer's share was calculated by dividing the farm gate price to the subsequent average price level along the chain. The trend shows that producer share decreases as the market chain becoming longer. The larger marketing margin from supermarket operators both for tomatoes and mangoes may be described with the fact that: Supermarket provides extension services to contracted farmers

and they store bulky quantities of tomatoes and mangoes in cold facilities which increase shelf life of the products.

**Table 23: Price comparison and marketing margin along the mango supply chain**

Marketing node	Price (Tsh/kg)	Marketing margin	Producer share (%)
Producers	350		
Intermediary traders	400	50	88
Urban market traders	478	78	73
Supermarket operators	654	176	54

#### 4.6.1.3 Tomato and mango farmers who have access to supermarket

During data collection, eighty one farmers who were selected sold both products, tomatoes and mangoes. If a farmer is selling tomatoes to supermarket, he/she is also selling mangoes to supermarkets and vice versa. Table 24 shows that, approximately 25% of the farmers who had access to supermarket for tomatoes had also access to supermarket for mangoes and vice versa. Table 24 also shows that, 44% and 31% of farmers who had no access to supermarkets they sold their tomatoes and mangoes to intermediary and urban market traders respectively.

**Table 24: Tomato and mango farmers who have access to supermarket**

Trading node	Number	% of farmers(n=81)	Niche markets
Intermediary traders	36	44.4	Not access
Urban market traders	25	30.9	Not access
Supermarket	20	24.7	Access
Total	81	100.0	

#### 4.7 Seller Concentration Index for Fruit and Vegetable Farmers in the Study Area

In calculating seller concentration index, tomatoes and mangoes were chosen as the sampled crops to represent other crops. Revenues accrued by the four biggest tomatoes and mangoes producers who sold their products to urban traders were calculated (See

Appendices 4 and 5). The seller concentration ratio of tomato and mangoes in the study area were estimated using the formula.

#### 4.7.1 Seller concentration index for tomato farmers

$$C_t = \left( \frac{8,092,100}{14,840,439} \right) \times 100 = 54.5\%$$

#### 4.7.2 Seller concentration index for mango farmers

$$C_m = \left( \frac{4,957,100}{8,231,822} \right) \times 100 = 60.2\%$$

The index is above 50% and according to Khols and Uhl (1985, p.187), the ratio is indicative of a strong oligopolistic industry, which implies uncompetitiveness of the market. According to participatory appraisal results, using focus group discussions in the study area where both producers and traders themselves expressed their views separately, it was found out that tomato and mango intermediary traders were the sole agents linking urban traders and producers. It was clearly not competitive as there were barriers to entry like poor financial capital availability to producers and relatively lower social capital of producers, poor coordinated market information system especially to producers and there were also few tomato and mango intermediaries as opposed to many sellers (producers). Evidence from participatory appraisal suggests that producers are bound to sell to a few buyers and sometimes traders collude to fix purchasing prices for tomatoes and mangoes in the study area. These findings negate the assumptions of neoclassical competitive market characteristics. This also answer specific objective (i) that is “To describe the current market structure for small-scale fruit and vegetable farmers”.

#### 4.8 Regression Analysis

Logistic regression analysis was used to identify factors influencing small scale fruit and vegetable farmers' access to niche markets. Two separate models, one for tomatoes and another for mangoes were estimated . Prior expectations are presented in Table 25.

**Table 25: Empirical Modal: Variable Description**

Variable name	Explanation and expectation
PRC-Price of product PRCt-Price of tomatoes PRCm-Price of mangoes	In order to improve tomatoes and mangoes production, the problem of low prices need to be addressed. Farmers are willing and able to produce more incase they are assured of good and reasonable prices. The higher the price, more farmers will choose the particular niche market.
TRA-Training 0=Do not get training 1=Get training	Farmers who got tomatoes and mangoes agronomical practices are more likely to meet niche market standards as compared to those who do not get training.
EDU-Education level 0=No formal education 1=Primary education 2=Secondary education	Educated farmers are more informed decision and are likely to decide to improve quality and increase production to meet niche market requirements. Dummy variables were created dropping the dummy for no formal education.
LAND=Access to land 0= Inherited 1= Bought and rented	Proxy for business strategy to participate in the market may be much more connected to business decision including trading.
REC-Record keeping 0=Keep no records 1=Keep records	Measure/proxy for business orientation. But most farmers do not keep records.
AGE=Age of respondent	Younger and medium farmers are more likely to invest in tomatoes and mangoes production and access to niche market than older farmers
QNTY-Quantity of products QNTYt-Quantity sold for tomatoes QNTYm-Quantity sold for mangoes	Most larger farmers would like to sell to larger market for bulky purchasing. Supermarkets go for regular small suppliers.



Then a combined model for both was estimated with a dummy variable niche market. (Access to niche market dummy = 1 and not access to the niche market dummy = 0) was thus dependent variables and the regressors were thus price of the products, training of the respondents, access to land by respondents, education level of the respondents, record keeping, age of the respondents and quantity produced. The variables that are statistically significant and have expected signs are price of the products, training of the respondents, education level of the respondents, record kept and age of the respondents. Results are presented in Table 26.

**Table 26: Parameter Estimates for Logistic Regression Model**

Dependent Variables	(Combined) Tomatoes or Mangoes	Tomatoes	Mangoes
PRCt	0.04 (2.797)*	0.004 (4.309)**	-
PRCm	0.001 (0.101)	-	0.004 (2.402)
TRA	3.144 (6.691)***	3.449 (7.856)***	3.181 (7.597)***
EDU1	-2.317 (3.009)*	-2.125 (2.896)*	-1.580 (1.729)
EDU2	-2.893 (6.630)***	-3.045 (7.754)***	-2.664 (6.497)***
EDU0	Dropped	Dropped	Dropped
LAND	-1.699 (2.581)	-1.854 (3.071)*	-1.740 (2.998)*
REC	-1.692 (4.343)**	-1.665 (4.471)**	-1.549 (4.132)**
AGE	-0.104 (6.605)***	-0.111 (7.608)***	-0.097 (6.560)***
QNTYt	0.000 (0.264)	0.000 (0.127)	-
QNTYm	-0.088 (2.389)	-	-0.068 (1.624)
CONST	17.275 (3.100)*	3.014 (1.979)	14.015 (2.324)
	-2 log likelihood 58.082	-2 log likelihood 60.87	-2 log likelihood 61.62
	Cox & Snell R Square 33	Cox & Snell R Square 30.7	Cox & Snell R Square 30
	Nagelkerke R Square 49	Nagelkerke R Square 45.6	Nagelkerke R Square 44.6
	Number of cases 81	Number of cases 81	Number of cases 81
	20 (25%) access to supermarket	20 (25%) access to supermarket	20 (25%) access to supermarket

Values in the parentheses are Wald statistics. The asterisk indicate statistical significant variables, single asterisk is 10% significance level, double asterisk is 5% significance level where as three asterisk is significance at 1%

#### **4.8.1 Price of the products (PRC)**

The coefficient associated with price is positive and significant for combined and tomatoes models, but positive and insignificant for mangoes model. Implying that price had a big influence for the farmer to make decision. The higher the price the more farmers will prefer a particular niche market as it was expected.

#### **4.8.2 Training of the respondents (TRA)**

The coefficient associated with training of tomato and mango farmers is significant and positive to all models as expected to have a positive effect on access to niche markets. Large scale-scale producers employ people with expertise on tomato and mango production and there fore produced quality products that could access the niche markets.

#### **4.8.3 Education level of respondent (EDU)**

The coefficient associated with education level is significant for all combined, tomato and mango models. Implying that education level had a very big influence for a farmer to access niche markets. Farmers who are more educated have better access to information on how to go about so as to access niche markets than less educated farmers. Results show that more educated farmers are likely to try to increase production than less educated farmers. Despite of this significance, the estimated coefficient is negative in all models. Only 12% farmers in the study area were more educated.

#### **4.8.4 Age of the respondents (AGE)**

The coefficient associated with age is significant and negative sign for parameter estimates for combined, tomato and mango model respectively. Implies that age had a very big influence on whether a farmer will access or not access niche markets. As age increases the

probability of access to niche market is decreasing. The older group has little labour and not active to use their money conspicuously.

#### **4.8.5 Records keeping (REC)**

The dummy variable associated with record keeping is significant and negative coefficient to all combined, tomatoes and mango models. It's also a measure/proxy for business orientation but most farmers do not keep records. Only 24% kept records. This implying that, record keeping had a very big influence for a farmer to know whether they operate on loss or profit.

#### **4.8.6 Access to land (LAND)**

The dummy variable associated with land owned is a proxy for business strategy to participate in the market. It is significant for tomato and mango models but insignificant for combined model and negative coefficient to all models. May be much more connected to business decision including trading.

#### **4.8.7 Quantity sold (QNTY)**

Regarding the insignificance of quantity produced and negative sign of the explanatory variable in all the three models, larger farmers would like to sell to larger market for bulky purchases. Supermarkets go for regular small suppliers. Approximately 25% of farmers who sold both tomatoes and mangoes were access to supermarket.

Chapter 4.8.2 and 4.8.3 respectively answers specific objective (iii) and (iv) that were “To determine the potential of training and examine the role of education level to small-scale fruit and vegetable farmers’ access to niche markets respectively”. There were null

hypothesis that “Training does not have influence and education level have no impact on fruit and vegetable farmers access to niche markets respectively”. Since had been a number of significant factors at ( $p < 0.01$  and  $p < 0.05$ ), the null hypothesis stated above were rejected and suggesting that “Training have influence and education level have impact on fruit and vegetable farmers access to niche markets respectively”.

## CHAPTER FIVE

### 5.0 CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusion

Several findings emanated from the analyses with respect to this study. The first objective of this study was to describe the current market structure for small-scale fruit and vegetable farmers. In addressing this objective the study made an assessment of variables that were thought to be potential in setting barriers to entry into any stage of the marketing chain. These variables includes capital required to take high position in the chain, access to land, collusion behavior among buyers and marketing information flow. All these factors determine market structure and conduct.

We found that concentration index were 55% and 60% of seller (producers) for tomato and mango farmers respectively, which implied existing of oligopolistic behavior in the market. Market information flow was poorly coordinated on producers' part while intermediary traders were found to be quite good with the use of mobile phones and motorbikes for physical contacts. Although there were no public information services, traders have invested in private information and in most cases producers were left out. There were also reports of collusion in setting of buying prices among traders from participatory appraisal with producers. Furthermore, the producers were having diseconomies of scale, which could render them less competitive in the market. It can therefore be concluded that the marketing chain for fruits and vegetables trade in the study area is not competitive. This is to the disadvantage of many producers who are the main stakeholders in fruits and vegetables trade in the study area. This also answer specific objective (i) that is "To describe the current market structure for small-scale fruit and vegetable farmers".

The second objective of the study was to assess various farmers' marketing chains for fruit and vegetable in the study area. Gross Margins from tomatoes and mangoes were obtained and later compared and the three different channels were identified.

These were:

- (a) Producers who are selling tomatoes and mangoes to intermediary traders.
- (b) Producers who are selling tomatoes and mangoes to urban traders.
- (c) Producers who are selling tomatoes and mangoes to supermarket operators.

Farmer who sold to supermarket operators had a gross margin of 569 128 Tsh for tomatoes and 58 548.5 Tsh for mangoes respectively. A farmer who sold tomatoes and mangoes to the urban traders had a gross margin of 271 520.2 Tsh for tomatoes and 35 959.1 Tsh of mangoes respectively. A farmer who had sold tomatoes and mangoes to intermediary traders had a gross margin of 147 671.4 Tsh of tomatoes and 25 686.53 Tsh of mangoes respectively. It can be observed thus, that the longer the market chain, the lesser the gross margin of the producer. Producers who sold their tomatoes and mangoes to supermarket operators had the shortest channel. Those who sold to urban traders had a relatively longer channel, where as those who sold to intermediary traders had the longest chain. In addressing specific objective (ii) that is "To assess various farmers' marketing chains for fruit and vegetable" there was a null hypothesis that "There is no significance difference between various farmers' marketing chains for fruit and vegetable". Since there have been statistical difference in mean difference gross margins at ( $p < 0.01$  and  $p < 0.05$ ) under different farmers' marketing chain arrangements, the null hypothesis is rejected and the alternative hypothesis is accepted, that, there is different between various farmers' marketing chain for fruits and vegetables in the study area".

The third and fourth objectives were “To determine the potential of training and examine the role of education level to small-scale fruit and vegetable farmers’ access to niche markets respectively”. Regression analysis employing maximum likelihood technique was used and results showed that, training and education level of the respondents were significantly affecting small-scale fruit and vegetable farmers access to niche markets. It therefore concluded that, farmers who got training and are more educated have better access to information on how to go about so as to access niche markets than less educated farmers. Results show that more educated farmers are likely to try to increase production than less educated farmers. In addressing specific objectives (iii) and (iv) that were “To determine the potential of training and examine the role of education level to small-scale fruit and vegetable farmers’ access to niche markets respectively” there were null hypothesis that “Training does not have influence and education level have no impact on fruit and vegetable farmers access to niche markets respectively”. Since had been a number of significant factors at ( $p < 0.01$  and  $p < 0.05$ ), the null hypothesis stated above were rejected and suggesting that “Training have influence and education level have impact on fruit and vegetable farmers access to niche markets respectively”.

## **5.2 Recommendations**

Based on the findings and conclusions of this study, the researcher puts forward the following recommendations to the process of formulating sound policies and regulations in the fruits and vegetables industry in the study area. It was evident that producers’ chance of trading at the lucrative position of traders was hindered by among other things social capital requirement. Since it is difficult to influence social behavior (interaction, trust etc) of the respondents to acquire the social capital, it is therefore recommended that

- a) There be training programme to these producers on credit management including records keeping so that they attain the capital credit worthiness status before the lending institutions. After attaining the capital there should be established a group (social capital net work) that can trade competitively and profitability in the chain.
  
- b) There be improved extension services and technical assistance to fruit and vegetable producers. Technical assistance to producers is an important component in rationalizing production and marketing of the crop. Increase in yield per hectare can be achieved through improved growing techniques. Improved qualities can also be achieved through better handling, grading and advanced marketing techniques. Provision of adequate and quality extension services is therefore vital.
  
- c) Access to market information was found to be biased among chain actors with traders being more access to market information than farmers. Improvement in the market information system should be done by promoting telecommunication infrastructures to increase the use of mobile phone in the rural areas and the use of internet in the urban areas



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## APPENDICES

### Appendix 1: Survey Questionnaire for Fruits & Vegetables Farmers in Dar es Salaam Region.

Questionnaire No. ....

Date of interview .....

#### SECTION A: BACKGROUND INFORMATION

##### A.1: Background

District	
Ward	Village
Name of respondent	
Age	
Sex: Male ( )	Female ( )
Education Level	Major activities
(1) Primary ( )	Agriculture ( )
(2) Secondary ( )	Business ( )
(3) Tertiary ( )	Shop keeper ( )
(4) None ( )	Driver ( )
	Other specify

#### SECTION B: FARM PRODUCTION TECHNOLOGIES

##### B.1: Which type of Fruits do you grow?

Mangoes ( )	Passion ( )	Paw paws ( )	Other Specify
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##### B.2: Which type of Vegetables do you grow?

Tomatoes ( )	Ocara ( )	Amaranthus ( )	Other Specify
-----------------	--------------	-------------------	------------------

##### B.3: How did you acquire land for starting fruits & vegetable production?

Buying ( )	Borrowing ( )	Inherited ( )	Other Specify
---------------	------------------	------------------	------------------

B.4: How much was your initial investment cost? \_\_\_\_\_

##### B.5: Do you use any production technology?

(1) Irrigation	( )
(2) Pesticides/Herbicides	( )
(3) Thinning/Weeding/fertilizers	( )
(4) Manure	( )
(5) Hand hoe	( )
(6) Tractor	( )
(7) Other please specify.....	

B.6: Indicate months with lowest and highest fruits production

Supply	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Low (Month)												
High (Month)												

B.7: Indicate months with lowest and highest vegetable production

Supply	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Low (Month)												
High (Month)												

C.1: What are post harvest practices do you us?

Washing	Packing	Drying	Freezing	Sorting	Grading	Other (specify)
( )	( )	( )	( )	( )	( )	

C.2: Which product do you sell?

Product	Where do you sell	To whom do you sell	Quantity sold (Bundles/ kgs)	Price/unit	Revenue
Fresh fruits					
Fresh vegetables					
Ice cream					
Juice					
Slice					
Others					

Coding for question C.2 above

Where do you sell

1. At home
2. Street
3. Market
4. Kiosk/retail shops
5. Supermarkets
6. Others

To whom do you sell

1. Consumers
2. Vegetable/Fruits collectors
3. Hawkers/retailers
4. Processors
5. Supermarkets

C.3: What is the average distance from farm to the market? ..... Km

C.4: If you do not sell to supermarkets give reasons

They require constant supply	They are located at along distance	They need large supplies	They have their contractual buyers	Others (specify)
( )	( )	( )	( )	

C.5: Do you have any plan to supply vegetables/Fruits products to supermarkets? (Yes/No)

C.6: Which means do you use to transport your products to the markets?

Bicycle	Public transport	Hired Vehicle	Own Vehicle	Head carrying	Other (specify)
( )	( )	( )	( )	( )	

C.7: What problems do you face during marketing?

Seasonal Suppliers	Unreliable buyers	Price Uncertainty	High Competition	Un trust Customers	Product deterioration
( )	( )	( )	( )	( )	( )

Other specify

#### SECTION D: FARMERS ORGANIZATION AND INSTITUTION SUPPORT

D.1: Is there any fruits/vegetables organization in your ward/district? (Yes/No)

D.2: Are you a member of the organization? (Yes/No)

D.3: If yes, how do these organizations assist you?

Input Supply	Provision of credit/loan	Provision of extension , training and veterinary services	To sell My products	Empowering of farmers	Other (specify)
( )	( )	( )	( )	( )	

D.4: How can you evaluate these organizations in facilitating marketing of your products? (helpful/Not helpful)

D.5: Do you get any training? (Yes/No)

D.6: If yes, what type of training?

Marketing ( )	Production ( )	Value adding ( )	Credit management ( )	Other (specify)
------------------	-------------------	---------------------	--------------------------	-----------------

D.7: Have you been visited by extension agents? (Yes/No)

D.8: If Yes. How many times during this year 2007. ....

D.9: Do you get loan? (Yes/No)

D.10: If you get loan, name the institution(s) from which you get loan

Commercial Bank ( )	SACCOS ( )	Farmers' Cooperatives ( )	Credit organisations ( )	Others (specify)
------------------------	---------------	------------------------------	-----------------------------	------------------

D.11: What problems do you face during production of your products?

Lack of capital ( )	Insufficient Markets ( )	Theft of fruits/vegetables ( )	High input Costs ( )	Price uncertainty ( )	Other (specify)
------------------------	-----------------------------	-----------------------------------	-------------------------	--------------------------	-----------------

D.12: What are your future expectations regarding you business?

Maintain the Same level of Production ( )	Abandon production ( )	Expand Production ( )	Focus other Markets ( )	Other (specify)
--	---------------------------	--------------------------	----------------------------	-----------------

D.13: Do you keep any records?

D.14: If yes what kind of records do you keep

Sales record ( )	Purchase records ( )	Credit records ( )	Other (specify)
---------------------	-------------------------	-----------------------	-----------------

D.15: How many times do you update them?

Daily ( )	Weekly ( )	Monthly ( )	Yearly ( )
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**THANK YOU FOR YOUR COOPERATION**

## Appendix 2: Survey Questionnaires for Fruits and Vegetables Traders in Dar es Salaam region

Questionnaire No. ....

Date of interview .....

### SECTION A: BACKGROUND INFORMATION

#### A.1: Background

District	
Ward	Village
Name of respondent	
Age	
Sex: Male ( )	Female ( )
Education Level	Major activities
(5) Primary ( ) (6) Secondary ( ) (7) Tertiary ( ) (8) None ( )	Agriculture ( ) Business ( ) Shop keeper ( ) Driver ( ) Other specify

### SECTION B: INFORMATION ON FRUITS/VEGETABLES PRODUCT PROCURMENT

#### B.1: Which type of Fruits do you buy?

Water melon ( )	Passion ( )	Paw paws ( )	Other Specify
--------------------	----------------	-----------------	------------------

#### B.2: Which type of Vegetables do you buy?

Amaranthus ( )	Ocra ( )	Tomatoes ( )	Other Specify
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## B.3 : Products procured

Products/ Source	Small farmers	Other traders	Local processors	Imported	Quantity purchased (Bundles/ Kgs)	Price	Revenue
Fresh fruits							
Fresh Vegetables							
Ice cream							
Juice							
Slice							
Others (Specify)							

Mode of Payment	Quality control measures before receiving Fruits/Vegetables	Mode of Preservation

## Codes:

Unit of measure	Mode of payment	Quality control measures before receiving fruits/vegetables	Mode of preservation
1. Bundles	1. Cash now	1. None	1. No treatment
2. Gallons	2. Cash next day	2. Smell/flavor	2. Cool boxes
3. Tins	3. Credit: fortnightly	3. Visual check	3. Cold water bath
4. Buckets	4. Credit: Weekly	Others	4. Refrigeration
	5. Others (specify)		5. Additives
			6. Others

B.4: Which source do you rely on for your procurement? .....

## B.5: Give reasons

High quality	Cheap products	Constant supplies	Sufficient supplies	Others (specify)
( )	( )	( )	( )	

B.5: Do you have contractual arrangements with suppliers? (Yes/No)



## B.6: If yes what are the terms of the contract?

Quantity of Daily supply	Mode of payment	Date of payment	Time of Supply	Price of fruits/vegetables supplied	Purchase of All fruits/vegetables supplied
( )	( )	( )	( )	( )	( )

Other specify

.....

## SECTION C: FRUITS/VEGETABLES PRODUCTS MARKETING

## C.1: Products sold

Product	Where do you sell	To who do you sell	Quantity sold	Price/unit	Type of handling vessel	Distance from buying to the selling point (Km)	Mode of transport to the selling point
Fresh Fruits							
Fresh vegetables							
Juices							
Ice cream							

Codes

Where do you sell	To who do you sell	Type of handling vessel	Mode of transportation to the selling point
1. At home	1. Consumers	1. Plastic materials	1. On foot
2. street	2. Wholesales	2. Standard metal materials	2. Draught animals/cart
3. Market	3. Hawkers/retailers	3. Glass materials	3. Bicycle
4. Kiosk/retail shops	4. Processors	4. Wooden materials	4. Public vehicle
5. Supermarkets	5. Supermarkets	5. Others specify)	5. Own vehicle
6. Institutions	6. Institutions		6. Hired transport

## C.2: If you do not sell to supermarkets give reasons

They require constant supply ( )	They are Located at a Long Distance ( )	They need Large Supplies ( )	They have their contractual buyers ( )	I do not meet standards ( )	They don't Have Instant Payments ( )
-------------------------------------	--	---------------------------------	---	--------------------------------	---

Other specify.....

C.3: If you supply to supermarkets, list them and the products you supply

Supermarket	Products supplied	Mini supermarket	Products supplied	Hotels	Products supplied
1.		1.		1.	
2.		2.		2.	
3.		3.		3.	
4.		4.		4.	
5.		5.		5.	
6.		6.		6.	
7.		7.		7.	
8.		8.		8.	
9.		9.		9.	
10.		10.		10.	
11.		11.		11.	
12.		12.		12.	

C.4: Are there larger regulations regarding Fruits and Vegetables marketing? (Yes/No)

C.5: If yes, what are these regulations?

Regulations	Paying fees and taxes	Ensure cleanliness of premises	Ensuring quality and standards	Business registration	Business location
Enforcement organ					

Other specify.....

C.6: Indicate the amount you pay for each of the following: Trade license, annual fees and taxes (Tsh/yr)

Municipal/city	Business license	Market service Charges/fees	Health inspection fees	Taxes

C.7: What are your major Fruits/vegetables products marketing problems?

Price ( )	High Competition ( )	Seasonality ( )	Unreliable buyers ( )	Un trust Customers ( )	Product Deterioration ( )	High Marketing Costs ( )	Legal Restrictions ( )

Other specify.....

C.8: Do you have planned to supply Fruits/Vegetables products to the supermarkets in the future? (Yes/ No).

C.9: What is your future prospect regarding Fruits/vegetables marketing?

Abandon this Business ( )	Expand my business ( )	Focus other markets ( )	No prospects ( )
---------------------------------	---------------------------	----------------------------	---------------------

Other specify

**THANK YOU FOR YOUR COOPERATION**

**Appendix 3: Survey Questionnaires for Fruits and Vegetables supermarket operators in Dar es Salaam region**

Questionnaire No. ....

Date of interview .....

**SECTION A: BACKGROUND INFORMATION**

**A.1: Background**

District	
Ward	Village
Name of respondent	
Age	
Sex: Male: ( ) Female: ( )	
Position in business	Period in business
Education Level	Major activities
(9) Primary ( ) (10) Secondary ( ) (11) Tertiary ( ) (12) None ( )	Agriculture ( ) Business ( ) Shop keeper ( ) Driver ( ) Other specify

Is your business Registered (Yes/No)	Do you have other branches (Yes/No)	Branches: In Tanzania ..... ..... ..... ..... ..... ..... ..... Other countries ..... ..... .....
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## SECTION B: INFORMATION ON FRUITS/VEGETABLES PRODUCT PROCURMENT

## B.1 : Products procured

Products/ Source	Small farmers	Other traders	Local proces sors	Imported	Quantity purchased (Bundles/ Kgs)	Price/Unit	Revenue
Fresh fruits							
Fresh Vegetables							
Ice cream							
Juice							
Slice							
Others							

## B.2: What methods do you use to preserve your products?

Refrigeration ( )	Stored in a cold room ( )	Store in Boxes/containers ( )	Put on shelves ( )	Others (specifies)

## B.3: Which source do you rely on for your procurement?

.....  
 .....

## B.4: Give reasons

Hygienic Quality ( )	Nutritional quality ( )	Proper handling ( )	Standard conformity ( )	Cheap products ( )	Constant supplies ( )	Prope r time ( )	Other (specifies) ( )

## B.5: Have you thought of purchasing from local suppliers? (Yes/No)

## B.6: If yes, who are these suppliers? Give names and products they would supply

Supplier	Products
1.	
2.	
3.	
4.	
5.	
6.	
7.	

B.7: If no, what are the reasons?

Poor Hygienic Quality	Poor Nutritional Quality	Insufficient supplies	High Price	Not Preferred by customers	Time consuming	Others (specify)
( )	( )	( )	( )	( )	( )	

B.8: Do you have any contractual arrangement with the suppliers? (Yes/No)

B.9: If yes, are the contractual arrangements (Formal/Informal)?

B.10: Contractual arrangements

Terms of contract	Enforcement measures	Penalty when terms are not observed
Delivery quality products		
Timely supply		
Constant supply		
Adequate supply		
Well packed products		
Others (specify) .....		

## SECTION C: MARKETING

C.1: Who are your customers?

Individuals	Other retail shops	Governmental institutions	Others (specify)
( )	( )	( )	

C.2: Do you have any contractual arrangements with customers? (Yes/No)

C.3: Do you prefer selling locally produced or imported Fruits/vegetables products?

C.4: If you prefer selling imported Fruits/vegetables products. Give reasons

High standard conformity	High hygienic quality	High nutritional quality	Low price	Constant supply	Other (specify)
( )	( )	( )	( )	( )	

C.5: How do you compare prices between imported and locally produced fruits/vegetables products?

Product	Purchase price		Selling price	
	Locally	Imported	Locally	Imported
Fresh fruits				
Fresh vegetables				
Ice cream				
Juice				
Slice				
Others				
.....				
.....				
.....				
.....				
.....				

C.6: Which products are highly preferred by your customers?

Locally Produced  ( )	Imported products  ( )
-----------------------------	------------------------------

C.7: What are the reasons with regards to customers' choice?

Cheap  ( )	Hygiene  ( )	Well packed/ labeled  ( )	Nutritional quality  ( )	Easy to use  ( )	Other (specify)
------------------	--------------------	------------------------------------	-----------------------------------	------------------------	--------------------

C.8: What problems do you counter with local fruits/vegetables suppliers?

1.	
2.	
3.	
4.	
5.	
6.	
7.	

D.2: What problems do you encounter with imported fruits/vegetables products?

1.	
2.	
3.	
4.	
5.	
6.	
7.	

D.3: Do you think imported products are suitable source for your suppliers? (Yes/No)

D.4: Do you have any plan to establish your own local suppliers for your supermarkets?  
(Yes/No)

D.5: What are your prospects regarding local farmers/processors as your future source of suppliers?

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	

THANK YOU FOR YOUR COOPERATION



**Appendix 4: Revenue data for calculating Buyer Concentration Index for tomatoes**

Tomatoes				
	Parameters	Price (Tsh/Kg)	Quantity (Kg)	Revenue (Tsh)
1	Maximum	810	3,430	2,229,500
2	Minimum	650	2,100	1,659,000
3	Range	160	1,330	570,500
4	Mean	740	2,772.5	2,023,025
5	Standard deviation (n=4)	73.94	571.97	251,096
6	Sum	2,960	1,1090	8,092,100

**Appendix 5: Revenue data for calculating Buyer Concentration Index for mangoes**

Mangoes				
	Parameters	Price (Tsh/Kg)	Quantity (Kg)	Revenue (Tsh)
1	Maximum	570	2,800	1,596,000
2	Minimum	480	1,800	918,000
3	Range	90	1,000	678,000
4	Mean	527.5	2,337.5	1,239,275
5	Standard deviation (n=4)	40.31	412.17	281,831.3
6	Sum	2,110	9,350	4,957,100

**Appendix 6: Gross margin analysis for farmer of tomatoes at deferent nodes**

Parameters	Farmer to Intermediary traders		Farmer to Urban traders		Farmer to supermarket operators	
	Average	Standard deviation (n=36)	Average	Standard deviation (n=25)	Average	Standard deviation (n=20)
1 Total yield (Kg)	1,264.59	294.53	1,344.29	479.08	1,560.29	600.1
2 Fine yield (Kg)	950.08	220.94	1,008.22	359.31	1,170.22	450.07
3 Rejected yield (Kg)	314.51	74.45	336.07	119.77	390.07	150.02
4 Price of fine yield (Tsh)	481.67	74.54	603.2	117.43	816.5	169.62
5 Price of rejected yield (Tsh)	440.83	60.96	377.8	34.7	406.25	75.34
6 Total revenue (Tsh/month)	590,280.3	125,908.2	742,021.7	322,142.5	1,115,231	439,144.54
7 Total cost (Tsh/month)	442,608.9	103,086.8	470,501.5	167,677.8	546,103.1	210,033.3
8 Gross margin (Tsh/month)	147,671.4	65,738.69	271,520.2	180,219.41	569,128	271,770.87

**Appendix 7: Gross margin analysis for farmer of mangoes at deferent nodes**

Parameters	Farmer to Intermediary traders		Farmer to Urban traders		Farmer to supermarket operators	
	Average	Standard deviation (n=36)	Average	Standard deviation (n=25)	Average	Standard deviation (n=20)
1 Total yield (Kg)	170	6.62	170.88	6.96	170	6.07
2 Fine yield (Kg)	127.5	4.97	128.16	5.22	128.16	1.01
3 Rejected yield (Kg)	42.5	1.67	42.72	1.74	42.73	1.52
4 Price of fine yield (Tsh)	398.61	28.09	478	66.39	653.5	128.53
5 Price of rejected yield (Tsh)	354.44	27.92	362	38.73	378.5	63.19
6 Total revenue (Tsh/month)	51,186.53	4,237.29	61,591.	8,638.22	84,183.	17,087.02

7	Total cost (Tshmonth)	25,500	993.69	1	25,632	1,044.92	5	25,635	910.34
8	Gross margin (Tsh/month)	25,686.53	3,812.95	1	35,959.	8,490.6	5	58,548.	16,884.4

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