

**FACTORS INFLUENCING SMALL-SCALE VEGETABLE PRODUCERS' CHOICE OF
MARKETING CHANNELS IN ZAMBIA - A CASE STUDY OF MAZABUKA.**

**A Research Report presented to the Department of Agricultural Economic
and Extension**

BY

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DEDICATION

This work is a dedication to the entire Zimba family whose patience and consideration sustained me through year of study and to my late parents, Mr. Lameck P Zimba and Mrs. Mary Chani Zimba whose love and affection inspired his endeavor.

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LIST OF ABBREVIATIONS

CSO	Central Statistics Office
FSRP	Food Security Research Project
MDGs	Millennium Development Goals
ZARI	Zambia Agricultural Research Institute
MAL	Ministry of Agriculture and Livestock
SPSS	Statistical Program for Social Sciences

ABSTRACT

FACTORS INFLUENCING VEGETABLE PRODUCERS' CHOICE OF MARKETING CHANNELS IN ZAMBIA

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Access to market in the form of different channels for small scale vegetable farmers is crucial for exploiting the potential of vegetable production to contribute to increased cash income of rural households. Identifying factors affecting market channel decision is therefore important. This paper reports on the findings of a study to investigate the factors that influence these choices among small scale vegetable farmers in Zambia. The study found out that the main marketing channels existing in the area were 1) private traders, 2) neighboring household. Vegetable farmers can choose to sell all, a proportion or nothing of their vegetable through any of these channels. Random sample of 96 household were selected from a number of camps to ensure representation of all categories of households. The study reveals that more 60% of the interviewed farmers sold their produce to neighboring farmers while less than 30% sold to private informal traders. Probit regression is made and the regression results for member farmers revealed that factors such as total farm income to affected market outlet choice.

The factors that influence the producers' market participation decisions included distance to nearest urban market (p-value 0.002) with marginal effect of -.0027459 i.e. a km increase in distance is less likely to increase market participation by 0.27%. Transport cost to nearest market is significantly important (p-value 0.014) with marginal effect of -.039928 i.e. a kwacha increase in transport cost is more likely to reduce market participation by 3.9%. Experience in growing vegetables (p-value 0.000) with marginal effect of .0449929 i.e. being more experienced in growing vegetable is more likely to increase market participation by 44.9%. The study also identifies that rape is the most grown vegetable in the district and that its market is largely informal. Ownership of transportation is the only factor identified which affects the choice of marketing channel among small scale vegetable growers in the area.

This study therefore recommend that more farmers be encouraged to grow vegetables not just as a subsistence crop but as a cash crop and also the development of sustainable value chains and that more effort is put in setting up of appropriate policies and infrastructure to encourage more market participation thus developing the vegetable value chain.

The top three staple vegetables tomato, rape, and onion account for a higher share of consumer expenditure (9.1%) than any food group other than cereals & staples and meat & eggs, and account for two-thirds of all vegetable consumption. Expenditure on all vegetables is four times that on fruit. While the share of expenditure devoted to all vegetables falls with income (while fruit's share rises), absolute expenditure on vegetables increases by four times from the bottom to the top income tercile, due to sharp rises in incomes (Tschirley and Hichaambwa, 2010).

The National Agriculture and Cooperative policy (2003-2015) noted that the agriculture sector is the key to development of the Zambian economy and will be the engine for growth for the next decade and beyond. Agriculture generates between 18-29% of the Gross Domestic Product (GDP) and provides livelihood for more than 50% of the population. The sector absorbs about 67% of the labour force and remains the main source of income and employment for the rural women who constitute 65% of the total rural population. Increase in rural income through better market information will therefore result in the overall poverty reduction and increased food security.

The poverty Reduction Strategy Paper, (2000) note that agriculture in Zambia has potential to enhance economic growth and reduction poverty. Good performance in the sector translates into overall improvement of the country's GDP, creates jobs, and expands the base. This is because the majority of the Zambian depends on Agricultural related activities for their livelihood.

1.2 Problem Statement

According to the central statistical office 2003/2004 report, domestic demand for vegetables is expected to grow by 5% per year. This is largely due the expected growth in population and a steady rise in income level among Zambians. It is vital that small and medium vegetable growers' not be left out in this potential lucrative market. It is evident from this information that farmers can increase their income by participating in this market. However, insufficient knowledge continues to be the main hindrance.

Very little is known concerning factors affecting small-scale vegetable producers' choice to sale or not to sale their produce and which marketing channel to use. By providing vegetable farmers with this knowledge they would know the supply chain attributes that consumer's value so that they can deliver those preferred attributes as they supply vegetable. By so doing, they can offer maximum satisfaction to their customers and hence be able to create customer loyalty for their products.

Previous study by Jari (2009) suggested that access to marketing information, such as ownership of radios for example had a significant influence in market participation among banana farmer. Other factors included availability to good market infrastructure such as roads and market places, existence of extensive social capital, group participation. These four variable where identified as the main influencers for famer participation in markets. Jari (2009) collectively considered issues concerning , demographics, production and market characteristics as the main factors influencing cowpeas producers' choice for market participation in relation to marketing channels.

According to a study done in Kenya and India, access to marketing information can be of great benefit to small and medium farmer through increased profitability von open et al, (1997) This study therefore intend to build on these previous studies by incorporating additional factors such as access to credit, geographic location, risk preference and lifestyle choices. The information collected will be vital in allowing farmers and interested stakeholder alike to make informed decisions relating to; supplying necessary goods, searching for potential buyers, negotiating, enforcing contract before deciding to go into actual production (Jari, 2009).

1.3 Objective

1.3.1. General Objective

To identify the factors that influence small-scale vegetable producers' choices of marketing channels.

1.3.2. Specific Objective

- To determine the production and marketing characteristics of vegetable producer .
- To identify the factors that affect vegetable producers' market participation decisions.

1.4. Hypothesis

- We expect that vegetable marketing cooperative members sell their vegetable to their own cooperatives.
- We expect non member vegetable growers prefer to deliver their vegetable to private buyers.
- We hypothesize that vegetable growers using multiple outlet channel earn more income through diversifying risk.
- Young vegetable farmers, with better education, high proportion of off farm income to total income prefer to sell more of their produce to private traders.
- We expect that member vegetable farmers with lower income deliver their vegetable to cooperatives due to limited access to market information.
- We expect that vegetable farmers earning high income deliver their vegetable to private traders due to more access to market search.

1.5. Rationale

This study is of great importance as it will help mitigate the knowledge gap that currently exist in the District and thus provide insight on the factors that determine small-scale farmers' market participation and choice of marketing channels. Marketing channel decisions are among the most critical decisions facing an organization and the chosen channels intimately affect all other marketing decisions (Berry .T, 2010).

In an effort to identify interventions that could stimulate farmer participation in marketing, it is important to understand the factors that influence the farmers' choices of marketing channels. This will help develop a vegetable value chain which is important in developing the vegetable market in the District. Through this information farmer can develop better marketing strategies that would enhance production "it marketing that stimulates production and not vise- verse". Smallholder farmer participation in vegetable market is an important strategy for poverty alleviation and food security in developing countries (Heltberg and Tarp, 2001).

With a steady rise in income among Zambians, it still remains unclear if marketing and production of vegetable has kept pace. If income growth continues and proper investments are made, Vegetable can be a major source of growth of the rural sector (Munguzwe Hichaambwa and David Tschirley), 2009. Results of this study will provide therefore, a better understanding of the main vegetable value chain in Mazabuka

1.6. Structure of the Report

This report begins by giving an introduction of the research topic. The introduction highlights the background information about the subject, the problem statement, objectives, rationale and scope of study. Chapter two focuses on literature review in which the key terms in the study are defined and several aspects of marketing which include the marketing of vegetables, direct and indirect channels, international marketing channels and factors influencing the farmers' choices of marketing channels are reviewed. Chapter three looks at the methods and procedures that were used for the study. It encompasses the research design, description of the data collection procedure, sampling design and data analysis. Chapter four highlights the findings and interpretation of the study, while chapter five gives conclusions and recommendations based on the findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant literature on definitions and the scope of the study; the various findings of the previous studies regarding factors affect vegetable producer's market participation and choice of marketing channels.

2.2. Definition of terminologies

Marketing channels refers to the ways in which products move from the manufacturer to the distributor to the end user. Also called distribution channels, the number and efficiency of a company's marketing channel can have a strong impact on the company's success. If a company does not have enough channels through which to market their goods, or if the channels are inefficient and expensive, it can be difficult for a company to locate customers for its products and/or to make a profit on sales of its products (Melvin and boyes, 2010).

Channel intermediaries are firms or individuals such as wholesalers, agents, brokers, or retailers who help move a product from the producer to the consumer or business user (Scribe, 2010). In Agriculture, distribution channels therefore move agricultural products from farmers to consumers and to other businesses and consist of a set of interdependent organizations such as wholesalers, retailers, and sales agents who are involved in making a product available for use or consumption.

2.3. Vegetable Marketing in Zambia

The role of markets in ensuring the efficient distribution of vegetables has been studied by different researchers in different parts of the world especially in Southern Africa (Ayinde, 2005). Zambian vegetable farmers have always had access to one or more types of markets for their produce. Market centre's can be found in almost all residential compounds and towns and also in the central Business District of the major towns. The supply chain for vegetables may involve a

combination of producers, traders, retailers and consumers. In addition, marketing through contract farming and outgrower schemes have also been taking place (MACO 2012).

2.4. Direct and Indirect Marketing Channels

Some companies, often referred to as direct marketing companies, sell the product directly from the manufacturer to the end user, or consumer. In such cases, the companies do not create or establish marketing channels. Instead, the consumer orders directly and the item is shipped to him, reducing costs for marketing and distribution. It can be difficult, however, for a manufacturer to locate customers using this form of marketing, since it may be less convenient if there is no storefront for a customer to go to this gives rise to indirect marketing. This type of marketing involves the use of intermediaries to move the product between the producer and the final user. Each channel member adds value and therefore expects a return for their investment (Anderson et al, 1987).

Direct marketing is the most preferred by small scale vegetable producer in Zambia. Small-scale producer sale directly to consumers bypassing market intermediaries, mainly because of the low quantities produced and higher price associated with selling directly. In indirect marketing channel, the choice of channel becomes more diverse and the factors to be considered increases (ZNFU, 2010). Farmers are faced with a decision of selling their produce to restaurants, grocery stores, and distributors. The decision is usually based on cost factors. Distribution costs are largely a function of the number of potential customers in the market, how concentrated or dispersed they are, how much each will buy in a given period, and costs associated with the practical side of the distributive operation e.g. transport, warehousing and stockholding (Lanchester, 1990).

Jari (2009) suggested that access to marketing information, such as ownership of radios for example had a significant influence in market participation among banana farmer. Other factors include included availability to good market infrastructure such as roads and market places, existence of extensive social capital group participation.

These four variables were identified as the main influencers for farmer participation in markets. Issues such as demographics, production and market characteristics have not been looked at in trying to determine market participation determinants (Jari, 2009, Nyaupane, 2010 and others).

According to a study done in Kenya and India, access to marketing information can be of great benefit to small and medium farmer through increased profitability von Oppen et al, (1997) This study therefore intends to build on these previous studies by identifying the factors that influence vegetable producers' marketing participation and channel choices in Zambia. The information collected in will be vital in allowing farmers and interested stakeholder alike to make informed decisions relating to supplying necessary goods, searching for potential buyers, negotiating, enforcing contract before deciding to go into actual production (Jari, 2009).

2.5. Factors That Affect Market Participation

A study by Jari (2009) suggested that the variables that have a higher probability of shifting Households from non-market participation to informal marketing are access to market information in which, for example according to Jagwe (2007), Ownership of radios turned out to be statistically significant in influencing market participation in the banana industry. Other factors included availability of good market infrastructure such as roads and market places, existence of extensive social capital, group participation and guidance. Ownership of radios turned out to be statistically insignificant in influencing market participation.

An empirical study of aggregate productivity of smallholder farms in India, Kenya, and the Sudan by von Oppen et al. (1997) found that improved market access results in increased on-farm productivity. Improvement in market access reduces transaction cost hence increasing the profitability of the farm. The results also suggested that, in Kenya, large farmers gain the most from improved market access (Kamara and von Oppen, 1999).

The results of a study by Jagwe (2007) showed that larger land sizes also raise the probability of market participation for banana sellers although Most female headed households lacked access to productive assets (land, labor, capital) thereby limiting their production capabilities. Access to

off farm income increased the likelihood of banana market participation for buyers. The gender of the head of the household had a significant impact in the market participation decision in which there was a lower likelihood of market participation female headed households.

2.6. Factors Influencing Marketing Channel Decision

Limited empirical studies exist regarding factors affecting farmers channel choice decision. Agarwal and Ramaswami 1992; Williamson, 2002 and Brewer 2001 have identified factors related to price, production scale and size, farm household characteristic, behavioral aspects such as (trust, risk, and experience), and market context (distance and purchase condition) affect producer market outlet choice. Furthermore, Zuniga-Arias (2007) found out that factors such as price attributes, production system, farm household characteristic, and market context could affect market outlet decision of farmers in mango supply chain in Costa Rica.

According to Gong (2007), in his study of transaction costs and cattle farmers choice of marketing channel in china, a farmer's choice of cattle marketing channel is influenced by a number of transaction cost variables, but may also be influenced by the socio-economic characteristics of the farmer or farm. The transaction costs in this study were divided into information costs (price fluctuation, information access and quality inspection), negotiation costs (payment delay and influence on agreement) as well as monitoring costs (grade uncertainty and farm service).

A study by Jari (2009) provides an insight into the institutional and technical factors that influence agricultural marketing channel choices among smallholder and emerging farmers in Kat River Valley. The institutional factors that influence agricultural marketing channel choices include transaction costs, market information flow and the institutional environment which encompasses formal and/or informal rules, the use of grades and standards, organization in the markets and the legal environment. An appropriate institutional environment reduces transaction costs for traders. Mburu et al (2007) found that the institutional factors that were significant in the study of the Determinants of smallholder dairy farmers' adoption of various milk marketing channels in Kenya highlands included credit availability, dairy cooperatives, policy related

interventions such as government extension agent as a source of government extension information and finally, membership to agricultural farmer's group.

Misra (1993) found out that factors related to price and non price factors affecting selection decision of milk producer farmers. According to Royer (1995) risks that agricultural producers face are linked with decisions about the prices, quantity, quality, and the timing of delivery. It also aims to explore the association between the factors that influence the farmers to adopt a particular marketing strategy and their selection of a particular distribution channel. According to Gong (2007) there are significant relationships between economic and social variables and marketing channel selection for cattle distribution in China. They argued that transaction cost has a significant impact on marketing channel selection.

2.7. Conceptual Framework

This study was based on the theory of utility maximization in producer market participation. The theory assumes that producers are rational and attempt to choose marketing channels that maximize their utility, subject to institutional and technical constraints.

As such, the utility maximizing function can be given as:

$$\text{Max } U = U(C_k, R_{fk}, H_k, H_u)$$

Where; Max U denotes the maximum utility that can be attained from agricultural production

C_k represents the consumption of produced goods by the household

R_{fk} represents revenue gained from formal market participation

R_{ik} represents revenue gained from informal market participation

H_u represents a set of institutional and technical factors shifting the utility function.

From the utility maximizing function, it can be seen that households make decisions to produce, consume and market, subject to institutional and technical factors. Therefore, if the costs that are associated with using a particular channel are greater than the benefits, households will be discouraged from using it, shifting to the option that maximizes their utility. In the utility

function, the amount of good k that is consumed or sold does not have to exceed the amount that is produced. However, it is difficult to measure utility directly; therefore, it is assumed that households make participation choices depending on the option that maximize their utility. Thus, the decision to participate in either formal or informal markets or even not participating, signify the direction which maximizes utility. With the given assumption, probit regression was used to relate the decisions to participate in formal and informal markets or not participating and the factors that influence these choices. A typical probit regression model which was used is of the form:

$$P(Y_i = 1) = P(Y_i^* > 0) = P(\alpha + \beta_i X_i + e_i > 0)$$

That is,

$$Y_i = \begin{cases} 1 & \text{if } Y_i^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

Where $i = 1, 2, 3, 4, 5, \dots, n$ and denotes the sample size that was surveyed.

- Y_i is the dependent binary variable which can take on two values representing market participation and choice of private traders ($Y=1$) and non market participation or choice of other households ($Y=0$) of vegetable farmers.
- β is the set of parameters to be estimated.
- X_i is a vector of independent variables that affects the possibility of a farmer participating in cowpea marketing or selling to private traders.
- ε is the independent normally distributed error term assumed to be normal with zero mean and constant variance.

In this research, j represents the alternative marketing channels, while x , the independent variables included:

I.	Household size	X1
II.	Household head age	X2
III.	Distance to nearest market	X3
IV.	Transport cost to MKT	X4
V.	HH head marital status	X5

VI.	Experience in growing	X6
VII.	Ownership o of transport	X7
VIII.	Ownership of machinery	X8
IX.	HH head off-farm employment	X9
X.	Household head education	X10
XI.	Radio ownership	X11

$$Y_i^*=a +\beta_1HH \text{ head size} + \beta_2HH \text{ head age} + \beta_3DIST\text{-market} + \beta_4tranport\text{-cost} + \beta_5marital\text{-status} + \beta_6experience + \beta_7 \text{ ownership-transport} + \beta_8 \text{ ownership of machinery} + \beta_9HH \text{ head off farm income}+ \beta_{10}HH \text{ education}+ \beta_{11} \text{ radio owners}$$

CHAPTER THREE METHODOLOGY

3.1 Introduction

This chapter outlines the methods and procedures used to achieve the stated goals. It gives information on the area of study, research design, sampling procedure, data collection and data analysis tools that were used in the study.

3.2. Study Area

The household data used in this study was collected from small-scale vegetable growers through a face-to-face questionnaire. The survey was conducted in Mazabuka District, which is in the Southern provinces of Zambia. The survey was carried out by 5 field assistants and the author.

3.3. Research Design

The research design that was used is a case study under non experimental research design. A non experimental research design was selected because vegetable farmer in the target areas were not divided into groups based on their similarities i.e. control and target group but rather were considered as being part of one group. A case study was used so as to have a deeper understanding and knowledge of the factors affecting market participation decision and choice of marketing channel. Besides, resources were inadequate to be able to carry out the study in the entire district.

3.4. Study Population and Sampling Procedure

Data was collected from a sample of smallholder farmers who are producing a marketable surplus in Mwanachingwala area. Ninety six farmers were randomly selected for the survey. The sampling frame from where the farmers were selected was obtained from World Vision. A questionnaire was then administered to the sampled household heads through face-to-face interviews. In the absence of the head, the spouse or any family member who is directly involved in the farming activities and management was interviewed.

3.5. Data Source and Collection

Primary and secondary data will be collected in this study. The primary data was collected through personal interviews using structured questionnaires which were carefully developed around the overall objective of the survey. Secondary data was collected from various institutions such as MACO, CSO, World Vision, relevant publications and the internet.

3.6. Data Analysis

Statistical Package for Social Scientists (SPSS version 16.0) was used to run the data collected from smallholder farmers. To analyze relevant data, descriptive statistics were used together with the probit regression model. The main descriptive indicators that were employed were frequency and mean values.

A Probit model was run using (STATA version 11.0) to analyze factors that affect market participation decision among small scale vegetable producers. A second probit model was used to identify the critical factors influencing the vegetable producers' choice of marketing channel in Zambia. The dependent variable was a dichotomous participation variable.

The probit regression models were run and tested using the Breusch-Pagan Godfrey test for potential heteroskedasticity which may be present across households due to the use of cross sectional data. Heteroskedasticity was not a problem for both models since $\text{Prob} > \chi^2 = 0.0000$ for the first model and 0.0370 both greater than all the levels of significance (1%, 5% and 10%). Multicollinearity was evident in some of the variables, therefore some of the variables were dropped to correct for multicollinearity.

3.7. Study Limitation

In this research, a sample size of 140 vegetable farmers was supposed to be sampled. Covering all sampled vegetable producers was not possible because of the resources that were limited. Secondly, the gathering of information from some consumers was difficult using structured questionnaires because some respondents were very reluctant to give all details.

CHAPTER FOUR

STUDY FINDING AND DISCUSSION

4.1 Introduction

This chapter presents the results of the study findings. It begins with a presentation and discussion of the demographic characteristics of the sample households. The results of the market participation probit model are next.

4.2 Demographic Characteristics

Demographic characteristics of households are essential when analyzing economic data because such factors influence the households' economic behavior (Randela, 2005). Age, gender, marital status and educational level of vegetable producing household heads were therefore considered in identifying the factors that influence farmers' marketing channel choice.

Table1: Summary Statistics

Variables	Sold	Not sold
Mean house hold size	5	9
Proportion of female	2%	13%
Proportion of male	27%	54%
Mean age	45%	55%

Source: own survey Data

The farmer who sold vegetables differed slightly from those who did not sell in terms of age and household size. The vegetable sellers were characterized by a smaller mean age 45%year while their non-seller counter parts had a mean age of 55% years.

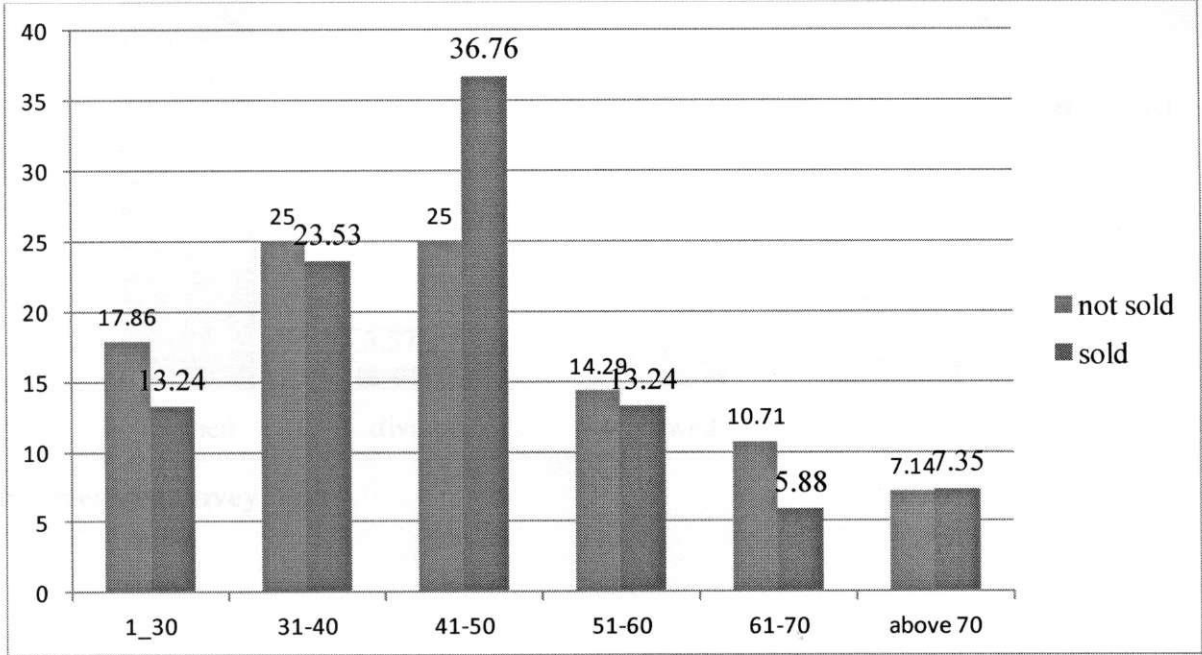
The sellers also had a smaller mean household size of 5 as opposed to 11 for the non sellers.

The proportion of males who sold vegetables was 27%% while of those who didn't sell, it was 54% while that of female was 2% sellers and 13% non sellers.

4.3 Age Distribution of Household Heads

The age of the household head is important because it shows the level of experience of each farmer which influences the production and marketing choices of each farmer. The bar chart below shows the age distribution of household heads for both the sellers and non-sellers of vegetables. The statistics shows that most of the farmers who sold vegetables are aged between 41-50 years and a majority of those who didn't sell were between 31-40 and 41-50 years. Age is therefore less likely to influence vegetable farmers' market choices.

Figure: 1 Distribution of Age for Household heads

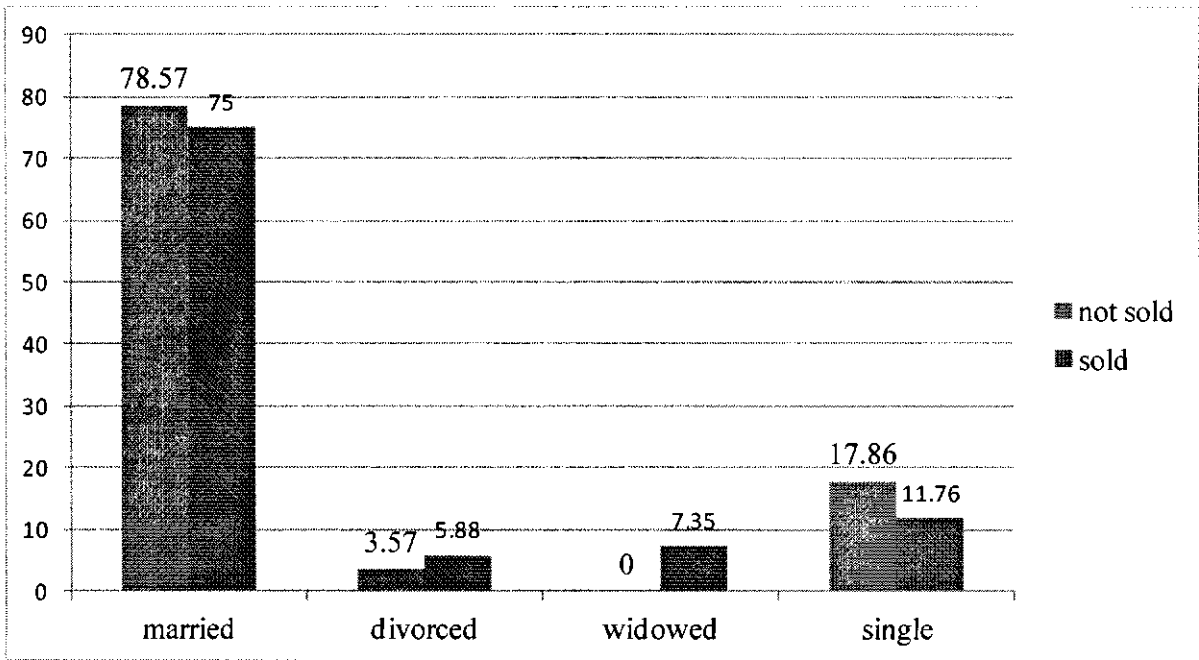


Source: own survey Data

4.4 Marital Status among the Household Heads

The bar chart below shows that most of the household heads are monogamously married with 78.6% of non seller and 75% of sellers. The marital status of the farmers influences how decisions concerning production and marketing of vegetable are made. All categories of marital statuses did participate in marketing of vegetables.

Figure: 2 Distribution of Marital Status of Household Heads

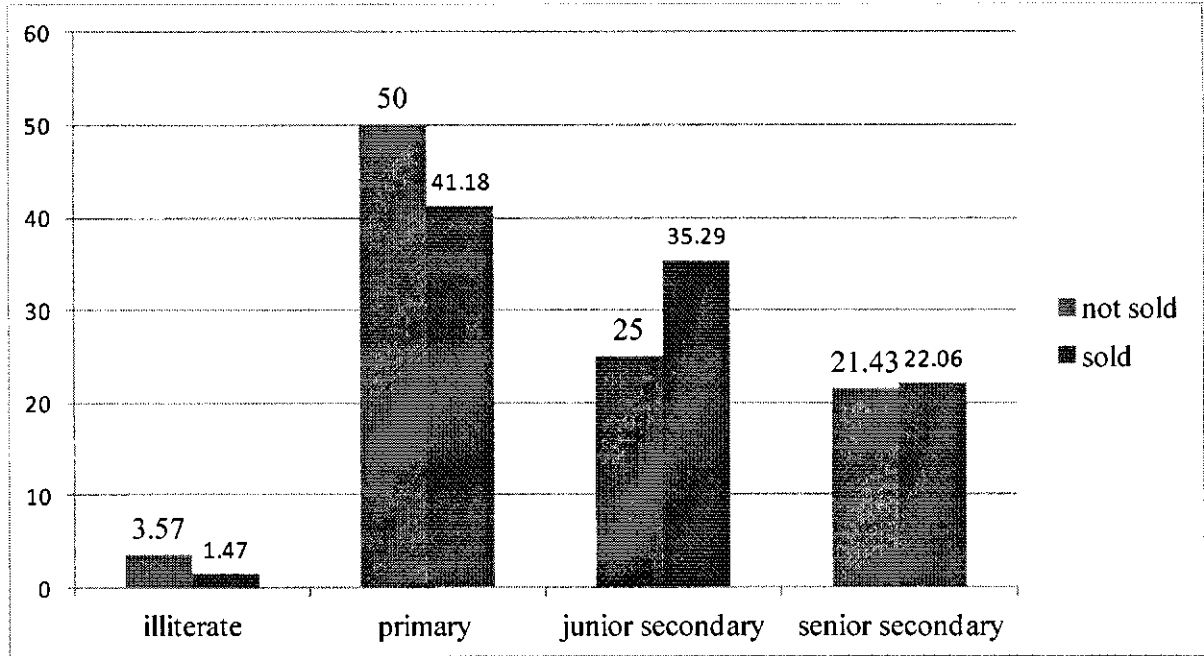


Source: own survey Data

4.4 Highest Educational level of Household Heads

The table below shows the distribution of household heads according to their highest level of education, for both sellers and non-sellers of vegetables. The education level among the sampled farmers is generally high, where 3.57% of the household heads who didn't sell never attended formal school, 50% went up to primary school who sold, 25% went up to junior secondary and 21.43% went up to senior secondary school. For those who sold 1.47% never went to school, 41.18% went up to primary school, 35.29% went up to junior secondary and 22.06% went up to senior secondary school. From the result we can conclude that the majority of the sampled farmer's attended primary school. This could be attributed to the presence of a primary school in the area (Chibiya basic).

Figure: 3 Distribution of Highest Educational level of Household Heads

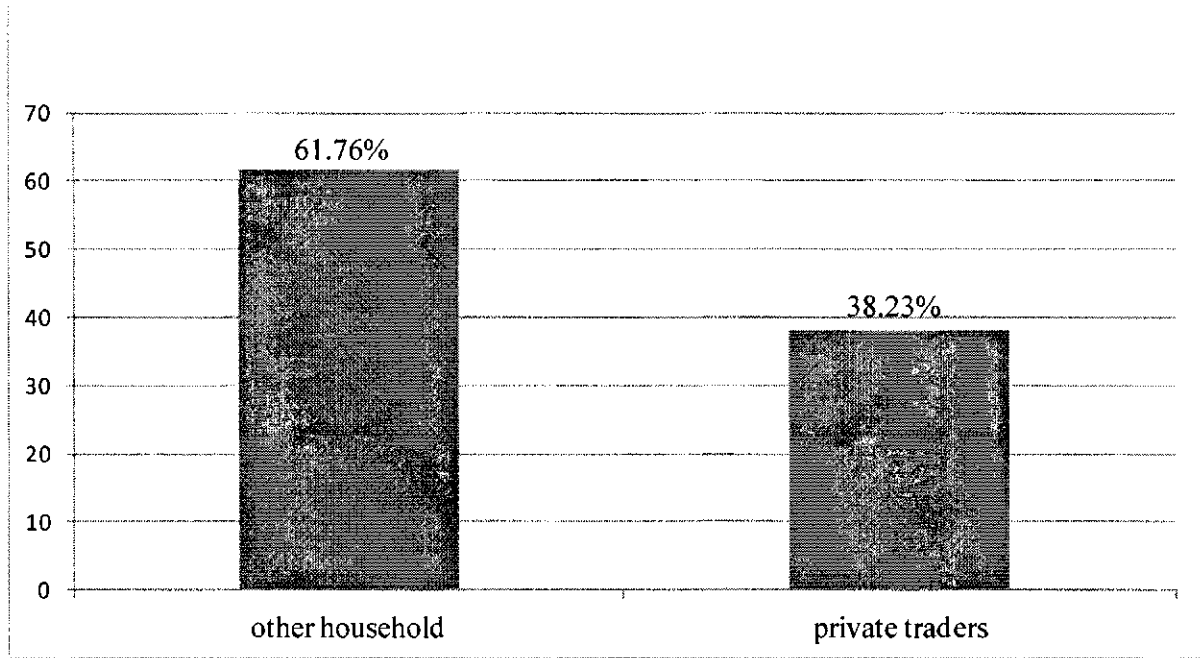


Source: own survey Data

4.5 Proportion of Channels used by Vegetable Farmers

More than 60 percent of the vegetable market transactions took place within the homestead while less than 40percent of them took place either within the village, the rural district or urban district. This shows that the largest market for vegetable is within the homestead thereby reflecting limited participation by private traders such as wholesalers retailers. The results therefore indicate that from the existing market channels in the study area, delivering to the local neighboring is still the most patronized outlet and Private traders constitute the second most common outlet.

Figure: 4 Proportion of Channels used by Vegetable Farmers



Source: own survey Data

4.6. Results from the Probit Model for Market Participation

Results of the probit model for market participation are presented below, in which the dependent variable is the decision to either sell or not sell. The marginal effects in the table describe the change in the dependent variable due to a unit change in each independent, ceteris paribus. The p-values of less than 0.1 represent the significant variables at 90% confidence level.

Table 2: Probit Regression Results for Market Participation

Variable Description	Coefficient	Coefficient	
Household Size	0.0465045	(0.0313)	*
Household Head Age	0.0027244	(0 .0027)	
Distance to nearest Market	0.0694906	(0.0221)	***
Transport cost to nearest Market	0 .039928	(0.0163)	**
HH marital status dummy	0.039928	(0 .984)	
Experience in growing	0.1091155	(0.0111)	***
Ownership of Transport	0.0449929	(0.0618)	
Ownership of Machinery	-0.0105483	(0.0459)	
Head off-Farm Employment	-0.038263	(6.57e-06)	
Total Income	3.09e-06	(8.26e-06)	**
Household Head Education	0.447795	(0.0812)	
Household Head Education	-0.1081719	(0.0908)	

Dependent variable, natural log of efficiency scores. Values in parenthesis are robust standard errors. *, **, *** denote statistical significant at 10 percent, 5 percent and 1 percent respectively.

The model was significant with a p-value of 0.0000 and pseudo R2 of 0.4539. That is, the independent variables explained 45 percent of changes in the dependant variables at 90% confidence.

A positive and significant relationship was found between household size and market participation decision. Farmers are 4.7% more likely to sell their vegetables with every additional increase in household size.

A negative and significant relationship was found between transport cost and the market participation decision. With a 1 increase in transport cost in Zambian kwacha, farmers are 0.039% less likely to sell their vegetables. This is because as the cost of transportation increases, the returns per unit sold is lower thereby presenting no incentive for profit maximizing farmers to sell their vegetables.

The farmers who had more experience in growing vegetables were about 45% more likely to sell their vegetables than those who were not experienced. This is more likely due to the fact that experience is important in generating confidence among the farmers to become receptive to new ideas to enable them be competitive in the market.

A negative and significant relationship was found between distance to the nearest urban market and the market participation decision. With a km increase in distance farmers are 6.9% less likely to sell their vegetables. This is because as the distance increases, the returns per unit sold are lower because of the increased transportation cost thereby presenting no incentive for profit maximizing farmers to sell their vegetables.

4.7. Model Results for Choice of Channel

The table below shows the probit results for the choice of channel, in which the dependent variable is the choice of either to sell vegetables to other households or to private traders. The marginal effects describe the change in the dependent variable due to a unit change in the independent variable, ceteris paribus. The independent variables are as discussed previously.

Table 3: Probit Regression results for Choice of Channel

Variable Description	Coefficient	Coefficient	
Household size	0.03156	(0.0558)	
Household Head Age	0.000116	(0 .0048)	
Distance to nearest Market	0.0937	(0.0616)	
Transport cost to nearest Market	0.0448	(0.0342)	
Household head Marital Status	-0.176	(0 .1400)	
Experience in growing	0.0113	(0.0138)	
Ownership of Transport	0.156	(0.1140)	
Ownership of Machinery	0.0619	(0.0711)	
Household Head Education	0.085	(0.0141)	
Total Income	1.70e-05	(8.26e-06)	**

Dependent variable, natural log of efficiency scores. Values in parenthesis are robust standard errors. *, **, *** denote statistical significant at 10 percent, 5 percent and 1 percent respectively. The model was significant with a p-value of 0.0370 and pseudo R2 of 0.2380. That is, the independent variables explained 23.8 percent of changes in the dependant variables at 90% confidence

The Probit result for market channel shows that total farm income is the only significant factor affecting choice of market channel. Farmers with a higher income are 4.0% more likely to sell to private trader than those who sell within the village community (i.e. local cooperative). Our results also indicate that from the existing market channels in the study area, delivering to the neighboring farmer’s is still the most patronized outlet and Private traders constitute the second most common outlet.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusions and recommendations of the study based on the findings and interpretations of the study.

5.2 Conclusions and Recommendation

Among the variables that were studied, only three (distance to nearest market, transport cost to nearest market and experience in growing vegetable) were found to be significantly important in their influence on vegetable farmer's decision to participate in a market and only one (farmers total farm income) factor was found to be significantly important in affecting vegetable farmer choice of marketing channel.

Rape is the most cultivated vegetable in the area with 80% of farmers sampled growing the crop. The market for vegetables (e.g. rape) in the area is informal with 62% of the farmers selling to other household while 38% sold to private traders.

Ownership of transport is the critical factor that affects vegetable producers' choice of marketing channel i.e. farmers are more likely to sell to private traders if they own some form of transportation. The farmers who had some form of transport were able to sell to far markets while those without only sold within 1km of their homestead

5.3 Recommendation

Based on the finding of the study and conclusion drawn, the following recommendations are in order.

I would recommend that more farmers be encouraged to grow vegetables not just as a subsistence crop but as a cash crop and also the development of sustainable value chains In light of the above recommendation I would also recommend that more effort is put into development of markets for vegetable.

The results of this study are limited to a small area restricted to Mwanachingwala area of Mazabuka District. Future studies should be carried out with much larger sample size in order to increase variations within the sample hence, capture more variables of importance.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

Questionnaire serial number

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FACTORS INFLUENCING VEGETABLE PRODUCERS' CHOICE OF MARKETING CHANNELS IN ZAMBIA –CASE STUDY OF MAZABUKA

Survey Instrument

This questionnaire is for academic purposes only. Be assured that all the information you provide will be treated as confidential as possible. Please feel free to answer all the questions honestly. Your cooperation will be highly appreciated

Instructions: Please write some answers in the tables, boxes or blank spaces provided

1.0. HOUSEHOLD IDENTIFICATION

1.1. Village name: _____

1.2. Household ID: _____

1.3. Name household head : _____

1.4. Is the head the main respondent? (1=yes; 0=no) |____|

1.5. Name of main respondent _____

1.6. Is this farming household ? (1=yes; 0=no) |____|

1.7. How do you view the household's farming activities?

1=Business

4=Hobby

2=Life style

5=All the above) |____|

2.1. Now would like to ask you a few questions about each of the members of your household/farm family (HOUSEHOLD CHARACTERISTICS)

Can you please give the names of the members of the household? Start with the household head		what is ...'s sex 0=female 1=male	When....was born		What is ...'s marital status	What is highest level of <u>education</u> attained	What is's <u>relationship</u> to the head	What is the main <u>occupation</u> of head 1=self employed 2=formal employment 3=other (specify)
Member code	Member name		Month code	Year (c.g. 1967)				
MID	Name	DM01	DM02		DM03	DM04	DM05	DM06
1								
2								
3								
4								
5								
6								

Marital status

1=single or under age
2=married
3=divorced or separated
4=widowed

Relationship with head

1=head 2=spouse 3=child 4=parent or parents in law
5=relative (uncle, Nephew/niece cousin) 6=Grandchild
7=member without kinship 8 other (specify)..

GRADE CODES:-

Grade 1 to 12=CODES 01 TO 12, Grade 12 GCE (O-level) = 12

Grade 12 GCE (A-level) =13, College = 14, Undergraduate University students= 15, Post-graduate Certificate/Diploma students= 16, Masters Degree students=17, Doctoral level and above students = 18

3.1 HOUSEHOLD AMENITIES

1. Main walling material of main residential house.....(Codes B)
2. Main roofing material of main residential house.....(Codes D)
3. Experience in farming (years).....
4. Experience in growing vegetables.....
5. Distance to the local (village) market from residence..... minutes of walking time
6. What means of transport do you use most frequently to get to the local market? (Codes F)
7. Distance to the nearest main (district) market from residence minutes of walking time
8. Quality of road to the main market (district) (Codes G).....
9. Average one-way transport cost (per person) to the main market using a car (ZMK/person).....
10. Distance to the nearest fertilizer/seed dealer from residenceminutes of walking time
11. Distance to the nearest farmer cooperative from residenceminutes of walking time
12. Distance to the nearest agricultural extension office from residenceminutes of walking time
13. Main source of drinking water.....(Codes H)
14. Do you treat water (chemical treatment) for drinking?.....(Codes C)
15. Distance to main water source for drinking from residence.....minutes of walking time

Codes B: 1. Burned bricks; 2. Unburned bricks; 3. Mud bricks; 4. Concrete block; 5. Pole & mud; 6. Timber; 7.Stick and grass; 8. Iron sheet

Codes C: 0. No; 1. Yes

Codes D: 1. Grass thatch; 2. Iron sheet; 3. Tiles; 4. Asbestos

Codes F: 1. Walking; 2. Bicycle; 3. Tractor; 4. Vehicle; 5. Cart, 6. other specify.....

Codes G: 1= Very poor; 2= Poor; 3= Average; 4=Good; 5= Very good;

Codes H: 1. Piped/tap; 2. Deep well protected and covered; 3. Deep well unprotected & uncovered;

4. Stream; 5. River; 6. Dams; 7. Ponds or floods; 8. Borehole Note: protected refers to water sources internally plastered and covered with a cap of wood, stone or concrete)

4.0. Crop Management – Planting and Harvesting

Field ID	Crop Code <i>Copy from</i>	<i>Area under cultivation crop from the sketch</i>		What was the source of most of the seed	What main transaction did you use to get 1=purchased 2=barter 3=loan 4=others(specify) 5=gift/free	What quantity of seed did you plant for the first Planting? <i>Do not ask for tubers and tobacco</i>		How much of this crop did you harvest from Each field?		Price/unity(ZMK)	Total value (ZMK)
		Quantity	Unit 1=lima 2=Ha 3=acre 4=Sq Meter			Quantity Planted	Unit 1=10-20g 2=20-30g 3=30-40g 4=40-50g	Quantity harvested	Unit		
FIELD	CROP	M01	M02	M04	M05	M06	M07	M010	M011	M012	M013

Crop code

1=Tomatoes
2=Rape
3=Cabbage
4=Onion

Main source of seed (M04)

1=private seed retailer
2= seed company
3=NGOs
4=Friend and benefit
5=others (specify)

Quantity harvested

1=crate
2=dish/plate
3=bunches
4=10kg bag
5=20kg bag
6=30kg bag
7=40kg bag
8=50kg bag

5.0. Physical capital/Assets *fill in the following table about the farmer's ownership of livestock and non-livestock assets*

Asset type		Does the farm have ...? 0=No - go to next Asset 1=Yes	How many does the farm own?	Which year was the newest acquired?(E.g. 1983)	What is the current value of all? (ZMK)
Asset	Name /description	AS01	ASO2	AS03	ASO4
1	Motor vehicle				
2	Motor cycle				
3	Bicycle				
4	Ox-cart				
5	Plough				
6	Wheel barrow				
7	Other Ox-drawn implements				
8	crop/animal sprayers				
9	Radio				
10	Irrigation equipment				
11	Television				
12	Computer				
13	Mobile phone				
14	Water pumps				

6.0. Fill in the following table about the farmer's ownership of livestock

Type of live stock		Does the farm have? 0=No1=Yes	How many....does the farm own?	What is the current value of all of?(ZMK)	How many were sold	What is the value of sells.....?	How many were given away (e.g. gifts)
Asset	Name	BS01	BS02	BS03	BS05	BS06	BS07
Cattle							
1	Cows						
2	Calves						
3	Steers						
4	Heifer						
5	Bull						
Poultry							
6	V. chicken						
7	G. fowl						
Other livestock							
8	Pigs						
9	Goats						
10	Others(spe cify)						

7.0. Fill in the following table of income earned by farm member from last year

List all income-earning members of the household/farm(i.e. those with DM08=1 Table 2.1 above)		What was....'s most important off-farm activity	How much income did earn from off-farm activities (ZMK)? <i>Enter '0' if none</i>
MID	Name	IN01	IN02

1=on commercial farm 2=in factory 3= fishing and selling 4=other industries 5= shop attendant 6= civil servant 7=firewood/charcoal
8=local brewing 9=non agriculture piece work 10=tailor 11=milling 12=other (specify)

8.0. Access to credit

8.1 Are you aware of any lending institutions such as banks and MFIs that you could borrow some? (0: No, 1: yes) []

8.2 Would you be willing to get credit?

8.3 Did you receive any credit during the past 12 months?

Value of credit ZMK_____

7.4 We are now going to ask about access to credit for vegetable production

Crop	1. Did you acquire credit for your vegetable production Enter 1 = Yes 0= No→ <i>Next crop</i>	2. How much credit did you get for your ...? Enter amount in (ZMK)
1= tomatoes		
2=onion		
3=rape		
4= cabbage		

9.0. We now would like to ask a few questions about market information and its usefulness in the marketing of vegetables

Source of market information	1. Did you receive information during 2010/11 marketing season? 1=Yes 0=No--->	2. Who owns the information/whom did you receive the information from?	3. What type of information did you receive from/through ...?	4. Do you confirm this information before using it? 1=Yes 2=No	5. To what extent do you depend on information from ...? 1=Not at all 5=Totally	6. Did you also give information to the information provider? 1=Yes 2=No
1=Radio						
2=TV						
3=Traders						
4=Other farmers						
5=Extension worker						
6=associate farmer						
7=others(specify)						

SOURCE OF INFO

1=other farmer 5 = govt
2=farmer group 6= othr
3=trade associate
4=NGOs

TYPE OF INFO RECEIVED

1=price 4=agro info
2=market demand 5=potential suppliers/buyer
3=marketing opportunities

10.0. *We now would like to talk about the challenges you might be facing in the marketing of vegetables*

Statement	<p>1. To what extent does ... present a problem with your tomatoes, rape and onion marketing activities?</p> <p><i>Enter any of codes 1-5, where 1 = Not a problem and 5 = A very important problem. Use the bar charts to help the respondent choose</i></p>		
	a. Tomato	b. Onion	c. Rape
1=Finding buyers or getting market access			
2=Negotiating prices			
3=Transporting products to market			
4=Getting payments from buyers			
6=Negotiating quality of product			
8=Meeting required volumes			
7=Getting good market information			

11.0. *We now would like to ask about your major buyers and their contact information*

Type of buyer	Do you consider ... as major buyers of your beans and/or vegetable? 1=Yes 2=No---> <i>Next buyer type</i>	Physical address of major buyer of type
1=Consumers (e.g. households)		
2=Local traders - retailers		