

**ANALYSIS OF THE PINEAPPLE MARKETING SYSTEM IN SELECTED
MARKETS IN KENYA**

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DECLARATION

Declaration by the Candidate

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Dedication

This thesis is dedicated to my father whose world outlook provided the much needed inspiration and to my mother for her tireless prayers.

ABSTRACT

An efficient marketing system is a stimulant to the development of a nation's economy. It enables markets to function in their dynamic role of coordinating resource allocation and providing price signals to producers and consumers that reflect their opportunity cost of their decisions, and enhancing their ability to react quickly and efficiently. In a market, the price

mechanism is expected to transmit orders and directions to determine the flow of marketing activities. Identifying the causes of price differences in spatial markets has therefore become an important analysis to understand markets better. If markets are not well integrated, price signals are distorted, which leads to an inefficient allocation of resources. The pineapple marketing system in Kenya deserves to be developed into a strong network of efficiently functioning markets, as more than 95% of the pineapple production is channelled regionally. Due to huge price differences in the markets, there may be a problem in the markets that is the markets may be segmented. The study therefore, aimed to analyze the pineapple marketing system in selected markets in Kenya, with a view of making recommendations for improving the marketing system in the region. These markets were, Bureti, Kericho, Bomet and Narok markets. The objectives of the study were to identify pineapple marketing channels and the role of marketing agents, determine whether pineapple markets in the region are integrated, determine the marketing costs associated with pineapple markets and to investigate price variations between rural markets and urban markets in relation to marketing costs. It was hypothesized that pineapple markets in the selected markets were not integrated and pineapple price variations across markets do not reflect marketing costs.. Purposive sampling was used to select four markets, with Bureti as the rural/source market and urban markets were Kericho, Bomet and Narok. Primary data were collected with the aid of structured questionnaires distributed to the respondents at the various rural and urban markets to capture the operating costs, returns, socioeconomic and marketing characteristics of the marketers in the study area. A random sampling technique was used to select a total of 168 traders from rural and urban markets. Time series monthly pineapple price data covering 2007 to 2011 (5 years) collected from the Ministry of Agriculture was used to analyze market integration. The statistical package for social scientists (SPSS) was used to generate descriptive statistics while time series data were analyzed using Eviews. The study revealed that women are more involved in pineapple marketing; most of the respondents had primary level of education and have been in the business for about 1-5 years. The study also indicated that price variations across markets reflect the marketing cost. Price differentials between rural and urban markets could be attributed to the scarcity of the product in the urban areas leading to a high demand. The results of market integration analysis shows that the selected pineapple markets were integrated and followed a long run relationship. Transportation cost accounted for the largest component of total marketing cost in both rural and urban markets and this is followed by storage cost. Thus efforts to reduce transportation and storage costs in terms of good roads and the use of effective storage facilities will be important factors that will facilitate market integration between rural and urban markets for pineapple.

LIST OF ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey-Fuller test
ECM	Error Correction Model
EPZA	Export Processing Zone Authority
Eviews	Econometrics Views

FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GoK	Government of Kenya
HCDA	Horticultural Crops Development Authority
I(0)	Intergration of order Zero
I(1)	Intergration of Order One
LOP	Law of One Price
SPSS	Statistical Package for Social Scientists

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The agricultural sector is the mainstay of the Kenyan economy. Annually, the sector contributes 24% directly and 27% indirectly to the Gross Domestic Product (GDP) (GoK, 2010). The agriculture sector constitutes of six subsectors; industrial crops, food crops, livestock, fisheries, forestry and horticulture. Horticulture, the largest subsector, has recorded a remarkable export-driven growth in the past decade and, contributes 33 per cent of the GDP and 38 per cent of export earnings (GoK, 2010). Kenya's success in expanding horticultural exports (fruits, vegetables and cut flowers) is well known. Horticulture ranks second to tea in agriculture export earnings and it accounts for approximately 16 percent of domestic agricultural exports. Kenya's horticultural sector has received a great deal of attention (Vision 2030, GoK, 2010) over the past decade due to the rapid and sustained growth of its exports to Europe (Muendo and Tschirley, 2004). This impressive growth has undoubtedly contributed to increased rural incomes and reduced rural poverty in Kenya.

The horticultural sub-sector employs approximately 4.5 million people countrywide directly in production, processing, and marketing, while another 3.5 million people benefit indirectly through trade and other activities (GoK, 2010; KDLC, 2010). Horticulture is a major source of livelihood to farmers generating in excess of \$1.0 billion in foreign earnings annually (HCDA, 2010). Horticulture production therefore offers the best alternative for increased food self-sufficiency, improved nutrition and ensuring the generation of increased incomes and employment (Ganry, 2007; 2009).

The ministry of agriculture has embarked on several strategies aimed at improving the sector's competitiveness including increasing market access through dissemination of market information, value addition, processing, packaging and branding the bulk of agricultural produce. Despite the Ministry's efforts, agricultural marketing and trade policy in Kenya is still dominated by the challenge of how to effectively deal with food price instability, which is frequently identified as a major impediment to smallholder productivity growth and food security. These concerns relate to both the producer and the consumer whereby the challenge has been how to keep farm prices high enough to provide production incentives for farmers while at the same time keeping them low enough to ensure poor consumers' access to food (Kiriti *et al.*, 2010). To address the aforementioned challenges, it is critical to determine the market performance of various crops that contribute to household incomes, food and nutritional security.

Pineapple is the second fruit of importance after bananas, contributing to over 20 % of the world production of tropical fruits (Coveca, 2002). Nearly 70% of the pineapple is consumed as fresh fruit in producing countries. Brazil, Thailand, Philippines and China are the main pineapple producers in the world supplying 52% of the total output (FAO, 2007). Other important producers include India, Nigeria, Kenya, Indonesia, Mexico and Costa Rica who produces the remaining (48%). Since 1960, pineapple production worldwide has risen by 400%. With the introduction of the "Gold" variety, developed and patented by Fresh Del Monte in the 1990's, the production of pineapple has grown again by nearly 50% since 1998.

Kenya has been one of the world's leading pineapple producers for many years and is currently ranked 9th in total production and Del Monte's farm in Thika is the leading producer of pineapples, but small-scale growers are also increasing their production for

the local market (USAID (United States Agency for International Development), 2005). Consequently, it might be difficult for small farmers to participate profitably in the market.

Table 1: Quantities (t/ha) of pineapples produced between 2001-2010

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
612 248	619860	399	536	498 469	499 409	514 490	339	257	272 230
		103	948				850	623	

SOURCE: Ministry of Agriculture - Country stat Kenya, 2011

Table 1 shows quantity of pineapples produced since 2001. The decrease in the pineapple volume could be due to the increased influx of imported pineapples from regional markets mainly Uganda (Oberthur, et al, 2009). Main production areas include Homabay, Malindi, Kisii, Kericho and Thika by small scale growers.

In Bureti district pineapples are produced by small-scale farmers for both home consumption and commercial purpose. In 2010, pineapple farmers in Bureti produced 56,000 tons of the crop, earning them more than US\$7.2 million with the bulk of the crop sold locally. The area has a production potential of 500,000 tons and due to this huge potential, the Kenya government has commissioned the construction of a US\$600,000 modern pineapple processing factory in the district (Ministry of Agriculture, 2011).

Pineapple farming and marketing as an activity is undertaken for different reasons by farmers depending on their income levels. The very low income individuals engage in pineapple marketing as a means of survival and a substantial percentage of their total income is derived from the activity. On the other hand, the high income individuals use the activity as a diversification strategy and thus as a hedge against risk. A large

percentage of pineapples produced in Bureti are consumed in the south rift region of Kenya such as Narok, Kericho, Bomet, Nakuru and Sotik (MOA, 2010).

Schiffer *et al* (1987), notes that the marketing system has to play an important role if the incomes of the rural poor have to be increased. They further observed the existence of a relationship between the marketing system and poverty trap. Poverty traps for various farmers include, geographical location, remoteness, low level of education among others. This implies that certain changes in the marketing system can contribute to development process. To the extent that the marketing system plays a part in the determination of the rural household real income, it is important. This provides the motivation for the desire to understand the functioning of various commodity markets in the rural areas due to their effects on development. Todaro and Smith (2003) put this into perspective by identifying the three objectives of development as a) increasing the availability and widening the distribution of life sustaining goods such as food, shelter etc b) raising the living standards and c) expanding the range of economic and social choices for individuals and nations.

Market integration is used to refer to the phenomenon of synchronous movement of prices of a commodity or a group of commodities over time in spatially differentiated markets. Market integration as an important aspect of market research provides the basic data for understanding how specific markets work. The usefulness of such information lies in its application to policy formulation and decisions, on the extent to which market development may be promoted. Market integration also helps in understanding the movement of equilibrium paths of demand and supply for a particular produce or group of commodities. The degree of proximity of the price movements, the speed and accuracy of diffusion of price information, or the efficiency of price transmission or information

spread are prerequisites for achieving efficient allocation of resources across space and time (Jayara, 1992).

In recent years, several studies relating to market integration have been done with the help of different statistical tools. The usual definition in the literature is that integrated markets are those where prices are determined interdependently. This has generally been assumed to mean that the price changes in one market will be fully transmitted to other markets. In making inferences about market efficiency from data on prices, the concept of integration has been central. Spatial market integration refers to a situation in which prices of a commodity in spatially separated markets move together and price signals and information are transmitted smoothly across the markets (Ghosh, 2000). Market integration occurs when product flows between markets are on the same terms and conditions within markets (Onyuma, 2006). A highly integrated commodity market is likely to increase market efficiency through efficient resource allocation and price transmission, which is likely to lower transaction costs and increase incomes to actors. Moving towards market integration is done by removing barriers towards commercial exchange. Barriers create a wedge between prices, create shortages that drive prices up and transportation costs raise prices. Price convergence is one of the four measures of integration; the other measures are factor markets, trade volumes and product availability.

If agricultural growth is to be realized, developing countries have to ensure effective and efficient marketing and distribution systems. Economic integration results in more efficient use of resources increase in trade, productivity and overall production (Ismeel *et al.*, 1998). In general, producer-marketing decisions are based on market price information, and poorly integrated markets may convey inaccurate price information, leading to inefficient product movements (Goodwin and Schroeder, 1991). This approach

is based on the concept originally developed by Bressler and King (1970) that an efficient commodity market will establish prices that are interrelated spatially by transaction and transfer costs and inter-temporally by storage costs.

Linkages to marketing centers have been found to contribute significantly to rural household's escape from poverty (Krishna, 2004; Krishna *et al.*, 2004). Market integration ensures that a regional balance occurs among food deficit, surplus and non-cash crop producing regions (Delgado, 1986). Moreover, how long an initially localized scarcity can be expected to persist depends entirely on knowledge of how well the region is connected by arbitrage to other regions.

If markets are efficient and interlinked, then it is likely that prices in different markets will move together. This has not been established in the pineapple markets in the pineapple markets in Kenya. Analysis of the marketing system can be understood by measuring/ analyzing price spread (marketing costs) among different marketing activities and through studying the levels of integration that exists.

1.2 Problem Statement

The agricultural sector has long been recognized as the key to economic development. Within the sector, however, the role of agricultural marketing has often been neglected in favor of production because of the erroneous belief that only production or physical transformation matters while agricultural marketing passively adapts to stages of economic development (Mafimesebi, 2002).

Horticultural crops are gaining popularity among smallholders' farmers in Kenya. Pineapples are among such horticultural crops adopted and several farmers are practicing crop trade-off with staple food. Anderson (2003) argued that horticultural crops have

high market value and yields more and regularly and hence suit the needs of smallholder farmers who face resource constraint and have no marketable surplus. Marketing of horticultural products has generally been free of direct government interventions. The local horticultural market is very open; hence, prices are determined by supply and demand factors (HCDA, 2005).

Bureti district increased earnings from KShs 300 million in 2007 through pineapples to KShs 654 million in 2010 (MOA, 2010). Bureti district produces about 56,000 metric tonnes annually and more than 95 % of the output produced is consumed by the neighboring districts. Despite the high pineapple market value, the farmers are faced with marketing problem evidenced by low farm-gate prices. In Bureti (source market), a mature pineapple retails at between Ksh15 and Ksh20, but drops during the peak season to an average of Sh15. The farmers have been counting huge losses during the peak season (MOA, 2010). On the contrary the prices of pineapples in Narok and Bomet (consumption markets) range between Ksh 70 and Ksh 100 during the same time.

Onyuma (2006) asserts that the trade in pineapple among the major growing regions of the country is acting in isolation with the prices varying widely. Therefore, it appears the marketing system for this particular crop is imperfect. Over the years, pineapple shortages coupled with high prices in some parts of the country have indicated that the domestic output has not been able to provide it at an affordable price. It is therefore logical to find out the factors (particularly transportation and marketing information) that are responsible for the price hikes and price differences between markets.

If markets are efficient and interlinked, then it is likely that the prices in different markets will move together. This has not been established in the pineapple markets. In addition, little is known on the factors that may cause the differences in market prices, the price

transmission mechanisms between the different markets and whether the spatially separated pineapple markets are integrated. The huge price difference indicates that there may be a problem in the markets and they may be segmented. The study therefore seeks to answer the following questions: Does price variation between markets reflect marketing costs? Could the rural and urban pineapple markets be integrated? And, if so to what extent? The study was aimed at benefiting farmers, marketing agents, consumers, processors and policy makers by providing them with information on the marketing of pineapples in the selected markets in Kenya.

1.3 Broad Objective

The general objective of the study is to analyze the pineapple marketing system in selected markets in Kenya.

1.4 Specific Objectives

- i. To describe the socio-economic characteristics of the pineapple traders and their market characteristics.
- ii. To identify pineapple marketing channels, and the role and linkage of marketing agents.
- iii. Determine whether pineapple markets in the selected markets are integrated.
- iv. To investigate price variations between rural market and urban markets in relation to marketing costs.

1.5 Hypotheses

H₀₁: Pineapple markets in the selected markets are not integrated.

H₀₂: Price variations across markets do not reflect marketing costs

1.6 Justification Of The Study

Fruits are important as sources of vitamin to the human body. In Bureti district, pineapple growing is a major source of income to many. The district produces 56,000 metric tonnes of the crop that earns them more than Sh654 million annually which is sold to several parts of the country. The choice of study area is based on the current improved production and the poor marketing systems in the area.

An efficient marketing system is therefore an important means of raising the incomes for farmers, which would enable them, allocate their productive resources to their comparative advantage and invest in technology that would enhance their productivity. It stimulates their production, as producers are likely to produce more if they are able to buy their requirements in the right form, place and time and at a minimum cost for maximum satisfaction.

In the short run, low marketing costs are the most efficient and sustainable solution to the food price dilemma. The narrower the margin due to genuinely low marketing costs and highly efficient price formation, the more the consumers and producers can share in the productivity potential of a healthy agricultural economy. It also enables markets to function in their dynamic role of coordinating resource allocation and providing accurate signals to producers and consumers that reflect the opportunity cost of their decisions, enhancing their ability to react quickly and efficiently to these price signals.

An integrated market gives advantages to both consumers and producers. For the producer, information of spatial market integration enables them to arrange resources more efficiently. For consumers, market integration gives access to new varieties of product and off-season of products with potentially lower price. In the other side, the market that is not integrated may convey inaccurate price information that might twist production decision and contribute to inefficiencies of product movement in markets

(Susanto, 2007; Abey, 2008). This enables them to allocate resources according to their comparative advantage.

1.7 Significance Of The Study

This research was crucial in regard to policy formulation arising from the study findings. Such policy recommendations are aimed at enhancing economic activities in the pineapple marketing system in Kenya, improving the performance of the sector with a view of enhancing the livelihoods of those who are directly or indirectly dependent on this sector. The researcher is also expected to add to the already existing stock of knowledge in this area from previous related studies. Finally, the study findings are likely to stimulate further research in this field.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter provides literature review on the pineapple industry, market integration concept, marketing cost concept, price differential analysis, conceptual framework, co-integration model and a review of various marketing studies that have employed the use of the model. In this part of the study the basic concepts of markets, marketing, marketing system, market channel, market integration, price differential analysis and the approaches and methods to evaluate the market integration of agricultural markets have been discussed.

2.2 Basic Concepts

2.2.1 Market

Market is an area in which one or more sellers of given products/services and their close substitutes exchange with and compete for the patronage of a group of buyers. Originally the term market stood for the place where buyers and sellers are gathered to exchange their goods, such as village square. The concept of exchange and relationships lead to the concept of the market. It is the set of the actual and potential buyers of a product (Kotler and Armstrong, 2003). Conceptually, however, a market can be visualized as a process in which ownership of goods is transferred from sellers to buyers who may be final consumers or intermediaries. Therefore, markets involve sales locations, sellers, buyers, and transactions.

2.2.2 Marketing

Marketing is defined as the performance of all business activities involved in the flow of goods and services from the point of initial production until they are in the hands of

consumers. Kohls and Uhl (1990), defined it as a value-adding process which adds time, form, place and possession utility to farm commodities. Thus, marketing system is a social network of elements (producers, consumers, marketing organizations and control organizations) concerned with the transaction and transformation of goods in space, time and form .

2.2.3 Marketing System

Broadly, marketing system may be defined as the totality of products channels, market participants and business activities involved in the physical and economic transfer of goods and services from producers to consumers. Within the marketing system, various intermediaries perform different functions from production to final consumption (Islam *et al*, 2001)

2.2.4 Marketing Channel

Kotler (2003) also explains marketing channels as a set of interdependent organizations involved in the process of making a product or services available for use or consumption. Most producers do not sell their goods directly to the final users; between them stands a set of intermediaries performing a variety of functions. These intermediaries constitute a marketing channel also called a trader channel or distribution channel.

2.2.5 Marketing Cost

Marketing costs are the embodiment of barriers to access to market participation by resource poor smallholders. It refers to those costs which are incurred to perform various marketing activities in the transportation of goods from producers to consumers. Marketing costs includes handling cost (packing and unpacking, costs of searching for a partner with whom to exchange, screening potential trading partners to ascertain their trustworthiness, bargaining with potential trading partners (and officials) to reach an

agreement, transferring the product, monitoring the agreement to see that its conditions are fulfilled, and enforcing the exchange agreement (Holloway *et al.*, 2002).

2.3 Market Integration Analysis

Market integration refers to a situation in which a) the prices in different markets move together, b) there is trade between the markets, or c) both as and b. In practice, most of the studies have used price data, so in most cases, market integration is said to exist when price changes in one market are reflected in price changes in other markets (Barrett, 2001).

One method for measuring the degree of price integration, and which takes the above mentioned critique into account is the co-integration procedure. This econometric technique provides more information than the correlation procedure, as it allows for the identification of both the integration process and its direction between two markets. The concept of co-integration was developed and applied by Engle and Granger (1987). It is an alternative procedure for evaluating spatial market linkage in the presence of stochastic trends in the price series. Its underlying importance is that it ensures deviations from equilibrium conditions between two economic variables, (which are individually non-stationary in the short-run) are stationary in the long- run.

Spatial market integration includes long-run market integration and short-run market integration. The former refers to such cases in which there exists a long-run and stable price relationship between two markets. Even if this long-run relationship “balance” is broken in the short run, eventually the balance will be renewed. Short-run integration shows that the price change in one market in some period will bring “in the next period”

(i.e., immediately) the price change in another market. This reflects the sensitivity of the spread of product prices between markets.

Integration across marketing stages reflects the effects of price change in one marketing stage on the price change in next stage (Susanto and Rosson, 2007).

An integrated market gives advantages for both consumers and producers. For the producer, information of spatial market integration enables them to arrange resources more efficiently. Producers can also increase product specialization and scale economies of production, thus giving the producer the ability to reduce the marketing costs especially in information and transportation cost. For consumers, market integration gives access to new varieties of product and off-season of products with potentially lower price. In the other side, the market that is not integrated may convey inaccurate price information that might twist production decision and contribute to inefficiencies of product movement in markets (Abey, 2008).

2.4 Marketing cost Analysis

The cost of marketing includes all the costs involved in the creation of place, time, and form utilities. Marketing costs include handling, transfer cost and marketing charges in any transaction performed. In an efficient marketing system, such costs should be recovered plus a reasonable return to investment (Pomeroy and Trinidad, 1995).

2.5 Price Differential Analysis

Mauyo (2004), in his study of cross-border beans marketing patterns in the border districts of Kenya and Uganda defines differential analysis as a process of calculating the actual price differences between the primary markets surveyed and the selected urban markets and interpreting them as price efficiency. The price structure of price is a function of the pattern of trade and transfer cost per unit of a product between regions that participate in arbitrage.

2.6 Cointegration Analysis Model

Co-integration is an iterative procedure that seeks to establish the existence of meaningful relationships (non-spurious), and causality between time series data. It is iterative in that it involves testing of stationarity, the order of integration of variables, co-integration and causality tests between variables. A series is said to be stationary if the mean and variance are constant, finite and independent of the time subscript, as are the variances of autocorrelations (Tambi, 1997).

Testing for co-integration involves looking for a co-integrating regression if all the variables are integrated in the same order. The tests applied to the co-integrating regressions are the same as those used in determining the order of integration of the variables, but here, it is the regression residuals that are tested. This is done by use of Augmented Dickey- Fuller (ADF) test. The null hypothesis is that the variables are not co-integrated (Schimmelpfenning and Thirtle, 1994).

A substantial body of literature has evolved attempting to measure market integration in order to answer the broad policy reform and market performance question. The empirical methods have evolved from simple price correlation between market locations in the 1970s to early 1980s, to lagged regression methods in the late 1980s and 1990s (Ravallion, 1986), to co-integration methods in the 1990s (Goletti and Babu, 1994). Co-integration methods take into account the fact that prices be non-stationary, which causes standard regression analysis to give misleading results. It also provides information on the long-run relationship between prices and the speed of adjustment toward that long-run relationship. However, standard co-integration methods do not take into account the fact that prices may not move together because the transfer cost is too high to justify trade.

2.7 Literature On Relevant Empirical Studies

Wim *et al.* (2010) in determining whether rice markets in Bangladesh were regionally/divisionally spatially integrated following the liberalization of the rice markets, made use co-integration analysis and a vector error correction model (VECM) to analyze market integration. They utilized wholesale weekly rice prices at six divisional levels over the period of January 2004 to November 2006. By use of the Johansen co-integration test they concluded that, there were at least three co-integrating vectors implying that, rice markets in Bangladesh during the study period were moderately linked together and, therefore, the longrun equilibrium was stable. From the results, it was concluded that the short-run market integration as measured by the magnitude of market interdependence and the speed of price transmission between the divisional markets had been weak.

Kuan *et al.* (2009) used the threshold error correction model to test whether the changes in the marketing margin between the farm and the retail prices can result in an asymmetric relationship between the farm and the retail prices in the rice market of Taiwan. They separated the transaction cost variation into two regimes, thus used a two-regime Threshold Vector Error Correction Model with the error correction term serving as the threshold variable to create a non-linear threshold model. The empirical results showed that when the marketing margin was lower than the threshold value, the market system operates freely and there was feedback between the farm and retail prices. However, when the marketing margin was higher than the threshold value, the government intervened in the market and the causality between the farm and retail prices no longer existed. Thus, they concluded that governments should intervene in markets

when the marketing margin is higher than the threshold to prevent asymmetric price transmission between farm and retail prices.

An early study of grain markets in Ghana used both the Ravallion model and co-integration methods to examine the relationships between maize, sorghum, and millet prices in three markets (Alderman, 1992). The study used monthly wholesale prices over the period 1970-1990 in two markets: Techiman, a maize zone in the center, and Bolgatanga, a sorghum-millet zone in the north. The author found that maize markets are relatively well integrated and that there are links between the markets for maize, sorghum, and millet. On the other hand, the speed of transmission was rather slow, with full adjustment taking three months.

Badiane and Shively (1998), examined the degree of integration and the speed of adjustment in Ghanaian maize prices. The study used monthly wholesale maize price data over the period 1980-1993 for three markets: Techiman, a surplus zone in the center, Accra, a deficit market in the south, and Bolangtanga, a maize-deficit market in the extreme north of the country. The analysis was carried out with an autoregressive model in price levels, as well as a model of price variability. The authors found that maize prices in both deficit markets were highly integrated with maize prices in Techiman, the surplus market. However, the relationship was closer between Techiman and Accra than between Techiman and Bolangtanga, presumably due to the shorter distance between them. Furthermore, they found that the economic reforms introduced in 1983, including agricultural market liberalization, reduced the level and volatility in maize prices in wholesale markets, though the degree of seasonality was still high.

Abdulai (2000) used a threshold co-integration model to examine the relationships among maize prices in the same three markets in Ghana. The analysis used monthly wholesale maize data over 1980-1997 for Accra, Techiman, and Bolgatanga. The study found that prices in Accra responded more quickly to changes in Techiman than prices in Bolgatanga, reflecting the fact that Accra is closer and a more active market. Half of the full adjustment in prices back to the long-run relationship occurred in 4-7 weeks. In addition, the results indicated that an increase in the maize price in Techiman was transmitted faster to the two deficit markets than a decrease; in other words, the marketing margin was more when it was compressed than when it expands. This could have occurred because of collusion among traders, changes in inventory, and search costs.

Overall, the study found that maize prices in different markets were highly integrated.

Jaleta and Gebremedhin (2009) considered the relationship between wheat and teff prices in six market towns in Tigray region of northeast Ethiopia. The analyses were carried out using semi-monthly prices from May 2006 to October 2008. The authors tested the co-integration of wheat and teff prices for each of the 15 pairs of markets. Wheat prices were co-integrated in 13 of the 15 market pairs, indicating that they followed common trends. Similarly, teff prices were co integrated in 12 of the 15 market pairs. The town of Adi was the least integrated of the six towns, appearing in three of the six market pairs that were not cointegrated. This was not surprising given that it was located more than 50 km from the nearest paved road; in contrast, four of the others are located on a paved road and the fifth is within 20 km.

In a study of market integration in Uganda, Rashid (2004) examined the effect of market liberalization on maize price movement. The study compared the behavior of maize prices before and after market liberalization, which occurred in the mid-1990s. The

analysis was based on weekly maize price data for eight districts over 1993-94 and 1999-2001. The analysis examined how many of the markets were co-integrated (that is, followed a common trend) in the two periods, as well as the direction of causality in pairs of markets. The results indicated that market integration had improved markedly between the early 1990s and the end of the decade. In 1993-94, only four of the eight markets were co-integrated, meaning that they followed a common trend. In contrast, seven of the eight markets were following a common trend in the 1999-2001 periods. At the same time, the maize markets in the northern districts of Gulu and Arua remained relatively disconnected from the other maize markets in the country. This was explained by the insurgency in the north making trade with the rest of the country both risky and costly. In addition, there was cross-border trade between the northern districts of Uganda and southern Sudan, so that prices in the north reflect, to some degree, market conditions over the border.

Van Campenhout (2007), analyzed the relationship between maize prices in seven markets in Tanzania using weekly price data over the period 1989-2000. He used a threshold auto-regressive (TAR) model, which allows pairs of prices to be linked only when the difference between them exceeds a threshold. The study found that the implied marketing cost is 2-11% of the mean of the two prices, depended on the market pair being analyzed. Generally, the markets that were close to each other, such as Iringa and Mbeya had a small threshold, while those that were further such as Iringa and Dar es Salaam had a larger threshold. The study measured the half-life of the adjustment process, that was, the number of weeks it took for half of the full adjustment to take place. Across the six pairs of markets analyzed, the half-life of adjustment was between 4 and 12 weeks. The analysis also showed that the speed of adjustment had decreased over the 11-year period, the decline being statistically significant in four of the six market pairs.

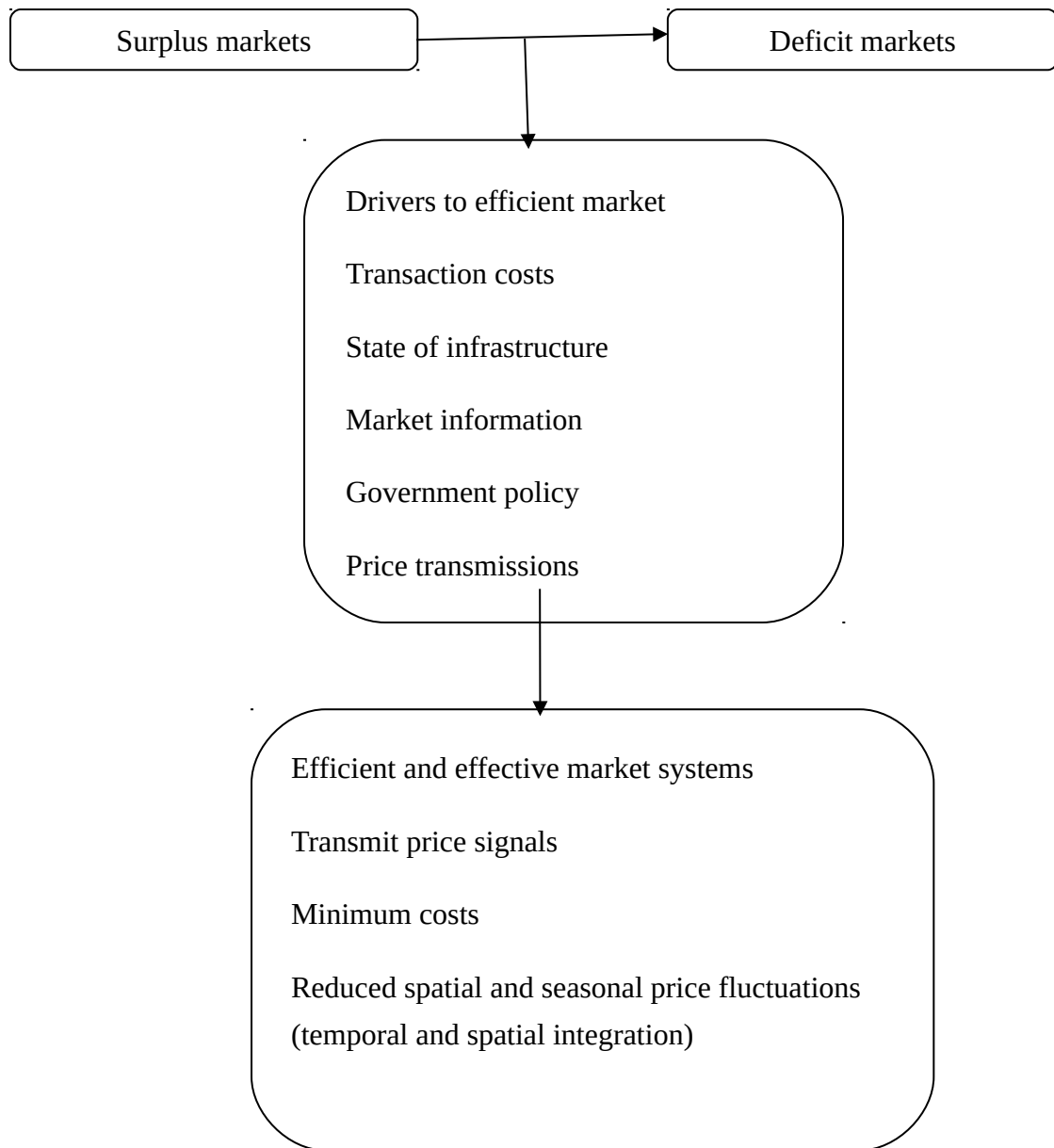
Chavas and Brorsen (2005), examined market integration in Mozambique using monthly retail prices of maize over 1994-2001 and estimates of transfer costs. They used the parity bounds method (PBM) which distinguishes among three regimes: competitive trade (when the price difference is equal to the transfer cost), non-trading markets (when the price differences is smaller than the transfer cost), and disequilibrium (when the price difference exceeds transfer cost). A measure of the level of the integration of a market pair is the proportion of the time they are in the first two regimes. The results suggested that markets within southern Mozambique were efficient (by this definition) 55% of the time, while those in central Mozambique were efficient 84% of the time. Southern and central Mozambique was well integrated, but the transfer costs between northern Mozambique and the rest of the country were too high to justify maize trade.

Getnet *et al.* (2004) added that, understanding the degree to which markets are integrated serves governments in planning routine procurement of emergency stocks. It also supplements other effective demand augmenting and trading capacity such that enhancing mechanisms at the central market level may provide feasible and sustainable alternatives for raising and stabilizing producer prices. As such, the benefits reaped at the central market level due to such targeted interventions transmit to local markets and to producers if domestic markets are well integrated.

Motamed *et al.* (2008) evaluated trade linkage between maize prices in United States and Mexico following North American Free Trade Agreement (NAFTA). Using linear cointegration analysis and error correction model, it was observed that prices between United States and Mexico do not share a common long run relationship. Rather Mexico prices are determined by local conditions in the regions. Such an analysis was to assist policy makers to develop complementary free trade policies, to reduce transportation and transfer cost from surplus to deficit areas within Mexico.

2.8 Conceptual Framework

Marketing system comprises several, usually stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process. An efficient marketing system is a stimulant to the development of a nation's economy. Within the marketing system, various intermediaries perform different functions from production to final consumption. The pineapple supply chain consists of several participants. All the participants help in moving the product in the market channel, which in turn develops to form a market. Participants in the channels perform different activities and thus different channels seem to offer different service outputs depending on the intended consumer needs. From Figure 2.1, market information and state of infrastructure will affect the price that is received by market participants in the pineapple markets by influencing the transaction costs thus the incentive to participate in the market. If transaction costs are reduced the likelihood of enhancing market participation increases as a result of increased marketing margin. If the conditions are satisfied farmers will have an incentive to produce a marketable surplus and commodities will effectively flow from surplus to deficit markets eliminating possibility of segmentation.

Figure 2.1: Conceptual Framework

Source: Author's conceptualization, 2012

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Area of Study

The study covered four markets in Kenya which are located in four different counties. They included: Bureti which is in Kericho County, Kericho market in Kericho County, Bomet market in Bomet County and Narok market in Narok County. Bureti markets was chosen as producer markets since it was assumed to fairly represent production area while Kericho, Bomet and Narok markets were assumed to represent destination/consumer markets of pineapples in Kenya. Bureti district is one of the districts in Kericho county and is ranked the best producer of pineapple in the country (MOA, 2010).

3.2 Theoretical Framework

Relatively, few studies have addressed the micro-economic behavior of market participants, such as individual traders or forms (Barret, 1996 and Madhin-Gabre, 1991). These studies highlight the importance of transaction costs facing individual traders, the role of intermediaries and of relationships. In addition this study links trader characteristics and market behavior with standards of market performance.

Fafchamps and Minten (2001), asserted that an efficient marketing system is a stimulant to the development of nation's economy. They stressed the importance of transaction cost for the reduction of marketing cost. They also noted that, food markets are operating in a weak institutional environment where institutions are deficient and the small scale nature of most of the transactions further constrain the effectiveness of existing formal institutions.

The ability of a market system, whether domestic or foreign, to efficiently perform its development functions depends on the ease with which price changes and responses are transmitted spatially and temporally. Hence, the synchronous movement over time among prices in different markets becomes an important indicator of market efficiency. Market integration is a concept with application in spatial or temporal and product form interrelatedness. The main aim of studying price integration in a marketing system is to be able to identify sets of markets that lead other markets in the price transmission process. If price signals can be detected, then the marketing system will be performing efficiently. In the marketing integration, if two markets, say A and B, are cointegrated, then there must be some sort of 'causality' running from one market to the other. Theoretically, if the two markets designated as A and B are linked by trade in a free market regime, excess demand or supply shocks in one market will have an equal impact on price in both markets (Rapsomanik *et al*, 2003). The study concentrated on spatial market integration, which involves a study of price relationships of pineapples in spatially differentiated markets. The cited literature forms the basis for the study.

3.3 Types and Sources of Data

In this study, both primary and secondary data were used. Secondary data used was time series data collected from the Ministry of Agriculture. Average monthly retail pineapple price data for a five year period from January 2007 to December 2011 from the four markets were used. Other sources were published and unpublished works from the library such as books, journals, academic research findings, internet and different publications and documentations including annual reports from the Ministry of Agriculture and other government publications.

Primary data was collected with the aid of structured questionnaire that were distributed to various rural and urban markets, which were designed to capture the pineapple buying and selling prices, transportation costs, mode of transport, and other costs incurred during the marketing process. Other techniques such as observations and oral personal interviews were also used.

3.4 Target Population

The target population were all the pineapple traders in the selected rural and urban markets in Kenya. The source / rural market was Bureti and the urban or destination markets were Kericho, Bomet and Narok.

3.5 Sampling Procedure

Both purposive and random sampling were used in the study. Purposive sampling was used in selection of the four markets since Bureti was the source market and the major consumption markets were Kericho, Bomet and Narok. Using table of random numbers, random sampling procedure was then used to select traders who were interviewed in all markets.

3.6 Sample Size

Since the whole population of the pineapple traders was not known with certainty and it was presumed to be large the study followed Cochran (1963) to determine the sample size.

$$n_0 = Z^2 pq / e^2$$

where n_0 is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area at the tails ($1 - \alpha$ equals the desired confidence level, e.g., 93%) i.e. is the desired level of precision, p is the estimated proportion of an attribute that is present in the population,

and q is $1-p$. The value for Z is found in statistical tables which contain the area under the normal curve.

If there is no estimate available of the proportion in the target population and is assumed to have the characteristics of interest, as is the case in the current study, 50% is used. In this case, the proportion of the study's target population with the required characteristics is 0.50, the z -statistic is 1.81, and the desired accuracy is at the 0.05 level, then the sample size of this study was:

$$n = \frac{(1.81)^2 (.50)(.50)}{(.07)^2} \\ = 168$$

Fourty two traders from each market were interviewed, the rural (Bureti) and urban markets (Kericho, Bomet and Narok) to come up with the 168 respondents.

3.7 Data Collection.

Data collection was done between the month of March and June 2012. The research was based on both primary and secondary data that was collected from the area of study.

3.8 Data Analysis

Both descriptive statistics and analytical models were used to analyze data. The traders survey data was coded and analyzed using statistical package for social scientists (SPSS) software to generate descriptive statistics. Descriptive statistics on traders characteristics that include gender, traders experience in marketing, age, education level, among others were investigated and described through cross tabulation and computation of means and percentages. Time series pineapple price data was entered in Ms-Excel and analyzed in Econometric Views (Eviews software) to generate inferential statistics.

3.8.1 Testing for market integration

To analyze market integration among the markets, the study utilized monthly retail prices of pineapples. Since the method of estimation depends on the stationarity properties of the independent time series, Augmented Dickey-Fuller (ADF) tests were applied to check for the stationarity in price series. Co-integration analysis was then used to test for price connection among the markets; based on the model as developed by Engle and Granger (1987).

3.8.1.1 Co-integration Approach to Market Integration

Korir (2003), indicates that a number of studies have examined price integration in different markets. The most common measure of spatial market integration between time series of commodity prices is the bivariate correlation coefficient. This test uses the Pearson's correlation coefficient, a scale-free measure of the covariance between two price series, giving values between -1.00 and 1.00. According to Steffen, (1994), statistically significant and positive correlation coefficients indicate a spatial integration between the respective pair of markets; while negative signs indicate that there is no market integration. A coefficient of 1.00 implies that prices in the markets are perfectly correlated with each other, hence perfectly integrated markets. The use of price correlation coefficient as a measure of market integration, however, has some weakness. There are chances that the correlations could be spurious, rather than resulting from the integrated nature of markets Barret, (1996).

One method for measuring the degree of price integration, and which considers the above-mentioned critique is the co-integration procedure. This econometric technique provides more information than the correlation procedure, as it allows for the identification of both the integration process and its direction between two markets. The concept of co-integration was developed and applied by Engle and Granger (1987). It is

an alternative procedure for evaluating spatial market linkage in the presence of stochastic trends in the price series. Its underlying importance is that it ensures deviations from equilibrium conditions between two economic variables which are individually non-stationary in the short-run but are stationary in the long run.

The concept of co-integration and the method for estimating a co-integrated relation or system provide a framework for estimating the long run equilibrium relationship (Rapsomanik *et al*, 2003). The co-integration method is an iterative process, which follows these steps:

- a) Plotting the price data to observe the trend
- b) Testing for stationarity by searching for unit roots through the use of ADF (Augmented Dickey Fuller) method
- c) Carrying out a co-integration test using Engel and Granger causality test or Johansen method. This helps in understanding the direction of causality in price changes.
- d) ECM (Error Correction Model) estimation.

Co-integration analysis will be used to check for the relationship among prices in different markets. When a long-run linear relation exists among different price series, these series are said to be co-integrated. If geographically separated markets are integrated, then there exists an equilibrium relationship amongst them (Goodwin and Schroeder ,(1990) and Sexton et al., (1991). The long run equilibrium relationship for analyzing market integration as used in the previous studies, e.g. Goodwin and Schroeder (1990), was specified as:

$$Y_t = \alpha + \beta X_t \dots\dots\dots (1)$$

Where; Y_t and X_t = are prices of a commodity in two spatially differentiated markets, rural and urban respectively and α and β are parameters to be estimated. If $\alpha = 0$, then the two prices are equal. This is the strict version of the law of one price (LOP).

A typical regression model to test for market integration between two markets under the traditional static method is specified as follows:

$$Y_t = \alpha + \beta X_t + u_t \dots \dots \dots (2)$$

Where

X_t = price for a central (urban) market in time t

Y_t = price series for a peripheral (rural) market in time t

α = the intercept term

β = a parameter of the slope

u_t = error term

If two markets are perfectly spatially integrated, then $\beta = 1$. If this holds, then price changes in one market are fully reflected in alternative market. When $\beta \neq 1$ (i.e. $\beta < 1$ or $\beta > 1$), then the degree of integration may be evaluated by investigating how far the deviation of α is from unity, (equation 2).

Test for Stationarity (Unit root tests)

Gujarati (2004) pointed out that, regressing a non-stationary time series can result to spurious coefficients which can lead to wrong interpretation of a data set. He thus suggested that time series data has to be made stationary before being subjected to any analysis. Since time series prices are usually non-stationary and because standard

statistical models do not allow explicit determination of α and β , a 2- step model by Engle and Granger (1987) will be used. The first step is to determine the “order of integration” of each price series by checking for stationarity. A time series (say Y_t) is stationary if the joint distribution of Y_t and Y_{t+1} is independent of time (t). This will be guaranteed by ensuring that the time series is integrated of order zero, $I(0)$. Since most price series have trends in them if only because of inflation, they are usually $I(1)$ and thus they need differencing once to obtain $I(0)$ process.

Augmented Dickey-Fuller test was used to determine the order of integration. This was achieved by regressing ΔY_t on Y_{t-1} and several lags of ΔY_t (enough to avoid auto correlated disturbances).

The model is specified as:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum \alpha_{k+t} \Delta Y_{t+k} + \varepsilon_t \dots \dots \dots (3)$$

Where: ΔY_t is the first difference of prices in market Y, Y_{t-1} is the lagged price of pineapple in market Y, α_0 and α_1 are parameters to be estimated and ε_t is the error term.

Following the t-statistic on the estimated coefficient of Y_{t-1} is then used to test the hypothesis that:

$$H_0: Y_t \sim I(1) \text{ Vs } H_1: Y_t \sim I(0)$$

If the null (H_0) above cannot be rejected then Y_t cannot be stationary, it can be integrated of order one or even higher. To find out the order of integration the test was repeated with ΔY_t in place of Y_t thus regressing $\Delta \Delta Y_t$ on a constant ΔY_{t-1} and several lags of $\Delta \Delta Y_t$. ADF test was then used to test the hypothesis that:

$$H_0: \Delta Y_t \sim I(1) \text{ Vs; } H_1: \Delta Y_t \sim I(0)$$

This process was repeated until the order of integration was established. The second step then involved testing for co-integration based on the idea that if two time series (eg. Y_t and X_t) are each $\sim I(1)$, then their residual (say U_t) will be integrated of order zero (stationary). Where $U_t = Y_t - \alpha - \beta X_t$, the residual (U_t) will then be tested for stationarity. The ADF tests was then applied to these residuals to yield statistics which are large and negative so as to reject the null hypothesis of $I(1)$ in favor of stationarity.

If the first step shows that each time series is integrated of order one, and if the second step results to a stationary residual, then the two time series are said to be co-integrated. This implies that long run (or equilibrium) relationship exists between the two sets of prices. In addition, to make a clear distinction between short-run and long-run integration an Error Correction Model (ECM) will be used. This allows for derivation of the speed of price transmission from one location/market to another. Within the context of market integration, it is important to consider the speed of adjustment as one dimension of integration.

The error term in the co-integration regression will be treated as the equilibrium error. The Error Correction Model (ECM) is specified as:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \delta U_{t-1} + \varepsilon_t \dots \dots \dots (4)$$

Where; Δ = first difference operator, ε_t = random error term and $U_{t-1} = (Y_{t-1} - \alpha - \beta X_{t-1})$.

ECM states that ΔY_t depends on ΔX_t and also on equilibrium error term, while absolute values of δ decide how quickly equilibrium will be restored (speed of adjustment).

3.8.2 Estimation of Marketing Costs

Marketing cost determines the marketing services offered by the marketing system. Different types of marketing costs were calculated (including transport, levies, cess, loading and off loading costs) relating to pineapple transactions of pineapple traders.

The weighted average method was used to obtain the average marketing costs for each different kind of trader; where average marketing costs were computed as:

$$AMC_i = \frac{\sum_{i=1}^n X_i Q_i}{Q_i} \dots\dots\dots (5)$$

Where;

AMC_i = Average marketing cost for each trader

Q_i = quantity handled during the transaction for each pineapple trader; used as a weighting coefficient.

X_i = Different types of marketing costs that were incurred by each pineapple trader during transaction.

3.8.3 Price Variation Analysis

The site price function was used to show whether the price variation between two markets (rural and urban) reflects the marketing costs. According to Bressler and King (1978) the site price function is mathematically presented as below:

$$P_{mi} = P_m - (H_{cim} + T_{cim} + M_c) \dots\dots\dots (6)$$

Where,

P_{mi} = Calculated site price at a selected market

P_m = Retail price at a selected market

H_{cim} = Handling cost involved in moving one or a unit of pineapples from rural to urban market

T_{cim} = Transport cost for moving pineapple from rural to urban market which is a function of distance

M_c = Market charges

If the site price at the urban market is equal or lower than the rural market price, no shipment occurs between the two markets. If the urban market site price is higher than the rural market price, it is an indication that the actual shipment from the rural markets are not enough to clear the markets. Hence there is need to determine whether such a situation is as a result of factors beyond the control of traders (Bressler and King, 1978).

If $P_{mi} =$ rural market price or $P_{mi} <$ rural market price we reject the null hypothesis and accept the alternative hypothesis which states that price variation across markets reflect the marketing cost.

CHAPTER FOUR RESULTS AND DISCUSSION

This chapter presents the descriptive and econometric analysis of the study in line with the objectives and hypotheses outlined in the first chapter. The descriptive analysis is employed to describe the market characteristics of sampled pineapple traders. Econometric analysis was employed to determine whether pineapple marketing system in selected markets were integrated, the main tool of analysis used in this study was co-integration.

4.1: Pineapple Marketing System

4.1.1. Pineapple Market Participants, their Roles and Linkages

In this study, different pineapple market participants were identified in the exchange functions between farmer and final consumer. Market participants in the study area include: producers/farmers, farmer traders, urban assemblers, wholesalers (regional and urban), retailers and commission agents. Each participant was involved in different activities (wholesale, retail, assembly etc), based on the major activity undertaken. Table 4.1 presents different categories of traders interviewed.

Table 4.1 Categories of Traders interviewed

Agents	Frequency	Percentage
Farmer trader	12	7.1
Producers	8	4.8
Rural Wholesaler	16	9.5
Urban assembler	6	3.6
Brokers	8	4.8
Urban wholesaler	30	17.9
Urban retailers	80	47.6
Commission agents	8	4.8
Total	168	100

Source: Survey result, 2012

Producers: These are the primary or first link actors of the market channel who cultivate and supply surplus pineapples to the market. They represented 4.8 % of the traders interviewed. Producers or farmers produce their harvest their and transport to the nearest markets (village market) or regional markets themselves. They had several marketing

options, selling directly to consumers in the market or selling through brokers to assemblers then to regional wholesalers. Alternatively, they sell to village assemblers known as “farmer traders” who assemble pineapples from a large number of farmers. Farmers also sell their products directly to urban wholesalers in regional markets who move from terminal market to regional market.

Village markets are markets which are the closest to the nearest of farmers, but have less marketing facilities (transport, electricity, water among others) and farmers sell a small quantity of pineapples. Regional markets are surplus markets, such as Bureti where most of surplus pineapples are transacted. Terminal markets are deficit markets which are found in town, and most of surplus products flow to these markets.

Farmer trader/village assemblers: From table 4.1 above 7.1% of farmer traders were interviewed. Farmer traders/village assemblers are farmers or part-time traders in the assembly markets who collect pineapples from farmers in village markets for the purpose of reselling it to consumers or regional wholesalers in regional market. They use their financial resources and their local knowledge to bulk pineapple from the surrounding area.

Urban assembler: The assemblers play an important role in the system of assembly. Not only do they know the areas of surplus well, but also speak the local language. Moreover, the assembler traders could be classified by size of the working capital, as large and small assembler. Those who have small capital act as rural assemblers. They buy pineapple from farmers in small village markets to resell to regional wholesaler or urban assemblers who have large capital. Urban assemblers have larger capital than village assemblers and they buy pineapples from farmers and village assemblers in the regional market to resell to consumers and wholesalers (urban and regional) in regional and terminal markets.

Assemblers also relieve their customers of the burden of quality by controlling the small quantities of pineapple typically offered by farmers. To some extent, the assemblers also sort and grade the pineapples. Once the required quantities have been gathered, the assemblers contact the purchaser. 3.6% of the interviewed respondents were urban assemblers.

Brokers: They formed 4.8% of the interviewed traders. Brokers are agents who work for a commission on behalf of other participants. They specialize in bringing the buyers and sellers together. They disseminate price and other information to the market participants and they play the leading role in influencing pineapple trade and price formation. These intermediaries play an important role in the process of arbitrage on the markets, in particular for farmers and non-resident wholesalers. They got their reward depending on the amount of pineapples they sell.

Wholesalers: Wholesalers are traders who buy large quantities of goods and resells to merchants rather than to the ultimate customers. Wholesalers are the major actors in the marketing channels. There are two major categories of wholesale traders:

Rural wholesalers: Regional wholesalers are those who reside in Bureti and purchase pineapples either through brokers or directly from farmers or farmer traders or urban assemblers or commission agents. They buy and supply the pineapples to the terminal market and other deficit markets. From the sampled traders, 9.5 % of them were rural wholesalers.

Urban wholesalers: From of the sampled traders 30(17.9%) of the urban wholesalers were interviewed. Urban wholesalers are terminal market wholesalers who reside in

terminal markets and travel to regional markets to buy pineapple through the service of a broker or directly from farmers or regional wholesalers or urban assemblers. Wholesalers in the terminal market purchase pineapple in bulk from regional wholesalers in terminal markets and sell it to retailers. They also serve as retailers in their local area and to a large extent also supply pineapple to groceries and supermarkets.

Urban Retailers: Retailers are persons or companies that sell commodities to end users. The majority of pineapple retailers in the terminal market are characterized by, stores and shops, often trading pineapple purchased from wholesalers (regional or urban) or farmer traders or urban assemblers or farmers. They sell whole pineapples or slice them into small pieces before selling.

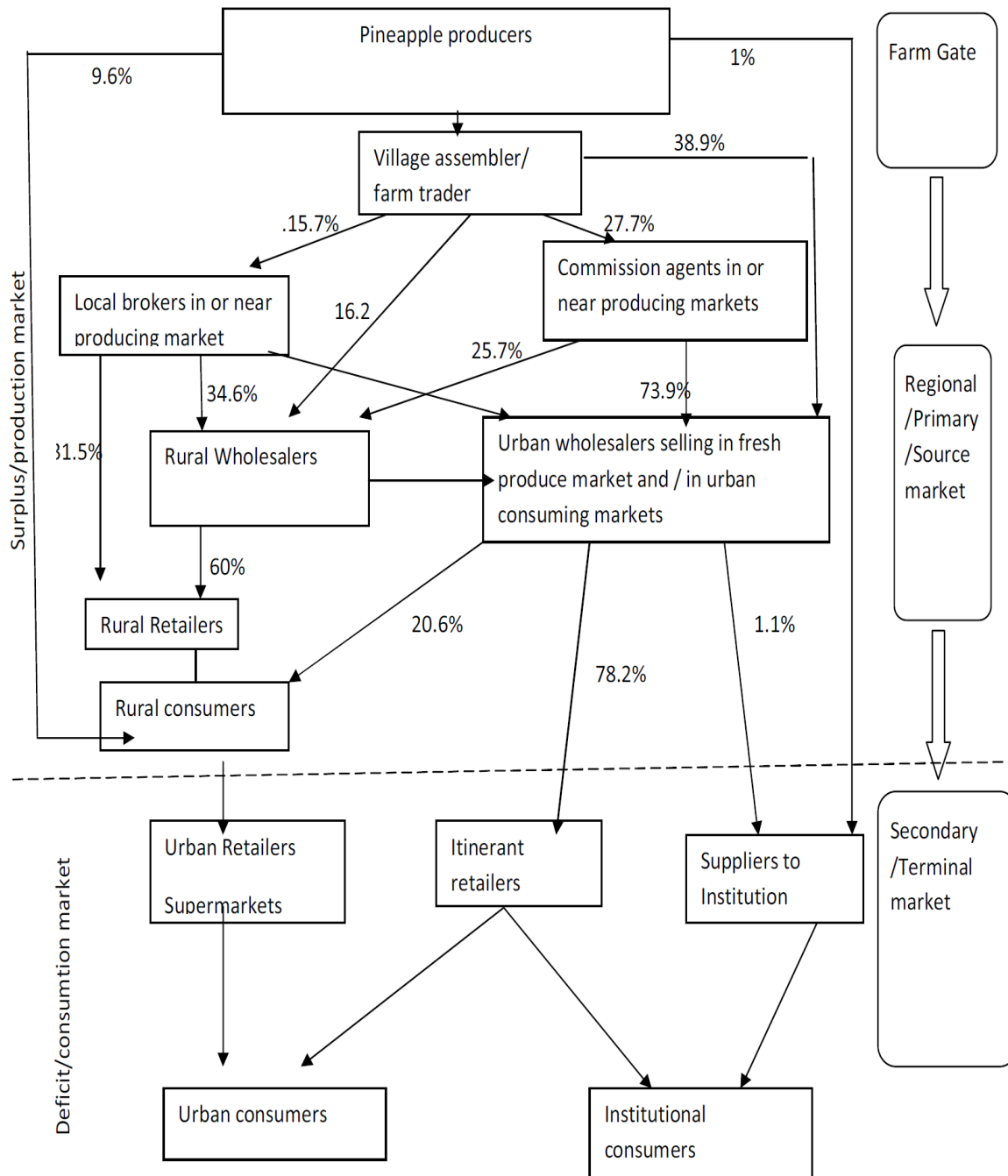
Commission Agents: Commission agents are buyers in the village or regional markets from farmers who sell pineapple to regional wholesalers. They do not invest their own capital. These actors are pre-financed by regional wholesalers and buy pineapples on their instructions. Commission agents obtain their reward from the price difference between the price they pay and the price that is agreed to be paid by regional wholesalers. They formed 4.8% of the sampled traders.

4.1.2. Pineapple Marketing Channel

According to Mendoza (1995), marketing channel is the sequence of intermediaries through which goods passes from farmers to consumers. The analysis of marketing channels was intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to the final destination (consumer). The pineapple marketing channel shows that pineapple marketing structure is characterized by interlink-

ages among farmers, village collectors, retailers and wholesalers. The marketing channels depicted in figure 4.1 was constructed based on the data collected in four markets.

Figure 4.1 marketing channels of pinaples in selected markets in Kenya



Source: Survey data 2012

Results for the identified pineapple marketing channels are presented in figure 4.1 above. From these results it was observed that pineapples flowed from producers/ farmers in the production region (Bureti) to consumers both within the production zone and in other consumption markets such as Kericho, Bomet and Narok. Results indicates that almost all 96% of farmers would sell their pineapples to village assemblers; out of which 38.9% of farmer traders would sell to urban wholesalers, 27.7% to commission agents, 16.2% to rural wholesalers and 15.7% to local brokers. Majority of the rural wholesalers/ stockists sold their stocks to retailers in the local markets (60%), and to urban wholesalers from the regional markets (39%).

The results revealed that there are several marketing channels. The main marketing channels of the four pineapple markets in terms of flow of pineapple from producer to consumer through different intermediaries are:

Channel I: Producer - Consumer

Channel II: Producer-Village assemblers-Brokers-Urban wholesalers-Urban Retailers-Consumer

Channel III: Producer-Village assemblers-Commission agents-Urban wholesalers-Urban Retailers-Consumer

Channel IV: Producer-Village assemblers -Brokers -Urban wholesalers-Itinerant Retailers-Consumer

Channel V: Producer-Village assemblers-Commission agents-Urban wholesalers-Institutional consumer

Channel VI: Producer-Village assemblers-Rural wholesaler- Rural Retailer-consumer

A terminal wholesaler establishes a link with about 3-5 local brokers or village assemblers. Likewise, village assemblers keep permanent relationship with farmers. As a result of such relationships, some farmers are at times willing to give pineapples to brokers or assemblers on credit, which is paid back immediately the commodity is sold. The local fresh pineapples are sold to consumers in rural areas and urban centers. In rural producing areas, there are two channels; one channel is where the farmer sells to local retailers or consumers, while the second channel is where the farmer sells to wholesalers. Wholesalers sell mostly to urban markets. Retailing to consumers is also done by some farmer-traders selling pineapples on trucks along busy highway junctions for reasons of making higher margins and as an alternative way of disposing of excess supply.

4.1.3. Transportation Systems

Transport is the connecting link between the rural producers and the urban consumers. The availability of well functioning transport network is very important because it creates place utilities of the product. It there by allows farmers in surplus areas to profit from better prices from other markets and also consumers in deficit areas benefit from lower prices by transporting from surplus areas. The mode of transport used by different market actors included head load, bicycle, donkey, pickups, nissans and lorries. In the study area, the distance ranged between 0.5km to 150 km from the regional and the terminal markets. Traders used various mode of transport; 13.7% used pickups as their mode of transport, 6.5% used donkeys, 4.8% used bicycles, 1.8% used head loads, while majority (58.3%) used PSV nissans and 14.9 used lorries.

Table 4.2: Mode of Transport by Respondents

Mode of transport	Frequency	Proportion
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Head load	3	1.8
Bicycles	8	4.8
Donkeys	11	6.5
Pickups	23	13.7
Nissans (PSVs)	98	58.3
Lorries	25	14.9
Total	168	100

Source: Survey results, 2012

This was expected given the bulkiness, amount of pineapple handled and the general nature of the terrain that allows extensive use of this mode of transport. Lorries were used mainly for transporting large quantities of produce to the final destinations, which are usually outside Bureti.

4.1.4. Market Information

Market information is vital to minimize information gaps and uncertainties that exist in the agricultural sector. It is imposed by producers in their planning of production and marketing. On the other hand, it is identically required by other market participants in arriving at optimal trading decisions. According to the results on market information sources, the majority of the respondents (88.1%) get destination market information before they went out to sell their pineapples. However, a major concern is that a substantial number of traders (11.9%) operate without any dependable source of market information, (Table 4.3). Regarding sources of market information, most of the respondents preferred market visit (37.50%), 22.7% got from personal investigation and 2.9% from cooperatives. Twenty five percent preferred getting information from other traders; this might not have been a reliable source as it predisposes those who market their produce to possible manipulation by agents and middlemen to suit their gains.

From these sources, market information was considered adequate for making decisions on the price and quantities to be purchased.

Table 4.3: Traders Sources of Market Information

Source	Frequency	% of traders
Personal investigation	38	22.7
Market visits	63	37.5
Other traders	42	25
Cooperatives	5	2.9
No market information	20	11.9
Total	168	100

Source: Survey results, 2012

4.1.5 Purchasing Strategy

The purchasing strategy for pineapple traders revealed that 12.33% of them purchase based on the long term client establishment and the rest 87.67% did spontaneous purchasing, they purchased without a median agent.

Table 4.4: Source of Supply

Source	Frequency	Percentage
Brokers	31	24

Market	69	57.2
Commission agent	11	8.6
Assemblers	5	3.7
Others	9	6.5
Total	168	100

Source: Survey results, 2012

The purchasing strategy results in table 4.4 above shows that about 57% of the traders purchase directly without a median brokers, 24% of them purchased through brokers, and the rest of traders bought by combination of direct purchase, through commission agents and brokers. Brokers were very important for regional and urban wholesalers and urban assemblers at the time of purchase. Convenient time of day preferable to purchase pineapple in terms of price was before 12a.m

4.1.6 Price Setting Strategy

The method of price formation is important. Majority (29.8 %) of the sampled traders reported that price is set through negotiation/forces of market supply and demand, 25% of them reported that their price is set by market, 7.7% of the traders set price by negotiation, 5.9% set the purchase price themselves and the rest reported that the price was set by assemblers.

Table 4.5: Methods of Price Setting

Who sets prices	Frequency	Proportion
Negotiation	13	7.7
Market (demand & supply)	42	25
Negotiation/market	50	29.8
Sellers (self)	10	5.9
Producers	32	19.1
Assemblers	21	12.5
Total	168	100

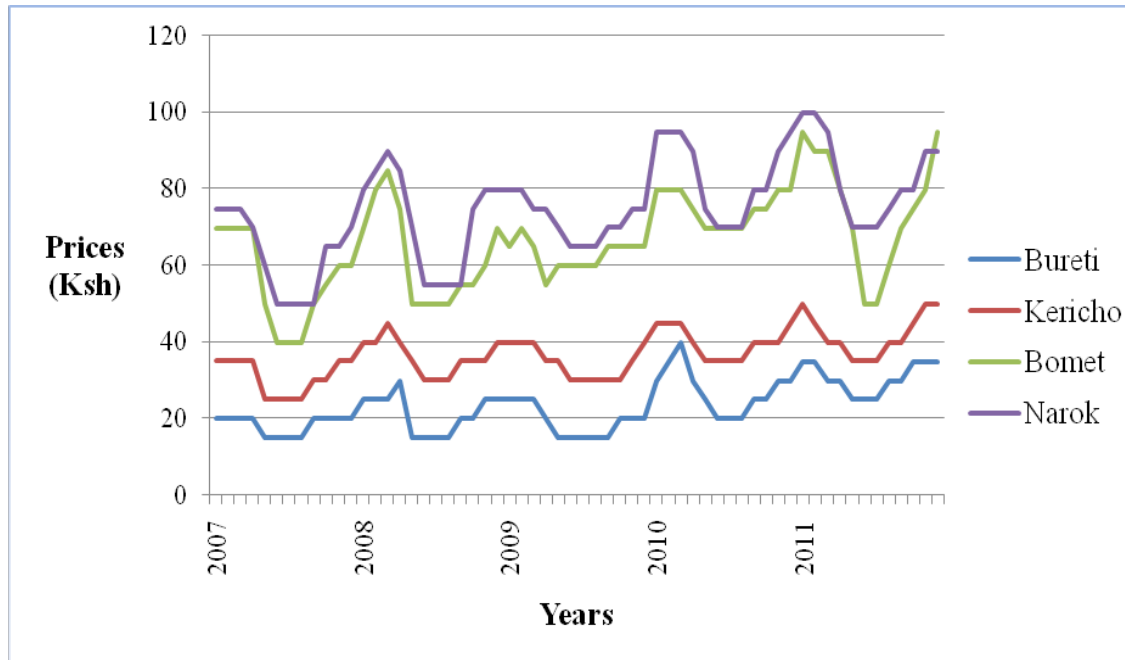
Source: Survey results, 2012

4.2 Market Integration Analysis

4.2.1 Pineapple Price Trends

Market prices that are stable and reliable are desirable in any marketing system. Price trend and stability can be used to measure market performance. Stable prices are required for planning purposes by all the pineapple production and marketing participants. Appendix 3 shows the average monthly retail pineapple prices for the period 2007-2011. Figure 2 below shows a graphical presentation of data for the period 2007-2011.

Figure 2: Pineapple price trends, Bureti, Kericho, Bomet and Narok (2007-2012)



Source: Survey data from pineapple price, 2012

The maximum price ever attained in pineapple prices in the study area was Ksh 100 recorded in Narok market in January and February 2011. The minimum price of Ksh 15 was recorded in Bureti market in May, June, July and August in 2007, 2008 and 2009, during this period the price of pineapple in other markets varied between Ksh 30 and 65 depicting a localized glut in pineapple production and marketing. The maximum price of pineapple ever attained in the source market (Bureti) is Ksh 40 in March 2011. Generally, prices of pineapple are not stable in all the selected markets as shown in figure 2 and appendix 2 . The peak of the prices was almost always in the first and fourth quarters of the year, while least price fell in the second quarter of the year. The price in urban markets rose higher and faster than that of the rural market in Bureti. The reason for the non-corresponding peaks of rural and urban markets could have been that fewer pineapples were being supplied from the rural markets to the urban markets. Thus, urban

markets had low supply of pineapples as against the high demand of pineapples in the urban markets. Due to the fact that the first quarter of the year is regarded as off-season, the resultant effect is the high price of pineapples. Also, the harvesting season is during the second quarter of the year, which in turn justifies low price for pineapples in the second quarter of the year. This is just an indication of price movement in these markets

4.2.2 Co-integration Analysis

The data used in this research are monthly pineapple price of four markets: Bureti, Kericho, Bomet and Narok. The data covered the period from January 2007 – December 2011 obtained from the Ministry of Agriculture i.e. 60 monthly retail prices. Co integration and error correction models, introduced by Engle and Granger (1987) were used to determine the market integration. To analyze the data Eviews 3.1 software was used.

4.2.3 Unit Root Test

Following the Engle Granger two-step procedure of co-integration test, the individual monthly retail prices were tested for their order of integration and then co-integration test was made. The test for the order of integration using ADF unit root test is summarized in Table 4.6. A non stationary series is integrated of order zero (I(0)), while a stationary series is integrated of the order one (I(1)). The results of the unit root test shows that all price series were non-stationary at level and stationary at first difference. This shows that the order of integration of Bureti, Kericho, Bomet and Narok monthly prices is one (I(1)) and the calculated t-statistic of DF and ADF tests exceeds the critical values of Dickey Fuller in absolute value. Hence we can test market integration between Bureti, Kericho, Bomet and Narok markets.

Table 4.6 Unit root tests for level and first differences (2007-2011)

Unit root test for levels

Unit root test for first differences

Price series	ADF	Mackinnon T- value	# of P-value	x2 at lags	ADF 10 lags	Mackinnon T-value	# of P-value	x2 at lags
				(P > x2)				(P > x2)
Bureti	-1.89	0.26	0	1.81 (0.58)	-7.16***	0.00	0	2.17 (0.35)
Kericho	-1.84	0.17	3	1.98 (0.32)	-5.94***	0.00	1	2.07 (0.45)
Bomet	-2.28	0.42	1	2 (0.65)	-5.50 ***	0.00	0	2.75 (0.48)
Narok	-2.02	0.20	0	1.03 (0.44)	-6.62 ***	0.00	0	2.28 (0.27)

Note: *** indicates significance at 1% significance level

x2= Durbin's alternative test for serial correlation, the values in the parenthesis

show the significance level where there is no autocorrelation

Source: Computation, 2012

4.2.4 Co-integration Test

The Engle and Granger test uses a standard OLS estimation for the long run relationship between the pair market prices. The results of the unit root test on the different market pair prices are summarized in Table 4.7. Based on the OLS estimates, when the price in Bureti rises by 1% there is a corresponding long run increase in the price level by 0.32, 0.75 and 0.95 in Kericho, Bomet and Narok market respectively.

Table 4.7: OLS Estimates of Co-integration Regressions

Markets	Constant (T-value)	Coefficient (T-value)	R-square	F-value
Bureti- Kericho	0.06 (5.10)**	0.32 (6.28) ***	0.52	65.40***
Bureti- Bomet	0.02 (10.2)***	0.75 (6.02) ***	0.64	74.39***
Bureti- Narok	0.12 (12.9)***	0.95 (5.51) **	0.76	58.01***

Note: *** and ** indicate significance at 1% and 5% levels, t-values in the parenthesis

Source: Computation, 2012

The co-integration tests on residuals summarized in table 4.8 confirm the existence of co-integration between the different consumption markets. The result imply that the Bureti pineapple market was integrated with Kericho, Bomet and Narok markets. Thus, the test

results support the prediction under expectation that the prices are cointegrated. Thus, from the results it was deduced that pineapple markets in the selected markets (Kericho, Bomet and Narok) were spatially cointegrated.

Table 4.8: Co-integration tests (Unit root test on residuals)

Markets	ADF T-value	Mackinnon P-value	# of lags	x2 at 10 lags (P > x2)	Critical value
Bureti - Kericho	-6.01**	0.02	1	7.5 (0.92)	-3.54
Bureti- Bomet	-6.02 ***	0.00	1	8.2 (0.35)	-3.50
Bureti-Narok	-5.51****	0.00	0	6.4 (0.55)	-3.54

Note: *** and ** indicates significance at 1% and 5% significance level
 x2= Durbin's alternative test for serial correlation, the values in the parenthesis
 show the Significance level where there is no autocorrelation

Source: Computation, 2012

4.2.5 Error Correction Model

An investigation of the price adjustment process, where significant response to different price shocks can be recognized, provides further evidence for market integration. Error correction model (ECM) is a method used to test whether the co-integrating markets have short run relation and are integrated or not. To examine the short run relation and causality, the study tests the joint hypothesis using F statistics. If $\delta < 0$ it shows the adjustment process will be towards the equilibrium. The negative sign showed that the speed of price adjustment was towards the equilibrium. The result when Bureti is the dependent variable shows that some of short term response parameters are statistically significant. The speed of adjustment implies that a deviation from the long run equilibrium in Kericho, Bomet and Narok the preceding period is adjusted for by 0.38%, 0.35% and 0.32%, respectively in Bureti market the following month.

In other words there is a short-run effect of Bureti market prices on that of Kericho, Bomet and Narok markets. A 1% increase in price of pineapple in Kericho the preceding month yields a 0.12% increase of the price level in Bureti in the current month. As a result there was a 14%, 45% and 26% of change in Kericho, Bomet and Narok market prices due to the current change in Bureti market respectively. The time required for one market to reach equilibrium with the other market price, as suggested by Solomon (2004), approximately $(1-\delta/\delta)$ units of time, where δ is the positive coefficient of the lagged error term. The time required for Bureti market to reach equilibrium with Kericho market was 1.6 months, time for Bureti and Bomet to be at equilibrium was 1.9 months whereas the time required to reach in equilibrium with Narok market was 2.1 months.

Table 4.9: Estimation of Error Correction Model between sample pair markets

Pair markets	α	β_1	δ	β_2	β_3	F
Bureti – Kericho	0.06	0.04	-0.38**	0.12**	0.14**	5.69****
Bureti - Bomet	0.10	0.40	-0.35****	0.35	0.45****	4.16****
Bureti – Narok	0.04	0.02	-0.32****	0.24*	0.26****	5.87****

Note: ****, ** and * indicate significance level at 1%, 5% and 10% respectively. A critical value of F statistic for a sample size of 168 is 3.74 at 5% significant level.

Source: computation, 2012

In summary, it is evident that the prices in paired markets are cointegrated and follow a long run relationship. This result supports the hypothesis of integrated markets for pineapples in the South Rift region market of Kenya.

4.3 Marketing Costs

Marketing costs are the costs incurred as goods change ownership and location along the marketing channel. They include costs of storage, transportation, cess, taxes, market levies and broker charges. Marketing costs in horticulture are particularly high because of the high bulk to weight ratio, the perishable nature of the produce and the strong expression of consumer preferences in the market with widely differing prices for perfect compared to slightly damaged produce (Onyuma et. al, 2006).

Table 4.10 indicates the marketing costs in the transaction of pineapples by the different marketing agents; assemblers, wholesalers (urban and regional), farmer traders, retailers, and commission agents. The structure of marketing cost reveals that transportation is the highest cost for each of the marketing agents, even for traders close to the market source.

The highest percentage was 48.6% recorded in Narok while the least was recorded in Bureti with 19.2% as transportation share of the marketing cost. This confirms other empirical findings that transport represents the largest share of marketing cost in sub-Saharan Africa (Madhin-Gabre, 1991). Storage cost is very important at the urban markets. It is the second most important marketing cost at this level; it is a combination of storage losses and actual cost of storing pineapples. The fact that storage cost was important at the retail end indicated that the cost of storage in urban market was relatively higher than rural markets since retailers paid on either daily basis or weekly basis as against rural markets monthly or annual payments. At times, no payment was made for restage in rural markets. Urban wholesalers did not have regular market dues since they pay inform of license which they did once a year.

Cost of marketing	Primary market				Terminal markets					
	Regional wholesaler/ Retailer	Farmer trader	Assembler/ Collectors	Commission agents	Urban Retailer Kericho	Urban Retailer Bomet	Urban Retailer Narok	Urban wholesalers Kericho	Urban wholesalers Bomet	Urban wholesalers Narok
Sack	50(11.6)	50(12.8)	50(9.6)	50(20)	50(9.6)	50(7.8)	50(6.9)	50(8.6)	50(7.1)	50(6.4)
Fill and stitch	10 (2.3)	10(2.6)	10(1.9)	10(4)	10(1.9)	10(1.6)	10(1.4)	10(1.7)	10(1.4)	10(1.3)
Load	20(4.7)	20(5.1)	20(3.9)		20(3.8)	20(3.1)	20(2.7)	20(3.4)	20(2.8)	20(2.6)
Unload	20(4.7)	20(5.1)	20(3.9)		20(3.8)	20(3.1)	20(2.7)	20(3.4)	20(2.8)	20(2.6)
Brokerage fee	50(11.6)	50(12.8)	50(9.6)	50(20)	70(13.4)	70(10.9)	70(9.7)	100(17.2)	100(14.2)	100(12.8)
Transportation +personal transport	130 (30.2)	100 (25.7)	100 (19.2)		150 (28.8)	270 (42.2)	350 (48.6)	150 (25.9)	270 (38.6)	350 (44.9)
Storage cost	20(4.7)	10(2.6)	20(3.9)	30(12)	30(5.8)	30(4.7)	30(4.2)	-	-	-
Storage loss	20(4.7)	30(7.7)	100(19.2)	20(8)	50(9.6)	50(7.8)	50(6.9)	80 (13.8)	80 (11.4)	80 (10.3)
Telephone	20(4.7)	10(2.6)	50(9.6)	50(20)	20(3.8)	20(3.1)	20(2.7)	100(13.8)	100(14.2)	100(12.8)
Market dues	40(9.3)	40(10.3)	-	-	50(9.6)	50(7.8)	50(6.9)	-	-	-
Personal expenses	50(11.6)	50(12.8)	50(9.6)	50(20)	50(9.6)	50(7.8)	50(6.9)	50(8.6)	50(7.1)	50(6.4)
Total cost	430	390	470	250	520	640	720	580	700	780

Table 4.10: Market cost of pineapples for different agents at primary and terminal markets (Ksh per 100 kg bag)

Note: Percentage share of marketing cost of the total marketing cost is given in parenthesis.

Source: computation, 2012

4.4 Price Difference Analysis

Table 4.11: Pineapple prices at different terminal markets

Markets	Marketing Agents	Rural market prices Ksh/90 kg bag	Urban market prices Ksh/90 kg bag	Handling costs per Ksh/90 bag	Transportion cost per 90kg bag	Market charges per 90kg bag	Calculated urban site prices
Kericho	Retailers	1000	2000	320	150	50	1480
	Wholesalers	1000	2000	430	150	-	1420
Bomet	Retailers	1000	2500	320	270	50	1860
	Wholesalers	1000	2500	430	270	-	1800
Narok	Retailers	1000	3500	320	350	50	2780
	Wholesalers	1000	3500	430	350	-	2720

Source: computation, 2012

Using the site price for the selected terminal markets and the primary market prices we can reject the hypothesis since the site prices are higher than the prices in the local market. The rural price is Ksh 1000 and the site prices for the urban markets in table 4.11 above are higher than that of the rural markets which is the buying price for the urban market traders.

Price differentials between rural and urban markets could be attributed to the scarcity of the product in the urban areas leading to a high demand. This allows for shipment of the product from the surplus to the deficit regions. High price differentials among markets were more than accounted for by transfer costs between markets.

The second hypothesis was tested by running a regression analysis of prices and marketing cost of traders where price was the dependent variable.

Table 4.12: Regression results of price and marketing cost

Variable	Coefficient	S.E	t-value	sign
(Constant)	2.45	1.307	1.875	0.069
Costs (X ₁)	0.66	0.239	2.762	0.009
Cost (X ₂)	0.74	0.259	2.857	0.006
Cost (X ₃)	0.86	0.295	2.915	0.007

a. Dependent Variable: price

Source: computation, 2012

Where X₁= Kericho , X₂= Bomet and X₃= Narok

The regression co-efficient attached to each continuous independent variable is the price elasticity of with respective cost. A positive coefficient indicates that an increase in cost increases the value of a product. The regression results show that the regression coefficient for cost is positive and significant at 1% of level of significance. This implies that an increase in the marketing cost will lead to an increase in price in the respective markets. A 1% increase in the marketing cost in will lead to an increase in price by 0.66%, 0.74 and 0.86 in Kericho, Bomet and Narok respectively. The t-statistic was used at specified level of significance, where:

$$T = \beta / S.E (\beta)$$

Tabulated t=2.457

Then the calculated t was compared with the tabulated t at the specified level of significance and degrees of freedom. Since the t calculated was greater than the t tabulated the null hypothesis was rejected. The results showed that the marketing costs

were significantly different from zero at 1% level of significance. This means that, price variations across markets reflect marketing costs.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This last chapter contains the key findings presented in the preceding chapters by summarizing the main findings of the study. Based on these findings a number of conclusions are drawn and policy recommendations discussed.

5.1 Summary and Conclusions

The ability of a marketing system to effectively and efficiently perform its development functions depends on the ease with which price changes and responses are transmitted spatially and temporally. This in turn depends on the availability of necessary infrastructure like storage, transportation facilities, communication system and competition in the markets. The pineapple marketing system in the selected markets in Kenya deserves to be developed into a strong network of efficiently functioning markets, as more than 95% of the pineapple production is channelized regionally. The objectives of the study were to identify pineapple marketing channels, and the role and linkage of marketing agents, determine whether pineapple markets in the selected markets were integrated, determine marketing costs associated with pineapple markets and to investigate price variations between rural market and urban markets in relation to marketing costs.

To achieve these objectives, secondary and primary data were collected. Structured questionnaires were used to collect primary data; they were designed to solicit information on traders' socioeconomic characteristics, marketing characteristics, operating costs and returns. In addition, secondary data collected from the Ministry of Agriculture of average monthly retail pineapple prices for a five year period from January 2007 to December 2011 were used to analyze market integration.

Purposive sampling was used to select four markets in the region, with Bureti being the rural/source market and urban markets were Kericho, Bomet and Narok. A scientific method was used to determine the sample size i.e 168 representative sample from the population. Using table of random sampling, sampling procedure was used to select traders from each market. Forty two traders from each market were interviewed to come up with a sample size of 168 respondents. This was done in the months of March-May 2012. Data analyses were done using SPSS and EVIEWS 3.1. Two methods of analysis were employed; these were descriptive analysis and econometric analysis. Descriptive analysis discussed on the traders socioeconomic characteristics, marketing characteristics and problems faced by the pineapple traders.

In a properly functioning market, marketing channels have to guarantee that consumers can buy and that farmers can sell their produce at a market place, they have to balance supply and demand in each market segment at any time. The channel should be able to provide exchange functions (assembling and distribution), physical function (storage and transportation) and facilitating function. The pineapple marketing system identified several actors in the marketing channel who performed different marketing functions from the point of production to the ultimate consumers. The actors included producers, farmer-trader/village assemblers, brokers, commission agents, urban retailers and rural and urban wholesalers. Purchasing strategy of traders indicates that about 87.6% of traders purchase by themselves, and 12.33% purchased the pineapples basing on their long term client relationship. A terminal wholesaler establishes a link with about 3-5 local brokers or village collectors. Likewise, village collectors keep permanent relationship farmers. Regarding the pricing strategy of the traders, the results indicated that the pineapple prices at the regional market are set through negotiation and market forces.

According to the study results on market information sources, the majority of the respondents (88.1%) got destination market information before they went out to sell or buy their pineapples. However, a major concern is that a substantial number of traders 11.9% operate without any dependable source of market information. The sources of market information for producers were friends and neighbors, and traders through telephone. During buying all traders made a price difference for quality and size of the pineapple. The survey result indicates that 73% of the respondent's sources of information were from other traders and through telephone. According to the survey results, 58.3% of the sampled traders used Psv nissans to transport the product, 14.9% of traders used lorries and 13.7% of the traders used pickups.

Transportation cost formed the largest component of total marketing costs in both rural and urban markets in the study area. Efforts to reduce transportation costs might translate to large marketing margin. This was due to the bulkiness of pineapples. The results of the marketing cost indicate that commission agents incurred the smallest marketing cost followed by farmer trader while terminal wholesalers incurred the highest marketing costs.

Co-integration and error correction models were used to test for market integration. Unit root test was used to test for stationarity and the results showed that all price series were non-stationary at level and stationary at first difference. Co-integration was then done on the pair of markets; the tests on residuals confirmed the existence of co-integration between the different consumption markets. Error correction model (ECM) was used to test whether the co-integrating markets have short run relation and are integrated or not. The ECM was found to be negative indicating that speed of price adjustment was towards

the equilibrium. The time required for Bureti market to reach equilibrium with Kericho market was 1.6 months, time for Bureti and Bomet to be at equilibrium was 1.9 months whereas the time required to reach in equilibrium with Narok market was 2.1 months. The results for pineapple market showed that the prices in pairs of markets were cointegrated and followed a long run relationship. These results rejected the null hypothesis that stated that pineapple markets in the selected markets are not integrated.

Using the site price for the selected terminal markets and the primary market prices the null hypothesis was rejected since the calculated site prices were higher than the prices in the local market. It was concluded that price variations across markets reflect the marketing cost. Price differentials between rural and urban markets could be attributed to the scarcity of the product in the urban areas leading to a high demand. This allows for shipment of the product from the surplus to the deficit regions. High price differentials among markets were more than accounted for by transfer costs between markets. Using regression analysis the study found out that costs had a significant effect on prices at 1% level of significance and a 1% increase in the marketing cost in will lead to an increase in price by 0.66%, 0.74% and 0.86 % in Kericho, Bomet and Narok respectively. The reduction of costs from operation, are very important to enhance profitability of the sampled traders.

The marketing constraints were analyzed at both retail and wholesale level. It was noted that both were faced with the same problems but the degree varied with the nature of the business. Retailers faced constraints such as poor market information, transport challenges, lack of capital availability, lack of capital (shortage), storage problems and unavailability of working space was their major challenge as 57% traders reported. For wholesalers their major problem was taxation and other fees where 54% responded,

transportation challenges, information flow and shortage of supply among others. Poor market information and transport problems characterize the marketing system in the study area.

5.2 Recommendations

The following recommendations are suggested based on the findings of this study:

1. There is need to provide necessary infrastructure in the pineapple production and consumption regions. Poor infrastructure, namely transport and communication services, gives rise to large marketing margins because of the high costs of delivering products to destinations. They may also hinder the transmission of price signals because of non-competitive behavior amongst traders. On the other hand, infrastructural development can play an important role in supporting the integration of pineapple markets, facilitating competition, encouraging investment, and allowing a more efficient allocation of resources and enhancing market oriented production.
2. The local government should construct markets or expand the existing markets to provide space for the retailers who are faced with the problems of unavailability of market spaces. This should also provide them with cheap storage facilities in order to reduce their handling and other marketing costs especially in urban markets.
3. Promoting potentially collective organizations (cooperatives) which are assumed to play an important role in improving the bargaining position of the producers, lowering transaction costs, reducing the level of oligopolistic market type by creating competitive market.

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APPENDIX 1: QUESTIONNAIRE

Dear respondent,

This questionnaire aims at collecting data that will form part of the study on **Analysis of the pineapple marketing system in selected markets in Kenya** that is being conducted by a student in Moi University in faculty of Agricultural Economics and resource management. You are kindly requested to assist in the attainment of the student's objectives. The responses will be confidential and will be strictly be used for the purposes of the mentioned study.

Yours faithfully,

Ndiwa Lucina.

1. Name of the trader.....
2. District
3. Name of market
4. Type of market rural () urban ()
5. Type of marketing agent: wholesaler () Retailer () Agent/broker () Farmer trader ()
6. How long have you been in the pineapple marketing business?.....years
7. What is the source of the pineapples you sell and is there any connection with your source? Farmer () Agent () Wholesalers () Others (Specify)
8. Where do most of the pineapples you buy come from? Region/area
9. Where/ to whom do you sell your pineapples?

10. What do you consider when deciding on where to buy pineapples? Distance ()
Prices ()

11. At what price do you sell your pineapples?

12. How much do you pay per pineapple? What is your mode of payment?

Small size

Medium

Large

13. What mode of transport do you use..... and what is the cost

(Ksh) ----- ?

14. How is the transport cost determined? Per volume transported () ,per distance () ;
both vol & dist () others (specify)

15. How long does it take you to get pineapples from the source to the markets?

16. Do you obtain adequate supplies?

17. Which time of the year do you buy and sell pineapples?

18. Who sets prices when you are buying pineapples?

Sellers []

Buyer (self) []

Through negotiation []

19. Who sets prices when you are selling pineapples?

20. How do you set the market prices?

21. What are some of the factors that you consider when setting the prices?

22. How do you transport your pineapples to the market and what is the distance covered?

23. What cost do you incur from the source to the market and how much?

TYPE OF COSTS	TOTAL COST PER TRIP
Cost of pineapples	
Volume per trip	
Labour for loading	
Transport cost	
Labour for off-loading	
Transportation charges	
Market charges	
Packaging	
Others (specify)	
Informal payments e.g Police	
Quantity of the consignment/trip (kgs/other units)	

24. Do you buy and sell pineapples individually or through association?

25. Do you experience pineapple losses before selling?

26. Do you incur any storage costs, Yes (..) No ()

If yes how much? -----Ksh

27. For how long do you store your pineapples?

28. How do you get market information on pineapples?

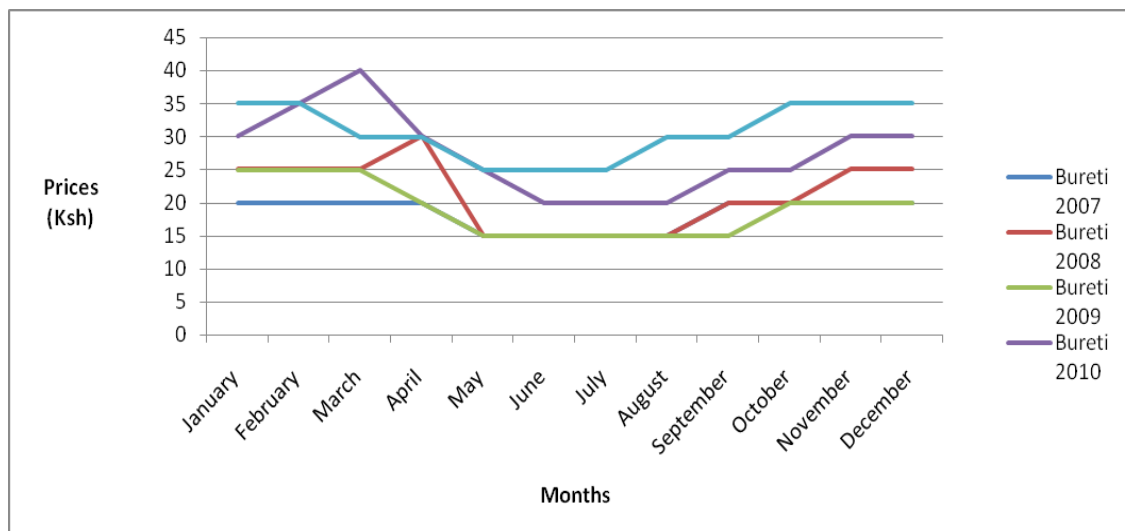
29. What problems do you experience during marketing?

30. What are the key things one has to have before starting this business?

31. What are the barriers to entry in the pineapple market?

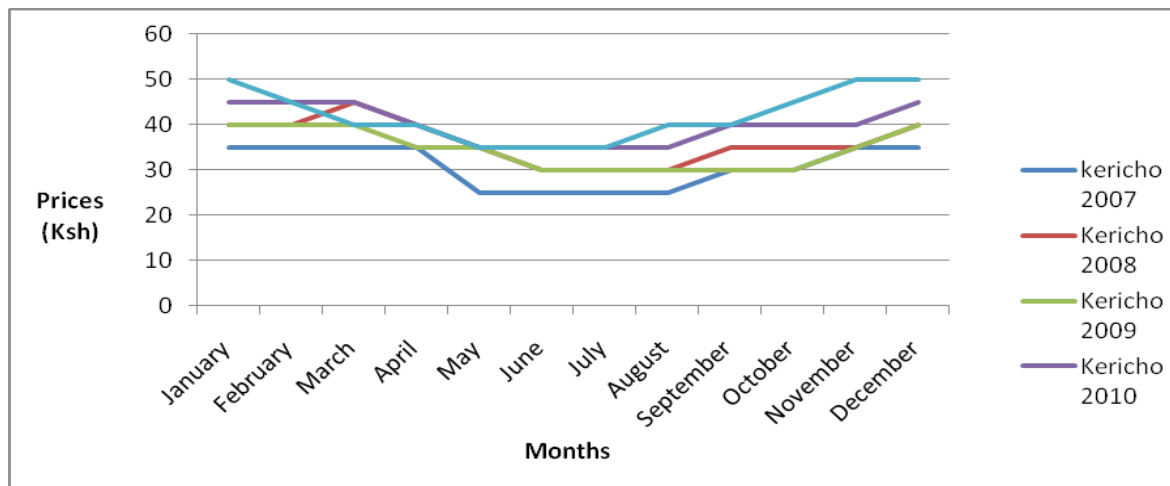
APPENDIX 2: Average Monthly Retail Prices 2007-2011

2.1 Pineapple price trend, Bureti (2007-2011)



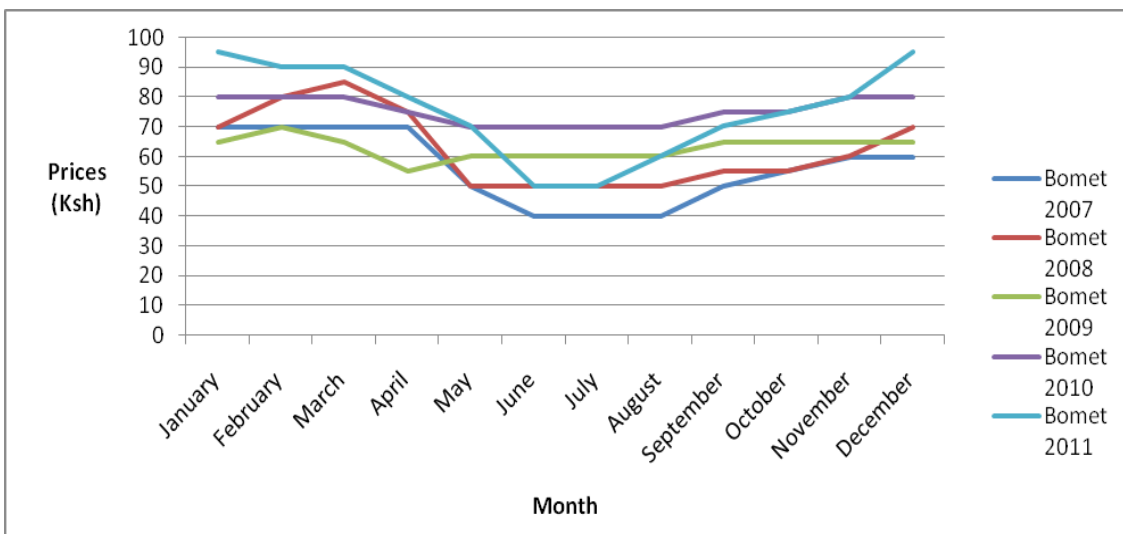
Source: survey data, 2012

2.2 Pineapple price trend, Kericho (2007-2011)



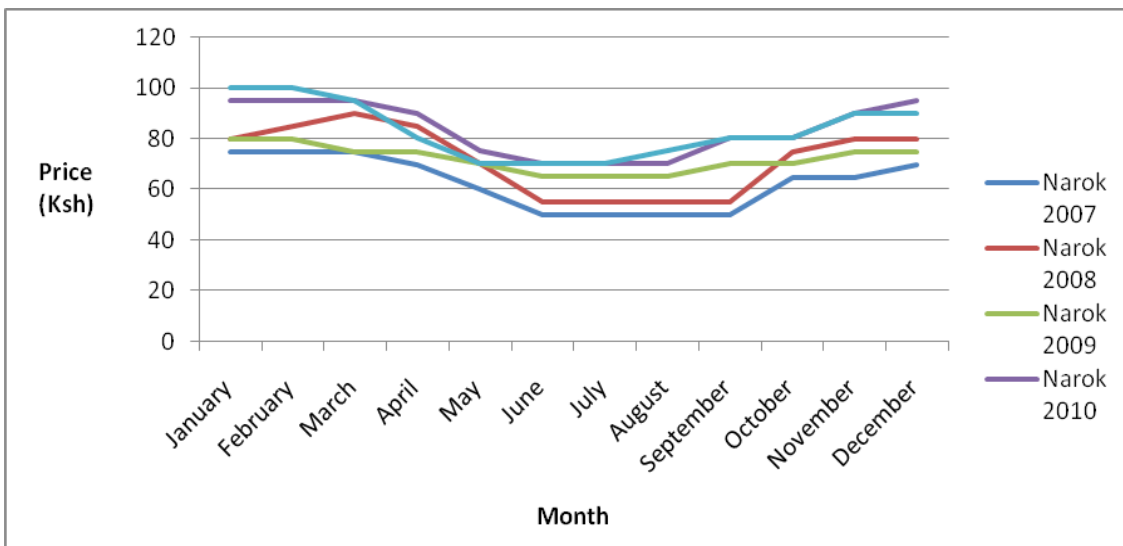
Source: survey data, 2012

2.3 Pineapple price trend, Bomet (2007-2011)



Source: survey data, 2012

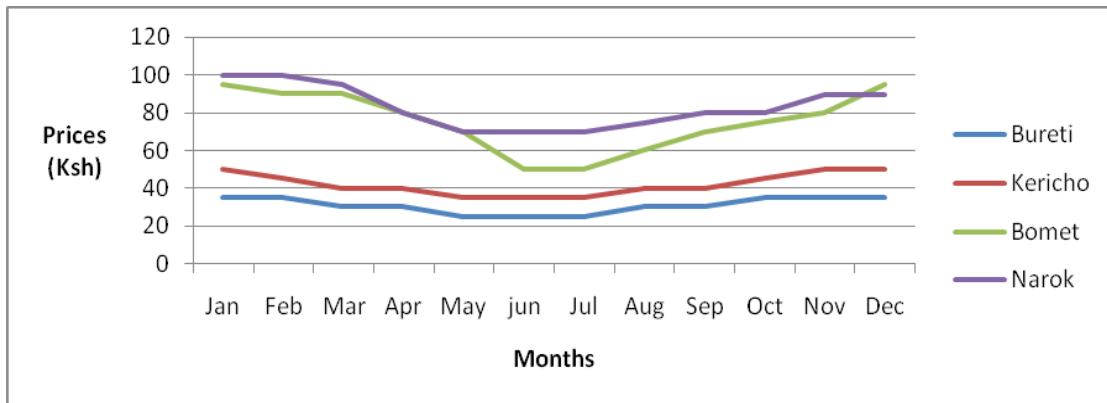
2.4 Pineapple Price trend, Narok (2007-2011)



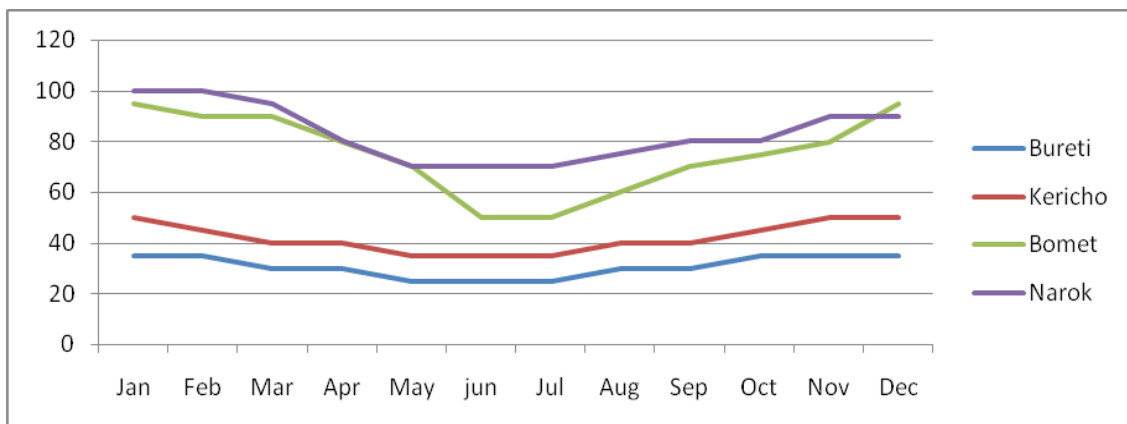
Source: survey data, 2012

2.5 Pineapple price trend in selected markets in Kenya, 2007-2012

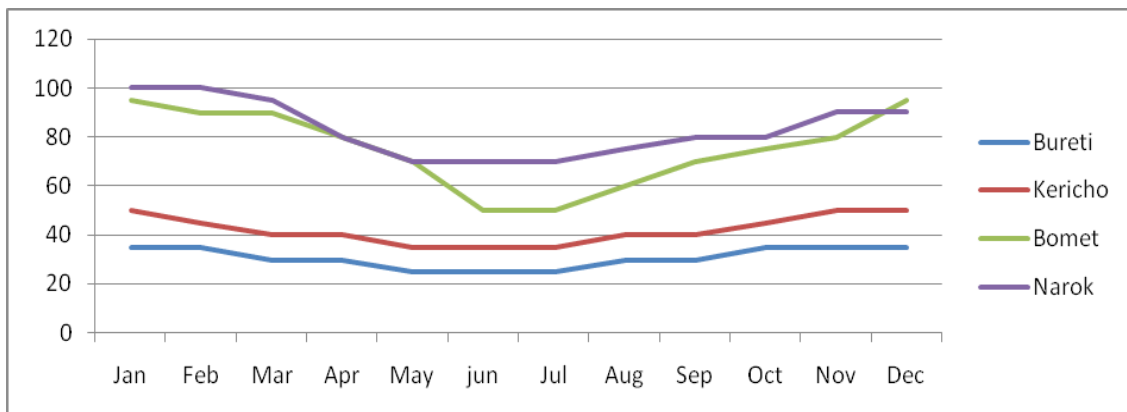
Year 2007



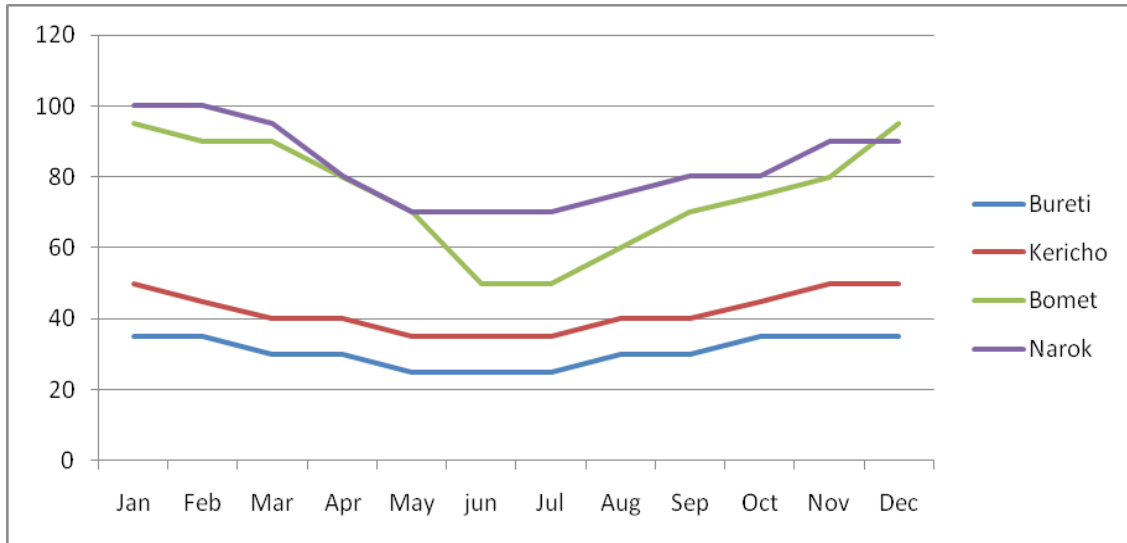
Year 2008



Year 2009



Year 2010



Year 2011

