

**SMALL-SCALE PRODUCERS AND TRADERS MARKET SUPPLY CHAIN
FOR FRESH VEGETABLES: A CASE STUDY OF LUSAKA**

**A research report submitted to the Department of Agricultural Economics and
Extension Education of the University of Zambia**

BY

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Degree in Agriculture**

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DEDICATION

To my wonderful Parents, Mr. & Mrs. Mukololo

To my Brothers and Sisters

My wife Matildah and my lovely Daughter Sibeso

Receive my Achievement.

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ABBREVIATIONS

ACF	Agriculture Consultative Forum
CSO	Central Statistical Office
GDP	Gross Domestic Product
MACO	Ministry of Agriculture and Cooperatives
MAFF	Ministry of Agriculture Food and Fisheries
MLE	Maximum Likelihood Estimate
OLS	Ordinary Least Squares
SPSS	Statistical Package for Social Sciences

ABSTRACT

SMALL-SCALE PRODUCERS AND TRADERS MARKET SUPPLY CHAIN FOR FRESH VEGETABLES: A CASE STUDY OF LUSAKA

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This study was undertaken to examine the fresh vegetable market supply chain for small scale producers and traders. Specific objectives were to determine producer and trader characteristics; identify the marketing channels; establish the determinants of farmer's supply choices; determine the market margins and the benefits and constraints.

Questionnaires were developed and pre-tested in another market. Trader's register was used as a sampling frame for a random selection of a sample of 117 respondents. An up-stream interview approach (from retailers to producers) was applied.

The age of respondents was between 18 and 67 years, 53% males and 47% females. Mean education was 6, 8 and 9 years for retailers, wholesalers and farmers respectively. Main source of vegetables for retailers is within Soweto. Modes of transport are the hired light trucks and wheelbarrows for retailers. Storage facilities are provided in the markets by private individuals at a fee. Membership to various associations and groups was poor and very few members appreciated services obtained from their associations. Retail marketing margins range from 17% to 45%, wholesale was between 6% and 23% and farmers were calculated between 39% and 64%. There is an inverse relationship in the market margins between farmers and retailers with the change in market prices. This signals conflict in price setting and entry of brokers to trade for the relatively inexperienced farmer at a commission.

Use of brokers by farmers is influenced by age, level of education, location and hectares cultivated. Marketing is constrained by lack of trading spaces, produce damage and price fluctuations. There is very low institutional support for the market actors and lack of small business loans.

In order to stabilize producer prices selling of vegetables at Soweto market should be decentralized by guiding and promoting sales from other markets around Lusaka. There is need to publicize both input and produce prices through public television sets available in the markets at selected hours, strengthen marketer's associations and encourage public and private sector partnerships in fresh vegetable trading. Improve conditions at Soweto market and open up the drainage system to provide better habitable conditions.

Keywords: Supply Chain, Farmer, Broker, Wholesaler, Retailer, Market Margin.

CHAPTER ONE

INTRODUCTION

1.1 Introduction and Background

Agriculture in Zambia remains at the centre stage of the economy currently contributing 18 per cent to the national gross domestic product (GDP) and provides livelihood (in terms of food resources and income) for more than 50% of the national population and employs 67 percent of the labour force mostly women and the youths. Production is dominated by the small-scale farmers, who account for more than 70% of the farming population. However, production and productivity is very low because most farmers lack, amongst other key factors, well functioning markets and support services (ACF Annual, 2002).

In the past 10 years, the country has evidenced economic expansion in many sectors of the economy which include mining, tourism and trade. This economic boom has however, been concentrated in urban areas which has seen an increase in the populations in urban townships. For instance, the population of Lusaka district increased by 30 percent from 1990 to 2000, representing an annual growth rate of 3.5 per cent. More than three quarters (78 per cent) of Lusaka provincial population is in Lusaka (CSO, 2000). This urbanization however, offers an opportunity and increased demand for fresh agricultural products which are supplied by farmers and traders from the outskirts of the city, other districts and also from neighboring countries.

In Lusaka district, Soweto and City markets are one such supply centers. It can be argued that these markets have the highest population density and serves for both low and high income earners. Also observable at these markets are a number of market players in the fresh vegetable marketing system with varied economic interests. The markets are composed of producers, brokers, wholesalers, stall retailers and street vendors mostly women.

The marketing system in the country operates under a liberalized market economy, where there is reduced government role in agricultural marketing, for instance, in price controls and trade regulations. Ideally, under this system both farmers and traders are 'price takers.' Produce prices are determined by the forces of supply and demand. It is however, reported that some market agents for example brokers determine their own produce prices and negotiate with farmers to sell for them on commission basis. These trade practices raise questions and doubts to the vegetable producers on the role and interests of some of the market players in the supply system. As Tschirley *et al.* (2006) noted, the role of agents or brokers in wholesale markets is a contentious issue in many countries. In their study, one of the most important complaints picked from farmers regarding brokers, was that they sell the produce at a higher price than they reveal to the producer, and pocket the difference; the true commission, then, consists of the explicit charge the broker imposes and any retained difference between what was said to be sold at and what was really sold at. However, other producers were of the opinion that brokers do provide some level of service in spite of incidences of adding price mark ups without their knowledge.

Hichaambwa *et al.* (2006) also confirmed that intermediation of products through brokers and wholesalers increased marketing costs for small-scale producers and decreased the prices they received. According to their study, they further noted that the vegetable marketing system was fragmented, the main markets were chaotic and unsanitary with inadequate physical infrastructure. Markets delivered low returns to most traders who operated in them, and they were very poorly suited to linking producers more closely with consumers to provide an increasingly reliable supply of quality produce.

1.2 Problem Statement

The increasing population in Lusaka has been the major influencing factor in stimulating the fresh vegetable production within the city, surrounding areas and neighboring districts and their subsequent supply at Soweto and City markets. This has also seen many market players taking up various roles in the marketing system.

Despite the considerable demand for vegetables, producers are still faced with the problem of supply choice. Vegetables are perishable; they need to reach the market early and to be sold when they are still fresh to fetch a good market price. However, markets are highly competitive, producers and traders contend for available customers and strive to maintain the product quality and profitability. It is in this light that market agents have taken up various roles in trading of fresh vegetables with various economic interests. In this category are the brokers who have been reported in various research studies as controversial to the vegetable farmers. Other reports particularly indicate that they reduce incomes for farmers and in some cases charge high commissions (Emongor *et al* 2004).

It is not clear by how much these market agents are able to reduce farmer's incomes and why other farmers have continued to use them despite recorded complaints. Also for farmers who appreciate them it is not known what service this group is able to provide as these reports do not indicate.

Literature also shows a number of research studies have been done in the sector among them by example by Tschirley *et al* (2006). However, no attention has been given particularly in examining the supply chain for small-scale producers and traders, determinants of their supply choices, benefits and constraints in particular supply channels.

1.3 General Objective

The overall objective of this study is to examine the small-scale producers and traders market supply chain for fresh vegetables.

1.3.1 Specific Objectives

- i). Determine the vegetable producer and trader characteristics
- ii). Identify the vegetable marketing supply channels
- iii). Establish the determinants of farmer's supply choice to market agents
- iv). Determine the market margins at each marketing stage in the supply channel

- v). Determine the benefits and constraints in fresh vegetable production and marketing.

1.4 Rationale

An effective market supply system can only be designed on the basis of sound and well researched market information. This study recognizes the potential of various vegetable market players in the supply of agricultural produce, fresh vegetables in particular.

Therefore, a comprehensive enquiry into the performance of the vegetable supply chain from the small-scale producer and trader's perspective will provide invaluable data that will guide authorities in formulating policies that will correct, activate and enhance sector development.

This will assure farmers of an effective and rewarding supply system, thereby promoting vegetable production, so as to meet the growing demand of the same. Good performance in this sector will translate into overall improvement of the country's GDP, create jobs, expand the tax base, and increase income levels of vegetable growers and traders. Food security in township would also be improved by making the commodities readily available and at competitive prices.

1.5 Limitations of the Study

The main limitations of the study were resources during data collection. It is beneficial for statistical analysis to obtain a bigger sample which the researcher would have wished to get but it was constrained by finances and time.

1.6 Organization of the Report

The report begins with chapter one, which highlights the introduction and background of the study, problem statement, objectives and the rationale. Chapter two follows with a review of relevant literature pertinent to the study. The third chapter looks at the theoretical framework. Chapter four discusses the methodology of the study and describes the study site, data collection procedure, and sample selection, limitation of the data and the method of data analysis. Chapter five presents the actual findings of the

study and discussions of the results. The last chapter presents the conclusion of the study and some recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The analysis of fresh vegetable marketing channels is intended to provide a systematic knowledge of the flow of the produce and services from their origin (producer) to their final destination (consumer). This knowledge is acquired by studying the “participants” in the process, i.e., those who perform physical marketing functions in order to obtain economic benefits. In carrying out these functions, market actors achieve both personal and social goals. They earn a (personal) financial reward by performing an activity desired by society. They add value to production and in so doing help satisfy consumers’ needs. The price the consumer pays for the produce and services rendered (e.g., transportation) compensates the market actors for their efforts. This price also serves as a signal to all actors in the marketing channel, i.e., producers, transporters, wholesalers and retailers.

2.2 Producer and Trader Characteristics

2.2.1 Producers

The first link in the marketing chain. The producers grow, harvests and supply the produce to the market agents or sale for themselves. This paper focuses on small-scale producers cultivating about 2 hectares of land using family labour and simple hand tool as defined by the Ministry of Agriculture and Cooperatives (MACO, 2000).

According to the national agricultural statistics, major vegetable types grown among local producers include tomatoes (20%), cabbage (16%), onions (7%), green beans (5%) and carrots (2%) with Non-traditional exports and other vegetable species accounting for the rest of the total volumes produced.

Brief outlines of production cycles of tomato, cabbage and onion are given below as the study looks at the four major vegetables which are tomato, onion, rape and cabbage.

Tomato: much of it grown in Zambia is for fresh market sales, with about 10% going for commercial processing into pastes, sauces, and jams (MAFF; 1996), and an annual peak production period of between August and October. Thus, there is always a marked low tomato production between December and April every year.

Cabbage: is among the most import leafy vegetables grown in the country. As a source of income, cabbage ranks first among commercial producers and third behind tomato and rape among small-scale farmers. Although cabbage can be grown throughout the year, its peak growing period is during the cool dry season. Its production significantly declines during the hot dry season. Scarcity is more pronounced during the hot humid months of November to April.

Onion: like tomato is widely grown by both commercial and small-scale farmers in Zambia. The peak production period is during the cool dry season with production declining during hot dry and hot wet seasons production is characterized by poor quality and low yields. Onion production in Zambia is also characterised by poor quality and low yields mainly as a result of poor culture and storage practices.

2.2.2 Rural Assemblers

Sometimes also known as the transporter, they are the first link between the producer and other middlemen. These collect several smaller lots of scattered rural production and combine them into a single load at one location. In so doing, they typically classify these diverse lots into fewer types.

Tschirley et al (2006) noted in their report that assembly of tomato, rape, and cabbage occurs through a decentralized process from within 20-30 km of each city (Lusaka and Ndola). Less perishable onions arrived from Eastern province, Malawi, and Tanzania. Smallholders tended to bring perishable items such as tomato and rape directly to wholesale markets; these farmers nearly always had to sell through brokers, which reduced the price they received. Cabbage and dry onion arrived at Soweto through traders who did not utilize brokers.

2.2.3 Wholesalers

These concentrate the various, intermediate-sized loads and put the products into large, uniform units. These activities all contribute to price formation. In so doing, the wholesaler provides information to suppliers (e.g. growers, rural assemblers) and assumes to a varying degree the risks associated with the transfer of property rights to the goods and services being bought and sold. They also facilitate mass and specialised storage operations, transportation and, in general, the subsequent distribution operations involving retailers.

2.2.4 Retailers

Middlemen, which includes supermarkets and other large-scale retailers who divide up large shipments of produce and sell it to consumers in small units. The basic function that they provide is bulk-breaking.

2.2.5 Brokers

These agents work for a commission on behalf of other market participants. They operate at all levels of the marketing chain. Typically, they work for either a flat rate or percentage of the selling price (commission). This group is the center of this study as many market researchers have documented it as most controversial in the marketing chain of fresh vegetables with farmers. Emongor *et al*, (2004) reported in their study that many farmers complained that the prices they received at Soweto market were much lower due the commissions charged.

2.2.6 Consumer

This is the last link in the marketing chain. Families usually personify the final consumer. However, processing companies may also be considered the user (or consumer) albeit at the intermediate stage. These participants and their respective functions often may overlap. The most widespread combinations are: traders-wholesalers that collect the commodity and supply it to retailers, wholesalers-retailers (wholesalers that also sell directly to consumers).

2.3 Marketing Channels

The majority of Zambia's farming population are small-scale farmers producing largely for subsistence purposes. Some small-scale farmers are however producing for the market while some large-scale farming enterprises focus mainly on the export market with certain volumes of their products also reaching the local market. Agricultural product sales to the local market are normally traded through the following marketing channels.

2.3.1 Sales at the Farm Gate

Emongor *et al* (2004), recorded in their study that the practice of farmers selling to traders and consumers at the farm gate is common around Lusaka and other urban centres. Fresh produce such as tomatoes, rape, *impwa* (local egg plant) and potatoes are among the crops sold in this manner. Almost a quarter of the farmers interviewed reported that they occasionally sold their tomatoes at the farm gate and through local market outlets.

2.3.2 Traditional Wholesale/ Retail Markets

A survey carried out in Zambia on urban agriculture in 1992/1993, showed that about 80 - 90 % of the respondents in urban areas of Lusaka, Ndola and Kabwe obtained their vegetables from the council markets. These markets included the well-known 'Soweto' market in Lusaka (Drecher, 1997). Farmers sold their produce through middlemen or market agents. The middlemen at Soweto market purchase the farmers produce and then retail it at higher prices at the same market. In some cases there also normal practices whereby middlemen sell the produce on behalf of the farmers on commission basis (Emongor *et al* 2004).

Hichaambwa and Tschirley (2006) conducted a study titled "Understanding Zambia's Domestic Value Chains for Fresh Fruits and Vegetables." with a focus on farmers and traders in Lusaka and Ndola markets. They noted that large farmers tended to sell directly into urban markets, while smallholder farmers nearly always faced intermediation, either through brokers or assemblers. This intermediation increased marketing costs for

smallholders and decreased the prices they received. Secondly, single wholesale markets, dominated urban marketing, but was increasingly complemented by modern wholesalers serving supermarkets, and by Freshpikt[®], a major processing operation. Finally, open air markets and street vendors dominated retailing.

2.3.3 Institutional Markets

Farmers also supply fresh produce to institutions such as schools, hospitals, hotels and lodges. Large-scale farms/processors that are able to go through the tendering process and have large volumes to supply continuously to these markets are usually the preferred suppliers to these markets.

2.3.4 Supermarkets

Large scale and at smaller volumes small scale farmers also sell to the various supermarkets. Freshmark[®] is one of the major buyers of fresh produce since it buys fresh produce on behalf of Shoprite stores in Zambia. Most of the other independent supermarkets tend to buy directly from farmers or from the whole sale markets such as the Soweto market.

2.4 Determinants of Supply Choice

Chikazunga *et al* (2007) undertook a study in the marketing of beef in Southern and Western provinces of Zambia. They analyzed their collected data using a probit model. Several hypotheses were made and found among others, distance to the markets and agricultural training as statistically significant factors in the determination of the marketing channel choices in the sector. Agricultural training was found to be negatively related to market channel choice; this meant according to their study, farmers with more agricultural training were likely to participate in traditional beef market channels (this was characterized as private sales, sales to informal agents and butcheries). This was so because a relatively more number of traditional market channel choice farmers were

found to receive formal agricultural training than their classified modern market channel farmers (those who sold to beef processors).

Distance to markets was found to be positively related to the market channel choice this also meant that on average farmers who marketed through Zambeef processors (modern channel) were further removed from their market destinations than those categorized as traditional market channel farmers. This was so because most of them had the means of transport.

2.5 Market Margins

Marketing margin refers to the difference between prices at different levels of the marketing system. It is the percentage of the final weighted average selling price taken by each stage of the marketing chain. The margin must cover the cost involved in transferring produce from one stage to the next and provide a reasonable return to those doing the marketing. Marketing costs are incurred when commodities move from the farm to the final market. Marketing costs include labour, transport, packaging, rent, utilities and advertising. Marketing costs vary from commodity to commodity and from product to product. There are several factors that individually or collectively account for these differences. These include:

- a). The more waste, the greater the marketing costs,
 - b). The more perishable the product, the greater the marketing costs,
 - c). The more processing of the commodity, the greater the marketing costs,
 - d). The greater the amount of product handling and transportation, the greater the marketing costs, (Musema, 2004).
- Gross Margin = Sales proceeds – Purchase costs
 - Net Margin = Sales proceeds – Purchase – Marketing Costs.

A paper on “Marketing of Vegetables in Lusaka” by Mambo (1987) pointed out that prices of vegetables fluctuate according to seasons. He observed that the price of vegetables were at the lowest level during the dry season, when supply is plentiful. He also observed that marketeers make little profits from vegetable marketing. He further

observed that vegetable price variations were due to fluctuations in supply and transportation costs.

2.5.1 Price Mark-Ups

In the study presented above by Hichaambwa and Tschirley (2006) it was also found that retail mark-ups in Lusaka markets ranged from 30 – 80 % over retailer purchase price, with lowest mark-ups for the highest volume items: cabbage, tomato, and rape. Soweto appeared to have had comparable overall mark-ups, while Kaunda Square's was much higher (reflecting typically higher prices in outlying markets). Total farm-to-consumer markups established on one day in July 2006 ranged from 65 to 92 per cent of the price paid at farm.

2.6 Benefits and Constraints in Vegetable Marketing

According to Kapunda (1995), the environments under which different marketers operate are different and as such their performance and problems tend to differ markedly. He observed that marketers in less urbanized areas seek to make high profits by means of raising prices, while urban marketers make profits through handling larger volumes of business. The difference is due to the fact that urbanized areas are characterized by a competitive market structure in which the trader is a price taker. The converse holds for less urbanized areas. Kapunda further observed that marketers do not generate enough funds to make any meaningful investment. However, the level of investment was observed to be relatively higher in urban areas. He noted that little profits generated are at best used for consumption and education of children. Kapunda, observed that problems encountered by (formal) vegetable traders were lack of appropriate skills, representation, rule of law in the business, adequate support services and business fluctuations.

Chanda (1993) observed that demand for vegetables was not affected by seasonal price variations. The major causes were found to be the farmers and the general tendency of price to increase due to inflationary pressure in the economy. He observed that the quality and standards to tomatoes, cabbages and rape in the market were influenced by the level of education, storage facilities, quantity measurements and type of packaging.

Bangwe (1988) in his study on “Lusaka’s Unlicensed Street Vendors in Agricultural Food Stuffs: What Role?” observed that the majority of the informal traders were women. The women sold along streets to either raise or supplement their income. Their services and prices were found to be comparable to those in established markets. Street vendors were found to be playing a significant role in marketing agricultural foodstuffs. Reasons cited by the informal traders for not selling from established markets were inadequate market stalls, congestion, too many (high) fees and political interference.

Daka A. (1997) observed that marketing was the most critical problem faced by vegetable growers in North-Western Province. Others were availability of inputs and soil related problems. He observed that vegetable producers could have their crops ready for harvest but had problems to access buyers. He noted that in critical times, farmers resorted to barter system of exchange. Sometimes produce was left to rot. Vegetable marketing was further constrained by lack of reliable transport and fluctuations in market prices.

Miti (2002) undertook a study to examine vegetable marketing constraints faced by small-scale farmers and the use of strategic marketing of tomatoes in Lusaka. It was found that 97.5 per cent of the small-scale farmers were found to be experiencing serious marketing problems such as low produce prices, lack of accessibility to market information, poor storage facilities lack of adequate product handling facilities and high transportation costs when marketing tomatoes.

The study also found that, small-scale farmers used the following marketing strategies tailored to their own unique situations. It was found that farmers used the following marketing strategies: u-pick markets, road stands and direct selling to the consumers. The study concluded that small-scale farmers face difficulties in finding established markets and also that the main factor causing low volume of tomato production were tiny profits for growers, which provide little incentive for production.

CHAPTER THREE

CONCEPTUAL FRAMEWORK

3.1 Market Structure

The study picks on a perfect market structure under a free market economy in which the horticultural industry operates. Perfect competition is a market situation in which a large number of producers offer a homogenous product, to a very large number of buyers of the product. The number of sellers is so large that each seller offers a very small fraction of the total supply, and therefore, has no control over the market price. Likewise, the number of buyers is so large that each buyer buys an insignificant part of the total supply and has no control over the market price. Both buyers and sellers are “price takers”, not “price makers”. The price of a commodity is determined in this kind of markets by the market demand and market supply. Each seller faces a horizontal demand curve, which implies that a seller can sell any quantity at the market determined price. Each firm is in competition with so large number of firms that there is virtually no competition.

3.2 What Influences Producer and Traders Prices in a Free Market

Supply is influenced by how much vegetables farmer’s produce; how quickly producers need cash; how much storage is available and the price offered for the vegetables. Consumer demand is influenced by the price. A high price will make consumers reduce purchases and be more careful with what they buy. A low price will encourage increased consumption. Trader demand is influenced by production levels in other parts of the country. Traders will prefer to buy in easily accessible areas. Demand for vegetables in other areas will thus be low until there is no more left in easy-to-reach areas. Production levels in the neighboring districts and countries also influences trader demand.

Location factors include, distance from the market; condition of the roads; quantity of vegetables available and extent of competition between traders. Another factor is the time of the year, seasonal price pattern is influenced by the farmers' cash needs after harvest; size of total harvest; storage by traders and forecasts of following year's production. The

extent of information available is also an important influence on prices. Finally, better quality fresh vegetables will get better prices.

3.3 Probit Model for the Farmer’s Use of Market Agents

The decision by farmers to use market agents (brokers) is modeled as a binary decision: a farmer either uses or does not use brokers. In situations such as this when the dependent variable is a discrete dummy variable (use brokers = 1; don't use brokers = 0), linear estimation is inappropriate for at least three reasons (Green 1993, Wooldridge 2000). First, the error term cannot be normally distributed since it can take only two values. Second, the error is heteroskedastic because it can be shown that the variance of the error term is not constant. Third, the estimated probabilities generated via a linear estimation would not necessarily lie between zero and one. Probabilities greater than one or less than zero are not acceptable; e.g. the use of brokers cannot be predicted with over one hundred percent certainty. Other estimation methods are used when the dependent variable is a discrete dummy variable.

For the reasons outlined above, estimating a binary response model typically utilizes maximum likelihood estimation (MLE) techniques (Wooldridge 2000). Appropriate MLE models include the logit or probit model. The difference between these techniques is insignificant (Green 1993). This study utilizes a probit model to analyze the factors affecting the use of brokers among small-scale farmers marketing at their produce at Soweto and City market. The probit model takes the basic form:

$$Y_i = G(I_i) \tag{1}$$

$$I_i = b_0 + \sum_{j=1}^n b_j X_{ji} \tag{2}$$

Where: Y_i is the observed response (1 or 0) for the i^{th} farmer;
 I_i is the underlying stimulus (reasons why the farmer used brokers or not);

G is the functional relationship between observation (Y_i) and the stimulus index (I_i);

$i = 1, 2, \dots, m$, is the index of observations, the sample size;

X_{ji} is the j^{th} explanatory variable for the i^{th} observation;

b_j is an unknown parameter; and

$j = 0, 1, 2, \dots, n$, where n is the total number of explanatory variables.

For the probit model $G(\cdot)$ is the standard normal distribution (cdf) and the model becomes:

CHAPTER FOUR

METHODS AND PROCEDURES

4.1 Introduction

This chapter presents the methods and procedures that were used in data collection and tools used in analysis.

4.2 Study Site

4.2.1 Soweto Market

This is a wholesale/retail market for agricultural produce and products. Fresh fruits and vegetables (cabbages, rape, tomatoes, potatoes, and onions, bananas, oranges etc) and dry farm produce such as maize, beans and fish are sold in this market. The fresh produce such as cabbages is just heaped on the ground and prices are called out to buyers (directly to consumers and those buying for resale). There are middlemen who buy the farmers produce to resell or sell for the farmer on commission.

During the rainy season it is very difficult to access the market as the roads within the market are earthy and become muddy. This market caters for all segments of the society (low, medium to high income groups) and it is estimated that about 70% or more of the farmers' fresh produce is sold through the Soweto market (Emongor *et al.* 2004).

The large exporting farms also sell the non-exportable produce such as snap beans through this market. Even those who have contracts with super markets also end up selling at this market if they fail to sell to the supermarkets.

No information was available on its exact date of establishment but informants report that when it started it was small but the market has been growing and expanding and serves as an important outlet for farmers around Lusaka, although farmers from as far as Copperbelt, Central and other provinces also sell their produce at this market. Buyers come from far places that include Chongwe, Mazabuka, Chirundu, Livingstone and Mongu. An ultra-modern Soweto market was scheduled for official opening at the time of data collection.

4.2.2 City Market

It is Lusaka's first modern market located at the central heart of business adjacent to Soweto market. It is a well refurbished market, trading in most of the various household goods, food products, groceries, business services, clothing etc. with most of its' agricultural products sold at retail coming from Soweto market. Both markets are highly populated during business hours with many vendors and women dominating the retailing of fresh vegetables.

4.3 Data Collection Procedure

Two types of semi-structured questionnaires were developed, one focusing on producers and the other on wholesalers and retailers. These data collection tools were designed to gather general and specific information about the vegetable marketing channels, production and market prices at various levels, preferences on supply choices, producer and trader characteristics dominating various supply options and the benefits and constraints in producing and trading in fresh vegetables in urban markets.

These questionnaires were pre-tested in another market and were administered as personal interviews. This was considered as an appropriate method as the target groups were in both categories of the literate and illiterate. Another advantage with this method was that it eliminated the cases of missing questionnaires because they have not been submitted back to the researcher, or that some questions have not been answered. However, face to face interviews, respondents tend to give responses that they think will impress the researcher and without full trust they tend not to give full information to do with their business activities and also anything considered as trade secret(s).

4.3.1 Sample Size and Selection

A sample size of 117 respondents was taken from fresh vegetable retailers, wholesalers and producers in the two markets. An upstream interview approach (retailers to producers) was applied. It was selected as the researcher had to find all the three business groups (retailers, wholesalers and producers) from the target markets. With the sample,

the objective was to ensure equal representation of retailers, wholesalers and producers. Traders register that contained 2,243 units classified in particular commodities traded was obtained from the Market administration and was used as a Sampling frame, from which 39 retailers and 38 wholesalers were randomly selected with an aid of a table of random numbers.

At the end of each interview, retailers and wholesalers were asked to provide contact details of their vegetable sources and names (if known) of producers that were available in the markets to be reached by the researcher on the particular research days. A random sample was then taken as they were sufficient numbers of producers especially in the mornings as they waited to sale their produce. This data collection exercise was conducted from January 9, through to February 8, 2009.

4.4 Types of Data Collected

In addition to the primary data obtained from the markets, secondary information was obtained through a desktop study were various documents (research and institutional reports) where reviewed both done in Zambia and other countries detailing on the subject under study.

Key informant interviews involved individuals/representatives for selected institutions involved in fresh vegetable marketing and/or research this included market administrators.

4.5 Method of Data Analysis

The data sets collected through the questionnaires were subjected to statistical analysis using Statistical Package for Social Sciences (SPSS version 15.0) and Stata (version 8). The results have been presented in the following chapter.

CHAPTER FIVE

RESULTS AND DISCUSSIONS

5.1 Introduction

This chapter presents the results of the study and the discussions thereof. Respondents characteristic have been separated into two, that is, demographic and business characteristics. Further, an analysis of the characteristics of farmers supplying their produce through brokers has been made. Major vegetable marketing channel and their marketing margins were determined. Benefits and constraints of vegetable production and marketing have been presented in the later part of the chapter.

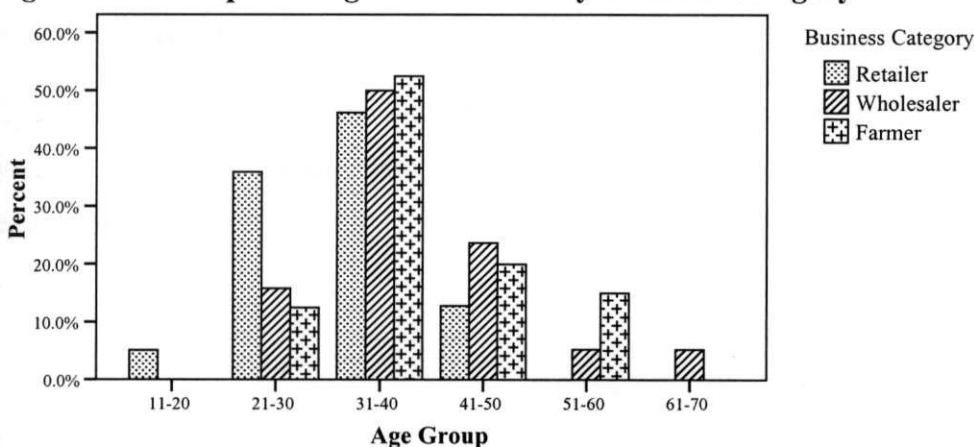
5.2 Demographic Characteristics

5.2.1 Age of the Participants

A total of 117 respondents participated in the study. The minimum age recorded was 18 years and a maximum age of 67 years. The mean age for the participants was 37 years old.

Three categories of the market actors were considered in this study and these are; the producers also interchangeably referred to as farmers; wholesalers and retailers. The figure below shows the age distribution by these trade categories.

Figure 1: Participants' Age Distribution by Business Category



Source: Survey Data (2009)

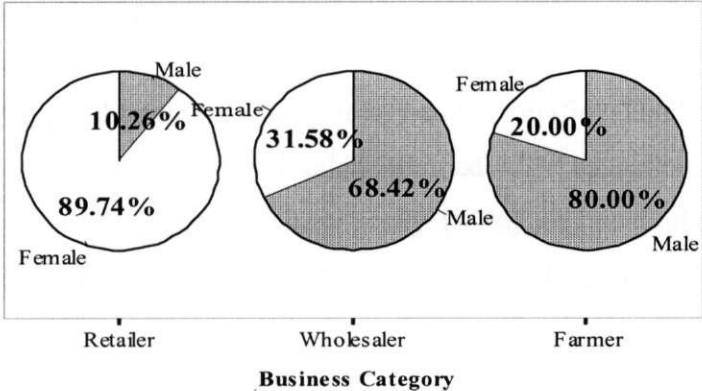
N=117

In all the three categories, the market actors are dominantly between the youthful age group of 31 to 40 years. The young are mostly from the retail business who recorded 32 years of mean age. Both wholesalers and farmers had a mean of 40 years old.

5.2.2 Gender by Participation

The overall record of participation by Gender in the study was 53% Males and 47% Females. This was distributed in the business categories as shown in Figure 2:

Figure 2: Participants' Gender by Business Category



Source: Own Survey Data (2009) N=117

Women dominated the retailing function and a good number of males as wholesalers. Male farmers dominated the production of fresh vegetables.

5.2.3 Education

The table below presents the education of the market actors in six classes; participants without education, those with primary, basic, secondary, college and university education.

Table 1: Participants Level of Education among Categories

Level of Education	Business Category			Total
	Retailer	Wholesaler	Farmer	
None	18%	5%	13%	12%
Primary	54%	18%	30%	34%
Basic	26%	45%	18%	29%
Secondary	3%	29%	35%	22%
College	0%	3%	3%	2%
University	0%	0%	3%	1%
Total	100%	100%	100%	100%

Source: Own Survey Data (2009) N=117

Majority of the retailers had primary education (54%) and a mean of 6 years of schooling, while majority of the wholesalers attained basic education (45%) with a mean of 9 years. Farmers were spread up in primary (30%) and secondary (35%) levels of education although the mean years of schooling came to 8 years.

5.2.4 Household Size

Retailers had a mean of 5 persons they were supporting, wholesalers hand 6 persons and families of farmers were larger with 8 persons. The Central Statistics Office findings of 2000 recorded a mean of 5.5 persons per household and along the line of rail tended to be larger.

5.2.5 Demographic Characteristics of Farmers Supplying through Sales Agents

Sales agents are a team of individuals who negotiate with farmers immediately the merchandise enters Soweto market gates to sale for them at a commission. This commission was found widely applied at 10 percent of the quantities sold or the revenue realized. These market agents are believed to have full knowledge of the market operations and have up-dated price information. The brokers also establish lasting business relations with farmers and assist them acquire production inputs. This is done in agreement that the farmer will channel the produce to the market agent at harvest.

Brokers also hire at their cost the packaging (crates/boxes) for tomato which are relayed to the farmer at harvest.

5.2.5.1 Age Group

The farmers who participated in the study were grouped into four age groups, from 21 to 60 years to determine under which age category of farmers that are utilizing brokers fall. The table below displays the findings.

Table 2: Farmers Age Group

Age group	Do you use brokers to sale your vegetables?				Total	
	No		Yes		N	%
	N	%	N	%		
21 – 30	1	5	6	29	7	18
31 – 40	11	58	9	43	20	50
41 – 50	4	21	3	14	7	18
51 – 60	3	16	3	14	6	15
Total	19	100	21	100	40	100

Source: Own Survey Data (2009) N=40

The age group 31-40 is the modal age category were both farmers using market agents and those who do not use them fall. The conclusion based on the age of farmers who use brokers most is between 31 and 40 years old.

5.2.5.2 Education

The study also looked at the level of education for the farmers who engage the services of the market agents.

Table 3: Farmers Education

Level of Education	Do you use brokers to sale your vegetables?				Total	
	No		Yes		N	%
	N	%	N	%		
None	5	26	0	0	5	13
Primary	5	26	7	33	12	30
Basic	3	16	4	19	7	18
Secondary	6	32	8	38	14	35
College	0	0	1	5	1	3
University	0	0	1	5	1	3
Total	19	100	21	100	40	100

Source: Own Survey Data (2009) N=40

The findings indicate that farmers without education do not use the brokers to market their vegetables they rather for themselves. In conclusion, there should be some level of education among the farmers to understand the role played by the market agents.

5.3 Business Characteristics

5.3.1 Participant's Location and Sources of Fresh Vegetables

Farmers were asked of the location of their farms and retailers and wholesalers were asked of their sources of fresh vegetables. It was found that fresh vegetables marketed at the study site, came from within Lusaka and other districts in the country. A similar trend was also noted for the buyers in the discussions held with the market authorities. Table 4 displays these sources of fresh vegetables.

Table 4: Market Actors' Participation and Sources of Fresh Vegetables

Vegetable sources	Business category			Total
	Retailers	Wholesalers	Farmers	
Lusaka west	1	1	1	3
Lilayi	0	2	3	5
Shimabala	0	0	4	4
Kabwe	0	0	3	3
Mumbwa	0	0	12	12
Chipata	0	6	0	6
Mkushi	0	7	2	9
Chongwe	0	3	9	12
Soweto	36	5	0	41
Makeni	1	4	6	11
University Farm	0	4	0	4
York Farm	1	6	0	7
Total	39	38	40	117

Source: Own Survey Data (2009)

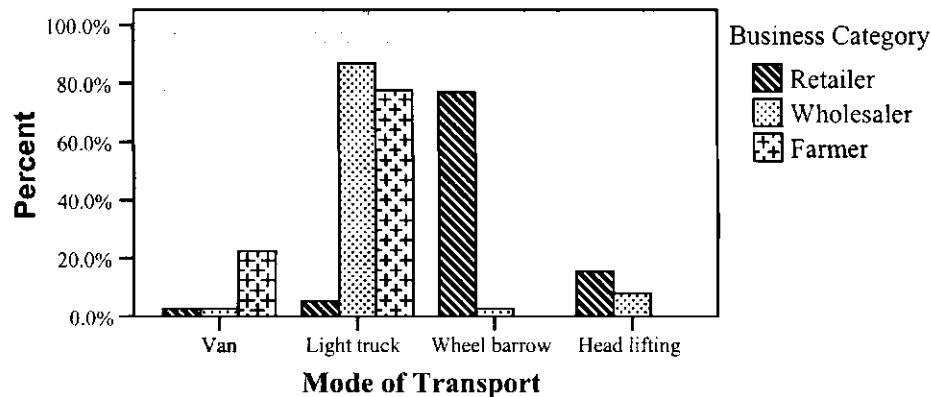
N=117

For the retailers, their main source of vegetables is within Soweto market. Wholesalers source from a variety of places mostly determined by the type of the vegetable and time of the year. Farmers came from Mumbwa, Chongwe, Kabwe districts and also within Lusaka.

5.3.2 Mode of Transport Used

The mode of transport for fresh vegetables varied according to the business category. Only 17% of the market actors owned their means of transport with 14% of it recorded from farmers. The market actors commonly hire light trucks to transport their fresh vegetables into the markets.

Figure 3: Mode of Transport Used by the Vegetable Market Actors



Source: Own Survey Data (2009) N=117

For the retailers, their common mode of transport is the Wheelbarrow. These are readily available and hired from within the markets.

5.3.3 Storage of Fresh Vegetables in the Markets

Participants in the study were asked how their vegetables are kept at the end of the business day when their merchandise is not all sold. It was found that market actors seek storage facilities from private providers within the markets. These services are provided at a fee overnight varying with the commodity stored and packaging. Traders with large quantities of fresh vegetables like crates of tomatoes, bags of cabbages engage services of market security guards who keep vigil of their merchandise overnight at a fee. Table 5, shows the market actors utilizing storage facilities provided in the markets.

Table 5: Overnight Storage of Fresh Vegetables

Market actors category	Stores within Market?				Total	
	No		Yes			
	N	%	N	%	N	%
Retailers	2	5	37	48	39	33
Wholesalers	5	13	33	43	38	33
Farmer	33	83	7	9	40	34
Total	40	100	77	100	117	100

Source: Own Survey Data (2009) N=117

Retailers and wholesalers utilize more of these facilities and services. With most farmers, it is a one day business for them in the markets. They pass on their commodities to

market agents who according to their trade conditions are responsible for the storage of the commodities not sold. In some cases, when its late in the day some farmers reduce their vegetables to very low prices so that they do not return with anything unsold back to their farms.

5.3.4 Membership to Associations

The Government and most private institutions are encouraging entrepreneurs to work in groups or cooperatives thereby supporting each other and are more at advantage for economic assistance. The market actors were asked if they belonged to any of these groups. Membership to these groupings was found to be poor. Only 31% of the respondents belonged to various groups or associations that in their opinion offered some level of service or benefit in their various businesses. Table 6, presents this percentage further split into particular groupings:

Table 6: Social and Economic Groupings for the Market Actors

Group or Association	Business Category						Total	
	Retailer		Wholesaler		Farmer		N	%
	N	%	N	%	N	%		
Chilimba	10	28	5	14	0	0	15	42
Cooperative	0	0	0	0	10	28	10	28
Group Initiative	0	0	6	16	1	3	7	19
Marketeers Association	0	0	4	11	0	0	4	11
Total	10	28	15	41	11	31	36	100

Source: Own Survey Data (2009) N=117

Chilimba is a common social grouping among women. 87% of the members under this group were women. In this group members take turns to contribute money to support one member to help improve or solve their business problem(s). 90% of the male farmers were under Cooperatives and 86% of the male wholesalers constituted the Group initiatives that aimed at finding solutions to the problems in the markets that affected them. All members recorded from Marketeers association were men.

5.3.5 **Appreciation of the Social Groupings**

The market actors where asked if these social and economic groupings where beneficial to their various businesses. The Table 7, indicates responses for those who appreciated these groupings only.

Table 7: Appreciation of Social and Economic Groupings

Group or Association	Business Category			Total
	Retailers	Wholesalers	Farmers	
	%	%	%	
Chilimba	67	33	0	100
Cooperative	0	0	50	50
Group Initiative	0	71	14	55
Marketeers Association	0	100	0	100

Source: Own Survey Data (2009) N=117

Chilimba is well appreciated by those who participate in it which also applies to the official Marketers’ Association. Half of the farmers do not appreciate the works by their cooperatives as having any bearing in their particulars business similar observation was made for the Group initiatives.

5.3.6 **Stall/Stand Ownership in Markets**

Ownership of trading space by the market actors in the study markets was analysed as this is one of the major outcries in urban markets. The findings have been presented in the table below:

Table 8: Ownership of Trading Spaces by the Market Actors

Business category	Do you have shelter/stall inside the market?				Total	
	No		Yes			
	N	%	N	%	N	%
Retailers	35	30	4	3	39	33
Wholesalers	25	21	13	11	38	33
Farmers	38	33	2	2	40	34
Total	98	84	19	16	117	100

Source: Own Survey Data (2009)

N=117

Only 16 percent of the market actors had their own trading spaces inside the study markets and were fully utilizing them. Usually, farmers do not apply for trading spaces as they only use the markets during marketing. Very low ownership of stalls is observed among the retailers. Most retailers always want the best position to display their merchandise and where it proves there is fast business for them. For some, allocations of trading spaces were made to them but because their positions in the markets have slow business or because of water stagnation in the market during the rains they tend not to use them. Retailers end up displaying their fresh vegetables on congested streets under scorching heat of the sun without protecting their vegetables.

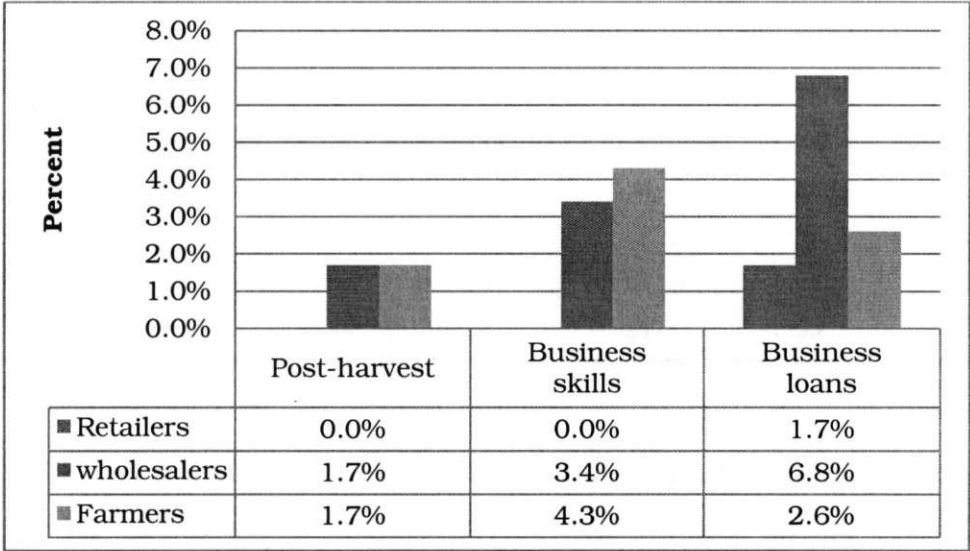
5.3.7 Business Experience

The study sought to find out the experience of the market actors in producing and trading in fresh vegetables. Retailers and farmers had a mean of 8 years business experience with a standard deviation of 6 and 4 years respectively. Wholesaler had longer year experience of 12 years. With a standard deviation of 8 years it dates back to the early 1990's when the free market economy in Zambia was introduced. For some market actors perhaps this is when they found an opportunity to engage in the business of trading in fresh vegetables.

5.3.8 Market Actors Support Institutions

Support institutions in entrepreneurship skills, market information, and technical skills are cardinal for the success of the small scale businesses. With this regard market actors were asked to identify any institution(s) that they knew or worked with that provided them with knowledge on how to maintain quality and increase shelf-life (post-harvest handling techniques), or institution(s) that offered them business skills and/or financial assistance. Figure 4, presents these findings:

Figure 4: Market Actors Support Institutions



Source: Own Survey Data (2009) N=117

It is evident of very low institutional support in the marketing of fresh vegetables. Some participants only expressed knowledge of these institutions and did not necessarily obtain their services. All the respondents expressed ignorance on any institution providing information on market prices. Some mentioned market price information is relayed among the traders and producers especially by those who just sold their commodities in the markets.

5.3.9 Business Characteristics of Farmers Using Brokers

5.3.9.1 Farm Location

The fresh vegetables traded at the study site were coming from a number of districts within the country and various locations within Lusaka. It was sought to find out if this variability could explain or affect the use of the market agents by the farmers.

Table 9: Farm Location and Use of Sales Agents

Farm Location	Do you use brokers to sale your vegetables?				Total	
	No		Yes		N	%
	N	%	N	%		
Lusaka	11	79	3	21	14	100
Chongwe	5	56	4	44	9	100
Mumbwa	3	25	9	75	12	100
Kabwe	0	0	3	100	3	100
Mkushi	0	0	2	100	2	100
Total	19	47	21	53	40	100

Source: Own Survey Data (2009) N=40

The observation made from the findings above is that there high percentages of farmers utilizing market agents that are coming from districts outside Lusaka. These places include Kabwe and Mumbwa which are on average 160 kilometers away from the markets. Chongwe district is near the markets on average of 30 kilometers and Mkushi district is the furthest.

5.3.9.2 Type of Vegetables Produced

The type of fresh vegetables marketed by the farmers was cross tabulated with the use of markets agents and the following table displays the results:

Table 10: Type of Fresh Vegetables Produced and Use of Brokers

Vegetable produced	Do you use brokers to sale your vegetables?				Total	
	No		Yes		N	%
	N	%	N	%		
Tomato	5	36	9	64	14	100
Onion	4	100	0	0	4	100
Rape	5	38	8	62	13	100
Cabbage	5	56	4	44	9	100
Total	19	47	21	53	40	100

Source: Survey Data (2009) N=40

Tomato and rape have a relatively shorter shelf life as compared to onion and cabbage. This characteristic of the two vegetables seem to influence the ultimate use of market agents by the farmers. Onion farmers do not channel any of their produce to the market agents.

5.3.9.3 Demographic and Business Characteristics of Farmers Using Brokers

Quantitative variables hypothesized to influence the use of market agents were aggregated into two (those who use brokers and those who do not) to obtain their means. Table 11, shows these results and a t-test was applied to determine the significance in the differences between the means.

Table 11: Factors Affecting Use of Market Agents

Description	Don't use brokers	Use brokers	t-test
	mean	mean	Sig. (2-tailed)
Age (yrs)	42	38	0.182
Years of schooling	7	10	0.180
Distance (km)***	50	123	0.000
Farm size (ha)**	5	79	0.101
Experience (yrs)	8	7	0.835
Area cultivated (ha)	1.36	1.44	0.357
Household size (persons)	7	9	0.877

Source: Survey Data (2009) ***1%, **10%

The statistics in table 11, show that farmers using market agents are relatively younger 38 years of age, have spent more years in school, came from distant places which was statistically significant at 1 percent and had larger farm sizes significant at 10 percent. Distance and farm size influence the farmer's decision to supply through market agents.

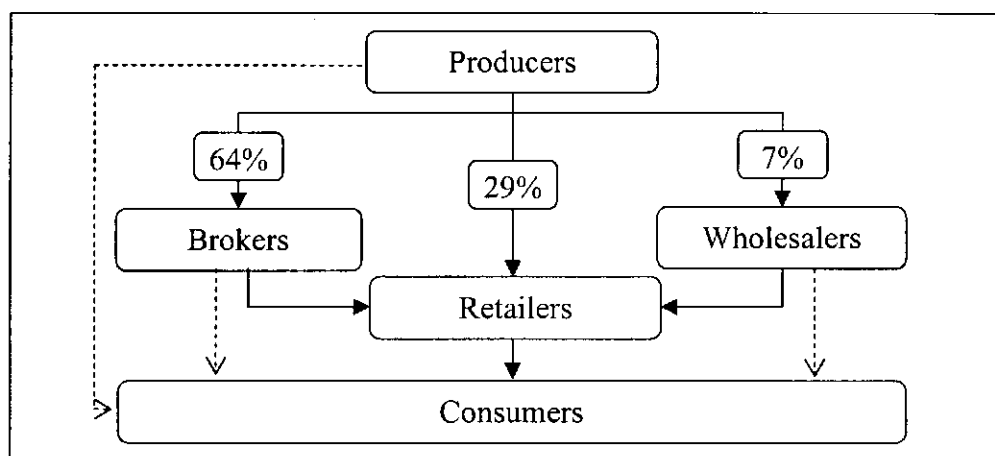
5.3.10 Other Observations

Farmers had a mean farm size of 79 hectares with farmers in Lusaka having smaller farm sizes. The mean area cultivated of fresh vegetables was recorded at 1.41 hectares.

5.4 Marketing Channels

The fresh vegetable supply chain was mapped out using the flow of vegetables from the producers to the retailers. Farmers were asked of the major supply choice of their produce. The percentages in the arrows (Figure 5) show the count of farmers supplying their main trading partners in the markets.

Figure 5: Tomato Producer's Major Supply Channels



Source: Own Survey Data (2009)

The presentation above shows the flow of tomato from the producers to the consumers. Doted arrows indicate sales from farmers, brokers and wholesalers directly to consumers which were not considered and should be acknowledged. In the figure high numbers of tomato farmers supply their produce through the market agents.

Similar flow charts were derived for Onion, Rape and Cabbage. Results for Onion farmers selling through wholesalers were 40 percent, directly to retailers was 60 percent and none where found marketing through brokers. An explanation for non-use of brokers by onion producers could be its' relatively longer shelf life as compared to the other vegetables. The market actors are able to keep it longer if it does not sale in a day.

Rape was also found to be highly marketed through brokers at 67 percent, through retailers at 25 percent and the least through wholesalers at 8 percent. Explanation for the high use of brokers could be the high perishability of the crop.

Cabbage had divided supply, 45 percent to brokers, 22 percent to wholesalers and 33 percent through brokers.

5.5 Determinants of Farmer's Supply Choice to Market Agents

Fresh vegetables need to reach the markets as soon as they are harvested to sale profitably and the use of brokers by the farmers who in the report by Emongor et. al (2004) were recorded as practicing unfair business conduct. The findings depicted in Figure 7, revealed, however that most farmers are utilizing services provided by this category of market actors despite the negative documentation. What then explains their continued use by the farmers? A probit model was employed and the hypothesized variables are presented in table 12.

5.5.1 Probit Model

Two vegetable crops (tomato and rape) found to be extensively supplied through brokers were considered for further analysis in the model. The decision by farmers to use brokers is modeled as a binary decision: a farmer either uses (=1) or does not use brokers (=0). Gender, age, education, distance in kilometers, business experience in years, total area of vegetables cultivated and quantities of fresh vegetables traded were conjectured. Location and type of vegetable were modeled as binary variables (farm location, within Lusaka = 1 and those not = 0, and the specified vegetable = 1 other vegetables = 0). Table 12, describes the definitions and their abbreviation in the output.

Table 12: Definition of Variables Conjectured in the Probit Model

Variable description	Abbreviation
Dependent variable	
Farmer uses brokers to sale fresh vegetables	UseAgents
Independent variables	
Gender	Sex
Age of the farmer	Age
Years spent in school	Education
Location of the farm	LocatnLsk
Distance from the farm to Soweto market	Distance
Experience in producing fresh vegetables for the market	Experience
Total area cultivated	HaCultivated
Quantities of fresh vegetables traded	Qtytraded

Source: Own Survey Data (2009)

5.5.1.1 Tomato Results**Table 13: Probit Regression Output on Farmer's Use of Brokers**

Probit regression		Number of obs =		40		
		LR chi2(8) =		28.72		
		Prob > chi2 =		0.0004		
Log likelihood =		Pseudo R2 =		0.5188		
UseAgents	Coef.	Std. Err.	z	P> z 	[95% Conf.	Interval]
Age	-.0718704	.0410034	-1.75	0.080	-.1522356	.0084947
Education	.2663237	.1254233	2.12	0.034	.0204986	.5121488
LocatnLsk	-1.548154	.9195897	-1.68	0.092	-3.350517	.2542084
Distance	.0067991	.0062871	1.08	0.280	-.0055234	.0191216
Experience	-.1104435	.0715357	-1.54	0.123	-.2506509	.0297639
Tomato	.7624847	.6300889	1.21	0.226	-.472467	1.997436
Qtytraded	-.0003742	.0003624	-1.03	0.302	-.0010845	.000336
HaCultivatd	.6389381	.3264726	1.96	0.050	-.0009364	1.278813
_cons	.5907571	1.793747	0.33	0.742	-2.924922	4.106436

Source: Own Survey Data (2009)

Table 14: Interpretation of the Probit Regression Results

Use of brokers is:	Significance	Where an addition of:
Directly affected by		
Education	5%	1 year there is 27% likelihood of using brokers
Hectares cultivated	10%	1 ha there is 64% likelihood
Inversely by		
Age	10%	1 year there is 7% likelihood of not using brokers
Location	10%	Farmer from Lusaka there is a likelihood of 155% of not using the brokers

Source: Own Survey Data (2009)

Similar results were obtained for rape farmers, where age ($p=0.092$), years spent in school ($p=0.062$), location of the farm ($p=0.088$) and hectares cultivated ($p=0.106$) were found significant variables in the use of brokers.

In theory, the more farmers are educated the further they will analyse benefits and convenience in the use of brokers. The greater the area cultivated the more the farmer will seek assistance in marketing increased output. The older market actors get the more will question what is around them and become more protective. Farmers coming from within Lusaka have more time on the markets to sale for themselves because of shorter distances from their farms to the market.

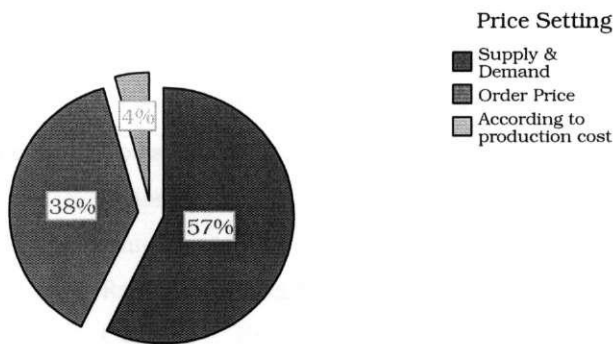
5.6 Market Margins

The section presents the market prices and looks at the profit margins gained by the fresh vegetable traders. The market margin is the difference between the amount paid by the market actors when buying and the amount they receive when selling. In this paper it is expressed as a percentage of the selling price. Net profit or margin is the total revenue less total costs and is expressed as a percentage of the turnover. The mark-up is the difference between the amount paid by market actors when buying and the amount received when selling. It is expressed as a percentage of the buying price.

5.6.1 Price Setting

Market actors were asked how prices for their merchandise were arrived at. Theoretically farmers must set their prices according to the cost of production and an addition of a profit margin. Retailers and wholesalers set their prices according to the purchase price taking into consideration of transport costs and also add on the profit margin. Figure 8, displays the results:

Figure 6: Price Determination by the Market Actors



Source: Own Survey Data (2009) N=117

As shown above 57 percent of the market actors mentioned prices were determined by supply and demand of the commodities. 39 percent of the retailers and wholesalers set their selling prices according to the purchase price. 4 percent of the farmers took into account of the production costs in setting their prices. It was found however that there is no control of the selling prices especially for the producers. Prices were very dynamic, highly determined by the amount of commodities that entered through the market gates.

5.6.2 Market Prices

The respondents were asked to recall market prices for fresh vegetables that prevailed when markets were oversupplied and the resulting lowest unit price, and the when markets were lowly supplied and the subsequent highest unit price recorded. Also average unit prices across seasons were given. This means that three categories of market prices were obtained i.e. low unit price, average unit price and the highest unit price

recorded in the market according their experience. Average of the three price categories with respect to the type of vegetable and level of trading were calculated and presented in the following table:

Table 15: Average Market Prices for the Fresh Vegetables

Category	Crop	Unit	Selling at Low		Normal Selling		Selling at High	
			Price		Price		Price	
			Price	Std. D	Price	Std. D	Price	Std. D
Retailer	Tomato	Crate	32,273	9,223	48,250	13,870	84,864	22,156
	Onion	10kg	27,333	24,007	33,333	27,538	46,667	41,932
	Onion	30kg	33,333	11,547	43,333	7,638	65,667	6,028
	Rape	50kg bag	28,333	10,408	36,667	12,583	70,000	20,000
	Cabbage	Head	1,288	402	1,813	530	2,563	821
Wholesaler	Tomato	Crate	24,286	8,052	40,071	11,166	72,500	15,259
	Onion	10kg	14,333	2,082	18,333	2,887	25,000	5,000
	Onion	30kg	22,600	6,427	31,600	8,385	47,500	12,748
	Rape	50kg bag	8,000	.	26,150	.	44,615	.
	Cabbage	Head	880	330	1,293	437	2,147	498
Farmer	Tomato	Crate	18,750	8,702	40,000	11,094	66,071	8,716
	Onion	10kg	11,167	1,893	15,167	289	20,333	289
	Onion	30kg	19,000	.	32,000	.	40,000	.
	Rape	50kg bag	6,692	3,919	24,615	9,887	33,000	11,983
	Cabbage	Head	700	653	1,000	753	1,553	1,209

Source: Own Survey Data (2009) N=117

The standard deviation shows that the prices can vary less or above the average price per unit within the price category (low, normal, high) by the given value.

5.6.3 Quantities of Fresh Vegetables Traded Per Day

In a similar method respondents gave self scored quantities of fresh vegetables sold in the three market price categories as given in table 15. The amounts of commodities sold per day have been summarized in table 16, below.

Table 16: Quantities of Fresh Vegetables Sold Per Day by all Market Actors

Category	Crop	Unit	Qty Low Sales	Qty Normal Sales	Qty High Sales
			Mean	Mean	Mean
Retailer	Tomato	crate	1.3	2.3	2.7
	Onion	10kg	2.2	6.7	21.3
	Onion	30kg	7.2	11.0	11.3
	Rape	50kg bag	1.0	1.7	2.0
	Cabbage	head	18.3	30.0	49.8
Wholesaler	Tomato	crate	62.1	129.5	189.5
	Onion	10kg	25.0	116.7	283.3
	Onion	30kg	38.0	178.0	412.0
	Rape	50kg bag	50.0	100.0	150.0
	Cabbage	head	263.7	468.3	1,338.7
Farmer	Tomato	crate	53.9	315.7	398.6
	Onion	10kg	59.0	116.7	210.0
	Onion	30kg	300.0	500.0	500.0
	Rape	50kg bag	39.8	66.2	93.0
	Cabbage	head	605.6	1,822.2	1,972.2

Source: Own Survey Data (2009) N=117

Noticeably, retailers who are the bulk-breakers sale very low quantities of full units. Wholesalers and farmers have relatively similar quantities sold. When there is high demand for fresh vegetables in the markets, quantities sold by all market actors are only limited by the amount of capital the individual trader has or the quantities the farmer has delivered into the markets. Usually, farmers sale all quantities delivered and will usually reduce prices as the day progresses. This is so because most vegetables lose their freshness overnight especially rape and most farmers will be looking forward to returning to their farms.

5.6.4 Calculations of Market Margins

The following tables show the determination of the net profits made by the market actors per day and the market margins in the fresh vegetable supply chain. Two previous tables have been used for these calculations; table 15, for average market prices and table 16, for the average quantities sold per day. An assumption has been made of an up-stream flow in the sources of the fresh vegetables, that is, retailer's source from wholesalers and the later source from farmers.

5.6.4.1 Retailers

Table 17: Retailers Profit Margin/day Selling at Normal Market Prices Tomato and Onion

Crop	Tomato			Onion		
	Qty sold/day	Unit Price (crate)	Total	Qty sold/day	Unit Price (10kg)	Total
Revenue	2.3	48,250	110,975.0	6.7	33,333	476,663.0
Less						
Purchase price	2.3	40,071	92,163.3	6.7	18,333	122,831.1
Transport			2,000.0			2,000.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Storage			500.0			500.0
Loss (5%) ^a			5,548.8			11,166.6
Total			102,712.1			138,997.7
Net Profit			8,263.0			84,333.4
Market margin			17%			45%
Mark-up			20%			82%
Net Profit			7%			38%

Source: Own Survey Data (2009)

^a Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

Table 18: Retailers Profit Margin/day Selling at Normal Market Prices Rape and Cabbage

Crop	Rape			Cabbage		
	Qty sold/day	Unit Price (50kg bag)	Total	Qty sold/day	Unit Price (head)	Total
Revenue	1.7	36,667	110,975.0	30	33,333	54,390.0
Less						
Purchase price	1.7	26,150	44,455.0	30	18,333	38,790.0
Transport			2,000.0			3,000.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Storage			500.0			500.0
Loss (5%) ^b			3,116.7			543.9
Total			52,571.7			45,333.9
Net Profit			9,762.2			9,056.1
Market margin			29%			29%
Mark-up			40%			40%
Net Profit			16%			17%

Source: Own Survey Data (2009)

The net profits show figures that retailers on average business day are able to return home with. This shows retailers trading in onion find better profits.

^b Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

5.6.4.2 Wholesalers

At this stage in the marketing system wholesalers source their fresh vegetables from farmers.

Table 19: Wholesalers Profit Margin/day Selling at Normal Market Prices Tomato and Onion

Crop	Tomato			Onion		
	Qty sold/day	Unit Price (create)	Total	Qty sold/day	Unit Price (10kg)	Total
Revenue	129.5	40,071	5,189,194.5	116.7	18,333	2,139,461.1
Less						
Purchase price	129.5	40,000	5,180,000.0	116.7	15,167	1,769,988.9
Transport			2,000.0			2,000.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Storage			500.0			500.0
Loss (5%) ^c			259,459.7			106,973.1
Total			5,444,459.7			1,881,962.0
Net Profit			-255,265.2			257,499.1
Market margin			0%			17%
Mark-up			0%			21%
Net Profit			-5%			12%

Source: Own Survey Data (2009)

The calculations show negative net profit for tomato, this is because the crop is widely sold by brokers who quote similar prices as farmers would sale directly to retailers hence there is very little or no margin between the source price and the selling price.

^c Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

Table 20: Wholesalers Profit Margin/day Selling at Normal Market Prices Rape and Cabbage

Crop	Rape			Cabbage		
	Qty sold/day	Unit Price (50kg bag)	Total	Qty sold/day	Unit Price (head)	Total
Revenue	100.0	26,150	2,615,000.0	468.3	1,293	605,511.9
Less						
Purchase price	100.0	24,615	2,461,500.0	468.3	1,209	468,300.0
Transport			2,000.0			46,830.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Storage			500.0			500.0
Loss (5%) ^d			130,750.0			6,055.1
Total			2,597,250.0			524,185.1
Net Profit			17,750.0			81,326.8
Market margin			6%			23%
Mark-up			6%			29%
Net Profit			1%			13%

Source: Own Survey Data (2009)

The results show very low returns for rape wholesalers. This crop is also widely sold by brokers quoting similar prices as producers would sale to retailers directly and ultimately low margin results.

5.6.4.3 Producers

The market margin for the producers is taken as the difference between the selling price and the estimated production cost expressed as a percentage of the selling price. This requires an estimate of the production cost per unit of the produce. The break-even price estimated under production Gross margins shown in Appendix 1-4 has been used for this purpose. The quantities sold per day have been multiplied by selling price to get the revenue and also by the break-even price to estimate the production cost.

^d Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

Table 20: Wholesalers Profit Margin/day Selling at Normal Market Prices Rape and Cabbage

Crop	Rape			Cabbage		
	Qty sold/day	Unit Price (50kg bag)	Total	Qty sold/day	Unit Price (head)	Total
Revenue	100.0	26,150	2,615,000.0	468.3	1,293	605,511.9
Less						
Purchase price	100.0	24,615	2,461,500.0	468.3	1,209	468,300.0
Transport			2,000.0			46,830.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Storage			500.0			500.0
Loss (5%) ^d			130,750.0			6,055.1
Total			2,597,250.0			524,185.1
Net Profit			17,750.0			81,326.8
Market margin			6%			23%
Mark-up			6%			29%
Net Profit			1%			13%

Source: Own Survey Data (2009)

The results show very low returns for rape wholesalers. This crop is also widely sold by brokers quoting similar prices as producers would sale to retailers directly and ultimately low margin results.

5.6.4.3 Producers

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^d Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

Table 21: Farmers Profit Margin/day Selling at Normal Market Prices Tomato and Onion

Crop	Tomato			Onion		
	Qty sold/day	Unit Price (crate)	Total	Qty sold/day	Unit Price (10kg)	Total
Revenue	315.7	40,000	5,189,194.5	116.7	15,167	1,769,988.9
Less						
Production cost	315.7	14,512	4,581,438.4	116.7	8,450	986,115.0
Transport			789,250.0			175,050.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Commission						
(10%)			1,262,800.0			0.0
Loss (5%) ^e			631,400.0			88,499.4
Total			7,267,388.4			1,252,164.4
Net Profit			5,360,611.6			517,824.5
Market margin			64%			44%
Mark-up			176%			79%
Net Profit			42%			29%

Source: Own Survey Data (2009)

^e Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

Table 22: Farmers Profit Margin/day Selling at Normal Market Prices Rape and Cabbage

Crop	Rape			Cabbage		
	Qty sold/day	Unit Price (50kg bag)	Total	Qty sold/day	Unit Price (10kg)	Total
Revenue	66.2	24,615	1,629,513.0	1,822.2	612	1,822,200.0
Less						
Production cost	66.2	10,192	674,710.4	1,822.2	612	1,115,186.4
Transport			132,400.0			182,220.0
Packaging			2,000.0			2,000.0
Council levy			500.0			500.0
Commission						
(10%)			162,951.3			182,220.0
Loss (5%) ^f			81,475.7			18,222.0
Total			1,054,037.4			1,500,348.4
Net Profit			575,475.7			321,851.6
Market margin			59%			39%
Mark-up			142%			63%
Net Profit			35%			18%

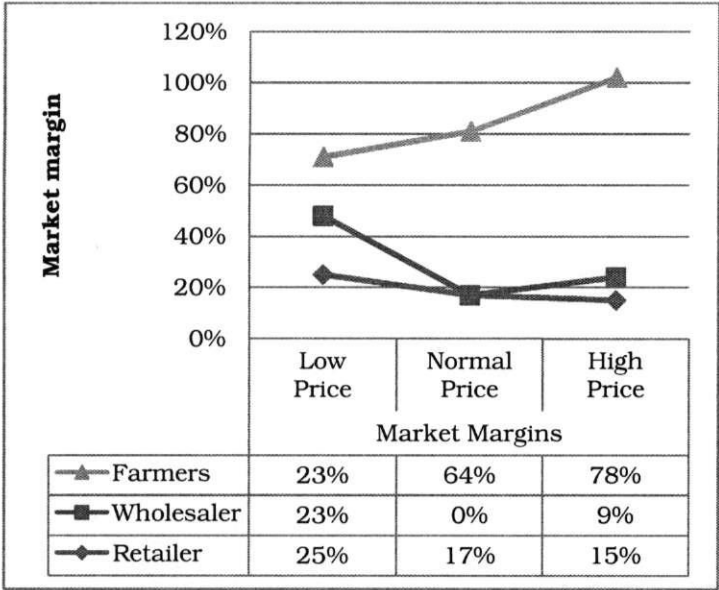
Source: Own Survey Data (2009)

5.6.4.4 Sensitivity Analysis of Market Margins with Price Changes

An analysis was made on the effects of price shifts (seasonal price changes) on the market margins among the vegetable market actors. Market margin is the difference between the purchase price and the selling price. This is expressed as a percentage of the selling price. The following figures show these findings:

^f Market losses have been estimated at 5 per cent of the revenue for tomato, onion and rape. Cabbage is estimated at 1 per cent because of the relatively stable shelf life as compared to tomato and rape.

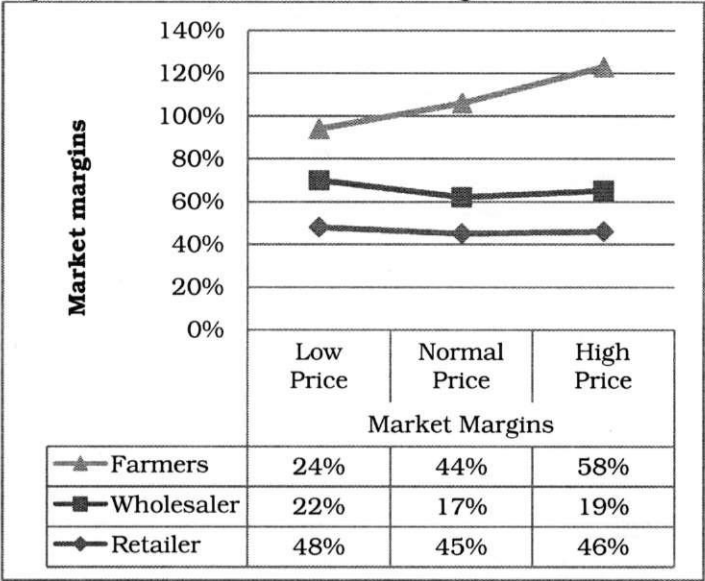
Figure 7: Tomato Market Margins



Source: Own Survey Data (2009) N=117

Figure 10, above shows that when there vegetable market price shifts, the market margins received by the retailers and wholesalers drop and the margins for the farmers increase.

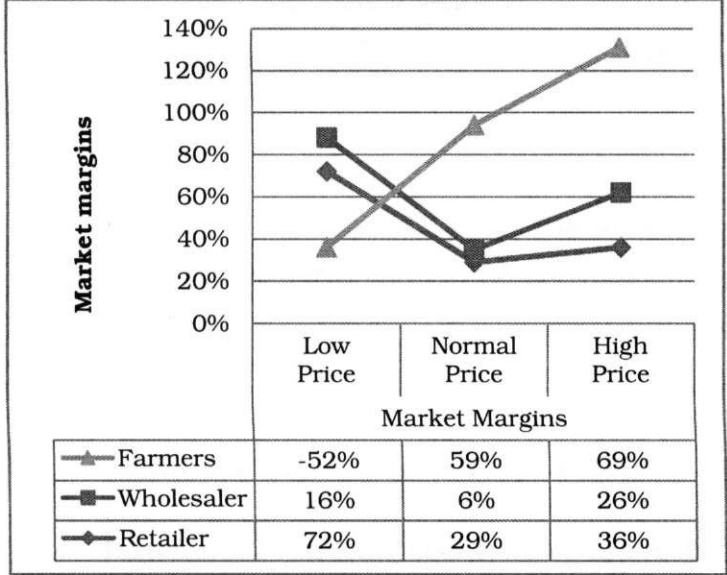
Figure 8: Onion Market Margins



Source: Own Survey Data (2009) N=117

A similar trend is observed in the marketing of onion. Farmer's market margins increase while other market actors decrease.

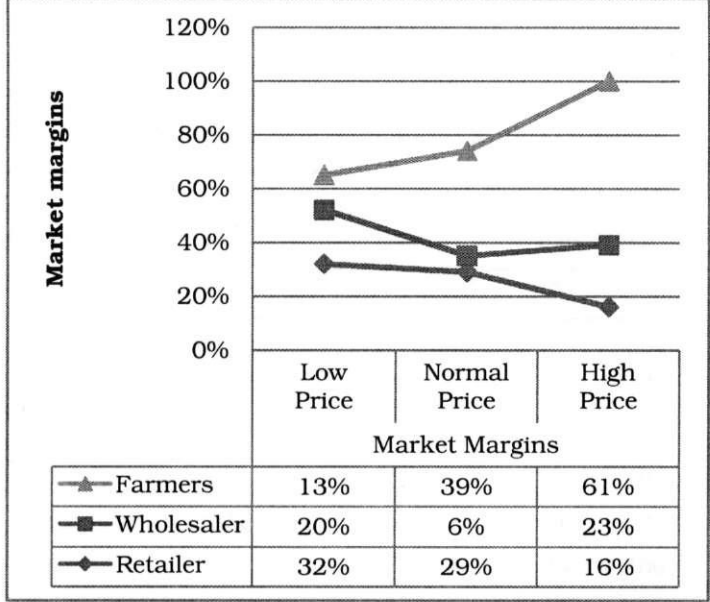
Figure 9: Rape Market Margins



Source: Own Survey Data (2009) N=117

The market margins for retailers and wholesalers drop with the seasonal change in prices.

Figure 10: Cabbage Market Margins



Source: Own Survey Data (2009) N=117

The trend is observed in all the fresh vegetables under study that with market price changes there will be a reduction in the market margins for retailers and wholesalers while there is an increase in that of the farmers. The reverse is also true that when there low market prices the market margins for the farmers will reduce and those for the retailers will increase. The farmer is made worse off than other market actors.

These findings reveal the conflict in price setting of the fresh vegetables between producers and retailers. There is a strong market force on to the farmer from the retailers and wholesalers on the level of the selling price and the reciprocating force from the farmer. This marks the origin of the commission agents who are believed to better understand the market to trade for the relatively inexperienced farmer.

5.7 Benefits and Constraints in Fresh Vegetable Production and Marketing

5.7.1 Benefits of Producing and Trading in Fresh Vegetables

Trading in vegetables is a well appreciated business venture. Market actors were asked of the benefits that they enjoyed in producing and marketing fresh vegetables. The responses were similar to this open ended query, in analysis they were classified giving results in table 23:

Table 23: Benefits of Fresh Vegetable Trading

Group or Association	Business Category						Total	
	Retailer		Wholesaler		Farmer		N	%
	N	%	N	%	N	%		
Profitable business	9	23	9	24	10	25	28	24
Source of Income	28	71	21	55	24	60	73	62
Source of Employment	2	5	8	21	3	8	13	11
Continuous earnings	0	0	0	0	1	3	1	9
Gets ready for market fast	0	0	0	0	2	5	2	2
Total	39	100	38	100	40	100	117	100

Source: Own Survey Data (2009) N=117

Majority of the retailers (71%) appreciate trading in vegetables as a source of income and 21% perceive it as a profitable business. More wholesalers also appreciate the trade in fresh vegetables as a profitable business (55%) and 24% perceive it as a profitable business. With farmers more appreciate producing and selling fresh vegetables as a source of income (60%) and also as a profitable business. Overall, markets actors appreciate marketing of fresh vegetables as a source of income (62%), profitable business (24%), and also as a source of employment for them (11%).

5.7.2 Storage Problems

At the end of the business day, market actors seek where to keep overnight the merchandise unsold. As earlier indication of the findings, these services are provided by private individuals in the markets. The facility users were asked if they were experiencing any problems at these storage facilities. The results have been presented below:

Table 24: Problems Faced with Storage Facilities in the Markets

Storage problems	Business category						Total	
	Retailers		Wholesalers		Farmers			
	N	%	N	%	N	%	N	%
Siphoning	23	62	12	36	4	57	39	51
Poor condition	2	5	2	6	1	14	5	6
No problem at all	11	30	18	55	2	28	31	40
Theft	1	3	1	3	0	0	2	3
Total	37	100	33	100	7	100	77	100

Source: Survey Data (2009) N=77

Siphoning of the merchandise in storage came out prominently in all categories of business among the users.

5.7.3 Particular Problems in Fresh Vegetable Business

The participants were asked identify particular challenges of faced in the marketing of fresh vegetables. The findings obtained were as given below:

Table 25: Peculiar Problems in the Vegetable Marketing

Problems	Type of vegetable traded								Total	
	Tomato		Onion		Rape		Cabbage			
	N	%	N	%	N	%	N	%	N	%
No problem	0	0	1	5	0	0	2	6	3	3
Price fluctuations	11	22	6	32	2	12	6	19	25	21
Spoils easily	38	78	12	63	15	88	24	75	89	76
Total	49	100	19	100	17	100	100	100	117	100

Source: Survey Data (2009)

N=117

Two challenges came out prominently that seemed to affect all types of vegetables traded. Commodity damage was identified to affect 76 percent of the markets actors trading in all the four vegetables. Some retailers and wholesalers trading in tomatoes complained of the fruit spoiling easily with others mentioning that it only takes two days of freshness. Onion retailers face the same problem although it has a relatively longer shelf life. Some wholesalers went on to say onion from local farmers is not treated to prolong its' shelf like that coming from South Africa. Retailers and farmers trading in rape confessed it was a very delicate commodity that spoiled easily. Similar case for Cabbage traders was recorded who particularly said it starts yellowing with the outer leaves. However, it has a longer shelf life than rape. Price fluctuation was second to the concerns of the participants at 21 percent.

5.7.4 Marketing Constraints and Problems

The study sought to find out the constraints and problems faced by the market actors in the urban markets and as producers and traders of fresh vegetables in general. Many responses were noted and aggregated in the table 26, below:

Table 26: Fresh Vegetable Marketing Constraints and Problems

Constraints and Problems	Business category						Total	
	Retailers		Wholesalers		Farmers			
	N	%	N	%	N	%	N	%
Market congestion	3	8	3	8	0	0	6	5
Lack of capital	1	3	6	16	8	20	15	13
High agent fees	0	0	0	0	5	13	5	4
High transport cost	0	0	0	0	1	3	1	1
Poor road network	0	0	0	0	2	5	2	2
Price fluctuation	6	15	10	26	9	23	25	21
No storage facilities	1	3	0	0	0	0	1	1
Commodity damages	3	8	6	16	0	0	9	8
Lack of trading space	17	44	3	8	0	0	20	17
Poor market conditions	8	21	6	16	15	38	29	25
Long distances to farmers	0	0	4	11	0	0	4	3
Total	39	100	38	100	40	100	117	100

Source: Own Survey Data (2009) N=117

Market actors were faced with a number challenges. Poor market conditions and price fluctuations were conclusively prominent from all the actors. There is a strong outcry for lack of trading space in the markets from the retailers. Wholesalers and farmers are constrained by the lack of capital in their businesses. Commodity damage and long distances in sourcing the vegetables was additionally noted among wholesalers. Farmers also complained of high fees being charged by their marketing agents (brokers).

5.7.5 Needs in the Fresh Vegetable Trading

The market actors were asked of the developments that they considered would ease and promote the production and marketing of fresh vegetables by the small holders. The table below presents the findings.

Table 27: Needs in the Fresh Vegetable Markets

Market actors needs	Business category						Total	
	Retailers		Wholesalers		Farmers			
	N	%	N	%	N	%	N	%
Improving market condition	8	21	12	32	11	28	31	27
Reduce transport costs	0	0	0	0	1	3	1	1
Improving road network	0	0	0	0	2	5	2	2
Building additional market	25	64	9	24	8	20	42	36
Regulate prices	1	3	2	5	1	3	4	3
Introduce loan schemes	2	5	14	37	10	25	26	22
Provide storage facilities	2	5	0	0	0	0	2	2
Council stop harassment	1	3	0	0	0	0	1	1
Increase production	0	0	1	3	0	0	1	1
Reduce cost of fertiliser	0	0	0	0	3	8	3	3
Eliminate market agents	0	0	0	0	4	10	4	3
Total	39	100	38	100	40	100	117	100

Source: Own Survey Data (2009)

N=117

Building of additional markets came out prominent as a need from all fresh vegetable market actors, with a high percentage noted among the retailers. They also want the improvement of market conditions under which they are marketing their fresh vegetables in the markets. The participants also indicated the need for more capital for their businesses through the introduction of loan schemes, a call from wholesalers and farmers.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 Producer and Trader Characteristics

Most actors in the fresh vegetables are still in their youthful age between 31 and 40 years with a mean of 37 years. The young are into retail business and these are mostly women. Males dominate the wholesale and production functions.

Retailers have primary level of education and wholesalers have attained the basic level of education. Farmers were found in both basic and secondary level of education. This requires that educational programs targeted at this group must be simple to apprehend.

There are various sources of vegetables that are sold at Soweto and City markets. Most retailers source within Soweto market. Wholesalers source within and outside Lusaka district. Farmers selling in the study markets come from a number of districts within the country.

The mode of transport used by the farmers and wholesalers are the light trucks which are mostly hired and for the retailers are the wheelbarrows.

Retailers and wholesalers store their merchandise within the markets at the end of business. Storage facilities are provided by private individuals at a fee depending on the type of vegetables and the packaging.

Membership to market associations and other social groupings was found to be poor among the market actors. For the few that belonged to various groupings, Chilimba was perceived as helpful to the traders which also applies to the official Marketeers association. Only half of the farmers appreciated Cooperatives.

Retailers and farmers had on average of 8 years of business experience and wholesalers had 12 years. Retailers have smaller average family sizes of 5 persons per household and wholesalers recorded 6 persons. Farmers have larger family sizes on average 8 persons per household.

The mean farm size recorded was 43.6 hectares and the area of vegetables cultivated was 1.41 hectares.

6.1.2 Marketing Margins

Price setting for the vegetables is through supply and demand with frequent fluctuations in a day.

Retailer's sale very low quantities of full units per day than wholesalers and farmers. When there is good demand, quantities sold by all market actors depends on individual capital and quantities available for sale.

Farmers usually drop their prices as the day progresses either because they do not want to return with anything unsold or because of the loss in quality and freshness of the vegetables especially rape.

Retail marketing margins of fresh vegetables range 17 percent to 45 percent. Mark-up range from 20 percent to 82 percent. Net profits from the retail business fall between 7 percent and 38 percent of the revenue. Onion retailers have higher net profits as compared to other vegetables.

Wholesale marketing margins were found between 6 percent and 23 percent. The mark-up was in the range of 6 percent to 29 percent. Net profits were between 1 percent and 14 percent of the revenue. *Onion wholesalers also earn higher net profits.*

From the estimates made farmers marketing margins were calculated between 39 percent and 64 percent under the average market prices. Mark-up range from 63 percent to 176

percent per unit of produce. Net profit from the returns was in the range of 18 percent to 49 percent with a higher record from onion trade.

There is an inverse relationship with the change (increase or decrease) in the market prices between farmers marketing margin and that of retailers. This signals conflict on the level of price setting for a unit of produce among the market actors and marks the entry of brokers to trade for the relatively inexperienced farmer at a commission. The commission widely applied was 10 percent of total sales.

6.1.3 Marketing Channels

Producers have a wide supply choice which includes supplies to wholesalers, direct sale to retailers and consumers. More farmers however, sale through market agents except for onion which has a relatively longer shelf life. Wholesalers and brokers are the major suppliers to retailers in the markets.

6.1.4 Determinants of Farmer's Supply Choice to Market Agents

Farmers selling through market agents were found to be in the age group of 31 to 40 years. These farmers have some level of education and usually are coming from distant places.

Tomato and rape is highly channeled to the brokers with an exception of onion. Farmers utilising market agents have larger farm sizes and have bigger family sizes.

Supply to through market agents is influenced by the farmer's age, years spent in school, location of the farm and hectares cultivated in the marketing of tomato and rape. However, the older the farmer the less they tend to use marketing agents. Farmers coming from within Lusaka tend not to supply their produce through the brokers.

6.1.5 Benefit and Constraints in Vegetable Production and Marketing

Producing and trading in fresh vegetables was regarded as source of income and a profitable business by most of the market actors.

However, the business is constrained by the lack of trading spaces in the available markets. Ownership of market stalls was found very low. Market actors also face the problem of siphoning from the storage facilities provided by private individuals in the markets this was cited by 51% of the traders.

Unique problem faced by the market actors in fresh vegetable marketing was that of produce damage and price fluctuations.

There is very low institutional support received by the fresh vegetable traders both from the public and private sector.

The sanitation facilities at Soweto market were registered as poor by the market actors. Other problems cited by the fresh vegetable producers and traders include poor conditions in the markets lack of capital, lack of trading space, commodity damage, market congestion, high agent fees and long distance covered by the market actors.

6.1.6 Needs of the Market Actors

The major requirement by the participants in the fresh vegetable marketing among others is the building of additional markets, improving existing markets and introduction of small business loan schemes.

6.2 Recommendations

Many farmers target Soweto market to sale their fresh vegetables. Selling of vegetables at this market should be decentralized by guiding and promoting sales from other markets around Lusaka. Prices are likely to be stable for the farmers if fresh vegetables are well distributed.

City market and the newly built Soweto market have television sets for the public. These should be utilized for publication of both input and produce prices obtaining at various

Appendix 4: Cabbage Production Budget

CABBAGE PRODUCTION				
Average figures based on 1 hectare (Small-Scale)				
Gross Income	Unit	Qty Yield	Unit Price	Amount
Yield	Head	11,000 ^s	1,000	11,000,000
Total Income (a)				11,000,000
Estimated Costs	Unit	Qty	Unit Cost	Amount
Land Preparation				
Ploughing (oxen hire)	Hectare	1	100,000	100,000
Planting				
Seed	Grams	500	160	80,000
Fertiliser				
Basal fertiliser	50kg bag	4	245,000	980,000
Top dressing	50kg bag	1	200,000	200,000
Insect control				
Insecticide (Fastac, Karate)	Litre	3.0 ^t	150,000	450,000
Disease control				
Fungicide (Bravo)	Litre	2.0 ^u	95,000	190,000
Casual Labour	man-days	200	5,800	1,160,000
Total Growing Expenses				3,160,000
Marketing costs				
Transport to Soweto	Head	11,000	250	2,750,000
Packaging (polythene bags)	50kgs	110	2,500	275,000
Crop levy (road blocks)	Head	11,000	50	550,000
Total marketing costs				3,575,000
Total Costs (b)				6,735,000
Gross Margin (A - B)				4,265,000
Break-Even Yield				6,735 ^v
Break-Even Price				612 ^w
Net Margin Per Unit				388 ^x

^s Estimated small-scale average yield per hectare

^t Insecticide application is ½ litre/spray/ha and fungicides is 2ltr/ha/spray

^u Ibid

^v Quantity of yield required to just recover cost of production

^w Cost of producing a unit of Cabbage

^x Margin received by the producer as profit per unit

Appendix 5: Farmers Questionnaire

Questionnaire number:

Examining fresh vegetable market supply chain for small-scale producers and traders

A Case of Lusaka Markets

Department of Agricultural Economics
University of Zambia

1. Identification

1.1 Market

Codes: 1 = Soweto, 2 = City market

1.2 Sex of Respondent

Codes: 1 = Male, 2 = Female

2. Producer Characteristics

2.1 Age

2.2 Marital Status

Codes: 1. Single 3. Widow
2. Married 4. Divorced
5. Other _____

2.3 Education attained

Grade/Form/Standard _____

2.4 Where is your farm located?

Farm Location _____

2.5 How many kilometers is your Farm to Soweto?

Distance (km) _____

2.6 What is your Farm size?

Farm Size _____

2.7 How long have you been growing vegetables?

Years/months _____

2.8 What type of vegetables do you produce most?

Codes: 1. Tomato 2. Onion
3. Rape 4. Cabbage

2.9 What tools do you use in field preparations?

Codes: 1. Oxen 3. Tractor
2. Hand hoe 4. Other _____

2.10 How many family members are at your farm?

Household Size _____

3. Marketing Channels

1. m d

3.1 Do you sale the vegetables yourself?

Code: 0. No 1. Yes

3.2 If not, who sales for you?

1. Families 3. Brokers
2. Partners 4. Other _____

3.3 Who do you mostly sale to?

1. Retailers 3. Brokers
2. Wholesalers 4. Consumers

3.4 Any reason you prefer to supply the above?

Reasons _____

3.5 How do you come up with market prices? _____

Codes: 1. Demand & Supply
2. Consider production cost
3. Other (specify) _____

4 Marketing Margins

4.1 How much do you sale at your farm?

Crop	Low Price	Av. Price	High Price
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.2 How much is the wholesale price at Soweto/City market?

Crop	Low Price	Av. Price	High Price
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.3 How much commission do you pay brokers/agents to sale for you? (if any).

Crop	Low Price	Av. Price	High Price
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.4 How much quantity do you sale per day?

Crop	Low Sales	Av. Sales	High Sales
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.5 What mode of transport do you use from your Farm to Soweto?

Codes: _____

1. Van	2. Light truck
3. Wheel barrow	4. Head balancing
5. Other _____	

4.6 Do you own or hire? _____

Codes: 1. Own 2. Hire

4.7 How much do you pay for transport from Farm to Soweto?

Crop	Cost	Unit
1. _____	K _____	_____
2. _____	K _____	_____
3. _____	K _____	_____
4. _____	K _____	_____

4.8 How much do you pay to the council per day?

Market Levy K _____

4.9 Any other payments that you make?

Specify _____ K _____ per _____

5 Seasonal Price Fluctuations

5.1 Which months in a year do you experience..

Crop	Low Prices	Av. Prices	High Prices
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

6 Constraints in Supply Channels

6.1 What problems do you find selling your crops?

Crop	Problems
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____

7 Producers production costs

7.1 How many acres have you planted?

Crop	Acres	Expected harvest	Unit
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

7.2 How much did you spend on?

Crop	Ploughing	Seeds
1. _____	K _____	K _____
2. _____	K _____	K _____
3. _____	K _____	K _____
4. _____	K _____	K _____

Crop	Fertilizer	Chemicals
1. _____	K _____	K _____
2. _____	K _____	K _____
3. _____	K _____	K _____
4. _____	K _____	K _____

8 Benefits and Constraints in Supply Channels

8.1 Do you store within the market?

Codes: 0. No 1. Yes ☐

8.2 How much do you pay per storage?

K _____ per _____

8.3 Any problems where you store your vegetables?

Codes: 1. No Problem 2. Siphoning
3. Poor Condition ☐

8.4 What are the benefits of selling/trading vegetables?

Benefits

9 Constraints in markets

9.1 Do you have shelter/stall inside the market?

Code: 0. No 1. Yes ☐

9.2 Do you use it?

Code: 0. No 1. Yes ☐
9.2 If not (Q. 9.2), give reason(s)

Reason _____
K _____
K _____
K _____

9.3 How is the condition of the sanitation facilities? ☐

Harvesting

K _____ Codes: 1. Good 2. Fair 3. Poor

K _____

9.4 What are other constraints/problems in the market?

Constraints/problems in markets

10 Institutional Support

10.1 Any institution giving you group business loans?

Codes: 0. No 1. Yes ☐

10.2 If yes, give the name

Name _____

10.3 Any institution teaching you business skills?

Codes: 0. No 1. Yes ☐

10.4 Any institution on post-harvest handling?

Codes: 0. No 1. Yes ☐

11 Social Capital

11.1 Are you a member of any farmers /traders association?

Codes: 0. No 1. Yes ☐

11.2 If yes, give the name

Name _____

11.3 Is your membership helpful to your business?
Codes: 0. No 1. Yes ☐

11.4 Any institution(s) were you find market prices?
Codes: 0. No 1. Yes ☐

11.5 If yes, give the name
Name _____

12 Needs and Problems

12.1 What are some of the marketing problems in the system?

Marketing problems

12.2 What are some of the needs in the marketing of fresh vegetables?

Needs

Appendix 6: Retailers and Wholesalers Questionnaire

Questionnaire number:

Examining fresh vegetable market supply chain for small-scale producers and traders

A Case of Lusaka Markets

Department of Agricultural Economics
University of Zambia

1 Identification

1.1 Market

Codes: 1 = Soweto, 2 = City market

1.2 Sex of Respondent

Codes: 1 = Male, 2 = Female

2 Producer Characteristics

2.1 Age

2.2 Marital Status

Codes: 1. Single 3. Widow
2. Married 4. Divorced
5. Other _____

2.3 Highest education attained
Grade/Form/Standard _____

2.4 Business Category?

1. Retailer 3. Broker
2. Wholesaler 4. Other _____

2.5 Household Size

2.6 How long have you been selling vegetables?
_____ years/months

2.7 What type of vegetables do you sale mostly?

1. Tomato 2. Onion
3. Rape 4. Cabbage

3 Marketing Channels

3.1 Which place do you source your vegetables from?

Source place _____

3.2 Who do you mostly buy vegetables from?

1. Farmers 3. Brokers
2. Wholesalers 4. Other _____

3.3 Any reason you prefer to buy from source above?

Reason(s) _____

1. m d

3.4 How do you come up with market price?

Codes: 1. Demand & Supply
2. Order Price
3. Other (specify) _____

4 Marketing Margins

4.1 How much do you buy per unit?

Crop	Low Pr.	Normal Pr.	High Pr.
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.2 How much do you find/earn after selling the whole unit?

Crop	Low Pr.	Normal Pr.	High Pr.
1. _____	K _____	K _____	K _____
2. _____	K _____	K _____	K _____
3. _____	K _____	K _____	K _____
4. _____	K _____	K _____	K _____

4.3 How much quantity do you sale per day?

Crop	Low Sales	Av. Sales	High Sale
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

4.4 What mode of transport do you use from your source to your stand/stall?

Codes: 1. Van 2. Light truck ☐
3. Wheel barrow 4. Head balancing

4.5 Do you own or hire? ☐

Codes: 1. Own 2. Hire

4.6 How much do you pay for transport from source to stand/stall?

Crop	Cost	Unit
1. _____	K _____	_____
2. _____	K _____	_____
3. _____	K _____	_____
4. _____	K _____	_____

4.7 How much do you pay to the council per day?

Market levy K _____

4.8 Any other payments that you make?

Specify _____ K _____ per _____

Unit

5 Seasonal Price Fluctuations

5.1 Which months in a year do you experience..

Crop	Low Sales	Av. Sales	High Sale
1. _____	_____	_____	_____
2. _____	_____	_____	_____
Unit	_____	_____	_____
4. _____	_____	_____	_____

6 Constraints in Supply Channels

6.1 What problems do you find in selling fresh vegetables?

Problems	Unit
_____	_____
_____	_____
_____	_____

7 Benefits and Constraints in Supply Channels

7.1 Do you store within the market? ☐

Codes: 0. No 1. Yes

7.2 How much do you pay per storage?

K _____ per _____

7.3 Any problems where you store your vegetables? ☐

Codes: 1. No Problem 2. Siphoning
3. Poor condition

7.4 What are the benefits of selling/trading vegetables?

Benefits

8 Constraints in markets

8.1 Do you have shelter/stall inside the market? ☐

Code: 0. No 1. Yes

8.2 Do you use it? ☐

Code: 0. No 1. Yes

8.3 If not (Q. 8.2), give reason(s)

Reason _____

8.4 How is the condition of the sanitation facilities?

Codes: 1. Good, 2. Fair, 3. Poor ☐

8.5 What are other constraints/problems in the market?

Constraints/problems in markets

9 Institutional Support

9.1 Any institution giving you group business loans? ☐

Codes: 0. No 1. Yes

9.2 If yes, give the name

Name _____

9.3 Any institution teaching you business skills?

Codes: 0. No 1. Yes ☐

9.4 Any institution on post-harvest handling?

Codes: 0. No 1. Yes ☐

10 Social Capital

10.1 Are you a member of any group /traders association?

Codes: 0. No 1. Yes ☐

10.2 If yes, give the name

Name _____

10.3 Is your membership helpful to your business?

Codes: 0. No 1. Yes ☐

10.4 Any institution(s) were you find market prices?

Codes: 0. No 1. Yes ☐

10.5 If yes, give the name

Name _____

11 Needs and Problems

11.1 What are some of the marketing problems in the system?

Marketing problems

11.2 What are some of the needs in the marketing of fresh vegetables?

Needs
