Efficiency of Soybean Markets in Malawi: Structure, Conduct and Performance Approach

Wisdom Madede Nzima
Department of Agricultural Extension Services
Ministry of Agriculture Irrigation and Water Development
P.O. Box 30145, Lilongwe 3
Malawi

Joseph Dzanja
Department of Agribusiness Management
Lilongwe University of Agriculture and Natural Resources
Bunda College of Agriculture
P.O. Box 219, Lilongwe
Malawi

Abstract

This study explores and assesses efficiency soybean markets in Malawi using structure, conduct and performance approach. Specifically, the study analyses soybean marketing systems, profitability, production and soybean marketing and production constraints. Smallholder farmers and traders involved in soybean were interviewed. Using time series price data, the spatially distinct soybean markets were also examined. The results show five profitable marketing channels with minimal value addition. Most of the marketing channels are inefficient. Quantity of seed used is the significant factor affecting soybean production. The markets are weakly integrated and segmented with a few sellers. The study highlights the need for strengthened research-extension-farmer linkage, strengthened farmer-agro dealer/seed company linkages, organised soybean seed system, improved roads to production areas; improved and affordable technologies on production and value addition; and vibrant farmer organizations.

Keywords: Soybean Market, Efficiency, Structure, Conduct, Performance, Market Integration

1.0 Introduction

1.1 Background on Agriculture Sector in Malawi

Agriculture remains the main driver of Malawi's economy despite some growths in the industrial and manufacturing sectors. It contributes 39% to the country's Gross Domestic Product (GDP), employs 85% of the country's workforce in food and cash production, agro-industries and inputs and outputs markets and accounts for more than 90% of the country's foreign exchange earnings (Government of Malawi, 2009). Agriculture is also the main source of savings and investible funds in Malawi—about 61% of the country's households depend on crop sales for their incomes. The agriculture sector is characterized by a dual structure consisting of the smallholder and estate sub sectors. The smallholder subsector is involved in the production of crops such as maize, soybean, groundnuts, cassava, tobacco, sweet potatoes, cotton, rice, pulses and potatoes. The estate subsector employs the production of high value cash crops for export such as tobacco, tea, sugar, coffee and macadamia (Kachule, 2011). The smallholder subsector accounts for more than 70% of agricultural GDP (GoM, 2009). Soybean is one of the crops grown under smallholder subsector.

1.2 Soybean Production and Marketing in Malawi

Soybean is produced in almost all the districts of Malawi as source of food and income, livestock feed, export earnings and also for improving soil fertility. However, the major producing areas are Kasungu, Lilongwe and Mzuzu Agricultural Development Divisions (ADDs) respectively. They account for 80% of the total soybean production in the country (Techno Serve, 2011).

Over the past 10 years, overall production has slightly increased from 47,000T in 2000 to 73000T in 2010 (FAO STAT, 2011). The increase in production during the period 2005 to 2010 was mainly due to improved yields (Techno Serve, 2011).

With regard to marketing, the Agricultural Development and Marketing Corporation (ADMARC), a statutory corporation, was the only buyer and supplier of farm produce and inputs respectively. However, since mid 1980s the government liberalized market to allow private sector play an active role in the marketing of farm inputs and produce, including for soybean. Smallholder soybean farmers sell their produce directly to buyers at local markets, companies and Non Governmental Organisations (NGOs). They also buy farm inputs directly from companies and businesses selling soybean farm inputs. In terms of exports, Malawi exports most of its soybean to the Southern Africa Development Community (SADC) countries. By 2005, the country exported 626T of soybeans which accounted for 9.1% of the total SADC market share (Tips & AusAid, 2006). The major trading partners within the region are Zambia, Mozambique, Zimbabwe and South Africa (Techno Serve, 2011).

Market liberalization was supposed to encourage efficient marketing through competition and increased efficiency of resource allocation and utilization. Despite the market liberalization opportunity to smallholder farmers and traders, government still feels there is low and fluctuating soybean production and marketing in Malawi (GoM, 2008). This contributes to poor human nutrition status, slow growth of livestock and crop cereals sectors, low income and foreign exchange earnings from soybean. The low and fluctuating soybean production and marketing in Malawi indicates an apparent problem of market failure to stimulate production and marketing.

1.3 Objectives of the Study

In order to address problems associated with market failure so as to increase production and marketing of soybean, knowledge of the structure, conduct and performance of soybean markets is required. The type of a market structure that prevails in any particular market is a major factor that determines the efficiency of marketing system. In addition, the structure, conduct and performance of soybean markets facilitate further innovations and productivity growth in the soybean subsector. Unfortunately, no studies have been conducted in Malawi to analyze the structure, conduct and performance of soybean markets. This study therefore aims at analysing efficiency soybean markets in Malawi using structure, conduct and performance approach. Specifically, the paper aims to (i) assess existing marketing systems of soybean, (ii) conduct soybean profitability analysis, (iii) identify factors that affect soybean production and (iv) identify smallholder farmers' constraints to soybean production and marketing.

2.0 Materials and Methods

2.1 Market Structure, Conduct and Performance

Market structure is a set of market characteristics that determine the economic environment in which a firm operates (Thomas and Maurice, 2011). It is characterized on the basis of four industry characteristics: (i) number and size distribution of active buyers and sellers and potential entrants; (ii) degree of product differentiation; (iii) amount and cost of information about product price and quality and (iv) conditions of entry and exit (Hirschey *et al.,* 1993).

Market conduct refers to the patterns of behaviours that firms follow in adapting or adjusting to the markets in which they sell or buy. The dimensions of conduct include methods employed by firms in determining the price of an output and sales promotion policy, the presence or absence of coercive tactics directed against either established rivals or potential entrants (Bain, 1968).

Market performance refers to the economic results that flow from the industry and how well it performs in terms of efficiency and progressiveness or innovation, given its technical environment (Bain, 1968). It is the impact of structure and conduct as measured in terms of the variables such as prices, costs and volume of output (Bresser and King, 1970).

2.2 Analytical Framework/Procedure

The structure, conduct and performance of markets have been analysed by researchers using various different approaches. Nambiro *et al.,* (2001) analysed the structure and conduct of the market in Trans Nzoia district (Western Kenya) in order to understand the organisation of the market and assess the degree of competition in hybrid maize seed production and retailing using Gini coefficients.

Enibe et al., (2008) described the structure, conduct and performance of banana market in Anambra State of Nigeria using descriptive statistics, Gini coefficients, price spread, behaviour of middlemen, conduct of marketing functions and gross marketing margins.

Giroh *et al.*, (2010) also examined the structure, conduct and performance of farm gate marketing of natural rubber in Edo and Delta States of Nigeria using Gini coefficient, Budgetary technique, Market margins, Marketing Costs and Rate of Return to investment. Odhiambo *et al.*, (2006) analysed the structure and performance of beans marketing system in Nairobi using descriptive statistics, concentration ratios and co-integration models. Bain (1968) observed that by analyzing the level of the marketing margins and their cost components, it is possible to evaluate the impact of structure and conduct characteristics on market performance. The high marketing margins result from imperfectly competitive market conditions (Pomeroy and Trinidad, 1995).

In this study, a number of analytical approaches were used. They include: Herfindahl-Hirschman Index (HHI), Marketing Margins, Marketing Efficiency Index (MEI), Price Spread, Cobb Douglas Production Function, and Spatial Market Integration (using bivariate correlation coefficients of price difference). Market structure was determined by assessing market concentrations and entry conditions of the markets using HHI as follows:

$$HHI = \sum_{i=1}^{n} MS^2 \quad ---------- (1)$$

Where: MS_i is the Market Share of seller$_i$; and n is the number of sellers in the market. The market shares were calculated based on quantities of soybean handled by each seller as follows:

$$MS_i = \frac{V_i}{\sum_{i=1}^{n} V_i} \quad ---------- (2)$$

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

Marketing margins were calculated by determining price variations at different segments and compare them with the final price paid by the consumer. The formula for total marketing margin was as follows:

$$Total\ Gross\ Marketing\ Margin = \left(\frac{Retail\ Price - Farm\ Gate\ Price}{Retail\ Price}\right) * 100 \quad --------(3)$$

The price spread was applied to measure the degree of pricing efficiency. For farmers, it was calculated by deducting costs of marketing from gross price. For traders in all the channels, the price-spread focused on the trader's surplus as a percentage of total marketing costs.

Marketing efficiencies of all channels were determined by MIE. According to Acharya and Agarwal (2001), MIE is the ratio of net price received by the farmer to the total marketing cost plus total margin as follows:

$$MEI = \frac{NP}{MM+MC} \quad ---------- (4)$$

Where MEI is the Marketing Efficiency Index; NP is the Net Price received by the farmers (MK/Kg); MM is the Total Net Marketing Margin (Total Traders Surplus) for Traders in the channel; and MC is the Total Marketing Cost incurred by Traders in the channel.

The performance of soybean markets was also assessed by the volume of output produced by farmers (and its underlying factors) using production function. The transformed Cobb-Douglas production model (which combined both physical and non physical factors of production) was applied as follows:

$$\ln OUTPUT = ln\beta_0 + \beta_1 lnLAB + \beta_2 lnSEED + \beta_3 EDUCAT + \beta_4 EXTVISIT + \beta_5 VOLSOLDLY + \beta_6 DISTMKT + \beta_7 FARMGP + \beta_8 AGE + \mu_i \quad ---------- (5)$$

Where:

lnOUTPUT = Natural log of soybean produced in household i (kg)
lnLAB = Natural log of amount of labour used in household i (person hours)
lnSEED = Natural log of amount of seed used in household i (kg)
EDUCAT = Education of household head i (number of years in school)
EXTVISIT = Whether a household is in contact with an extension worker (1=yes and 0=no)
VOLSOLDPY = Volume of soybean sold previous year (Kg)

DISTMKT = Distance to market (in Km)
FARMGP = Farm Gate Price (MK/Kg)
AGE = Age of the household i (years)
β_i = Coefficients (parameters) to be estimated (i= 0,1,2,3,4,5,6,7,8,9)
u_i = Error term

Spatial market integration analysis was conducted to compliment assessment of performance of soybean markets in Malawi. Market integration refers to the price transmission in the marketing chain. Spatial market integration reflects the effects of a price change in one market on the price of the same commodity in another market location. Bivariate coefficients of Correlation of price differences were calculated determine degree of soybean market integration.

2.3 Data Collection

Primary data was collected from soybean smallholder farmers and traders in Mzimba and Kasungu districts through interviews and focus group discussions using questionnaires and checklist respectively. The districts are among the major soybean producing areas for Malawi. Stratified random sampling method was used to sample a total of 115 farmers (52 in Mzimba and 63 in Kasungu) and 67 traders. Specifically, farmers were from Extension Planning Areas of Santhe, Lisasadzi, Kasungu-Chipala and Kaluluma (for Kasungu) and Luwerezi, Champhira and Vibangalala (for Mzimba) The sampled traders were from the markets of Mzuzu, Mzimba, Kasungu, Jenda, Embangweni, Nkhamenya, Chatoloma, Chinkhoma, Santhe and Lilongwe. Mzuzu and Lilongwe are the major market outlets for soybean produced in the study area. The study also employed the use of monthly time series data on price of soybean collected from April 2005 to June 2011 for the aforementioned markets.

3.0 Results and Discussion

3.1 Soybean Marketing Channels in Malawi

The majority of farmers (85.2%) sold their produce to traders and 29.6% sold directly to consumers at government markets. The traders consisted of vendors, retailers, wholesalers, companies and individual households or fellow farmers. About 63.5% of farmers sold their soybeans produce to the vendors, 19.3% to wholesalers, 8.7% to retailers, 7.8% to ADMARC, 5.2% to National Smallholder Farmers Association of Malawi (NASFAM), 4.3% to fellow farmers and 3.5% of farmers sold to Mulli Brothers Group of companies. The other buyers that existed include Farmers World Company, Export Trading Company, Takondwa Company and Agro-dealers. The study identified five marketing channels.

Marketing channel 1 comprised of farmers who sold soybean to vendors at their local market. The vendors incurred transport, storage and packaging costs from the local markets to the consumers. The consumers included individual people and institutions (such as hospitals and schools). Channel 2 consisted of farmers that sold soybean to vendors who in turn sold to retailers. The retailers then sold to final consumers. Marketing channel 3 consisted of farmers that sold directly to retailers, who in turn sold to consumers. The retailers in channels 2 and 3 are retail shops, super markets and agro-dealers. Channel 4 comprised of farmers that sold directly to the consumers in rural markets. The rural consumers included other farmers that buy soybean from their fellow farmers for consumption and as seed. Channel 5 comprised of farmers who sold soybean to wholesale-retailer group of companies that in turn sold to the consumers. The companies included ADMARC, Mulli Brothers Group, NASFAM, Farmers World, and Takondwa Company. The major marketing functions that were carried out were storage (in sacks), grading and processing (into soybean flour, milk, coffee, soy pieces, soy powder and animal feed).

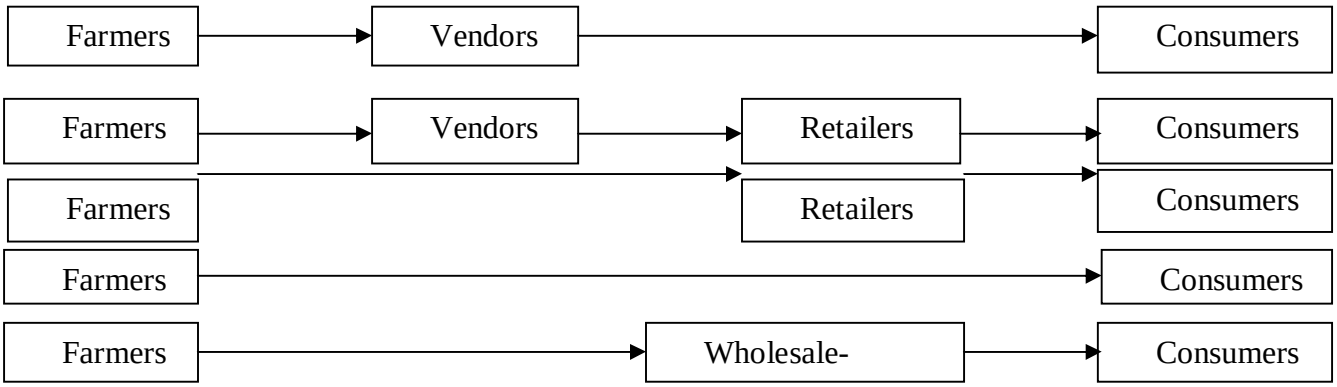

Figure 1: Soybean Marketing Channels

3.2 Market Structure of Soybean

Herfindahl-Hirschman Indices were calculated to assess market concentration for the markets of Chatoloma, Chinkhoma, Embangweni, Jenda, Kasungu, Nkhamenya, Mzuzu, Santhe, Mzimba and Lilongwe. The degree of seller concentration was very high (above 0.5) in the markets of Chatoloma, Embangweni, Jenda, Kasungu and Nkhamenya. This means that the markets were dominated by a few sellers. The markets for Chinkhoma, Lilongwe, Mzimba, and Santhe were also dominated by a few sellers since their HHI were above perfect competition index (0.1) despite being below 0.5. Table 1 below shows HHI of seller concentration for each market.

Table 1: HH Indices of Seller Concentration in the study Markets

Market	Soybean HHI Indices
Chatoloma	0.740
Chinkhoma	0.390
Embangweni	0.760
Jenda	0.973
Kasungu	0.528
Lilongwe	0.202
Mzimba	0.414
Mzuzu	0.103
Nkhamenya	0.947
Santhe	0.239

The dominance of few sellers in most markets implies low competition among sellers. This would in turn make farmer receive lower prices for their soybean produce. It would also make other potential traders fail to penetrate the markets resulting into no further innovations in the soybean industry.

3.3 The Conduct of Soybean Markets

The analysis of soybean market conduct established that there were no trader based organisations or marketing groups in all the markets to affect the bargaining power. This means that setting of prices was done on individual basis. The behaviour was reflected in purchase of produce from farmers in that it's the individual traders that most of times determined the price. The determination of prices in soybean markets was dependent on the demand (58.2%), transport cost (56.7%), quality in terms of maturity and grading (26.9%) and purchase price (20.9%).

3.4 Performance of Soybean Markets

3.4.1 Marketing Margins and Marketing Efficiency Indices

The prevailing mean selling prices (MK/Kg) at farm gate, vendor, wholesale-retailer and retailer levels were K76.26, K129.44, K166.79 and K216.82 respectively. The marketing margins were calculated for all the five marketing channels. Farmers' producer share was lowest (64.83%) for channel 5 and highest (100%) for channel 4. The producer share increased to 100% because farmers played the role done by vendors and retailers and took profits that could have gone to them.

Channels 2 and 3 recorded same producer share (70.10%) 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. Table 2 below shows marketing margins and producer share for each marketing channel.

Table 2: Gross Marketing Margins (GMM in %)

	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Total GMM	41.08	64.83	64.83	0.00	41.75
GMM-Middleman	41.08	24.53	-	-	-
GMM-Wholesale-Retailers	-	-	-	-	41.75
Retailers	-	40.30	64.83	-	-
Producer Participation	68.26	70.10	70.10	100.0	64.83

The price spread method was applied to assess efficiency of marketing channels by removing marketing costs. Traders' surplus was calculated as a percentage of the total marketing costs to determine how well markets perform in terms of prices. The mean vendor's surplus was 40.7%, wholesale-retailer's surplus was 92.7%, retailers' surplus was 29.2% (for channel 2) and 66.3% (for channel 3). This means that all the intermediaries (except retailers in channel 2) make super normal profits as they are way above the acceptable range of 20-30%, according to Hay and Morris (1979) as quoted by Nakhumwa (2001). Marketing Efficiency Indices were thereafter calculated to determine level of marketing efficiency for all channels. Channel 4 was the most efficient since it had the highest index of positive infinity. This was followed by Channels 1, 5, 3 and 2 respectively. The results are presented in Table 3:

Table 3: Soybean Price Spread and Marketing Efficiency Indices

Participant	Description	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5
Farmers	Selling Price	76.26	76.26	76.26	76.26	76.26
	Storage	2.57 (2.0)	2.57 (1.2)	2.57 (1.2)	2.57 (3.4)	2.57 (1.5)
	Grading	3.1 (2.4)	3.1 (1.4)	3.1 (1.4)	3.1 (4.1)	3.1 (1.9)
	Net Margin	47.51 (36.7)	134.89 (62.2)	134.89 (62.2)	70.59 (92.6)	84.86 (50.9)
	Gross Margin	53.18 (41.1)	140.56 (64.8)	140.56 (64.8)	0	90.53 (54.3)
	Farmers Share	68.26	70.1	70.1	100	64.83
Vendors	Buy price	76.26 (82.9)	76.26 (82.9)	0	0	0
	Transport Cost	12.36 (13.4)	12.36 (13.4)	0	0	0
	Storage Cost	1.68 (1.9)	1.68 (1.9)	0	0	0
	Market Costs	1.71 (1.9)	1.71 (1.71)	0	0	0
	Total Costs	92.01	92.01	0	0	0
	Selling Price	129.44	129.44	0	0	0
	Traders Surplus	37.43 (40.7)	37.43 (40.7)	0	0	0
Wholesale-Retailers	Buy price	0	0	0	0	76.26 (88.1)
	Transport Cost	0	0	0	0	7.41 (8.6)
	Storage Cost	0	0	0	0	0.86 (1.0)
	Market Costs	0	0	0	0	2.02 (2.3)
	Total Costs	0	0	0	0	86.55
	Selling Price	0	0	0	0	166.79
	Traders Surplus	0	0	0	0	80.24 (92.7)
Retailers	Buy price	0	129.44 (77.1)	76.26 (58.5)	0	0
	Transport Cost	0	15.05 (9.0)	27.41 (21.0)	0	0
	Storage Cost	0	11.7 (7.0)	13.38 (10.3)	0	0
	Market Costs	0	11.6 (7.0)	13.31 (10.3)	0	0
	Total Costs	0	167.79	130.36	0	0
	Selling Price	0	216.82	216.82	0	0
	Traders Surplus	0	49.03 (29.2)	86.46 (66.3)	0	0
Marketing Efficiency Index		1.33	0.50	0.51	∞	0.78

NB: Numbers in the parentheses are percentages of retail price (for farmers) and percentages of cost (for vendors, retailers and wholesale-retailers)

3.4.2 Soybean Production Analysis

The transformed Cobb-Douglas production model was used to determine factors that affect soybean production. The analysis shows that quantity of soybean seed positively and significantly influenced soybean production. This implies that a unit percent increase in quantity of seed will lead to an increase in soybean production by its percent parameter estimate (size of its coefficients) and vice-versa. This is so because an increase in quantity of soybean seed will lead to an increase in area planted to soybean thereby increasing production (and vice versa).

Labour, extension-farmer contact, volume of soybean in the previous (last) year, farm gate price and education level also positively influenced soybean production. This means that a unit percent increase in each of the variables (for the household) will result into an increase in soybean production by the magnitude of their parameter estimates (and vice versa). This could be so because an increase in labour enables the farmer to increase amount of land cultivated to soybean thereby increasing production. As for the extension-farmer contact, farmers that are more visited or in contact with extension workers are likely to follow recommended soybean husbandry practices and also adopt new or improved technologies on production hence increasing soybean production.

The volume of soybean sold in the previous (last) year determines how much the farmer should produce in the following season. An increase in the volume of soybean sold in the previous year makes the farmer allocate more resources to that crop to increase production in the following year and vice versa. The rise or increase in farm gate price (if done before planting) makes the farmer allocate more resources to soybean thereby contributing to increase in production. Similarly, a decrease in farm gate price makes the farmer reduce or sometimes abandon production of that crop thereby decreasing production. With regard to education level, as education level of a farmer increases, the understanding and management ability also improves (increases). This helps the farmer to easily and quickly adopt improved technologies and recommended farming practices. It also helps the farmer to properly manage the crop and easily access extension services on soybean through reading. The overall result is an increase in soybean production.

Distance to market and age negatively influenced soybean production. This implies that an increase in distance to markets and age of the farmer will lead to a decrease in soybean production. This could be so because further increase in distance to markets makes farmers have difficulties and sometimes fail to transport produce to the market hence reducing production. On the part of age, further increase in age of a farmer make them to be less productive thereby decreasing production. This is economically justified by the fact that the curve of production of an individual increases with age, reaches a maximum before decreasing with increase in age. This is true too with the curve of margin productivity of labour that increases with age, reaches maximum before decreasing in old age. Table 4 below shows the coefficients, standard errors, t-values, p values, variance inflation factor (VIF) and the Breusch-Pagan test. The coefficients constitute parameter estimates.

Table 4: Parameter Estimates of Transformed Cobb Douglas Production Model on Soybean Production in Mzimba and Kasungu, 2011

Variable	Parameter Estimate	Standard Error	t-ratio	p-value	Variance Inflation Factor	Tolerance
lnLABOUR	0.041	0.189	0.216	0.830	1.418	0.705
lnSEED	0.491***	0.143	3.445	0.001	1.525	0.656
EDUCATION	0.003	0.035	0.072	0.942	1.269	0.788
AGE	-0.021**	0.010	-2.209	0.031	1.216	0.822
EXTVIST	0.029	0.246	0.118	0.906	1.123	0.891
VOLSOLDLY	0.001	0.001	1.639	0.106	1.725	0.580
FARMGATP	0.002	0.004	0.459	0.648	1.130	0.885
DISTMKT	-0.016	0.014	-1.131	0.262	1.179	0.848
CONSTANT	4.190**	1.619	2.588	0.012		
R-square	0.396					
Adj R-squared	0.323					
Breusch-Pagan Test	p = 0.936					

*Note: Significant at *** (1%), ** (5%), *(10%)*

3.4.3 Spatial Market Integration Analysis of Soybean Markets

The spatial market integration between two markets for Mzuzu, Mzimba, Jenda, Embangweni, Santhe, Kasungu and Lilongwe markets was measured using bivariate correlation coefficients of price difference. Differencing removes time trends, non-stationarity and other problems associated with time series data. The coefficients ranged from -0.06 (for Lilongwe—Santhe) to +0.21 (for Santhe—Kasungu). Markets that have negative coefficients (such as Mzuzu—Santhe, Kasungu—Mzimba, Jenda—Santhe, Lilongwe—Santhe) means that they are not integrated to each other. The negative coefficients indicate a degree of segmentation between markets. So, an increase in price of soybean in one market would not lead to an increase in soybean prices in the other markets (and vice versa). This could also be due to high transfer costs, poor infrastructure and lack of information flows between spatially separated markets. On the other hand, markets with positive coefficients (such as Lilongwe—Kasungu, Mzuzu—Mzimba, Santhe—Kasungu) are integrated to each other. So, an increase in price of soybean in one market would lead to an increase in price of soybean in other markets. This indicates competitiveness and information and trade flows between spatially separated markets. The results are shown in Table 5 below

Table 8: Soybean Bivariate Correlation Coefficients of Price Difference

	Mzuzu	Mzimba	Embangweni	Jenda	Santhe	Kasungu	Lilongwe
Mzuzu	1.00						
Mzimba	0.14	1.00					
Embangweni	0.00	0.00	1.00				
Jenda	0.06	0.08	0.04	1.00			
Santhe	-0.03	0.01	0.00	-0.02	1.00		
Kasungu	0.05	-0.02	0.02	0.06	0.21**	1.00	
Lilongwe	0.09	0.04	0.01	0.00	-0.06	0.05	1.00

*** Correlation is significant at 0.05 level (1-tailed)*

3.4.4 Constraints to Soybean Production and Marketing

The smallholder farmers and traders cited various constraints hindering increased groundnuts production and marketing. Smallholder farmers' constraints to soybean production are poor road infrastructure, labour demanding, lack of markets, pests and diseases, low prices, inadequate improved seed and inadequate and poor storage facilities. Traders' constraints to soybean marketing also include poor road infrastructure, limited capital, high market fees, poor grading and drying, low supply of produce, high transport costs, inadequate technology for value addition and storage facilities.

4.0 Conclusion and Recommendations

The study attempted to determine the structure, conduct and performance of soybean markets as measures of market efficiencies in Malawi. It has been shown that there are five profitable soybean marketing channels. However, there is still minimal value addition in all the channels. The inexistence of innovations along the channels implies market imperfect competition and inefficiency of the markets. Most farmers use local seed due to in accessibility and unavailability of improved seed. The soybean markets also consist of a few sellers. The traders make supernormal profits. There are also a number of factors and constraints to soybean production and marketing as identified in the study.

Based on the aforementioned results and discussion, the study makes the following recommendations:

- Organise soybean seed systems to ensure availability of high quality seed to farmers. Farmers also need to be capacitated in certified seed production under phytosanitory control of research and extension. The building of farmer capacity in improved seed production is more sustainable than other systems that do not involve farmers.
- Strength research-extension-farmer linkages for quick awareness and training of farmers on the use of the released improved soybean seed varieties.
- Strength farmer-agro dealers/seed companies linkage to ensure quick delivery and access of improved seed to farmers for use.

- Government and other organizations should improve roads and road networks to production areas to facilitate trading of the produce and acquisition of farm inputs for use during production. Market infrastructures and storage facilities should also be increased and improved to ensure availability of high quality products on the market.
- There is need to develop and improve existing technologies on production and value addition. The technologies should be affordable to most farmers and traders. These will ensure an increased productivity, production of high quality produce, reduce losses or wastage and increase value addition.
- Vibrant farmer organisations (such as cooperatives) should be developed to ensure farmers are more organized. Farmer organizations will help farmers in accessing high quality farm inputs, better markets, better extension services, credit and capacity building.

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