

**STRUCTURE, CONDUCT AND PERFORMANCE OF SOYBEAN
MARKETING IN EMBU, THARAKA NITHI AND MERU COUNTIES,
KENYA**


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DECLARATION

This thesis is my original work and has not been presented for the award of a degree in any other university or any other award.


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DEDICATION

This work is dedicated to my beloved parents, Mforlem Emmanuel and Mforlem Isabella.

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TABLE OF CONTENTS

DECLARATION.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENTS.....	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES.....	vii
LIST OF TABLES.....	viii
ABBREVIATION	ix
ABSTRACT.....	x
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1. Background of the study	1
1.2. Problem Statement	4
1.3. Objective of the Study.....	5
1.4. Research Questions	6
1.5. Significance of the Study	6
CHAPTER TWO.....	7
LITERATURE REVIEW	7
2.1 Over view of Structure, Conduct and Performance	7
2.1.1 The Concept of Structure-Conduct-Performance	7
2.1.4 Market Performance	14
2.1.5 Limitations of the Structure-Conduct-Performance Model	16
2.2 Conceptual Framework	16
2.3 Studies on Structure Conduct and Performance Analysis	19
2.4 Criticism and Research Gap	25
CHAPTER THREE.....	27
RESEARCH METHODOLOGY.....	27
3.1 Study Area	27
3.1.1 Embu County	27
3.1.2 Meru County	28
3.1.3 Tharaka Nithi County	28
3.2 Sources of data and Data Collection Instrument	31
3.3 Research Design	32

3.4	Sampling methods	33
3.5	Data management and analysis.....	35
3.5.1	Structure of Soybean Markets in Embu, Tharaka-Nithi and Meru.....	36
3.5.2	Assessing market Conduct and Performance of Soybean Markets in Embu, tharaka-Nithi and Meru.....	37
CHAPTER 4: RESULTS AND DISCUSSION.....		39
4.1.	Socio-demographic characteristics of respondents	39
4.1.1.	Age distribution of traders.....	39
4.1.2	: Level of Education based on Gender	42
4.2.	Results on Market Structure	42
4.2.1.	Marketing channels in Embu Tharaka-Nithi and Meru.....	42
4.2.2.	Barriers to Entry and Exit.....	51
4.2.3.	Type of product in the market.....	52
4.2.4.	Market Concentration for Retailers	53
4.2.5.	Market Concentration for Wholesalers	54
4.2.6.	Market concentration for processor	54
4.3.	Conduct and Performance of Soybean Markets	55
4.3.1.	Market Conduct	55
4.3.1	Market Performance	59
4.4.	Constraints to Soybean Marketing	65
4.4.1.	Farmer Groups Perception on what Constraints them from Marketing.....	65
4.4.2:	Constraints faced by wholesalers and retailers.....	67
4.4.3:	Constraints faced by processors and processing companies.....	67
4.4.4:	Opportunities for Soybean Traders	68
Chapter 5: Summary, Conclusion and Recommendation.....		70
5.1	Summary	70
5.2	Conclusion	72
5.3	Recommendations	73
Based on the results gotten from the study, the following are recommended:		73
REFERENCES.....		75
APPENDICES		80

LIST OF FIGURES

Figure 2.1: A complex relationship between structure, conduct and performance

Figure 2.2: Conceptualization of structure conduct and performance Framework

Figure 3.1: Map generated from ArcGIS

Figure 4.1.: Gender Distribution based on the Level of Education

Figure 4.2: Various Channels through which Soybean Passes to the Final Consumer.

Figure 4.3: Figure showing the percentages of soybean bought from the various actors.

LIST OF TABLES

Table 3.1 Definition of Different Traders in this Study

Table 3.2 Method of sampling the actors and number sampled.

Table 3.3: Respondents list in the Counties

Table 3.4: Data analyses by objectives

Table 4.1: Age distribution of traders in Embu, Tharaka-Nithi and Meru

Table 4.2: Gender of soybean traders in Embu, Tharaka Nithi and Meru Counties

Table 4.3: Level of education of respondents

Table 4.4: Sources of Soybean for Traders in percentage

Table 4.5: Factors considered when buying soybean by traders

Table 4.6: Average amount of soybean traded by traders

Table 4.7: Pricing behavior between actors

Table 4.8: Responses to behavior of traders in the market

Table 4.9: Soybean price spread in Embu Tharaka Nithi and Meru (for a 1kg of soybean)

Table 4.10: Percentage of trader's surplus to cost incurred in each channel

Table 4.11: Gross Marketing Margin and Marketing Efficiency Index in each Channel

ABBREVIATIONS

CR : Concentration Ratio

EC : Entropy Coefficient

FAO : Food and Agricultural Organization

GC : Gini Coefficient

GTZ : German Agency for Technical Cooperation

Ha : Hectare

HK : Hannah and Kay Indices

MT : Metric Ton

OPV : Open Pollinated Varieties

REC : Relative Entropy Coefficient

RI : Rosenbluth index

S-C-P : Structure Conduct Performance

SPSS : Statistical Package for Social Sciences

UNIDO: United Nations Industrial Development Organization

USA : United States of America

VL : Variance of logarithms of market share

ABSTRACT

Soybean has the potential of contributing significantly to Kenya's national objective of enhancing food security. The demand of soybean has increased from roughly 150,000MT in 2008 to 220,000MT in 2011, while supply is roughly between 50,000MT to 120,000MT. Many efforts have been put in place by the government to increase on the production and productivity of soybean. However, soybean farmers are faced with the difficulty in accessing the market, while on the other hand traders are experiencing an insufficient supply. Little is known about the soybean market in the central highlands of Kenya. This study therefore aimed at assessing the structure, conduct and performance of soybean markets. Specifically, the study determined the structure of the soybean market, the conduct and performance of the soybean market as well as opportunities and challenges affecting the marketing of soybean in Embu Tharaka-Nithi and Meru Counties. Key informant interviews were carried out among soybean farmers' groups (16), Ministry of Agriculture Livestock and Fisheries (3) and soybean processing companies. A structured questionnaire was administered to respondents comprising of processors (16), wholesalers (15), retailers (86) and assemblers (3). Data was collected mainly on characteristics of respondents and marketing information such as quantities of soybean traded by wholesalers and traders, pricing, availability of price information and access to market. Data was used to calculate Herfindahl Hirschman Index (HHI), gross margins, marketing margin, and marketing efficiency. The results showed that there were eight (8) important marketing channels. Channel one the shortest (farmer-consumer) and channel three the longest (farmer, assembler, wholesaler, retailer and consumer). The HHI showed that wholesalers were competitive (0.0997); retailers were relatively competitive (0.1701) while processors indicated an oligopolistic market structure with an HHI index of 0.18 which is highly concentrated. Farmers, wholesalers and assemblers sold their soybean to processors at a fixed price given by the processors. The prices ranged from Ksh 58 to Ksh 70. Quantities traded were low with an average of 333.3kg for wholesalers, 793.33kg for assemblers and 47kg for retailers in the year 2016'. There were no trader associations in the study area even though farmers engaged in group marketing. Marketing Efficiency Indices revealed that Channel one was the most efficient. Constraints to marketing by farmers include low prices, lack of processing equipment's, inadequate marketing arrangements, and high cost of processing. Wholesalers, retailers, processors and assemblers complained of in-adequate supply of soybean. The study recommends that more processors be encouraged to enter the soybean market and farmers encouraged to do value addition so as to increase their returns.

CHAPTER ONE

INTRODUCTION

1.1. Background of the study

Soybean (*Glycine Max*) is one of the fastest growing agricultural crops over the last twenty years in terms of production. It is expanding at a rate of 8% per year in over 85 countries on a total of almost 100 million hectares (Fliehr, 2013). The impressive growth has occurred despite being a non-native crop in 94% of regions currently producing soybean (Deshmukh *et al.*, 2013). This recent expansion has occurred in the lower latitudes of the world where food insecurity rates and poverty rates are highest and where poor populations are often deficient in protein consumption (Zamasiya *et al.*, 2014). The dramatic rise of soybean in global agriculture can be attributed to the nutritional value it offers to the users given its high protein and oil content, and the economic benefits it provide farmers by being both a highly productive and profitable crop (Chianu *et al.*, 2008).

However, even though worldwide soybean production is increasing, in Africa since 1970, per capita supply of soybean has been estimated to be falling by an average of 0.3% per year (Chianu *et al.*, 2008). This could be attributed to inadequate marketing systems that limit yield growth and also falling real incomes. Trevor *et al.* (2015) suggested that to reverse this falling trend of falling in Africa it will require a collaborative action among the actors and this should be based on information that is reliable and a joint effort between the public sectors and private sector (Mohamedkheir *et al.*, 2016). The collaborative action should include activities to understand the relationships and linkages among buyers and suppliers. Also Chianu *et al.* (2009)

argued that small scale, dispersed and unorganized producers are unlikely to exploit market opportunities as they cannot attain the necessary economies of scale and lack power in negotiating especially the prices reason why a collaborative action is required.

In Kenya, soybean production remains low averaging between 50,000MT-120,000 metric tons (MT) yearly (Keino *et al.*, 2015). The industrial demand for soybean products, however, has continued to grow from roughly 150,000MT in 2008 to 220,000MT in 2011 (Carr *et al.*, 2012).

Many efforts have been put in place to improve on the production and productivity of soybean in Kenya. In the 80s, the German Agency for Technical Cooperation (GTZ) project and United Nations Industrial Development Organization (UNIDO) were introduced to improve on the production of soybean in the Kenya (Jackson, 2016). In addition, the development of the soybean sector through the Alliance of the Green Revolution (AGRA) funded soybean and climbing beans project in the central highlands and also the Kenya Agricultural Marketing Strategy (2011-2016), emphasized soybean production and productivity (MoALF, 2012). All these initiatives demonstrate the Kenyan Government efforts at harmonizing both production and productivity to enhance soybean production in the country. However, little has been done as concerns the marketing of soybean from farm gate to the final consumer (Njeru *et al.*, 2013).

In 2011, funded by the Japanese government, the Kenya Industrial Ministry together with the United Nations Industrial Development Organization (UNIDO) built three soybean processing factories to promote the spread of locally produced and locally consumed soybeans. As the Kenyan government efforts progressed, she realized that

there were some fundamental problems: Kenya had almost no established supply chain especially after the soybean was harvested. As a result, farmers were unable to earn a stable and continuous income through the marketing of their soybean. For the farmers producing soybeans, finding a market was not easy because of limited information (Yegon *et al.*, 2015). Even if they found one, it was beyond their capacity to meet the amounts and delivery times that the processors demanded. Meanwhile, processing manufacturers were unable to obtain steady supplies of high-quality soybeans. Kenya's soybean processing industry, concentrated in Nairobi and Nakuru, is well-established, but it has relied on imported soybeans as the annual demand for 150,000 – 220,000MT per year greatly exceeds the annual local production.

Despite the high demand and the fact that soybean grows well in Kenya, farmers in the western and central highlands of the Kenya have been reluctant to grow soybean. However, even though the total quantity produced in the country is not up to what is required by the processors, farmers are still not able to sell their soybean. A lack of knowledge about how soybeans can be used to make food, combined with uncertainty about the market price after harvest by farmers, has contributed to low production levels. This situation required a thorough solution that would improve soybean access by the processors and hence increase consumption. This is important because no matter how many factors are introduced into the process of commercializing soybean, the market will always be the final adjudicator (Galor, 1990). Without an efficient market, no matter how bountiful production may be, it will always be considered useless if it cannot enter the market. The objective of the Kenyan government is to help small-scale producers to transit from subsistence to commercial farming, while at the same time

improving market access and returns for traders. Sound agriculture markets are of fundamental significance as they ensure fair returns to all market participants, from producers to the final consumer.

Well-functioning markets provide remunerative prices to market participants and boost their efforts for increasing and sustaining agricultural production and marketing. Despite government efforts to develop the soybean productivity, local producers and traders, in central highland of Kenya are faced with unfavorable market conditions such information asymmetry, lack of access to markets and competition from neighboring countries such as Uganda (Moepeng, 2013). Traders in the central highlands sometimes resort to sourcing their produce from neighboring Uganda and DR Congo because most of the farmers in the area are in closed contact just with some few processors. This ends up creating an imbalance in the market where these few contracted traders control a larger share of the market Kumar *et al.* (2011).

Many studies have been carried out in areas of production and introduction of high yielding varieties of soybean. However, there is little knowledge on the marketing of soybean in the central highlands of Kenya. Improving the structure and performance of agricultural markets in Kenya can make an important contribution to increasing incomes and reducing poverty by enabling smallholder to use the opportunity available for improving the marketing of their produce.

1.2.Problem Statement

There is an increasing awareness world wide of the nutritional content of soybean as a source of protein for both humans and animals implying soybean is seen as a future

crop. This therefore means demand for soybean will keep increasing (Mutegi *et al.*, 2013). However, soybean farmers are faced with the difficulty in accessing the markets despite the fact that the current demand in the market for soybean is greater than the supply. Reasons for this scenario are not clear: for example, the reason may be that there are just few buyers in the industry implying they may collude and sell their product at a high price resulting in an uncompetitive market. There is limited information regarding the soybean market in the central highlands of Kenya generally and particularly how aspects of the markets such as market concentration, the market share, the nature of competition, and behavior of market participants affect the performance of the market. The purpose of this study is therefore to address this information gap through analyzing the market structure; conduct and performance of the soybean market in Embu, Tharaka-Nithi and Meru Counties. Analysis of the structure, conduct and performance of the soybean market will provide insight into what is happening in the market for soybean products and help explains the current market situation in the Central highland of Kenya.

1.3. Objective of the Study

This study aimed at analyzing the structure, conduct and performance of soybean marketing in Embu, Tharaka Nithi and Meru Counties

Specific Objectives

1. To determine the structure of the soybean market in the counties of Embu, Tharaka-Nithi and Meru

2. To assess the conduct and performance of the soybean market in Embu, Tharaka-Nithi and Meru Counties
3. To identify the challenges and opportunities in the marketing of soybean

1.4. Research Questions

- 1 How is the structure of soybean markets in the counties of Embu, Tharaka-Nithi and Meru?
- 2 How is conduct and performance of the soybean markets in Embu, Tharaka-Nithi and Meru?
- 3 What are the challenges and opportunities in the marketing of soybean in Embu, Tharaka-Nithi and Meru?

1.5. Significance of the Study

This study aimed at analyzing the structure conduct and performance of soybean marketing in Embu, Tharaka-Nithi and Meru counties. This study has provided information on the structure, the conduct and performance as well as constraints and opportunities faced by the farmers. This information is envisaged to assist policy makers in designing appropriate policies for intervention. Also, extension workers, governmental and non-governmental organizations that are engaged in soybean development will benefit from the results of this study. The findings of this study will also be useful to soybean producers, processors, whole sellers, traders and marketing agents to make informed decisions. The study will also serve as a reference document for researchers as literature on the same or related kind of study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Over view of Structure, Conduct and Performance

2.1.1 The Concept of Structure-Conduct-Performance

The SCP paradigm postulates that there is a causal relationship between market structure, conduct and performance. It argues that performance is determined by the conduct of firms, which is in turn determined by structural characteristics of the market. Attractiveness of the SCP approach lies in straight forwardness of the chain of reasoning and the relative ease with which structural characteristics can be identified (Bain, 1975). Mason first formalized the approach in 1939 and Bain, 1959) modified it to obtain more generalized conclusions from cross-section studies (Teshome, 2014).

The Structure-Conduct-Performance (SCP) paradigm comprises:

Structure, which is described by seller concentration, entry barriers and degree of product differentiation, conduct is the behavior of firms, and is explained by pricing strategies, advertising, collusion, capacity investment and research and development. Performance, refers to an outcome that is assessed in terms of allocative efficiency and the widely used measures of performance are price-cost margin and profitability Tung *et al.*,(2010).

The conventional premise which states that market structure is exogenous is unreliable, since conduct and performance affect structure. In light of this fact, Koch modifies the definition of structure as “the relatively permanent strategic elements of the environment of a firm that influence, and are influenced by, the conduct and performance of the firm in the market in which it operates” Edwards, *et al.*, (2005).

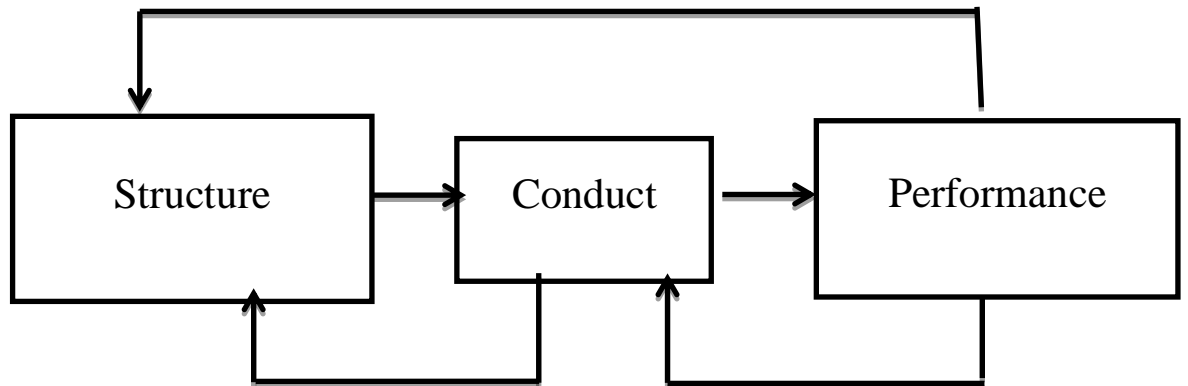


Figure 2.1: A complex relationship between structure, conduct and performance

The traditional structure performance hypothesis and efficient structure hypothesis are two competing hypotheses in the SCP paradigm. The structure performance hypothesis states that the degree of market concentration and the degree of competition are negatively related. This is because market concentration encourages firms to collude and hence discourage competition. This hypothesis will be supported if a positive relationship exists between market concentration and performance, regardless of efficiency of the firm, measured by market share (Edwards, 2006).

The efficiency structure hypothesis asserts that there is a positive relationship between performance of a firm and its efficiency. This is because market concentration emerges from competition where firms with low cost structure increase profits by reducing prices and Structure Conduct Performance expanding market share. In contrast to the traditional SCP paradigm, it postulates that more efficient firms earn increased profits because they are more efficient and not because of collusive activities.

2.1.2 Market Structure

Market structure relates to the importance and characteristics of individual markets within the economy. It describes the environment within which firms in a particular market operate. It can be identified by considering the number and size distribution of buyers and sellers (market concentration), the extent to which products are differentiated, the conditions of entry and exit and the extent to which firms are integrated or diversified (Weiss, 1975). Market structure is generally examined in terms of degree of sellers' concentration as it shows the extent of imperfect competition. In the absence of entry barriers, even the most complete monopoly is open to competition from new entrants.

Nzima & Dzanja, (2015) carried out a study to assess the efficiency of soybean markets in Malawi. They used the SCP approaches. The specific objectives of the study were to analyze soybean marketing systems, the profitability and production constraints. Spatially distinct soybean markets were examined with the help of time series price data. From the results obtained, most of the marketing channels were inefficient. Results from five marketing channels with minimal value addition were profitable. Also, the results showed that the markets were weakly integrated and segmented with a few sellers. The significant factor that affected soybean production was the quantity of seed used. The study recommended that extension services be strengthened. Also the need to enforce linkages between those agro dealers mostly in seed and farmers, organized soybean seed system, improved roads to production areas; improved and affordable technologies on production and value addition; and enforce farmer organizations.

2.1.2.1 Market concentration

The most widely used measure of market structure is market concentration, especially seller's concentration. The degree of concentration of a market is negatively related with the number of firms in that market. Market concentration is an attractive measure of market structure as published data on the number and size distribution of firms is usually accessible and also as it can shed light on the degree of market power, which can in turn, help to make inferences about performance.

There are several measures of sellers' concentration. These can be categorized into absolute measures of concentration and relative measures of concentration. "Absolute concentration measures combine the number of firms and their size distribution in a single measure while relative measures of concentration show the inequality of firm sizes in a market and disregard the number of firms present." (Mohamed *et al.*, 2013).

Absolute measures of concentration include the N-firm concentration ratio, Herfindahl Hirschman Index (HHI), Hanna and Kay indices, the Horvath index and Rosenbluth index. Gini coefficient and variance of natural logarithms of market shares are relative measures of concentration. The above-mentioned measures are positively related with concentration, as they increase with an increase in concentration. Inverse concentration measures, which fall with a rise in concentration, include occupancy count, the entropy coefficient, the relative entropy coefficient and numbers equivalent of Hanna and Kay indices (Pisanie, 2013).

Herfindahl-Hirschman index (HHI)

The Herfindahl index, also known as Herfindahl-Hirschman Index (HHI), is a measure of the size of firms in relation to the industry and an indicator of the amount of

competition among them. It is calculated as the sum of the squares of the market shares of firms within the industry.

$$\sum_{i=1}^n S_i^2$$

Where S_i is the market share of firm i in the market and N is the number of firms. It ranges from $1/N$ to 1, where N is the number of firms in the industry. If percent are used as whole numbers, the index can range up to 10,000.

A HHI index below 0.01 (or 100) indicates a highly competitive index.

A HHI index below 0.15 (or 1,500) indicates un concentrated index.

A HHI index between 0.15 to 0.25 (or 1,500 to 2,500) indicates moderate concentration.

A HHI index above 0.25 (above 2,500) indicates high concentration.

Increases in the Herfindahl index generally indicate a decrease in competition and an increase of market power, whereas decreases indicate the opposite. In order to ensure the validity of concentration measures, (Donkoh *et al.*, 2012) list conditions which these measures should always fulfill. These are: “The concentration curve ranking criterion: if firms are ordered from largest to smallest and plotted against their cumulative output and the concentration curve of one market lies above that of another market at all points [except (0, 0) and, when N is equal in the two markets, (N, 1)], a positive concentration measure of the first market must be greater than that of the second market, while an inverse concentration measure must be lower.”

The sales transfer criterion: measured concentration should increase if customers switch from smaller to larger firms and vice versa.

The entry criterion: if a new firm which is smaller than the average size of incumbent firms, enters the market, measured concentration should decline, assuming that the relative market shares of the existing firms decline proportionately to accommodate the new firm.

The merger criterion: measured concentration should increase if existing firms merge showed that concentration ratios, the occupancy count (CRN%), the Gini coefficient (GC), the variance of logarithms of market shares (VL) and the relative entropy coefficient (REC) and the Horvath index fail to meet the above-mentioned Hanna and Kay criteria and advised that these measures should not be used to study seller concentration. On the other hand, Herfindahl-Hirschman index (HHI), the Hannah and Kay indices [HKI(α)], the Rosenbluth index (RI), the numbers equivalent of the Hannah and Kay indices [HKIne(α)] and the entropy coefficient (EC) were found to meet the conditions laid out by Hanna and Kay. Accordingly, the HHI is used in the present study to measure the degree of concentration in the soybean market.

2.1.2.2 Entry barriers

An entry barrier is any factor that reduces the motivation or ability of potential entrants despite established firms' excessively high profits. The ability of firms to enter an industry is an important structural factor that determines market performance Bain identified product differentiation and absolute cost advantages of incumbent firms to be the main determinants of entry into a market. On the contrary, Stigler emphasized that

product differentiation and high absolute capital requirement of operating at minimum efficient scale are entry barriers, only if it is more expensive for entrants to create a specific amount of differentiation and if entrants are faced with higher cost of capital than incumbents, respectively.

Neo-Austrian economists only consider barriers created by governments to be persistent, as enterprises cannot overcome them. Already existing firms in a market can deliberately create entry barriers to influence the strategic decisions of prospective competitors. This implies that structure is to a great extent endogenous, except in the short run (Stead et al., 1996). With respect to the soybean market, entry regulation is believed to hinder its development.

2.1.3 Market Conduct

Conduct represents the decisions and policies of producers. It relates to pricing policies, collusion, attempts of entry barrier creation, investment and mergers. Conduct affects performance directly and through feedback on market structure. Successful firm strategies and market characteristic often describe market conduct (Weiss, 1975) . Selling effort, which includes advertising and marketing of products or services, influences financial performance. Advertising differentiates products from that of rivals, creates entry barriers and enhances the image of firms, while expenditure towards building up marketing and distribution related complementary assets improves financial performance by raising competitiveness through developing marketing and service networks, which, in turn, facilitates appropriateness of products/services and enhances efficiency Sahoo *et al.*,(2012).

Product strategies are concerned with the number and diversity of products, product innovation, and product scope and product design. It includes features of a product such as quality, convenience, branding and the likes. With regard to pricing strategies, for a new product, the pricing strategy may be skimming or penetration pricing, whereas for an already existing product, the producing firm may maintain, increase or decrease the price of the product. Pricing decisions are guided by pricing objectives, cost, competition, and demand for a product. Distribution strategies deal with the channels a firm may use to make its goods and services available to customers while promotion strategies are concerned with planning, implementing, and control of persuasive communication with customers that may be designed around advertising, personal selling, sales promotion, or any combination of these

2.1.4 Market Performance

Market performance is concerned with the benefits an industry generates for its different stakeholders (Stead et al., 1996). Measures of market performance reveal whether there is market power in an industry (Perloff, 2007). Market performance may be measured by profitability, productivity and efficiency.

2.1.4.1 Profitability

Financial self-sufficiency (FSS) refers to the ability of a MFI to cover all of its costs through income generated from its own operations. It is a preferred measure of financial performance as it offers a more complete summary of inputs and outputs than standard financial ratios such as return on assets or return on equity

2.1.4.2 Productivity

Productivity refers to “the amount of physical output produced by one unit of a given factor of production at a stated time period.” In this study, marketing productivity measures the efficiency with which marketing inputs are used to generate target levels of marketing output. A rise in the productivity of marketing inputs shows the amount of input that has been saved or employed more productively. Productivity may be influenced by different factors(Weiss, 1975). These may include economic factors, demographic and social factors, manpower, institutional mechanisms, policies and strategies, infrastructure, technology and management styles Greer, (1992). With respect to soybean marketing in this study, productivity measures the quality of the services delivered by the various actors in marketing soybean till the soybean reaches the final consumer.

2.1.4.3 Efficiency

Efficiency involves the production of an output with the use of the least possible resource, whether be it physical resource or monetary resource. In order to attain efficiency, a firm must both be technically and economically efficient (Greer, 1992). Minimizing the cost of operations to the least possible level enhances efficiency. In the agricultural industry, cost per borrower is one of the measures of efficiency. In this study efficiency is looked at from the marketing aspect. Marketing efficiency is the ratio of output of marketing system (value added) to inputs used in the marketing system (cost of marketing). The higher ratio denotes higher efficiency of produce marketed through a particular marketing channel.

2.1.5 Limitations of the Structure-Conduct-Performance Model

The SCP model has been criticized as being descriptive rather than theoretical (Tung *et al.*, 2010). Other limitations of the model include the following. The empirical test of the SCP involves testing the relationship between structure and performance, considering conduct as either a black box or theoretically proven. The above specification is due to the fundamental hypothesis that concentration determines profitability. Another issue of importance in the empirical literature of SCP is the measurement of performance. Theoretically, Lerner index (ratio of the difference between price and marginal cost to price) is a good measure of market power. Yet, it is not always possible to empirically derive the index, as it may be challenging to find data on the marginal cost of firms. Another measure of market power is the concentration ratio. However, this measure is also criticized as it does not account for the distribution of market shares across all firms in an industry, unlike the HHI.

2.2 Conceptual Framework

The study was based on industrial organization which states that there is a causal link between the structure of a market in which a firm operates, the organization's conduct, and in turn the organization's performance in terms of profitability (Bain, 1975). The theory is captured in the SCP model first developed by Joe S. Bain. The model explores the relationship between the market structure, conduct and performance and the effects of the internal and external factors on all three. In the 1980's, McKinsey suggested a dynamic approach to the SCP model, rather than only focusing on the static element of the model. The dynamic approach suggests that the relationship among structure, conduct and performance is not only unidirectional but also flows both ways. The

performance of the market can influence the conduct of the market participants which in turn influences the structure of the market.

According to (Beamon & Chen, 2001) market structure is influence by basic conditions of demand and supply such as the number, type and distribution of sellers in the market. In order to identify the structure of the soybean market, variables such as type of product marketed, barriers to entry and exit and the availability the number of buyers and sellers are considered. The way the structure of the soybean market in the central highlands of Kenya is organized will influence the behavior of firms and individuals operating in the market. For example a if the buyers of soybean (wholesalers, processors and retailers) in the study area with substantial amount of market power may misuse that that power and set prices sufficiently low with the purpose of forcing a competitor to withdraw from the market (Beamon & Chen, 2001). The type of behavior depicted by players in the soybean market together with the structure will determines the performance of the soybean market. The performance of the market is measured by comparing the results of the soybean players in the market in terms of efficiency. Different ratios may be used to determine firm efficiency such as profit margins, marketing margins and technical progress (Edwards *et al.*, 2005). In this study, the supply of good soybean seeds to farmers and on time has an influence on the quantity of soybean produced which intern affects the market structure. It affects the market structure based on the number of buyers and sellers of soybean who enter the market, also intern of barriers to entering and exiting the market. Also, the number of buyers and sellers of soybean will also determine how prices will be set and this will affect the performance of the market interns of marketing effecting and the cost incurred by each

actor along the marketing chain of soybean. In this study, marketing margin, and marketing efficiency were used to sum up the results of the firms along the soybean market in the central highlands of Kenya. This is shown on the figure below.

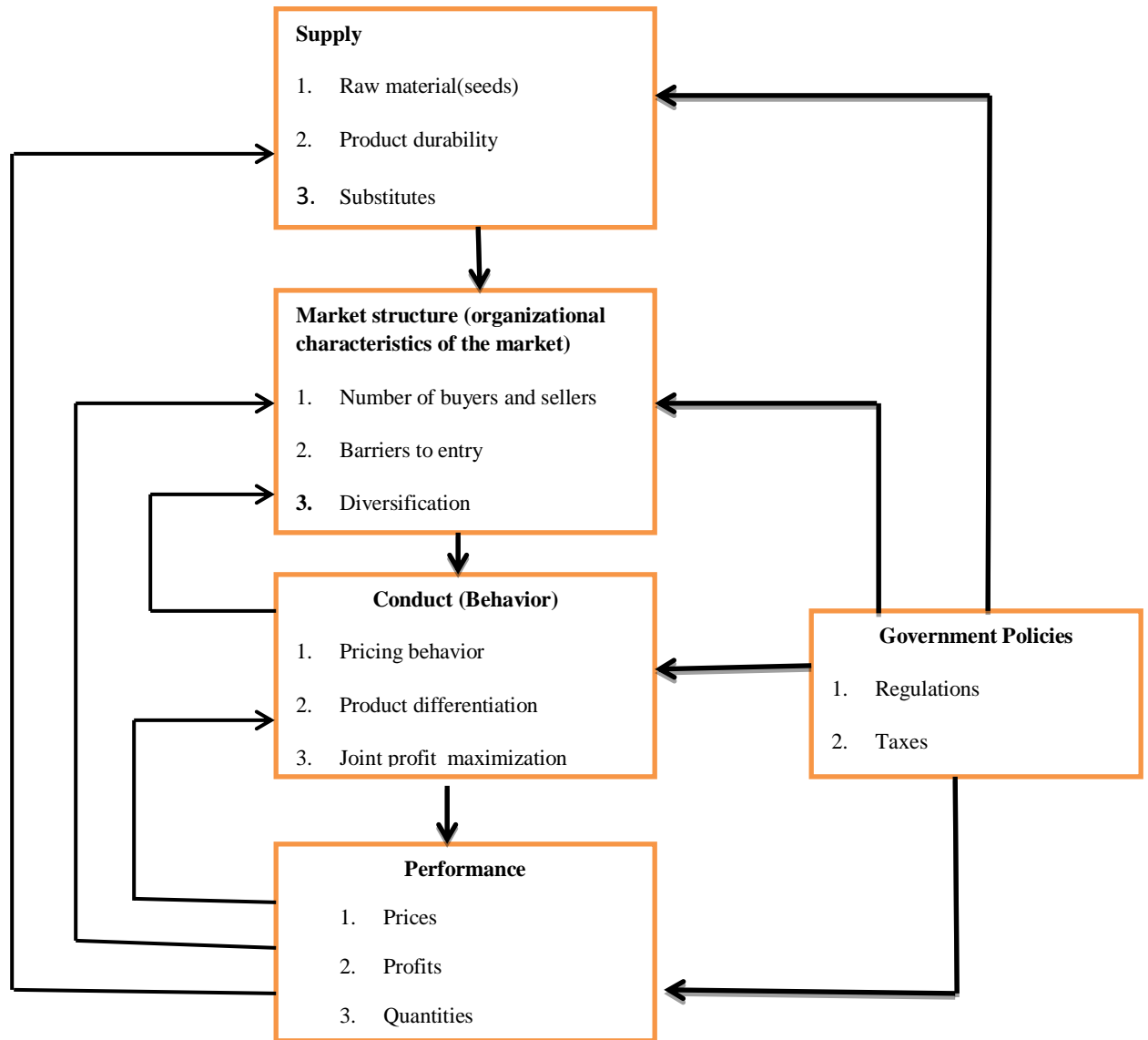


Figure 2.2: Conceptualization of structure conduct and performance Framework

Source: Adapted and modified from Giroh, & Yakub (2010)

2.3 Studies on Structure Conduct and Performance Analysis

Dodo & Umar, (2015) assessed the structure, conduct and performance of beef marketing, as well as the constraints faced by the beef marketers in Katsina local government, in Nigeria. A Multistage sampling technique was used to select 60 respondents from the target population. The study used a combination of Gini Coefficient, and marketing efficiency ratio to achieve its aims. The market structure characteristics discovered by the study consisted of product homogeneity, absence of barrier to trade, numerous buyers and sellers, full awareness on information on market conditions among market participants and a Gini Coefficient of 0.23 (index of 23%). Market Conduct considered by this study consisted of absence of exclusionary measures against existing and incoming firms, sales promotion by selling on credit, and price determination using cost price as a measure. The study also revealed a marketing efficiency ratio of 2.20 depicting a well performing market. Interventions in livestock marketing through addressing the marketers' infrastructural needs such as storage and credit facilities to better up their situations are recommended by the research. This study has similarity with the present study because its looks at the performance in terms of the marketing efficiency. However, they differ in that this present study will also look at the opportunities in the marketing of soybean.

Eronmwon *et al.*, (2014) examined the conduct, structure and performance of plantain marketing in Edo State. The results obtained showed that the markets were highly competitive with many buyers and sellers. Moreover, the results showed that prices were determined by the forces of demand and supply and also by other factors such as purchase price, buyer's ability to bargain and transportation cost. The Gini coefficient

value of (0.677) indicated some level of inequality and this value indicates suggests the presence of market concentration among the respondents. This study did not look at the market concentration in terms of the Gini coefficient however, they failed to look at the various channels in the marketing of plantain which could affect the performance.

Girei et al., (2013) carried out a study to assess the problems affecting structure, conduct and performance of cowpea marketing in Yola South and Yola North Local Government Area of Adamawa State, Nigeria. The finding of the study indicated that, several problems were associated with cowpea marketing in the study area namely; inadequate capital, pest infestation, and low profit, high cost of transportation, bad road network, storage, high taxes, inadequate market information and lack of standard measure are some of the problem militating against cowpea marketing in the study area. Amongst all the problems inadequate capital, pest infestation and low profit ranks the first three most serious problems. The study therefore recommends that, Government and the private sector should facilitate the marketers in accessing a timely and affordable credit facility so as to sustain and expand their marketing activities. Government should open up and rehabilitate the road network in the hinterland to facilitate easy evacuation of agricultural inputs and commodities in and out of the markets. This study looked at the problems affecting the structure conduct and performance of the market however the author failed to look at individual aspects of the structure conduct and performance. The current study will look into the different aspects affecting the structure, conduct and performance.

Haruna, (2012) analyzed the efficiency of marketing system of tomatoes in Pwalugu in the Upper East Region of Ghana. Data was analyzed using deconstructed Marketing Margins, Gini Coefficient, Returns on Capital Employed and the marketing efficiency. The results show that retailers received the highest profit followed by wholesalers and farmers. The study recommended that a module under the National Youth Empowerment Program be put in place for tomatoes processing. This study is similar with the present study in that it assesses the marketing efficiency. However, the study did not look at the opportunities in the marketing systems which the present study will look at.

Funke & Raphael, (2012) analyze the garri industry through a Structure-Conduct-Performance (SCP) framework utilizing cross-section data for the year 2009 in Southwestern Nigeria using a multi-stage sampling technique. Descriptive statistics, gross margin, gini-coefficient and production function analyses techniques were used to analyze the data from farmers. The profitability analysis showed that an average marketer incurred an average total variable cost of N7, 640.30 per week but earned average revenue of N12, 452.35 per week indicating N4, 812.05 as gross margin. A Gini coefficient of 0.4256 was obtained in the study implying a high level of concentration in the garri market. The study concluded that there were great opportunities for garri marketers in Nigeria. This study has similarity with the present study in that it looked at the opportunities for garri marketer. However, the study talked just of the farmers and not the other actors involved in the marketing of garri in the supply chain. The present study will include the other actors involved in the soybean marketing chain

Giroh *et al.*, (2010) examined the structure, conduct and performance of farm gate marketing of natural rubber in Edo and Delta States of Nigeria. To analyze the data collected, Gini coefficient and budgetary technique were applied. The marketing margin and efficiency were 44.03 and 122% respectively. The Gini coefficient analysis showed that the market was concentrated (0.256), showing the possibility of non-competitive behavior and equality in earnings among marketers. This study in the present study are similar in that they both look at the marketing chain of the product. However they differ in that the present study will include the constraints and opportunities in the marketing chain.

Muslim *et al.*,(2008) analyze the real market condition related to the instability of palm cooking oil price in Indonesia by using Structure Conduct Performance (SCP) method. To know the size of market share, the market structure was identified together with barriers to entry in palm oil cooking industries. Econometric analyzes mainly multiple regression was used to know the relationship between variables indicating structure and industrial performance. Data was collected from the year 2001-2005. The research found out that there was an oligopoly market structure due to the behaviors of a few big companies. Also, the results showed that the average palm oil cooking industry profit margin was more than 0 (0.2-0.35) implying a company has the power to control the market. The study also concluded that policies put in place by the government to stabilize palm oil cooking prices were not effective due to the persistent increase in the prices. This study looked at the structure conduct and performance of palm cooking oil in terms of the relationship between the variable using regression model. However, they did not look the various channels involved and their efficiencies. The present study will

study the relationship between the structure conduct and performance of soybean marketing by looking at the degree of concentration, how it affects price determination and the outcome of the performance.

Odhiambo *et al.*, (2006) carried out a study to analyze the structure and performance of the beans marketing system in Nairobi metropolitan area, Kenya. Primary data augmented by secondary data were used to analyze the marketing system by applying descriptive statistics, concentration ratios and co-integration models. The results obtained from the study showed that the beans marketing structure approached that of pure competition; however, lack of capital was a barrier to entry into the wholesale and retail trade. The Johansen likelihood-based vector autoregressive model showed that there was no significant co-integration of the major markets in the city possibly due to inefficient market information flow. However, even though the study looked at the structure and performance of beans marketing, little is said about the conduct in terms of the behavior of actors in setting the market price. The present study will look at the conduct of the marketing while also looking at the opportunities for various player.

Lubungu *et al.*,(2013) carried out a study to analyze soybean value chain in the Eastern Province of Zambia. The objective of value chain analysis was to identify the factors limiting smallholder linkages to the growing markets for soya in Zambia, and to provide concrete strategies to overcome them. The study highlights the following challenges: first, there is limited availability of high yielding soya seed and limited incentive for private investment in smallholder soya seed multiplication. This is partly because smallholder farmers prefer open pollinated varieties (OPVs), which can be recycled for

up to five years with minimal yield loss. Secondly, yield improving input usage in soya bean production is low. Smallholder farmers rarely use inoculum in soya bean production due to a lack of knowledge about the benefits of using inoculums, coupled with problems associated with acquisition. Thirdly, due to low production, farmers tend to have small quantities to sell and the earliest opportunity farmers have to turn their crop into cash is when the prices are the lowest of the marketing season during harvest time. Limited quantities of production do not justify transporting soya to potentially more remunerative markets in the district capital where buyers are willing to pay a premium on bulk purchases. Lastly, there is a large amount of trade distrust between farmers and traders, and it flows in both directions. Farmers complain of rigged scales whereas traders complain that sacks are frequently loaded with sand or stones to increase their weights. The study recommends that projects should work with seed suppliers and agro-dealers on forecasting demand based on project interventions. In addition, work with farmers on local bulking for onward sale. Strategies for improving farmers' capacity include market training on negotiation, market identification, and capacity to store. This study is similar with present study in that they both look at the actors in the soybean marketing chain and the constraints in the marketing. However, the present study will look at the marketing chain through the structure conduct and performance method for better understanding of the problems.

Deshmukh *et al.*, (2013) carried out a study on constraints in the marketing of soybean using primary data which was collected by personal interview. With psychological characteristics, maximum number of respondents had shown medium category economic motivation (44.66%), scientific orientation (45.33%), risk preference

(41.33%), respectively. According to constraint level 25.33 per cent showed high constraint level. In rank of situational constraints, first rank was given to non-available of labour in time. In case of knowledge and information constraints, first rank was given to lack of knowledge about seed treatment and in communication constraints lack of contact with extension agencies was ranked first. In economic constraints, the first rank was given to high cost of manures and fertilizers and in production constraints first rank was given to severe insect and disease infestation. Among the marketing constraints, lack of processing plant in local areas was ranked first. The results further indicated that age and scientific orientation were non-significantly associated while education, land holding, annual income, socio-economic status, economic motivation and risk preference were significantly associated with constraint level. All the respondents suggested a need of co-operative processing plant in the area and refresher training before season was suggested by 99.33 per cent of the respondents. However even though this study looked at the constraints in the marketing of soybean, it did not include the opportunities for better understanding.

2.4 Criticism and Research Gap

Based on the literature reviewed in the forgoing section, no study has examined the market structure, conduct and performance of any product while looking at the various actors involved in marketing chain in Kenya (Chianu *et al.*, 2009; Tinsley, 2009; Mahasi *et al.*, 2011; Jackson, 2016). Therefore, this study is unique in the sense that it examines the soybean markets while focusing on the different actors and how the structure of the market influences the conducts of the specific actors and the overall

performance of the market. The Herfindahl Hirschman Index (HHI) was used to examine the structure of the soybean market in keeping with previous literature. To examine the conduct of the market participants, variables such as pricing strategies, collusion and advertising and promotion were used. To assess the performance of the soybean market, the profit margin, marketing margin and marketing efficiency were used.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

The study was undertaken in three sites; Meru County, Tharaka Nithi County, and Embu County in the central high lands of Kenya. These counties were purposively chosen because they are the counties where soybean is highly cultivated in this region. In Embu County Mbeere South and Manyatta Sub-Counties were chosen, Tharaka and Maara Sub-Counties for Tharaka Nithi and for Meru, Imenti South and Tigania East Sub-Counties were chosen. These areas were also chosen purposively in the counties because they are the major areas in the various counties where soybean is cultivated.

3.1.1 Embu County

Embu County borders Tharaka Nithi County to the North, Kitui to the East, Machakos to the South, Murang'a to the South West, Kirinyaga to the West, and Meru to the North West. It comprises of five sub counties namely, Embu East, Embu West, Embu North, Mbeere South and Mbeere North. The county has an approximated population of 516,212 and covers an area of 2,818 Km² and lies at an altitude of approximately between 1000 to 1500metres above sea level. The monthly average temperatures range between 140C and 250C. The average annual rainfall ranges from 1200mm to 1500mm for the Embu sub counties. The Mbeere sub-counties are characterized by hot and dry weather condition for the greater part of the year. Annual rainfall ranges between 640 mm to 1,100 mm with most parts of the area receiving 550 mm of rainfall per year (Kithama and Obondo, 2013). The soils in Embu sub counties are mainly humic nitisols derived from basic volcanic rocks. Soils in Mbeere are nitro rhodic ferrassols (Jaetzold

et al., 2006). The main food crops grown include; maize, beans, yams, cassava, soybean, millet, sorghum, bananas and arrowroots among others. Cash crops include Coffee, Tea and Pyrethrum. Livestock keeping is also practised and includes cows, goats, sheep and chicken.

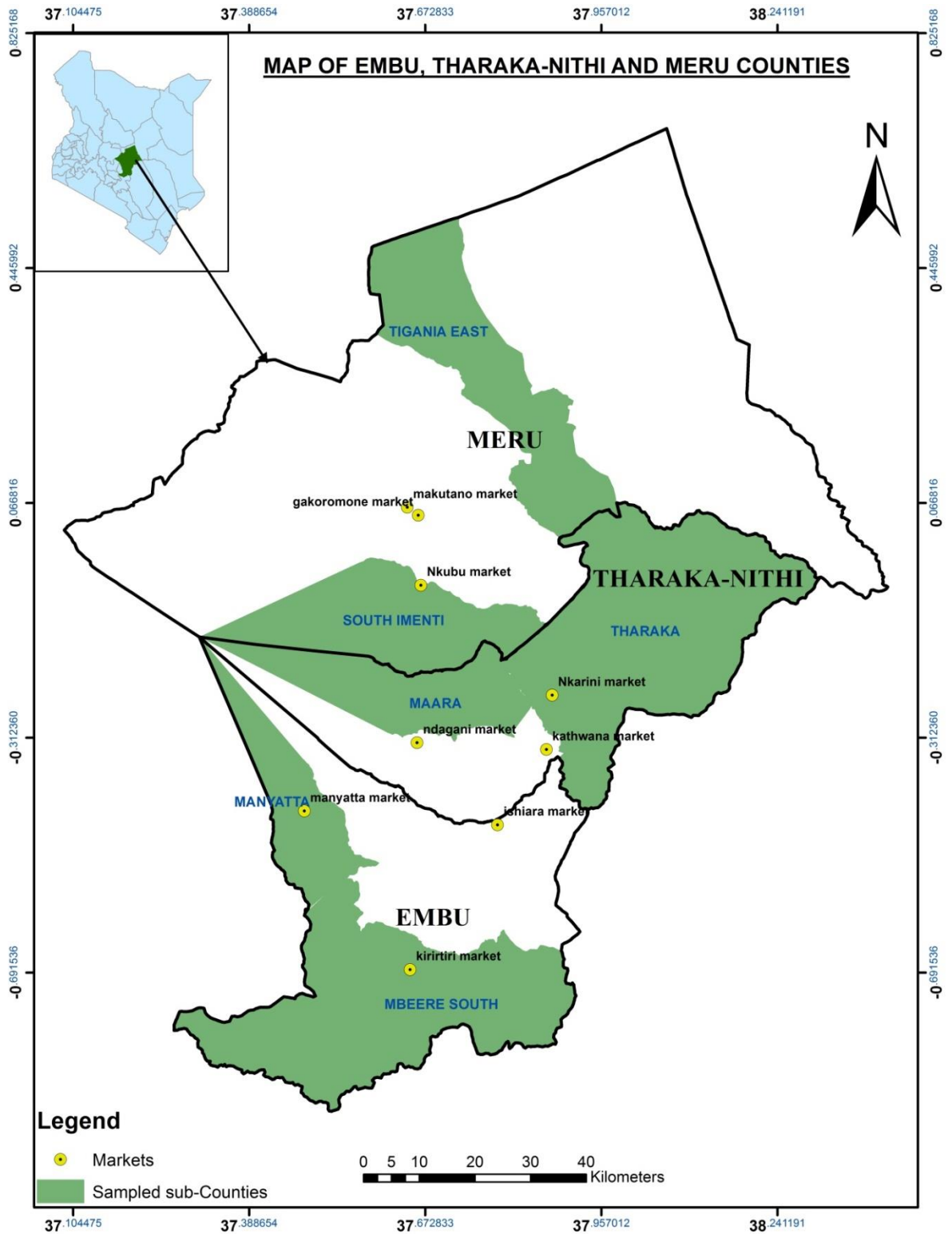
3.1.2 Meru County

Meru County borders Isiolo County to the North and North East, Tharaka County to the South West, Nyeri County to the South West and Laikipia County to the West. The county has five sub counties namely Igembe, Imenti Central, Imenti South and Tharaka. It has a Total Population of 1,356,301; 320,616 Households and covers an area of 6,936 .9km². The county lies in the Lower Highland (LH1), Upper midland (UM1, 2, 3) and Lower midland (LM3, 4, 5) agro-ecological zones. The soils in Imenti sub counties are Humic Nitisols while in other parts of the county they are Ferrasols and Luvisols. Temperatures range from a minimum of 16°C to a maximum of 23°C. The rainfall ranges between 500mm and 2600mm per annum (Jaetzold et al., 2006). The main food crops grown include; maize, beans, yams, soybean, cassava, millet, sorghum and bananas. Cash crops include Miraa (khat), Coffee and Tea. Livestock keeping is also practised and includes cows, goats, sheep and chicken (Saiyana and Mathooko, 2013)

3.1.3 Tharaka Nithi County

Tharaka-Nithi County borders Meru County to the North and North East, Kitui County to the East and South East, Embu County to the South and South West and covers an area of 2,638.8 Km². The County lies between latitude 000 07' and 000 26' South and between longitudes 370 19' and 370 46' East. The County is divided into four

administrative Sub Counties namely Tharaka North, Tharaka South, Meru South and Maara (Kamau and Mativo, 2013). The county lies in the Lower Highland (LH1), Upper midland (UM1, 2, 3) and Lower midland (LM3, 4, 5) agro-ecological zones at an altitude ranging from 830m in the lower areas to 1850m above sea level at the base of Mount Kenya. According to Jaetzold et al., (2006) the soils are mainly humic Nitisols in Meru south and Maara while in Tharaka the soils are mollic Andosols and eutric Nitisols. Annual mean temperatures range from a minimum of 18°C to a maximum of 24°C, and rainfall pattern is bimodal with the long rains beginning March and end in May while short rains start in October and end in December ranging between 1200mm to 1400mm annually. In the Tharaka sub counties the rainfall ranges between 500mm to 1000mm (Jaetzold *et al.*, 2006).



t Figure 3.1: Map generated from ArcGIS

3.2 Sources of data and Data Collection Instrument

The study used mainly primary data and secondary. Primary data were collected from wholesalers, retailers, farmer groups, Processors of soybean, assemblers, Ministry of Agriculture Livestock and Fisheries (MOALF) and projects that deal with soybean Food and Agricultural Organization (FAO), and Soybean and Climbing beans Project (SOCO). For wholesalers and retailers, questionnaires were used for data collection while checklist were used for farmer groups, processors of soybean, assemblers, MOALF and projects that deal with soybean (SOCO and FAO). See Appendix 4. The questionnaire had sections on demographic characteristics of respondents and marketing information such as quantity of soybean grown and traded by producers, quantity of soybean traded by wholesalers and traders, pricing, availability of price information and access to market. The questionnaires targeted soybean traders who had been active for two years or more. The use of both questionnaire and check list for various stake holders was to ensure that correct and reliable data were collected.

Pre-testing of the questionnaires was done one month prior to the general collection of data by trained enumerators who used English and Swahili for easier understanding. The pre-test was done on 12 randomly chosen respondents in Embu in order to check if the questionnaires were comprehensive enough to carry out the whole process of data collection and modifications were made on the questionnaires where necessary. Key informant interviews for the MOALF officers in the study area were conducted by the author. The questionnaires used in the study are included in the appendices.

3.3 Research Design

The research design used for the study a cross-sectional design. The study used both qualitative and quantitative data to describe the nature and performance of the soybean market in the Central highland of Kenya. This design was useful for descriptive purposes and in obtaining qualitative information as well as for determination of relationship between variables Bailey, (1998).

Table 3.1 Definition of Different Traders in this Study

Trader	Description
Assemblers	Traders who assemble soybean from different farmer groups in the counties and sell to the processors or to wholesalers. They pay the farmers later after they (traders) have sold the soybean.
Wholesalers	Traders who bought soybean from the farmers directly or assemblers and sell to processors and retailers. They bought from farmers who had quantities greater than 20 kg and do not sell directly to the final consumer.
Retailers	Traders who buy soybean either from the farmers directly or from the wholesalers. They later sell directly to the final consumer.
Processors	Traders who bought soybean from Assemblers, wholesalers, and directly from farmers. The traders process soybean into soy flour, soy drink, and soy oil. The processors sold processed soybean whereas the assemblers, wholesalers, and retailers, sold unprocessed soybean.

3.4 Sampling methods

The sample for this study consisted of various stake holders in the soybean value chain (Table 3.2). In order to ensure a reasonable representation of retailers across the study area, 9 markets were purposely sampled. A sampling frame was then developed from the sampled markets and contributed in the drawing of a random sample of retailers. A total of 86 retailers were sampled from a frame of 284 retailers.

$$n = \frac{N}{1+Ne^2}$$

$$n = \frac{284}{1+284(.09)^2}$$

A sample of 15 wholesalers, 16 processors (appendix 2 and 3), 16 farmer groups, 3 people from MoALF, 4 people from the SOCO project, 1 person representing FAO and 1 person from soybean processing company (BIDCO) were also sampled.

Table 3.2 Method of sampling the actors and number sampled.

Actors	Method of sampling	Number sampled
Assemblers	Purposive	3
Retailers	Simple random sampling	86
Wholesalers	Snowball sampling	15
Processors	Snowball sampling	16
Farmer groups	Purposive sampling	16
Ministry of Agriculture Livestock and Fisheries	Purposive sampling	3
Projects concerned with soybean in the study area (SOCO Project and FAO)	Purposive sampling	2x

$$n = \frac{N}{1+Ne^2}$$

Where; N = population of soybean traders e = level of precision, and n = sample size (Israel, 1992).

Purposive sampling was used to select 16 farmer groups with 6 groups, 6 groups, and 4 Groups from Embu Tharaka-Nithi and Meru Counties respectively. The purpose was based on the fact that they had been farming soybean for at least two years and in all the two seasons per year. Purposive sampling technique was also used to select the markets. A total of 9 markets were selected with 3 from each county. The markets were selected based on the fact that they are the major markets in the study area where soybean is sold by traders. The snowball sampling technique was used to select wholesalers and processors. A total of 15 wholesalers were selected with 5 from each county while 16 processors were selected with 5, 6 and 5 from Embu Tharaka-Nithi and Meru respectively. A total of 3 assemblers were selected with 1 from each county. According to (Eronmwon *et al.*, 2014; Nzima & Dzanja, 2015) there is no specify way to determine sample size for various actors in the various locations. As assemblers often only exist for some products, and only during the harvest period, they may not be available for an interview in that case, it was suggested to interview at least five traders. In addition, they recommended it was necessary to interview one key resource person for better understanding. This study therefore selected the number of processors, wholesalers and retailers based on their level of involvement in soybean activity. Table 3.3 below shows how the sample was distributed between processors, wholesalers and retailer, assemblers and farmer groups.

Table 3.3: Respondents list in the Counties

Location	Number of markets	Traders	Number of farmer groups in each county	
Embu	(3) Manyatta Ishiara Kiritiri	Wholesalers (5) Retailers (45) Assemblers (1) Processors (5)	Mbeere south	Manyatta
			Mbeti south (2)	Mbeti north (2) Kirimari (2)
Tharaka Nithi	(3) Kathwana Ndagani Nkarini	Wholesalers (5) Retailers (24) Assemblers (1) Processors (6)	Tharaka	Maara
			Magumoni (1) Mariani (2)	Chogoria (2) Mwimbi (1)
Meru	(3) Gakoromone Makutano Nkubu	Wholesalers (5) Retailers (17) Assembler (1) Processors (5)	Imenti south (2)	Tigania East (2)

3.5 Data management and analysis

The data collected from the traders, farmers and other actors was analyzed using descriptive statistics and inferential statistics. The data on the questionnaire was entered into the Excel software. The data was cleaned coded and validated then transferred to SPSS 20 where data was analyzed. For the continues variable, the 1-Sample K-S (Kolmogorov-Smirnov) test was performed to test for data normality and ANOVA was also used. Results were presented using frequencies, means, percentages and cross tables were used for categorical variables. Results were presented in tables, charts and graphs. Data were analyzed with the help of Herfindahl Hirschman Index (HHI), gross

Where: MS_i is the Market Share of seller_i; and n is the number of sellers in the market.

The market share is calculated based on quantities of soybean handled by each seller as follows:

$$MS_i = \frac{V_i}{\sum_{i=1}^n V_i} \dots\dots\dots$$

.....2

V_i is the quantity of soybean handled by seller i (in kg); and $\sum V_i$ is the total quantity of soybean handled by sellers in the market (in kg)

3.5.2 Assessing market Conduct and Performance of Soybean Markets in Embu, tharaka-Nithi and Meru

3.5.2.1 Assessing Market Conduct

The conduct of the market was analyzed by describing the buying and selling practices in the three counties, advertising and sales promotion strategies, degree of price collusion, and differentiating products. The degree of collusion was determined by evaluating whether there are coordinated restrictions of products in this case soybeans, in the market, thereby raising prices. The different buying and selling practices in the market were also observed. In an uncompetitive market, prices of products may not be openly displayed for every to see and traders may charge different prices to different firms or individuals for the same product.

3.5.2.2 Assessing Market Performance

Performance was assessed by conducting Gross Margin analysis, Marketing Efficiency and Marketing Margin.

$$\text{Total Gross Marketing Margin} = \left(\frac{\text{retail price} - \text{purchase price}}{\text{retail price}} \right) \times 100 \dots\dots\dots 3$$

$$\text{Marketing margin} = \text{selling price} - \text{total cost price for the various actors} \dots\dots\dots 4$$

Marketing efficiency index was used to determine marketing efficiency and is the net price ratio farmers received to the total marketing cost in addition to total margin as calculated follows:

$$\text{MEI} = \frac{NP}{NM+MC} \dots\dots\dots 5$$

Where MEI is the Marketing Efficiency Index; NP is the Net Price received by the farmers; NM is the Total Net Marketing Margin (for other actors in the chain); and MC is the Total Marketing Cost incurred by the actors in the chain.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Socio-demographic characteristics of respondents

4.1.1. Age distribution of traders

The minimum age of traders was 26 years and the maximum were 73 years with a standard deviation of 10.82. The result of the ANOVA shows that the mean age of the respondents did not significantly ($P>0.05$) differ among the categories of traders, suggesting that the traders appears to have similar age. The mean age ranges from 39.33 ± 15.28 years in collectors to 50.50 ± 10.24 years in processors. The traders' community comprised mostly of middle-aged traders with an average age of 47.7. This goes in line with the study of (Funke & Raphael, 2012) which concluded that among traders of garri the average age was 47.9. The percentages of traders that were above 50 years were higher in Tharaka Nithi and Meru than in Embu.

Table 4.1: Age distribution of traders in Embu, Tharaka-Nithi and Meru

Category of trader	Min age	Average	Maximum	N	Age (years)
Retailers	27	52	73	86	47.87 ± 10.77^a
Wholesalers	26	38	42	15	45.40 ± 10.74^a
Processors	32	46	68	3	39.33 ± 15.28^a
Assemblers	36	48	65	16	50.50 ± 10.24^a

Means on column with same superscript are not significantly different. Mean separation was done using LSD tested at 5% level of significance ($P<0.05$).

The results further indicate that 80% of traders were younger than 60. Demissie *et al.*, (2015) on Structure, conduct and performance of marketing chain of milk in Ethiopia

also found out that the traders of milk were in the working age group of below 60. This is because trading in soybean requires constant movement from one market. The results imply that soybean traders fall within the productive age where they can actively participate in trading and economic activities.

In all the counties, the findings indicate that more women (64%, 58% and 64% for Embu Tharaka-Nithi and Meru respectively) are involved in soybean trading than men (Table 4.2). The findings also showed that 64% of the respondents are women while 36% are men.

Table 4.2: Gender (%) of soybean traders in Embu, Tharaka Nithi and Meru Counties

Gender	Wholesalers	Processors	Assemblers	Retailers	Percent
Female	47.7	56.25		70.9	64
Male	53.3	43.75	100	29.1	36
N	15	16	3	86	100

The findings could be attributed to the fact that women have a higher likelihood of joining soybean trading as compared to men. This could also be because trading in soybean does not require a lot of energy. This can also be because women are also known to share more and also influence each other easily thus reason why there are more women than men (Girei, *et al.*,2013).

The results indicate that 45% of respondents had attended primary school and 37.5% had attended secondary school (table 4.3). In addition, 73% of wholesalers had attended

secondary school while 53.5% of retailers had attended primary education. This implies that the level of education among traders is relatively high thus easy for traders to adopt new technologies faster than those with no formal education.

Table 4.3: Level of education of respondents

Level of education						
No formal education	Primary education	Secondary education	College	University	N	
Retailer	1.2	53.5	32.6	10.5	2.2	86
Wholesaler	0	13.3	73.4	13.3	0	15
Collector	0	0	33.3	0	66.7	3
Processor	6.3	37.5	31.2	12.5	12.5	16

Gender distribution based on level of education shows that, out of all those who attended primary education 24% are males while 76% are females, for secondary education 62% are males while 38% are female. Out of those who attended university education, 66.67% are males while 33.33% are females. It is evident from the study area that females are less educated than men.

4.1.2 : Level of Education based on Gender

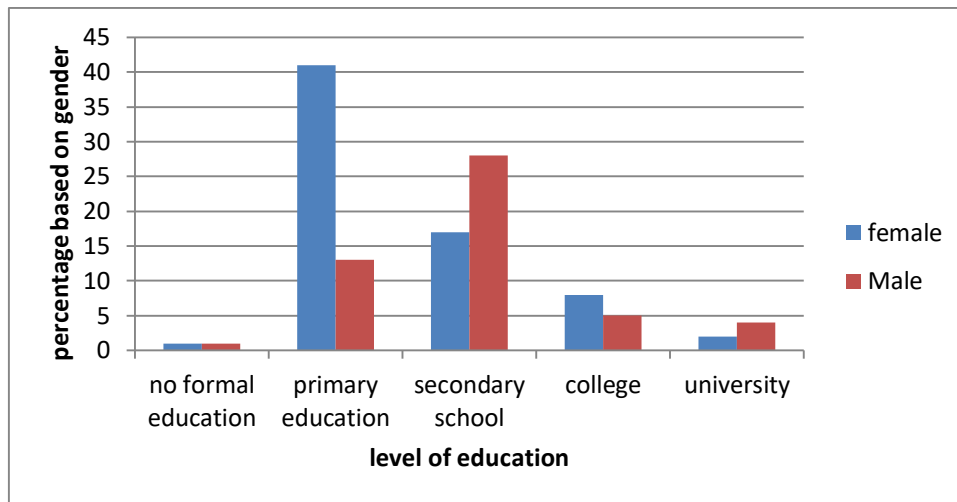


Figure 4.1: Level of Education based on Gender

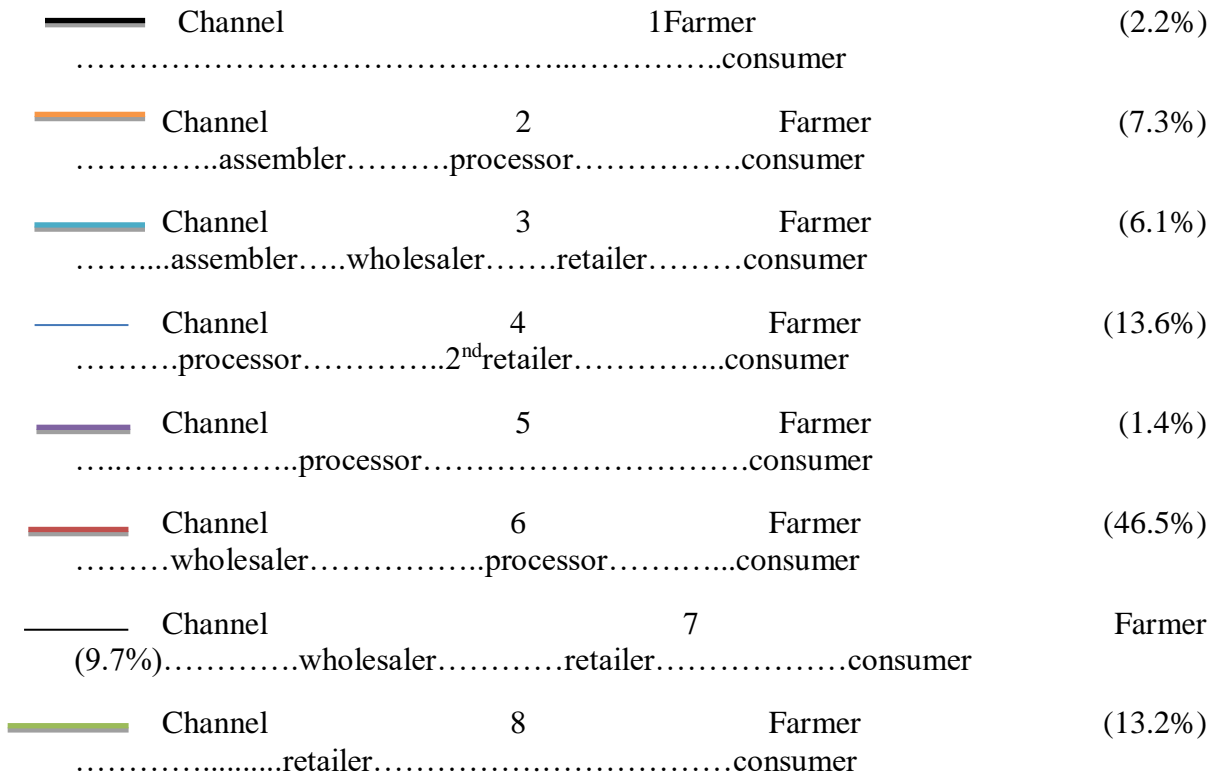
This result indicates that even though more women are involved in soybean trading they are less educated than men. This goes in line with World Bank report (World Bank, 2007) which highlighted that women traders are faced with lack of education and formal training which may limit their capacity to grow in their area of operation. The policy implication of this is that women who are less educated may be adamant to changes or slow in adopting new changes to fit with the changing environment.

4.2. Market Structure of Soybean

4.2.1. Marketing channels in Embu Tharaka-Nithi and Meru

Marketing channels refers to the sequence of intermediaries through which a product passes from producers to consumers. Marketing channels provide a systematic knowledge of the flow of the goods and services from their origin (producer) to the final

Figure 4.2: Various Channels of soybean from farmer to the final consumer in the central highlands of Kenya 2017.



Channel one with 2.2% was the shortest where soybean passed directly from the farmer to the final consumer. This was mostly done by farmers with very little quantities where by the cost of taking it to the assembler or whole seller was considered very high. This channel was common in Tharaka-Nithi County. These farmers in most cases knew who they are going to sell to. In other cases, the farmers go to the consumers and sell because they already know the consumers. The consumers are mostly around their neighborhood where they buy and add with other product for their animal feed or they process it locally into soy flour or soy drink for home consumption.

Channel two passes through the assembler, processor then to final consumer. This channel was common in the three counties. However, it is the most common channel in

Meru County as reported by all the farmer groups in Meru County. The assembler in Meru County was in close contact with the farmer groups and would always make arrangement for a particular day with the farmer groups to collect the soybean. In addition, it is highly practiced in Meru County because most farmers in this county were not aware of ways of how to process soybean to soy flour or soy drink for home consumption. Also, farmers were not aware of other markets to sell their produce reason why they sold mostly to the assemblers. It was also reported that the remains, which are rejected by the assemblers, was used for home consumption in the form of cooking with maize.

Channel three channel was common among farmers with little quantities, less than 10kg of unprocessed soybean. It was common to find one of the farmers assembling the soybean and then taking to the assembler who would sell to the wholesaler, the wholesaler then would sell to the retailer who sells to the final consumer. The soybean that moves through this channel is unprocessed soybean and the farmers who are involved in this channel are not sure of who to sell to. The farmers involved in this channel were not also aware of ways to process their soybean for home consumption. This explains why one farmer assembles the soybean and also why the farmers bear the cost of transportation to the assembler. The assembler sells to wholesalers because of the increase cost involved due to assembling of little quantities and can charge higher prices.

In channel four, the farmer sells directly to the processors. The farmers who sell directly to the processors are larger scale farmers with at least 45kg of soybean therefore can

cover the transport cost. Farmers with lesser quantities who sell to the processors are those who are closer the processor and do not inquire transport cost or very little transport cost.

Channel five was most common in Tharaka-Nithi and Embu. These are farmers who have above 20kg of soybean and know where to sell their soybean and they consider it because it is cheaper and they are sure to sell their soybean. The wholesalers in channel six mostly source the soybean from Busia, Uganda and also DR Congo then sell to the processors who processes and sell to the consumers. These wholesalers buy at least 90kg of soybean from those areas. These wholesalers know the person who will transport the soybean to their point of sales in situations where they do not go to buy themselves.

Channel seven involves larger scale farmers who produce at least 45kg of soybean. Most of the farmers already know who they will sell to and are sure of the market. Additionally, these farmers prefer the wholesalers because they do not have to bear the transport cost to sell and also, they can negotiate the prices at which to sell. More to that, the wholesalers are the ones who search for the farmers because of the relatively larger quantities of soybean they have. This reduces the cost of assembling the soybean for the wholesalers and also this helps the farmers as they do not have to look for buyers of their soybean. This channel was not common in the three counties however used mostly by farmers who do not belong to any soybean farmer group.

Farmers in channel eight also have very little quantities. They gather and sell to a retailer who already knows the consumers to sell to. These retailers are mostly around

the neighborhood of the farmers and they know them and also the distance to the processors or assemblers is quite long. This reduces the transport cost for the farmers since they do not have to carry to an assembler or processor. In addition, the farmers can negotiate the prices they charge. This channel is not very common in three counties however used mostly by farmers who know a retailer.

Results showed that 12.5% of respondent (retailers, wholesalers, processors) changed where they get soybean from while 87.5% did not change their source of supply. However, even though just 12.5% (15) of respondent changed their source of supply, they were those who buy in large quantities (wholesalers and processors). The processors and wholesalers all confirmed that it was due to inadequate supply and because of high demand from their consumers that made them to change their source of supply. Lubungu *et al.*, (2013) also found out in their study in Zambia that wholesalers and retailers changed their source of supply mainly due to non-availability of soybean. However, they also found that high prices were also another reason why traders changed their source of supply. In the study area, because prices at which soybean was bought from farmer was relatively stable, prices did not have any influence on wholesalers or processors but the fact that it was not readily available.

Table 4.4: Sources of Soybean for Traders in percentage in the year 2016/2017

Actors	From County	Outside County	Total Kg
Assembler	100		2380
Wholesaler	3692 (40.06)	72.3 (59.4)	9093
Processor	5792 (52)	5348 (48)	11140
Retailer	3550 (72.3)	1361 (27.7)	4911

The numbers in parenthesis are kilograms of soybean

The assemblers bought the entire soybean they traded from within the county (Table 4.4). Wholesalers got 59.4% of the soybean they traded from outside the county while they got just 40% of the soybean from within the county. Wholesalers bought from outside the county because they could not get the quantities, they required within the county because of the little supplies that was supplied by farmers and the high cost of gathering soybean also involved.

Processors got 52% of the soybean they traded from within the county and 48% from wholesalers out of the county. This was also because they could not get the required amount of soybean from within the county. Retailers got 72.3% of the soybean they traded within the county and just 27.7% from outside the county. This is because most retailers' trade with little quantities of soybean and it would be very costly to buy from out of the county.

Some retailers bought soybean based on the demand of the consumers at a particular point in time which is not always regular. During such periods, retailers go in search of soybean and usually the demand is not large enough reason why they prefer to buy most

of their soybean within the counties to reduce the cost involved. It is clear that even though retailers bought most of the soybean within the county, the quantity is not much (26.65% of total soybean) compared to the wholesalers and processors hence cannot have a significant influence on the market for soybean.

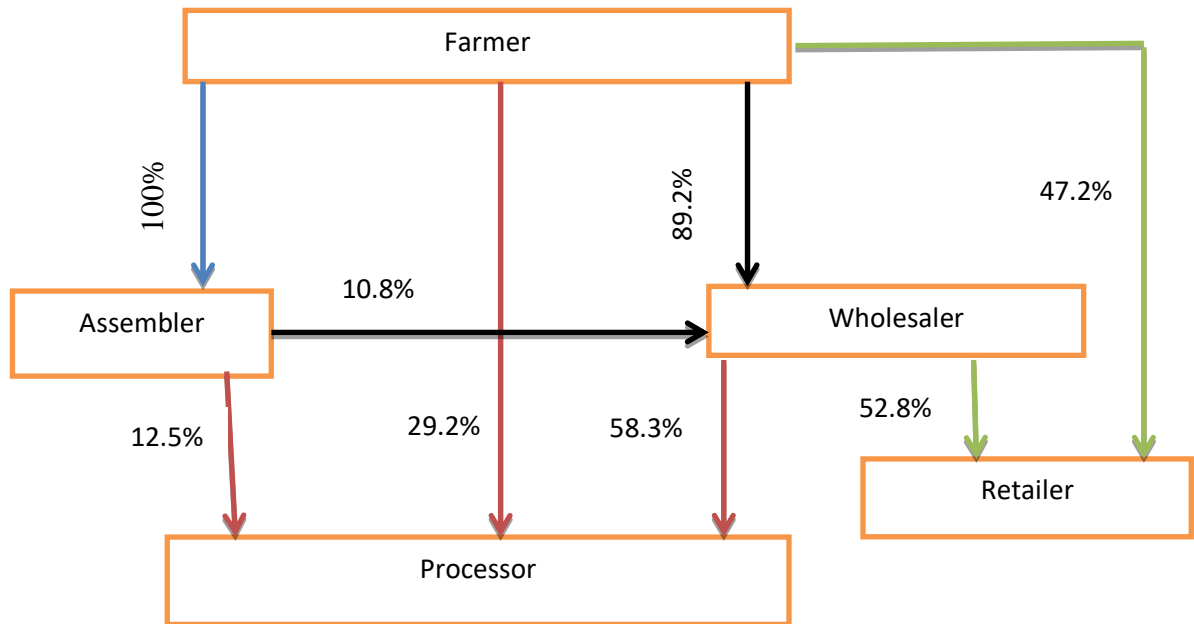


Figure 4.3: Percentages of soybean bought from the various actors.

Wholesalers bought most of their soybean from farmers (89.2%) because their gross margins were higher than when they bought from assemblers. Wholesalers sold 58.3% of their soybean to processors. Wholesalers sold more to processors because they buy in larger quantities and a ready market for wholesalers compared to the retailers. However, even though wholesalers sold more to processors, retailers offered higher prices to the wholesalers. Retailers bought more from wholesalers because of the larger quantities they had relatively to the farmers.

Results showed quantity and price were the main factors considered by the traders in buying of soybean (Table 4.5). However, 16.4% of, retailers and 6.25% of processors considered other factors such as size, variety and color when buying soybean.

Table 4.5: Factors considered when buying soybean by traders in %

Actors	Quality of soybean (moisture content and cleanness)	Price of soybean	Others (size, color, quantity)
Assemblers	66.67	33.33	
Wholesalers	73	20	
Retailers	23.6	60	16.4
Processors	75	18.75	6.25

Processors and wholesalers considered quality first as the major factor when buying soybean followed by the price. Retailers considered price first before buying because they mostly trade during periods of low supply by farmers due to droughts or poor harvest. They get the soybean from farmers around their neighborhoods and do not care much about the cleanliness or quality of the soybean. This was because in most cases those that are going to buy the soybean are in desperate need of it and will not also complain because they have no choice. These were the seven-day Adventist Christians who demanded for the soybean because they do not take tea. They quality considered here was the cleanliness of the soybean. Some processors, considered the moisture content of the soybean from farmers. Quality was a major factor as it formed the basis for the price negotiation by the buyers. Soybean with moisture content below 12% and

also clean were offered higher prices. (Ksh60/kg and above). Soybean with higher moisture content were bought sometimes at low as Ksh50/kg but never exceeded Ksh59/kg. The results from the traders based on the quality of soybean also confirms with that of the report obtained from the farmer groups as some of their soybean was rejected based on quality of the soybean. This goes in line with the study of Nkegbe, (2012) who also found out that price and quality was a major factor that determine the buying of tomatoes in Ghana both by traders and consumers. However, even though quality of the soybean was a major factor considered when buying soybean by traders, price was considered more by the consumers. This finding implies that farmers should be more cautious when it comes to the quality of the soybean because that is the major factor considered when traders want to buy soybean and will determine the price at which soybean is bought.

4.2.2. Barriers to Entry and Exit

According to the information gathered from the Ministry of Agriculture Livestock and Fisheries in Embu, Tharaka-Nithi and Meru, there were no barriers to entry and exit into soybean trading in terms of licensing. There is no requirement for anybody to start trading in soybean. The only exception was for the agro-processors who need a license in order to process soybean. However, just 12.5% of processors had a license. The existence of unlicensed processors suggests weak monitoring and enforcement of compliance by regulatory authorities in the three counties for processors without licenses. The freedom to enter and exit in the market was most common among retailers especially those who retail just soybean (34.2%). During seasons when farmers have relatively larger quantities, those traders who retail just soybean exit the market because

most of the soybean is assembled and bought by the wholesalers or processors. During periods of low harvest, the retailers are many because the cost of gathering becomes very high and the assemblers or wholesalers will not be willing to incur the cost. These retailers who retail soybean usually retail at their neighborhood or process it to soy flour and retail. This is because the cost of assembling and transportation is high for wholesalers and processors and since the retailers buy in little quantities and around their neighborhood the cost is relatively cheaper for them.

Barriers to entry and exit may also be in the form of technical and managerial skills. Technical and managerial skills in this context were assessed using level of education and years of experience in soybean trading. The traders had an average experience of 4 years in trading soybean and most of the traders (55%) had attended secondary school. The results show minimal chances of technical and managerial skills acting as barriers for traders to enter the market. The minimum years of trading experience was 1 and the maximum was 18, with an average of 3 years which showed that the traders did not have to have a certain number of years in trading in trading soybean to permit them enter the market and hence a better performance of the market. These findings go in line with that of (Tadesse (2011) who also reported that technical and managerial skills did not prevent traders from entering the fruit and vegetable market in Ethiopia. This finding implies that anyone can trade in the soybean market because there is limited restriction.

4.2.3. Type of product in the market

According to farmers in the focus group discussion in the study area, two varieties of soybean were mostly cultivated (SB19 and Gazelle). This was because that is what was

preferred by traders and because it was what they were being offered and was also available. After farming and harvesting the soybean, it is sold to traders without any form of processing or packaging. After buying from the producers, the assemblers deliver it directly to the processors or to the wholesalers, the wholesalers also deliver it to the processors or to retailers without any form processing or packaging. The average duration it took for retailers to sell unprocessed soybean was 3months with a maximum of 6 months and a minimum of 2 weeks. Wholesalers and assemblers took a shorter time to sell soybean averagely 1month while retailers took longer periods to sell their soybean because they sell in very little quantities.

4.2.4. Market Concentration for Retailers

The majority of retailers traded between 16 and 360 Kg of soybean with an average of 47Kg of soybean per year.

Table 4.6: Average amount of soybean traded by traders

Traders	Minimum	Mean	Standard Deviation	Maximum	HHI
Assemblers	540	793	2.3	1080	0.359
Wholesalers	135	333.3	6.6	630	0.0997
Retailers	16	47	10.1	360	0.1701
Processors	13	696	4.4	4500	0.2955

The HHI for retailers was 0.170. According to (Diallo., *et al* 2015) this value implies that, retailers are relatively concentrated in the market, hence no single retailer or a

group of retailers can influence the market price of soybean hence some competition. This is because most of the retailers' trade in very little quantities and do not have enough quantities so as to influence the market price. In a study carried out by (Eronmwon *et al.*, 2014), based on the results obtained using HHI, they also found out that plantain retailers were competitive. They then concluded that retailers of plantain could not join to influence the market price of plantain.

4.2.5. Market Concentration for Wholesalers

The average quantity of soybean traded per wholesaler was 333.3kg per person in the year 2016 and also the wholesalers sell between 135kg and 630kg per year (Table 4.6). The average amount of income from soybean sold in 2016 per wholesaler amounted to 23752.33Ksh. The HHI index for wholesalers is 0.0997 which is below 0.1 implying that the market for wholesalers is competitive. This implies that no one wholesaler can have an Influence on the price at which soybean is sold.

4.2.6. Market concentration for processor

The HHI for processors was 0.295529 and according to Diallo *et al.*, (2015) any HHI value above 0.18 is highly concentrated. The concentration ratio of the four largest processors (CR₄) is 0.897 and this value implies that four processors in the three counties control almost 90 percent of what was handled by the total number of processors. Based on the result obtained from the HHI and CR₄ this market structure is an oligopolistic market structure. This results ties with the report from the ministries and that of the entire farmers groups. They all confirm that farmer groups and large-scale farmers sell their soybean to the processors at a price that is never above (Ksh70)

per kilogram and the price was jointly determined by the processors. They never consulted the farmers or wholesaler and retailers to determine the price. The value of HHI confirms this as it indicated an oligopolistic market structure. In addition, processors are the highest buyers of soybean in the study area with 69.4% of the soybean produced in the study area bought by the processors.

4.3. Conduct and Performance of Soybean Markets

4.3.1. Market Conduct

The most common pricing behavior among farmers was that of negotiation. However, there was fixed pricing behavior. Farmers had the option of either selling directly to the processors at a fixed price whereby they bare the transport cost or sell to assemblers so the assembler sells to the processor. The farmers could also sell to either the wholesalers or retailers at a negotiable price above or below Ksh60 depending on the supply of soybean during that particular season. However, because the number of wholesalers and retailers available for the farmers are few, the ready market for farmers is that of processors.

Table 4.7: Pricing behavior between actors

	Assemblers	Wholesalers	Retailers	Processors
Farmers	Fixed	Bargaining	Bargaining	Fixed
Assemblers		Bargaining		Fixed
Wholesalers	Bargaining		Bargaining	Fixed
Retailers		Bargaining		
Processors	Fixed	Fixed		

Based on the data collected, 80% of farmers sold their produce directly to the processors or pass through an assembler who sells to the processor and the farmer is the person who bears the transport cost. The remaining 20% sold their produce directly to wholesalers or retailers and the transport cost was being considered in the price negotiation.

Among the retailers, prices were mostly through bargain/ negotiating with the farmers. From the results obtained, 90% of retailers bought soybean through this method while the others were either through fixed prices or through the demand and supply forces. Bukar *et al.*, (2015) in their study concluded that of most agricultural commodities, in Nigeria was done through bargaining and negotiation with the traders and consumers. Also, when selling the soybean, the prices are fixed depending on the season. During harvesting seasons, the prices are lower than during off peak seasons. However, this was the case in Meru and Tharaka-Nithi counties but in Embu County, as reported by the farmers and reports from the ministry, the price of soybean does not depend on the seasons but relatively fixed all year round.

Table 4.8: Responses to behavior of traders in the market

Question	Yes (%)
Do you seek out price information before buying and selling soybean	37.5
Do farmers engage in group marketing	80.8
Are traders merging to become one large business	1.7
Are prices of soybean displayed	24.2
If prices are not displayed is there any secret bidding	28.6
Are standard measures used in measuring (weights)	100
Is there any regulation in the market for soybean	18.3

From the results, 37.5% (45) of respondent seek price information before buying and selling soybean. However, 57.8% of those who responded yes received the information verbally from other traders when buying and selling. 75% of respondent determined the price through which soybean was bought through informal negotiation with the seller while 19.2% said the prices were fixed. Those who confirmed prices were fixed were the processors because they buy soybean at a fixed price directly from farmers where by the farmers' bears the transport cost till it reaches the processor at their point of sale. For the wholesalers and retailers, even though the farmer in most cases brings the soybean and delivers to the market, they bear the transport cost.

Based on the results obtained, 80.8% of traders agreed that farmers engaged in group marketing. The farmers who engaged in group marketing are those who belong to a farmer group. This was because it was easy for a farmer group to organize on how to gather their soybean together and sell as a group. The farmer groups sometimes agree on a day when they will gather their soybean and sell to an assembler or a wholesaler and they sell as a group even though the money is paid based on the quantity bought by each individual. The remaining 19.2% of respondents are those traders who buy directly from farmers who already have those they will sell to. These traders are those who by an average of 10kg of soybean from farmers, do not buy in large quantities. They buy based on the demand from the consumers' reasons why they may not be aware of the fact that farmer groups sell soybean and do not buy from them.

Based on the results obtained, all the farmer groups reported that wholesalers and retailers are not in any way influencing the price at which soybean is bought from

farmers. Wholesalers and retailers trade with an average quantity of soybean less than 333Kg per year per person. This means that no single trader could collude with few to influence the market price. This is also explained by the fact that in the study area there were no traders' associations where they could join and influence the market price. This response matches with that from the ministries of agriculture in the 3 counties, as there are no traders' associations for soybean hence reason why wholesalers and retailers do not engage in any way to influence the market price.

The results also showed that 75% of respondent claimed that prices of soybean are not displayed and even though the prices are not displayed, 71.4% of those who said prices are not displayed claimed there is no secret bidding or bargaining by the buyers. The traders all agreed that they are standard ways used to measure soybean. For retailers, they used a tin container which they say its measures two kg (*mkebe*) while for wholesalers, assemblers and processors, they used standardized weighing machines to measure the soybean.

The results also showed that the form of advert was mostly through word of mouth, phone call, display soybean at point of sale. Wholesalers used telephone to advertise and alert regular retailers and processors whom they had agreement with. The results indicated that 86.7% of wholesalers had verbal agreement with retailers or processors to deliver soybean to them. Among the wholesalers, there was no form of written agreement with farmers or retailers. Retailers advertised through word of mouth to their customers mostly the seven-day Adventist who were their biggest customers while others displayed their soybean at their point of sale. Processors carry out adverts by print media, going to agricultural shows, word of mouth, and by putting advert on

boards at their point of sales indicating availability of soybean products. In addition, 75% of processors advertise by word of mouth mostly to friends and around their neighbourhood.

4.3.1 Market Performance

Table 4.9 shows the various costs at which the various chains actors bought soybean and the price at which they sold soybean to the buyer. The table also shows the mean selling prices (Ksh/Kg) at farm gate, assembler, wholesaler, retailer 1, processor and retailer 2. Though the price at which farmers sold their soybean varied, the difference came in in terms of who bears the transport cost. This was because the market for wholesalers was highly competitive and they go in search of soybean to satisfy their consumers.

Table 4.9: Soybean price spread in Embu Tharaka Nithi and Meru (for a 1kg of soybean)

Participant	Description	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
Farmers	Selling price	60	58	58	59	59	61	62	57
	Transport cost	0	2	.5	1	1			3
	Transaction cost	0	0	0					
	Total cost	0	2	.5	1	1			
Assemblers	Buying price		60	60					
	Transport cost	0	1	1					
	Transaction cost								
	Total cost	0	61	61					
	Selling price	0	70	70					
	Surplus	0	9	9					
Wholesalers	Buying price	0		70			61	62	
	Transport cost	0		2			2	3	
	Transaction cost	0		1			1	1	
	Total cost	0		73			64	66	
	Selling price	0		74			70	74	
	Surplus	0		1			6	8	
	Total cost	0							
Retailer 1	Buying price			74				74	60
	Transport cost	0							
	Transaction cost	0		2				2	2
	Total cost	0		76				76	62
	Selling price	0		98				98	98
	Surplus	0		22				22	36
	Total cost	0							
Processor	Buying price	0	70		60	60	70		
	Cookx/lab/fryx/milx/others	0	113(133)		113(133)	113(133)	113(133)		
	Transaction cost	0	1		1	1	1		
	Total cost	0	184(204)		174(194)	174(194)	184(206)		
	Selling price	0	300(400)		250(350)	300(400)	300(400)		
	Surplus		116(196)		76(156)	126(206)	116(196)		
Retailer 2	Buying price	0			250(350)				
	Transport cost	0							
	Transaction cost	0			2				
	Total cost	0			252(352)				
	Selling price	0			300(400)				
	Surplus				48				
Consumer buying price		60	300(400)	98	300(400)	300(400)	300(400)	98	98

All the values for processors are for soy flour and the values in bracket are for soy drink.

Transaction cost was the cost of gathering information, loading and off-loading cost of soybean, and bargaining cost. In most cases, the wholesalers and consumers go in search of the producers because soybean is not readily available in the market. However, wholesalers who go in search of producers did not get large quantities because of little supplies by farmers (averagely 46Kg). This finding implies that if farmers produce larger quantities of soybean, the wholesalers are ready to buy. For channels 2,3,4,5 and 8 the transport cost was borne by the farmers thus reducing the return that goes to farmers. This was because the processors buy at a price that is never above Ksh60 directly from farmers and are the largest buyers giving the condition that it is the farmers who deliver at their point of sale. No matter what cost is incurred by the farmer in bringing the soybean to the processors, the processor pays a kilogram of soybean at the price of Ksh60. This was also because the processors have an oligopolistic market structure and have the power to influence the market price at which they buy from farmers. In addition, because processors are the only sure buyers of soybean in the study area at any given time, farmers are bound to accept the prices they are being offered because they might not find another buyer immediately. This explains why farmers are sometime reluctant to produce soybean. For channel 2, 3, 6 and 7 where soybean goes through the assembler or wholesaler, and the processor needed it and thus can buy at a price greater than 60Ksh. This is because the processor is in desperate need of the soybean and request for it from the assemblers or the wholesalers. In most cases because of the high demand from the consumers, the processor is willing to pay a price higher than Ksh60.

The surplus (difference between selling price and total cost incurred for soybean) for assemblers was the same irrespective of whether they sale to the wholesaler of processor. This was because they added a price of ksh10 irrespective of the transport cost. Sometimes, the assemblers negotiated the prices they sell but this was in very rare situation reason why the price was the same irrespective of whom they sold to. For wholesalers, their surplus for channel 3 was ksh 0.85 per kg, ksh7.15 per kg for channel 6 and ksh10.85per kg for channel 7. This can be explained by the fact that the more actors in the chain, the lesser the surplus because it has to be distributed among all the actors. Also, from whom the soybean was bought and to whom it was sold also determines the surplus. When they buy directly from farmers the surplus is higher but when they buy from assemblers, the surplus reduces reason for the higher surplus in channel 6 and 7. For processors they make a higher surplus when they buy directly from farmers than assemblers and wholesalers. This was also the case with retailer1 when they buy directly from the farmers their surplus is highest than when they buy from wholesalers. This analysis is illustrated in table 4.10 below.

Table 4.10: Percentage of trader’s surplus to cost incurred in each channel

Actors	Chan nel 1	Channe l 2	Chan nel 3	Channe l 4	Channel 5	Channe l 6	Chan nel 7	Chan nel 8
Assemblers		14.75	14.75					
Wholesalers			1.37			9.38	12.12	
Retailers 1			29				29	58.06
Processor		63.04(9 6.08)		43.68(8 0.41)	72.41(10 0.06)	63.04(9 6.08)		
Retailer 2				19.05(1 3.64)				

All the values for processors are for soy flour and the values in bracket are for soy drink.

In channel 1, the farmer sold directly to the final consumer hence got all the benefits that should have gone to other actors (Table 4.10). The assemblers made a surplus of 15% /kg of soybean in both channel 2 and 3. For wholesalers, their surplus for channel 3 was the smallest (1.37%/kg of soybean) while greatest in channel 6. That was because they got soybean directly from farmers and sold to retailers whereby the prices are negotiable unlike when they sale to processors where the prices are fixed at Ksh70. According to Tung *et al.*,(2010) normal surplus for any actor along a chain should not be more than 20% of the total cost incurred. In this study, the wholesalers where within the range of normal surplus hence. Assemblers, wholesalers and retailer 2 made normal surplus while the retailers 1 and processors made ad normal surplus. Retailers' 1 surplus was greatest in channel 8 (58.06%/kg of soybean) because they bought directly from the farmers. Thus, the surplus that could have gone to the wholesalers they now get it which increases their surplus. The fewer the actors involved in a channel the more the surplus for the chain actors hence less efficient. For a market to be efficient, it requires more actors in a chain so each actor can have normal surplus. Processors made the largest surplus and it was greatest in channel 5 because they sourced their soybean directly from farmers. They made a surplus of 76.83%/kg of soybean for soy flour and 106.67%/kg of soybean for soy drink. Channel 5 also had less actors involved hence was the least efficient channel.

Table 4.11: Gross Marketing Margin and Marketing Efficiency Index in each Channel

	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Channel 8
TGMM	100	20 % (15%)	62%	20 % (15%)	20 % (15%)	20 % (15%)	62%	62%
Assemblers		0.14	0.14					
Wholesalers'			0.05			0.14	0.05	
Retailers 1			0.24				0.24	.38
Processors		0.66(0.85)		.76(.83)	0.8(0.85)	0.8(0.85)		
Retailer 2				0.8(0.85)				
Gross Margin per channel		240(340)	36.56	240(340)	240(340)	240(340)	36.56	36.56
MEI	∞	.26(0.18)	1.60	.26(.19)	.25(.17)	.26(0.18)	1.61	1.54

Values for processors are for soy drink and soy flour respectively

In table 4.11 above, it shows gross marketing margin (GMM) and marketing efficiency index (MEI) for all channels. Farmers' share of the GMM was lowest for channel 2,4,5,6 (20% and 15% for soy drink and soy flour respectively) and highest for channel 1. The producers' share increased because farmers played the role done by wholesalers and retailers and took profits that could have gone to them. Channels 3, 7 and 8 recorded same producer share (62%) despite differences in the number of players in each channel because farmers sold their produce to all types of traders in their locality. The farmers' selling price was the same for all the channels but the consumer price differed. Marketing Efficiency Indices were calculated to determine level of marketing efficiency for all channels. Channel 1 was highest followed by Channels 7, 3, 8, 4, 2, 6 and 5 respectively. The results are presented in Table 4.6 above.

4.4. Constraints to Soybean Marketing

4.4.1. Farmer Groups Perception on what Constraints them from Marketing

Table 4.12: Frequencies on Constraints and their Position in Ranking

Constraint	Frequency	Ranking
Low prices	16	1
Low demand	14	2
Accessing market information	13	4
Delay in payment	13	3
Delay in buying	11	5
Inadequate knowledge in processing	11	6
Inability to meet quality grades	8	7
Inadequate transport means		8

Farmers groups reported that what limited them most were low prices being offered. The also reported of delay in payments, inadequate means of transport, low demand in some cases, inability to meets the quality grades, delay in buying and in payment, and problem of assessing reliable market information. They also reported that they lack adequate knowledge in processing soybean and also do not have the machinery for processing. These constraints made the farmers to allocate a little potion of their farm land for soybean averagely a 1/4 of an acre of land. The delay in payment is because farmers are not paid on the spot when the sell to the assemblers. They also reported that soybean is not a crop which can readily for cooked for home consumption because it needs a lot of processing which they don't have the machineries for such processing. Farmers and local processors also complained of lack of processing machinery to help them in grinding soybean to flour and soy drink. This was a major problem because the local millers who usually grind maize and other product usually refuse to grind soybean. This is because it spoils the machines and other customers complain of the smell of

soybean in their product and might avoid their mills hence hindering the marketing of soybean. The millers also charge very high prices for grinding of soybean average 10ksh/kg or more if they agree to.

They also reported of insufficient working capital which is often a result of inadequate or poor access to credit and farmers' inability to earn sufficient income and save adequately for investment. As a result of inadequate capital, many small-scale farmers may not be able to expand their scale of production hence marketing.

Another problem was that of insufficient seeds for planting. Soybean seeds cannot last for more than a season before it is planted. It can last for a maximum of 4 months and thus loses its viability. Inefficient marketing arrangement was another problem were due to farmer groups selling their produce mostly to the assembler. Farmers groups were not able to sell their produce out of the county without the help of the assemblers. This was a major problem with all the farmers groups in the 3counties. This finding corroborates with a report that soybean farmers in Embu Tharaka-Nithi and Meru operate through middlemen because most buyers of the produce in large quantities are located outside the counties (BIDCO, SoyAfrica). This could result to low returns on soybean investment for farmers as the traders share in farmers' profit. Consequently, farmers may not earn adequate income to purchase vital inputs which could increase production and productivity. This was followed by high cost of transportation arising from poor road infrastructure and lack of adequate market infrastructure such as stalls. However, FAO observed that a good marketing infrastructure, maintenance of rural roads and marketing services have profound effects on food availability, market prices

and physical access to food at the community level. Poor marketing infrastructure, particularly market stalls limit the length of time that the crops can be stored, thereby resulting in low returns on investment for farmers.

4.4.2: Constraints faced by wholesalers and retailers.

Wholesalers and retailers reported the problem of inadequate supply. They also talked of irregular supply and also the period of soybean availability was very short. They reported that they were not able to get in contact with soybean farmers because they are dispersed and usually have little quantities of soybean. In addition, the few farmers they usually contact, due to the very poor nature of the roads it is difficult for them to get soybean. Another problem was that the farmers had very little quantities and because of the high transport cost involved, they were not able to get the soybean. All the wholesalers and retailers said if farmers can produce in large quantities so as to reduce the cost of transportation, there is always a market for soybean.

4.4.3: Constraints faced by processors and processing companies

Based on the market survey carried out, processing companies in Kenya such as BIDCO which deals with soybean as a main raw material, they complained of inadequate supply of soybean from the country. This can be seen from the fact that most of the soybean they got was imported. They import more than half of the quantity of soybean they require from out of the country (Uganda, Malawi and DR Congo). Even with the import from other countries, their yearly demand for soybean has never been met. According to processors what hindered the production of soybean were good quality seeds and inadequate quantities as well. According to these processing companies,

what hindered soybean marketing was the fact that farmers had very little quantities and the cost of transportations been very very high and was borne by the farmer. As a result, they never get the total quantity they require yearly.

4.4.4: Opportunities for Soybean Traders

Soybean has a bright future in Kenya. BIDCO estimates on average that the demand for soybean products increases yearly by 0.035%. The Kenyan government through the Kenya Nutrition Policy 2015-2020 reiterates the need to halve the current malnutrition levels in the country which soybean propagation can help meet. With the current rate of malnutrition being 35%, it makes it easy to convince the policy makers on the utilization on utilization of the as ameliorating malnutrition hence enhancing its marketing (Jackson, 2016). For example, the Eastern Region of Kenya has the highest number of children that are malnourished (44%) yet the country has potential for producing and marketing soybean (Kenya National Nutrition Action Plan, 2012). There are also plans to incorporate soybean as a second crop in Sugar Industry (Kenya Sugar Board, 2013). In addition, some few industries are being set up such as animals feeds concentrates like one at the Dominion farms Ltd. Some religious organizations also such as the Seventh Day Adventist Church are playing a big role in soybean consumption in especially in central and western Kenya. There is still a huge demand for soybean crop, a gap that can be filled by local production. In addition, there are also potential markets in war torn countries around the world which need relief foods that can be supplied by local soybean companies. There are varieties that have been tested and identified for distribution from KARI, for dry areas. There are many institutions undertaking research on the crop in the country including CABI, IITA, TSBF-CIAT,

and SOCO among others. Involvement of NGOs in utilization especially for women groups and those involved in HIV/AIDS patients it offers a confounding opportunity for farmers. Women have been contracted to supply these NGOs with many of such groups responding well due to immediate markets, good price, Ksh100 per Kilo and consistency in payment by these NGOs. There is also religious fervor in Utilization of soybean on health grounds especially with the Seventh Day Adventist Church.

CHAPTER FIVE

Summary, Conclusion and Recommendation

5.1 Summary

The main objective of the study was to analyze the structure, conduct and performance of soybean marketing in Embu, Tharaka Nithi and Meru Counties. Specifically, to assess the structure of soybean marketing systems, to assess the conduct and performance of soybean marketing systems, to identify the challenges and opportunities affecting marketing of soybean in Embu Tharaka Nithi and Meru. Primary data were collected from wholesalers, retailers, farmer groups, Processors of soybean, assemblers, MOALF and projects that deal with soybean (FAO and SoCo) in the study area. For wholesalers and retailers, questionnaires were used for data collection while checklist were used for farmer groups, processors of soybean, assemblers, MOALF and projects that deal with soybean (SOCO and FAO). Market structure was determined by looking at the conditions of entry and exit in the market sources of soybean to the various actors and by also assessing market concentrations using HHI. The conduct of the market was analyzed by describing the buying and selling practices in the three counties, advertising and sales promotion strategies, degree of price collusion, and differentiating products. Performance was assessed by conducting Gross Margin analysis, Marketing Efficiency and Marketing Margin.

Results showed that (8) marketing channels were in operation. Channel one involved (selling directly to the consumer) and therefore was the shortest. The longest channel was three, which involved a farmer, assembler, wholesaler, retailer and finally consumer. The major factor that was considered when buying soybean was the quality followed by the price being offered. The Herfindanl-Hirschman index (HHI) showed that wholesalers were competitive; retailers were relatively competitive while processors indicated an oligopolistic market structure. Processors bought more than 60% of the total soybean traded in the study area.

Based on the conduct of the respondents, traders practiced a fixed pricing behavior as well as a negotiable pricing. The processors were the highest buyers of soybean in the study area. On average, the farmer received a net price of 58ksh when they sell to processors. Wholesalers and retailers never had any groups or associations in the study. Hence did not engage in group marketing or any tactics to influence the price of soybean in the market. This was the reason why the prices at which they bought soybean from farmers were negotiable on the other hand, farmers engaged in group marketing and standard measures were used to measure the soybean. For wholesalers and retailers, the main form of advert was at their point of sale and word of mouth while among processors; they go to shows as well as print papers for advert. Based on the results obtained from Marketing Efficiency Indices, Channel one involving direct selling from farmer to consumer was the most efficient because it had the highest index. The least efficient was channel five because it had the lowest marketing efficiency index of 0.17. Based on the results from GMM, the value was lowest for channel 2,4,5,6 and highest for channel 1.

The major constraints faced by farmer groups in marketing are low prices being offered, delay in payments, inadequate means of transport, inability to meet the quality grades, delay in buying, problem in assessing reliable marketing information, inadequate knowledge in processing soybean and also no machinery for processing. The major constraint faced by wholesalers, retailers, and processors in getting soybean from the study area was mainly inadequate supply due to the very small quantities supplied by farmers thus increasing the marketing cost.

5.2 Conclusion

It can be concluded from this study that there were 8 functional marketing channels with channel 7 (farmer to wholesaler to retailer to consumer) being the most profitable for farmers. The market for processors indicated an oligopolistic structure hence it can be concluded that processors had a higher say when it came to the determination of the market price for soybean. The major factor that was considered when buying soybean was the quality followed by the price being offered. Based on the conduct of the respondents, it can be concluded that traders practiced a fixed pricing behavior as well as a negotiable pricing. Based also on the conduct of the respondents, it can be concluded that wholesalers, retailers and assemblers did not engage in group marketing hence cannot influence the market price for soybean. On the other hand, processors indicated an oligopolistic market structure and based on their conduct, it can be concluded that they can influence the price at which they buy soybean. Based on the results obtained from Marketing Efficiency Indices it can be concluded that Channel one involving direct selling from farmer to consumer was the most efficient because it had the highest index. The least efficient was channel five because it had the lowest

marketing efficiency index of 0.17. Based on the results from GMM, the conclusion is that farmers' share of the GMM was lowest for channel 2,4,5,6 and highest for channel 1.

5.3 Recommendations

Based on the results gotten from the study, the following are recommended:

- The MOALF through its extension workers should train more processors and encourage them to join the soybean market because it is very profitable. This is because it will reduce the market power of the processors and hence increase competition in the market.
- The MOALF should also encourage Wholesalers and retailers by bringing them together and helping them to form trader associations. In this way, it will be easy for them to get in contact with farmers and farmer groups and get more soybean at a reduced cost. A soybean trader association will encourage farmers to farm more as they are certain of the market and where they can sell their soybean. With a trader association, traders will interact more in terms of assessing information.
- Farmers with the help of the extension workers, are recommended to sell soybean to wholesalers in channel 7 and 6 because these channels are most profitable.
- The extension workers in the MOALF are also recommend to organize more trainings and train farmers on how to add value to their soybean in to soy flour or soy drink because with processed soybean, their returns are increased.

- The extension workers in the study area should help farmers to use contract farming in this way they are sure of the market. They could link the farmers to the more wholesalers and processors so as to ensure the market for their soybean is guaranteed.

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APPENDICES

Appendix 1

Checklist for focus group discussions (farmer groups)

1. What is the largest land size under soybean cultivation?
2. What is the smallest land size under soybean cultivation?
3. What was the maximum quantity of soybean harvested by a farmer in 2016?
4. What was the minimum quantity of soybean harvested by a farmer in 2016?
5. a) Are there any formal or informal contracts used in land, labor and capital equipment transactions?
b) If yes, what are the terms and conditions of such contracts?
6. Who do you sell your soybean to?
7. a.) Do you go to the same location in (1) to sell your food and other products?
b.) If no, please provide (name location of shop/market/district)
- 5 a) Which are some of the common products that you sell in the markets? *(Please rank them in terms of quantity sold in the last year)*
b) What is the selling price per Kg of the products? *(Please tabulate)*
- 6 a) Which are the most important food products that you purchase in your house? *(Please rank them)*
b) Is there a deficit or surplus of the products in the household?
c) Is your household sufficient in soybean products?
d) In case of insufficiency in soybeans supply, how do you cope?
- 8 What are the main challenges in utilizing soybean at household level?
- 9 When selling soybean do you sell based on the grades or standard?
- 10 Do traders offer different prices based on grades?
- 11 Do farmers display their prices for various grades of soybean?
- 12 Can soybean that are damaged or below standard be return back?
- 13 Are standard measurements such as weighing scales used in market to measure volumes traded?
- 14 Do farmers sell their soybean in terminal or spot markets?
- 15 Do farmers sell directly to buyers at their homes or farms?
- 16 Do farmers deliver output to markets or do they deliver through middlemen?
- 17 Do farmers sign contracts with traders to supply at agreed prices in the future?
- 18 Are farmers and traders engaged in any form of collective action such as cooperatives or marketing groups?
- 19 Who sets prices at which soybean is sold?
- 20 How are prices determined?
- 21 Is price determination based on a standard formula?

- 22 Is the formula used to set producer prices known to farmers and traders, and is it calculated to reflect changes in production, marketing and transaction costs over time?
- 23 Do consumers and traders have access to market information including prices, quantities, grades and standards of soybean that are sold in the market?
- 24 What is the profit margin from trading in soybean in this area?
- 25 What is the difference between consumer (retail) prices and farm gate prices of soybean?
- 26 Do traders engage in aggressive tactics such as to influence price?
- 27 Are some traders merging to become one large business?
- 28 Are some traders advertising their commodities?
- 29
 - a) Which months have the highest sells volume in the year 2016?
 - b) What is the average sales volume during this period?
 - c) Which months have the lowest sells volume in the year 2016?
 - d) What is the average sales volume during this period?
- 30 How would your purchase behavior change if the purchase price of soybean were 25% higher or lower?
- 31 How would your purchase behavior change if the selling price of soybean were 25% higher or lower?
- 32 A) Has there been a decline in the sell of soybean incases of draught or excessive rains? (*Please explain both scenarios and how you coped*)
 - b) Did your sells in soybean change? If so, why did they change?
- 33 Please describe the following key features in the local markets:
 - (a) Number of people who visit markets
 - (b) Profile of people who visit markets
 - (c) Access and market infrastructure
 - (d) Activity levels at the market visited
- 34 Do you have challenges in physical access to soybean markets in your region?
- 35 What risks do traders face when they trade in soybean in this area?
- 36 Do traders require license to operate in the soybean markets?
- 37 a) Is it easy to get a license for trading in soybeans?
 - b) If no, what are some of the challenges in getting license? (*Give 5 reasons*)
- 38 What type of taxes and levies are paid by traders in the local markets?(*Please list them and give their average monthly values*)

Appendix 2

Market checklist

1. Where do you get your soybean from?
2. Are there any factors that you consider when buying soybean?
3. Who sets the price for soybean in the market?
4. Is there any formula used to set price?
5. If yes is the formula known by both farmers and traders of soybean?
6. Do farmers engage in group marketing?
7. Do farmers sell on the spot, auction or terminal markets?
8. Do traders engage in aggressive tactics to influence price?
9. Do traders price discriminate among soybean producers or consumers?
10. Do farmers get price premiums for producing higher grade commodities?
11. Are standard measurements such as weighing scales used in market to measure volumes traded?
12. Who do you target with your products?
13. Do you carry out any market survey for your products?
14. A) If you carry out market surveys for the products what type of media do you use in conducting the market survey? *E.g. paper, media or writing*
 B) How many people did you interview in the last market survey?
15. What is the brand name for your product?
16. Do you have a slogan for marketing your product(s)?
17. Do you have a label for the product that includes?
 - Product name
 - Product slogan and logo
 - Ingredients and storage requirements
 - Nutritional information (*model format after traditional food labels*)
 - Recommended serving size
 - Attractive graphics that are appropriate for the target audience
 - Production date and expiring date

- 8 How do you package your product for sale?
- 9 Do you design artwork for product advertising campaign?
- 10
 - i) What is the highest volume of soybean that is handled by a single trader in the markets in this region in 2016?
 - ii) What is the lowest volume of soybean that is handled by a single trader in the markets in this region in 2016?
- 11 Can consumers return goods that are damaged or below standard?
- 12 Are there some cultural practices that limit the participation (or lead to the marginalization) of some traders or a section of the population (e.g. women) in the market?
- 13 What are the difficulties you face when trading with soybean?
- 14 What do you think can be done to improve on you trading with soybean?

Appendix 3

TRADERS QUESTIONNAIRE

STRUCTURE CONDUCT AND PERFORMANCE OF SOYBEAN MARKETING SYSTEM IN EMBU, THARAKA NITHI AND MERU COUNTIES, KENYA

This study is strictly for academic purposes and to generate knowledge. This will be useful to the stakeholders in implementing policies. We assure you that any information shared will be strictly confidential.

QUESTIONNAIRE SERIAL NUMBER-----

COUNTY-----

DATE OF INTERVIEW-----

NAME OF RESPONDENT -----

POSITION OF RESPONDENT -----

MOBILE CONTACT AND LOCATION-----

NAME OF THE AGROPROCESSOR'S BUSINESS-----

Section 1: General characteristics of traders

1.1 Gender	1.2 Educational level	1.3 Age in years	1.4 Experience in soybean trading(years)	1.5 Type of commodity you sell
1=male 0=female	1= no formal education 2=primary school 3=secondary school 4=college 5=university 6= others specify _____ _____			1=cereals 2=vegetables/fruits 3=cash crop 4=oil crops 5=livestock 6=fish/meat 7=poultry

Key [retailing=purchasing from traders and selling to consumers, wholesaling=purchase from traders and selling to traders, collecting=purchase from farmers and selling to traders]

1.11 What type of activity are you involved in? 1=retailer	Please indicate in terms of quantities the three most important commodities that you trade in. 1=..... 2=.....
--	--

2=wholesaler 3=collecting 4=others 99=no answer	3=.....

1.12 a) How many customers do you receive averagely on yearly basis? -----

- i. On average how many customers do you receive during peak periods -----

- ii. On average how many customers do you receive during off peak periods-----

b) How many regular suppliers do you have?

- i. On average how many suppliers do you receive during peak periods -----

- ii. On average how many suppliers do you receive during off peak periods-----

Section 2: Volumes and Flows of Soybean

Source	2.1 Location 1= farmer within county 2= farmers outside county 3=traders within county 4=traders outside county 5=traders outside country 6=others 99=no answer	2.2 Quantity	2.3 Price	2.4 Did you change source of supply in 2016 1=Yes 0=No
Direct from farmers				

Wholesaler				
Retailer				
Agro processors				
Bulkers				
Farmer groups				
Others specify				

2.5 If you changed your source of supply what was the reason?

Reason for change in volume	
Better harvest in 2016	
Poor harvest in 2016	
Better procurement in 2016	
Poor procurement in 2016	
Better supply in 2016	
Poor supply in 2016	
Higher profit margins in 2016	
Poor profit margins in 2016	
Less capital/credit in 2016	
More capital/credit in 2016	

2.6 Estimated number of customers (Low season)	2.7 Estimated number of customers (High season)	2.8 Changes in sales volume	2.9 Reason for change in volume
Less than 10	Less than 10	Increased by more than 50%	Better harvest in 2016
More than 10 less than 70	More than 10 less than 70	Increased by 10-49%	Poor harvest in 2016
More than 70 less than 140	More than 70 less than 140	Increased by 0-9%	Better procurement in 2016
More than 140	More than 140	Decreased	Poor procurement in 2016
No answer =99	No answer =99	No change	Better supply in 2016
		Decreased by more than 50%	Poor supply in 2016

		Decreased by 10-49%	Higher profit margins in 2016
		Decreased by 0-9%	Poor profit margins in 2016
			Less capital/credit in 2016
			More capital/credit in 2016

2.10(a) Do you trade in differentiated soybean products? 1=Yes 0=No

(b) If yes, please fill the table below

Product bought	Quantity	Price	Value added 1=Yes 0=No
3.10 Product sold	3.11 Quantity	3.11 Price	Value added 1=Yes 0=No

3. Credit and stocking strategy

3.1 Do you offer credit to your customers? 1=Yes 0=No	3.2 What share of the total sales is currently on credit?	3.3 Have there been changes on the number of people	3.4 How long do you keep your soybeans between purchase
---	--	--	--

99=no answer		that have received credit? 0=no 1=Yes ,more people 2=Yes,less people 3=remained the same 99=no answer	and selling?weeks 99=no answer

4. Price and transaction cost

[Introduce a transaction to the interviewee from the moment the trader buys the soybean to the time they sell it. You should also provide an example of a transaction]

Item	Units	Charges
Loading		
Transport		
Off loading		
Fumigation		
Cleaning		
Drying		
Bagging		
Drying		
Losses		
Transport to buyers		
Other charges		

4.2a) Do you know the price of soybean today in the market? 1=Yes 0=No 99=no answer

4.2 b) If yes, Please fill the table below

4.3 Soybean prices in Ksh today/Kg	4.4 Soybean prices 6 months ago in Ksh/Kg	4.5 If there is a decrease in the sales prices for soybean, what are the likely causes? 1=poor harvest 2=Good harvest 3=inflow from surplus zones 4=excess inflow from surplus zones	4.6 If there is an increase in the sales prices for soybean, what are the likely causes? 1=poor harvest 2=Good harvest 3=in flow from surplus zones
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		5=less exports 6=others 99=no answer	4=excess inflow from surplus zones 5=less exports 6=others 99=no answer

4.3a) Are there any factors that you consider when buying soybean? 1= Yes 0=No

4.3b) If yes, which of the following factors do you consider

- i. Quality
- ii. Price
- iii. Size
- iv. Variety
- v. Color
- vi. Others, specify-----

4.4 How do you get in contact with your suppliers of soybean? -----

4.5 How can we get in contact with your suppliers? -----

4.6 Did you get the quantity of soybean you needed in 2016? -----

i) If no why? -----

4.7 Do you know any other agro processors involved in soybean processing? -----

4.8 If yes where are they located and how can they be contacted?-----

4.9 What different products do you process out of soybean?

- i) -----
- ii) -----
- iii) -----
- iv) -----

4.10 From the products above how, much did you spend in the following items in 2016?

Item	Units				Cost per unit			
	Units (i)	Units (ii)	Units (iii)	Units (iv)	(i)	(ii)	(iii)	(iv)
Soybean (raw)								
Labor								
Electricity								
Firewood								
Water								
Levies								
Fees								
Packaging								
Transport								
Others specify								

4.11a) Is there any kind of agreement between you and your suppliers of soybean in terms of price and quantity? 1=Yes 0=No

4.11b) If yes, what form of agreement? 1=Verbal agreement 2= Formal agreement 3= others specify -----

4.12) Do farmers engage in group marketing? 1=Yes 0=No

4.13a) Do traders engage in aggressive tactics such as predatory or exclusionary pricing? 1=Yes 0=No

4.13b) If yes, do traders practice price discrimination among commodity producers or consumers? 1=Yes 0=No

4.14c) If yes, do farmers get price premiums for producing higher grade commodities? 1=Yes 0=No

If no, why-----

14.15) Do farmers sell on the spot, auction or terminal markets? 1=Yes 0=No

4.16) Can you return soybean that are damaged or below standard? 1=Yes 0=No

14.16a) If no, why-----

4.17) Are some traders merging to become one large business? 1=Yes 0=No

4.17a) If yes, why-----

4.18) Are prices of the soybean displayed? 1=Yes 0=No

4.18a) If no, is there any secret bidding? 1=Yes 0=No

4.19) How does the soybean get to you before you process it? 1= collect at farm-gate 2=collect from a collection point (s) 3=supplier (s) deliver to the market 4=others (specify) -----

4.20) Are standard measurements such as weighing scales used in market to measure volumes traded? 1=Yes 0=No

4.21) Do you find any difficulty in getting soybean? 1=Yes 0=No

4.21a) If yes, what are the difficulties? -----

4.22 Did you advertise your soybean products in the market in 2016? 1=Yes 0 =No

(i) If yes, fill in the Table below

Form of advert	4.17 Amount spent	4.18 Customers reached	4.19 Constraints and comments
Verbally			
Printing papers			
Electronics (phones)			
Others specify			

5. Market response

5.1 Did you carry out any market survey for your product in 2016? 1=Yes 0=No

i) If yes ,

5.2 Frequency of survey	5.3 Amount spent	5.4 Location of survey

5.6 Do you seek out price information before buying and selling soybean?	5.7 If yes how do you receive this information		5.8 How do you determine the price of soybean	
1=yes 0=no	a)When buying	b)When selling	a)When buying	b)When selling
	1=by cell phone from farmer(s) I know 2=By cell phone from trader(s) I know 3=verbally from farmer(s) I know 4=verbally from trader(s) I know 5=from farmers association 6=From traders association 7=others specify	1=by cell phone from farmer(s) I know 2=By cell phone from trader(s) I know 3=verbally from farmer(s) I know 4=verbally from trader(s) I know 5=from farmers association 6=From traders association 7=others specify	1= Informal negotiation with buyer 2= Active consultation with other traders in the market 3= From traders associations 4= standard formula 5= others specify	1= Informal negotiation with buyer 2= Active consultation with other traders in the market 3= From traders associations 4= standard formula 5= others specify

5.9 Which was your most preferred market for selling of soybeans in 2016?

Preferred market	Reason	Rank
1	1=High price for soybean 2=Short distance to the market (How many kilometers from home 3=Because it is safe to sell in that market 4=Because there is no transport cost to that market 5=I am assured of sale in that market 6=Others specify	
2	1=High price for soybean 2=Short distance to the market (How many kilometers from home 3=Because it is safe to sell in that market 4=Because there is no transport cost to that market	

	5=I am assured of sale in that market 6=Others specify	
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5.10 When selling soybean which was your most preferred buyer in 2016?

Buyer	Rank	Reason
1=direct consumers 2=Broker 3=Retailers/wholesaler 4= Agro-processors 5=Others specify		

- 2 (i)Are you aware of any regulations in the marketing of soybeans? 1=Yes 0=No
(ii)If yes, do these regulations affect you as a soybean trader? 1=Yes 0=No
(iii)If yes, please fill in the table below

Regulation	Comment

- 3 Is there any kind of agreement between you and your suppliers of soybean in terms of price and quantity? 1=Yes 0=No
4 If yes, what form of agreement? 1=Verbal agreement 2= Formal agreement 3= others specify -----

5 How does the soybean get to you before you sell it? 1= collect at farm-gate 2=collect from a collection point (s) 3=supplier (s) deliver to the market 4=others (specify) -----
6 Do you find any difficulty in getting the soybean? 1=Yes 0=No
7 If yes what are the difficulties? -----

8 (i) Did you advertise your soybean products in the market in 2016? 1=Yes 0 =No
(ii)If yes, fill in the Table below

Form of advert	Amount spent	Customers reached	Constraints and comments
Verbally			
Printing papers			
Electronics			

(phones)			
Others specify			

9 Did you carry out any market survey for your product in 2016? 1=Yes 0= No
 a)If yes ,

Frequency of survey	Amount spent	Location of survey

6. Constraints and response capacity

6.1 What do you consider as the FIVE primary limiting factors to soybean trading

1=poor road infrastructure 2=inadequate storage 3=poor access to transport means 4=insufficient market information 5=long distance between supply and resell markets 6=price instability 7=low trade margins 8=Lack of standard measures 9=poor access to credit 10=Others specify	Rank the factors in their other of severity starting with the most severe 1= 2= 3= 4= 5=	What would happen to the prices of soybean if the demand for soybean would increase by 25% in the next six months? 1=decrease 2=No change 3=Increase 99=No answer

6.2 What do you think can be done to improve on your processing of soybean?-----

6.3 a) Do you expect an upward increase in the soybean prices? 1=Yes 0=No

6.4 a) By 25%, would you have the capacity to deliver? 1=Yes 0=No b) If yes, do you expect the increase in prices to be sustained in the next six months?

1=temporary 2=sustained 99=No answer

b) If yes, in what period would you deliver the soybeans?

1=No 2=within 1 week 3=within 2 weeks 4=within 1 month 5= after 1 month 99=no answer

Appendix 4

Ministry of Agriculture Livestock and Fisheries(check list)

1. What are the main crops that are produced in this region?
2. What are the quantities of each of these crops in the last year?
 - i) Out of these quantities how much was imported into this region?
 - ii) Out of these quantities how much was exported outside this region?
3. Where is soybean ranked among the crops produced in this region?
4. How long has soybean production been done in this region?
5. Who are the main producers of soybean in this region?
6. What are the common varieties of soybean that are produced in this region?
7. How much soybean was produced in this region in the last 5 years?
8. Is this region self-sufficient in the production of soybean?
9. In case it is not a self-sufficient region, how does this region cope with the deficits in the production of soybean?
10. Do farmers have challenges in physical access to soybean markets in this region?
11. Are standard measurements such as weighing scales used in market to measure volumes traded?
12. Do farmers engage in group marketing?
13. Do farmers sell on the spot, auction or terminal markets?
14. Are some traders merging to become one large business?
15. Do traders engage in aggressive tactics such as to influence price?
16. Do traders price discriminate among soybean producers or consumers?
 - i) If yes, do farmers get price premiums for producing higher grade commodities?
 - ii) Can consumers return soybean that are damaged or below standard?
17. What role does the Ministry play in promotion of soybean crop in this region?
18. What are the benefits and challenges associated with soybean in this region?
19. i) Who are the important consumers of soybean in the regions in terms of ranking?

ii) Are you able to quantify the annual consumption of individuals in (i) as a fraction of the total annual consumption in this region?

20 What are some of the setbacks in the consumption of soybeans in this region?

21 Based on recent soybean production data in this region, is there a decline or an increase in the production of soybean?

22 What are some factors that have led to the decline or increase in production of soybean in this region?

23 What is your assessment of the future soybean production trends in this region?

24 What are some of the opportunities that have not been exploited in the soybean production in this region?

25 Do you as a Ministry department collaborate with any agency in the promotion of soybean?

Appendix 5**Names of Respondents****Wholesalers**

- 1) Justin Kamau
- 2) Doris Nyagah
- 3) Fridah Nyanga
- 4) Florah wawirah
- 5) Muchira Nikashu
- 6) Njeru Josiah
- 7) Nyakio Mwari
- 8) Pius Murere
- 9) Njoki Mwari
- 10) Jane Muthoni
- 11) Njagi Karanja John
- 12) Ann Mwangi
- 13) Wambogo Jane
- 14) Gichangi Machinda
- 15) Irine Rando

Processors

- 1) Gichangi
- 2) Lydia Mbugi
- 3) Evageline Mwiti
- 4) Irangi
- 5) Roselyne Wambui Mbugui
- 6) Weveti T
- 7) Helen Ngina
- 8) Agatha Wangiri
- 9) Githonga
- 10) Naomi Ndwiga
- 11) Emanuel Njoro
- 12) Nubian
- 13) Evangiline Mwiti
- 14) Njomo
- 15) Mathew kari
- 16) Mbae

SOCO and FAO project

- 1) Peter Ndegwa
- 2) Murangiri
- 3) Kariuki
- 4) Jotham
- 5) Madam Irene

MOALF

- 1) Weveti T
- 2) Marion Sadika
- 3) Mati Kennedy

BIDCO

John Kariuki