BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT OF AGRICULTURE ECONOMICS EDUCATION AND EXTENSION

AN ASSESSMENT OF SOCIO-ECONOMIC FACTORS AFFECTING YOUTH PARTICIPATION IN PIG MARKETING. A CASE OF BINDURA DISTRICT

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN AGRICULTURE ECONOMICS AND MANAGEMENT

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DECLARATION

I hereby declare that the research project entitled "**An Assessment of Socio-Economic Factors Affecting Youth Participation in Pig Marketing. A Case of Bindura District**" submitted to Bindura University of Science Education, Department of Agricultural Economics, Education and Extension is a record of an original work done by me under the guidance and supervision of Mr V.T Munyati and this work is submitted in partial fulfilment of the requirements for the award of Bachelor of Science Honors degree in Agricultural Economics and Management. The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree or diploma.

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DEDICATION

This dissertation is dedicated to myself, my husband Dereck T Dvene, kids, my bosses Mr Ian Kennaird and Mr P.J Odendaal and the rest of my family. Thank you for all the financial and moral support, not forgetting my all time friend Rofina Ngunguzala Thank you

God bless you!!!!!!!!!!!!!

DECLARATION

I hereby declare that this research has not been submitted for any other degree. Where other sources have been used, duly acknowledged in the text.

Signed_____ Date_____

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As the supervisor. I agree/disagree to submission of this dissertation for examination

Supervisor_____ Date_____

Mr V. Munyati

ACKNOWLEDGEMENTS

I am first and foremost grateful to the Lord for making this thesis a success. He gave me strength; guidance and wisdom that made me sail through. My profound gratitude also goes to my supervisor and all Bindura staff members who guided and supported me throughout this study.

I also want to extent my gratitude to pig producers in Bindura District, stakeholders, traders and the local authority for presenting me the opportunity to carry out this study freely. People say “time is money”, and if the time I spent with them during the lifespan of this study was to be valued, then I would never be able to pay it back, as they provided their valuable time to me to carry out this study. I also learnt a lot from interactions with all of them.

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ABSTRACT

The pig sector is an important agricultural activity in many households in Zimbabwe. Despite its importance, little research has been carried out to enhance its productivity. Pig sector presents an ideal poverty and food insecurity exit strategy especially for smallholders. This study focused on Assessment of Socio-Economic Factors Affecting Youth Participation in Pig Marketing. The objectives of this study were to map pig marketing channels used by the youth in Bindura district, assess the pig marketing margin of pig production amongst the youth in Bindura District and evaluate factors influencing youth participation in pig production in Bindura District. The main analytical tool that was used in the study was the Tobit regression model. The results showed that, the average Gross Marketing Margin of pig marketing channels was 67.4%. On analyzing the most preferred buyer by youthful pig producers in Bindura district, results of the study indicated that the most preferred buyers are local butcheries, with 45% of the farmers preferring to sell their pigs to the local butcheries followed by institutions. The Tobit results show that price had the expected positive and significant influence on the chances of farmers participating in pig marketing at the 1% level. Pricing information has a significant and positive effect on market participation by the pig farmers in Bindura district. The study recommends that youthful farmers should use centralized contract models for direct marketing of pigs. This would reduce marketing costs and to increase producers share in the final consumer price. Youthful farmers should also organize a board and perform group marketing. As an organized board they would acquire better bargaining power for their products over the middlemen that manipulate and control the price.

Key words: **Market Participation, Tobit model, marketing channel**

ABBREVIATION AND ACRONYMS

ESH	Efficient Structure Hypothesis
FAO	Food Agriculture Organization
GMMp	Gross Marketing Margin of producers
ME	Marketing Efficiency
SPH	Structure Performance Hypothesis
TMM	Total Marketing Margin
ZimStats	Zimbabwe Statistics

CHAPTER 1

INTRODUCTION

1.1 Introduction

The chapter is introductory and includes the background of the study, the problem statement, the objectives and the research questions of the study. This chapter also contains the research hypothesis, the significance of the study as well as the scope and limitation and the organisation of the study. The chapter concludes with a summary chapter.

1.2 Background

The vast majority of the youth in Africa who live in rural areas are engaged in agriculture, and therefore activities designed to address the vulnerability of these rural poor youth are often geared toward improving agricultural practices as a means of increasing productivity, efficiency and ultimately income (Parvan, 2011). Agriculture is an important sector providing employment and sustainability for the majority of Zimbabweans and is responsible for about 20% of the total Gross Domestic Product (FAO, 2020). An estimated 300 000 households in Zimbabwe have livelihoods based on livestock production (FAO), 2005). Pig production helps farmers earn a source of income be it small scale farming or commercial farming. In Zimbabwe agriculture is the main source of spurring growth and a means to improve the income of smallholder farmers and overcome poverty; it can be enhanced by the adoption of improved agricultural technologies. It is an important source of cash and meat and plays a fundamental role to youth farmers not only in income generation but also as an economic perspective, an asset representative of wealth or a very good agricultural diversification project, while from a sociological perspective, traditional ceremonies and beliefs in some places center on the pig as an asset to their belief system (FAO, 2012). Livestock production is very important for domestic consumption in Zimbabwe.

Africa is considered most susceptible to climate change due to its vulnerability and inability to cope with the physical, human and socio-economic consequences of climate extremes (Besada; Sewankamo, 2009). Zimbabwe has been experiencing these hostile climatic conditions and these have been weighing down the potential of the agricultural sector. Over the years, youth in Africa

have been motivated to venture into agriculture due to its attractive income (Poisung, 2009). Given that the demand for agriculture products in world markets has been increasing and that developed countries are slowly decreasing production due to scarcity of land, producers of pig production in developing countries have opportunities to increase their incomes (Dosman, 2009). Pork marketing is highly associated with the international market and very volatile resulting in changes in the supply and demand at international markets (Fikru Tenesgen, 2017). According to ZimTrade (2018), Global demand for pork products has risen as the product gains momentum as a source of proteins. There is a considerable international market demand for pork products, and it is expected to continue increasing in the future (Sorsa, 2009). In Africa, pig production is a smallholder project and much of its harvest is consumed locally, without the record of internal trade and domestic processing. Poverty is a big challenge not only in Zimbabwe but also in the Sahara Africa region and it spreads among rural Smallholder farmers. In developing countries, Smallholder agriculture remains a key sector in economic development (Quan, 2011). For farmers to fully benefit from pig production, a value chain has to transmit efficiently price incentives to farmers, farm-level viability has to be significant. The participation rate in pig production should be high and the extent and intensity of participation in pig production should increase. The study assesses prospects to which pig production is an avenue for increased youth farmer's income. The transformation from poverty to increased income is linked by value chain, viable and farmer's participation in pig production. According to Don Hofstrand (2009), Profitability is the ability to maintain an economically viable farm business, keep the land in agriculture long-term, and steward the land so it will remain productive into the future (VSP 2016). A value chain describes a range of value-adding activities required to bring a product from its conception to the final consumer (Kaplinsky, 2000; McCormick and Schmitz, 2001, Makoka, 2009).

1.3 Problem Statement

In Zimbabwe, 80% of the market share of pig meat and products is currently being produced by only two farms which are Triple C Pigs and Garfunkel's. This has led to more and smaller-scale production farmers culling down their herds due to excessive competition (PIB, 2011). In Zimbabwe, youth farmers have been urged to venture into agriculture to participate in export because of the global import of pork products, which has increased in 2017. Due to the shortage

of foreign currency in the country, the government needs to have another reliable alternative foreign currency source that can be easily grown by smallholder farmers, requires little investment, is environmentally friendly because of climate changes and is not knowledge-intensive. Apart from Tobacco which is labelled a profitable crop and provides foreign currency (2019 sales gross was USD$ 14 million). In Zimbabwe there is extreme poverty and the agricultural sector is poorly performing. The low productivity is leading to many challenges including foreign currency shortages, prices hike etc. Despite its pig production potential to improve farmer incomes, not much is known about the marketing channels, its profitability and drives for its production by youth farmers. The study aims to cover a critical knowledge gap for understanding the potential contribution of pig production to increasing youth incomes.

1.4 Research Objectives

The main aim of the study is to determine the factors affecting youth participation in pig marketing in Bindura District.

1.4.1 Specific objectives

- **i.** To map pig marketing channels used by the youth in Bindura district
- **ii.** To assess the gross marketing margins amongst the youth in Bindura District
- **iii.** To evaluate factors influencing youth participation in pig production in Bindura District.

1.4.2 Research questions:

- **i.** What are the pigs marketing channels used by the youth in Bindura district?
- **ii.** What is the Gross Marketing Margin amongst the youth in Bindura District?
- **iii.** What are the factors influencing youth participation in pig production in Bindura District?

1.5 Significance of the Study

The study main aim is to explore prospects of pig production in Zimbabwe and factors influencing youth farmer participation and suggest possible policies that can be used by the government to improve its production. If the production of pigs by youth farmers improves, the problem of poverty among the youth population will be ameliorated. Also, foreign currency can be generated and improve the current foreign currency shortage in the country. Finally, local utilization of the animal can improve the local confectionery industry. To the researcher; it is part of the study so it will assist the fulfilment of the degree programmer. The researcher can also

gain knowledge and a better understanding of the significance of the concepts under research. The research will also enable the researcher to increase her skills and develop them so that she will have more knowledge on how to tackle more researches that will emanate in future.

1.6 Structure of the dissertation

Chapter 2: Literature Review: Related literatures that have been researched by other researchers are reviewed. It covers theoretical framework, empirical evidence and gap analysis (what needs to be filled).

Chapter 3: Research Methodology: the chapter looks at the methodology used to collect data. It covers research design, target population, sample techniques, research instruments, data analysis and presentation.

Chapter 4: Data Presentation, Analysis and Discussions: The chapter covers presentation of data that would have been collected, analysis and discussions

Chapter 5: Summary, conclusions and recommendations: The chapter concludes the research findings and discussions.

1.7 Chapter Summary

This chapter looked at the introduction, the purpose of the study as well as defining the research problem. It also focused on the back ground of the study, delimitations, and limitations, objectives of the research, research question, and definition of terms and structure of the dissertation. The next chapter will review literature related to the topic to be studied.

Chapter 2

Literature review

2.0 Introduction

This chapter review theoretical and empirical literature relevant to the current study with a critical focus on the analysis of factors affecting marketing participation by youth pig producers in Bindura District. This chapter begins with defining the key terms and concepts of the study, namely market, marketing, marketing channel, marketing margin and marketing efficiency. The chapter will go on to review of empirical literature and it finally concludes by insight from literature.

2.1 Definition of key terms

2.1.1 Value Chain

Norton (2014) defined a value chain as a set of linked activities that work add value to a product. It consists of actors and actions that improve a product while linking commodities producers to processors and markets. According to Porter (1989) value chain is a representation of the activities performed to design, produce, commercialize, deliver and sustain a product. Value chain mapping is the art of describing the activities required for the existence of a product or service from concept, passing through the different phases of production, delivering to customers and final disposal after use (Kaplinsky and Morris, 2001).

2.1.2 Marketing Channel

Pelton *et al*., (2002) defined marketing channel as exchange relationships that created customer value in the acquisition, consumption and disposition of products and services. Acharya and Agarwal (2004) viewed marketing channels as routes through which agricultural products moved from producers to consumers. The length of the channel varied from commodity to commodity, depending on the quantity to be moved, the form of consumer demand and degree of regional specialization in production. Coughlan *et al.,* (2005) reported marketing channel as a set of interdependent organizations involved in the process of making a product or service available for

use or consumption. Dhanapal (2007) considered marketing channel as the track or path in which the produce moved from the farmer to the consumer.

2.1.3 Marketing Costs

Acharya and Agarwal (2004) defined marketing cost as the cost involved in moving the commodities from the producers to consumers i.e., the cost of performing the various marketing functions and of operating various agencies. Kumaravel (2005) and Sivagurunathan (2006) considered marketing cost as the actual expenses incurred by farmers, wholesalers, vendors and retailers for performing their functions in the movement of produce from the farmers to the consumers. Prakash (2010) viewed marketing cost as all the expenses incurred by the farmers or marketing intermediaries in performing various marketing functions.

2.1.4 Marketing Margin

According to Acharya and Agarwal (2004) marketing margin are costs involved in moving the product from the point of production to the point of consumption that is the cost of performing various marketing functions, of operating various agencies and profits of the various market functionaries involved in moving the produce from the initial point of production until it reaches the consumer. Prakash (2010) explained marketing margin as the profit earned by each stakeholder in marketing of cut flowers. According to Urgessa (2011), marketing margin is the percentage of the final weighted average selling price taken by each stage of the marketing chain

2.2 Pig production in Zimbabwe

In Zimbabwe, pig production plays important role in the provision of a balanced diet for human consumption while generating income for almost 80 percent of most of the smallholder farmers who derive their livelihoods from agriculture. However, over the years, like any other livestock sector in Zimbabwe, pig production has been declining. According to Mutambara (2013), the national commercial sow herd picked at 20 000 sows in 2007 from 15 500 in 2005 but then declined by almost half to about 8000 in 2008. Although, pig numbers have been rising steadily, estimated to be about 10 000 sows as of 201, these figures, however, exclude the pigs in the smallholder sector, which comprises approximately 80 percent of the total pig population in Zimbabwe (USAID, 2010).

The current database in Zimbabwe shows that the pig industry supplies approximately 100 000 animals per year for slaughter and processing and this is a major increase compared to those

recorded in 2008. Out of the 100 000 pigs slaughtered and processed, Triple C, one of the largest commercial farms and division of Colcom foods, Zimbabwe's largest slaughtering and processing, supplied 57 646 pigs in 2013, above 50 percent of the total slaughtered pigs (Colcom annual report, 2013. This domination affects the participation of the youth sector in these value chains.

2.3 Value chain analysis and value chain mapping: SWOT analysis

A commodity value chain analysis refers to the range of all activities involved in the design, production and marketing of a product (Gerriffi, 1994; 1999). Since many development interventions now utilize the value chain approach as an important entry point for engaging small farmers, individually or collectively, in high-value export markets, understating this approach is of crucial importance as it helps to achieve the main objective of this research. Kaplinsky and Morris (2001) Vermeulen et al, (2008), refers to the value chain as the full range of activities that are required to bring a product (or service) from conception through different phases of production to delivery to final consumers and disposal after use. Roduner (2007) highlighted that value chains analyses the links and information flows within the chain and reveal the strengths and weaknesses in the process. The value chain concept was therefore used in this research to investigate and analyze the strengths and weaknesses of some key actors from pig producers through processors and to see how they can improve the effective participation of youth pig farmers in markets

SWOT analysis provides a better framework for understanding internal conditions (strengths and weaknesses) and external conditions (opportunities and threats) of a value chain (Sabbaghi and Vaidyanathan, 2004). According to the study done in Uganda by Munyua et al., (2013) strengths of pig productions are that there is high demand for pig products in both domestic and export markets. The weaknesses of the piggery value chain are the weak link between producers and exporters as noted in the study done by Temesgen et al., (2017). In addition to that, Abede (2016) stated in the study done in Ethiopia noted that there is price dictation by the brokers in the pig producer value chain and holding back of produce by farmers. Another study by Abede, (2016) noted that Africa has the advantage of having a favourable climate, suitable soils and cheap labour. However, Abede (2016) noted that African countries like Ethiopia have low productivity due to low levels of extension services. Hagose (2017) find out that there is

inadequate research on pig production and linkages among researchers, extension functionaries and farmers.

2.4 Value chain mapping

The following actors are common in pork value chains and this includes smallholder farmers, commercial farmers, small rural traders that do bulk for sale to larger wholesalers, domestic processors, exporters and urban consumers (Dalipagic and Elepu, 2014). Smallholder farmers are the major producers of piggery. They rear swine for home consumption and increase income through selling. Local traders collect bulk quantities of swine. They collect pigs from farms` gates. Wholesalers link the main producing centres and main regional or international markets. They buy from local traders and bulk up enough quantities to destination markets, figure 1 depicts a typical value chain mapping in Africa.

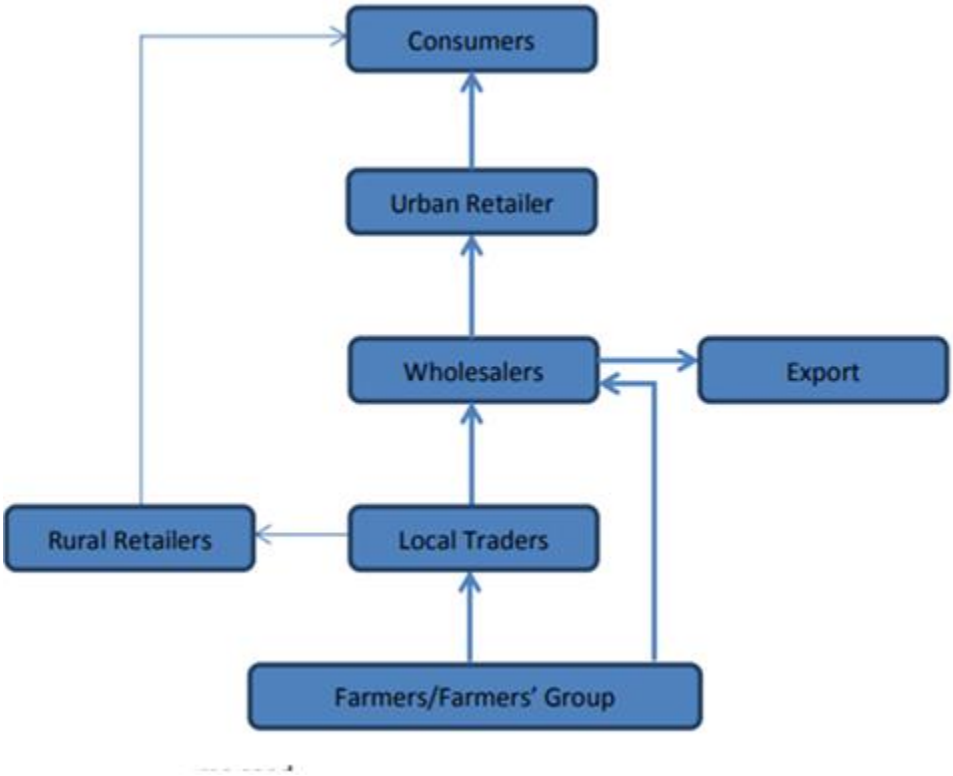


Fig2.1- Pig Value chain

2.5 Gross margin

Abu and Adah, (2011) conducted a study in Nigeria that revealed that the majority of farmers had a gross margin that range from N70 001 per 100 swine's and above of pig production. The mean profit earned of pig produce was found to be N132 917 per 100 swine and therefore implies that piggery production is a profitable enterprise. According to Dalipagic and Elepu, (2014), pig production was generally profitable in Northern Uganda as shown by the positive margins obtained by farmers. Haruna and Aliyn (2011) indicated that the study of economic returns was profitable as reflected by positive values of gross margin.

2.6 Factors affecting youth farmers' participation in pig production.

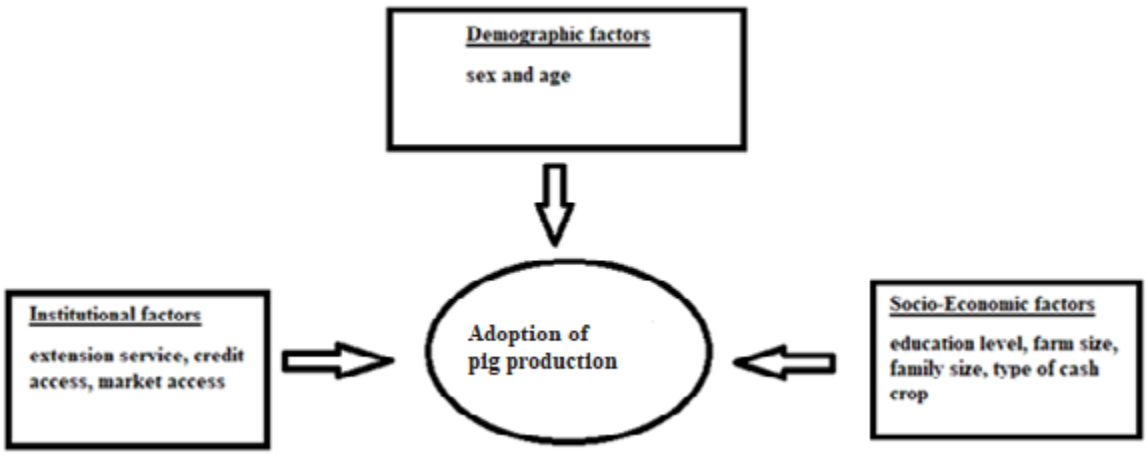
Studies that have been conducted explain that a relative contribution of socio-economic factors depends on the type of enterprises and associated innovations (Al-Shadiadeh, 2012 and Rogers, 1995). Household head and education status are the most common and important variable that explains farmers' agricultural adoption behaviour (Melesse, 2018). Igben (1988) results state that household size is an advantage when it comes to farm labour supply if it is relatively large. Different studies explain that it has a significant positive influence on the adoption of new technology. Mahabi, (2012) conducted a study in Ethiopia and stated that more educated farmers are more likely to adopt new highly valued products. Govereh and Jayne, (2003) in their research of agriculture production in Zimbabwe, detected that farmer education level was the most critical factor affecting smallholder farmers' decisions in the production. Kefyalem (2013) revealed that family labour is one of the factors that influence farmers' participation in pig production in Diga, Ethiopia. These findings are in line with other results.

Institutional factors deal with the extent or degree to which institutions impact the adoption of new livestock by youth farmers and include all the services to agricultural development, such as finance, insurance and information dissemination. According to Kefyalem (2012), the results indicated that access to market information was also found to be an important factor in influencing pig production. According to Wachira, (2012) and Anyiro and Oriaku, (2011), revealed that access to the marketplace and accessibility of market is assured to reduce marketing costs on transport and other transaction costs and provide a favourable price for the livestock,

believed to have a negative result on productivity as it diminishes the profits which might be gained from marketing farm outputs. Oriaku, (2011), conducted a study and indicated that extension service is imitated by the number of extension contacts moreover through training sessions received during production season and farm visits made influence livestock productivity. This is because farmers who meet the extension agent are more likely to get the right technology and information on animal production.

2.7 Conceptual framework

The conceptual framework shows the adoption of cash livestock production and it is affected by demographic factors; sex and age. Institutional factors that affecting adoption of pig production includes extension services, credit access and market access (Kefyalew 2012; Wachira, 2012), Socioeconomic factors that affects adoption of pig production includes education level, farm size, family size and type of cash livestock. (Melesse, 2018; Igben, 1988)



Source: author

Figure 2.2: Conceptual framework

2.8 Econometric models

Miah et al., (2015) used the MLE methods to run the Probit model using STATA software with a dependent variable being the adoption of improved varieties. The researchers used the Probit model because the dependent variable was dichotomous as a result an OLS could not well fit the

estimation. A study on the determinants of smallholder farmers` participation by Kefyalew, (2013) used a double-hurdle model which involved running of Probit regression to analyse the determinants of participation as well as truncated regression model to analyse factors affecting the level of participation. In Northern Burkina Fuso, Ouedraogo et al., (2018) used the Tobit model to analyse farmers` willingness to pay for Climate Information Services from Cowpeas and goat producers because the zero values constituted more than 5% of the dependent variable. Ouedraogo et al., (2018) argued that Ordinary Least Square gives inconsistent estimates and is asymptotically biased. Hence Tobit is preferable when there is a significant fraction of zero values.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focuses on the description of the methods employed in the study. It focuses on the research design, the description of the study area and the analytical framework as well as the methods of data presentation used in the research.

3.1 Study Area

The study was done in Bindura district which is in Mashonaland central Province in Zimbabwe. Bindura town is the administrative and commercial centre of the district, is located in the Mazowe Valley about 88 km north-east of Harare. The area receive fair annual rainfall which can support a series of crop and livestock production ranging from 750 to 1000 mm and 11 to 18 pentads per year. The area receives summer rains from early November to late March. The area also has predominantly sandy loam good agriculture soils which support optimum crop and livestock production. The cropping systems are based on flue-cured tobacco, maize, cotton, wheat, soybeans, sorghum, groundnuts, seed maize and burley tobacco grown under dry land production as well as with supplementary irrigation in the wet months. The area receives the highest rainfall in November and the temperature ranges from 26 ^{o}C to 35^{o}C

3.2Research design

The research is a survey study which focused on both qualitative and quantitative variables. Data was collected from youths who are into pig production and were randomly selected using purposive sampling. Survey questionnaires were used to collect data from the respondents. Secondary data in form of journals and other production records were used as well. The data was

analyzed using the two limit Tobit model for quantitative analysis and descriptive statistics for qualitative data. The results attained were presented in form of tables.

3.3 Data collection methods

Both qualitative and quantitative methods were used. "Use of both qualitative and quantitative research methods emphasize truth, consistency, applicability, and neutrality while taking different procedural approaches to assure quality" (Harwell, 2011). Triangulation of data ensured rigor of the findings through verification, refuting and supporting findings by one method.

- ✓ Key Informant Interviews – SMEs, Council, and youth pig production groups, ZFU, NGOs, Pig abattoirs, Supermarkets. Agritex, Vet Services and Councilors.
- ✓ Focus Group Discussion, a group of 10 youths (pig farmers)
- ✓ Individual household Interviews using a designed questionnaire – 62 households were interviewed.
- ✓ Selection of these households was done with assistance from Village heads, Veterinary Services and Agritex extension workers based on their records.

3.4 Data sources

The research employed the use of both the primary and secondary sources of data. The main source of primary data were youths who are into pig production in Bindura district. Publications constituted the majority of the secondary sources of data. Other important sources of secondary data used in the survey included the Ministry of Agriculture, ZIMSTAT and Triple C Pigs. E-Journals were extensively used during the project and formed the major basis for the review of literature.

3.5 Sampling procedure

This study was conducted in 2 wards of Bindura district, namely ward 6 and 5. The 2 wards were from Bindura's high and low pig producing wards, based on statistics gathered from the district

offices at Agritex and Veterinary Services. To come up with meaningful results, target households were those youths who have been into pig production for at least three (3) years.

3.5.1 Sampling Framework

To obtain the desired respondents, a stratified sampling procedure was employed since the study used both "with and without" impact assessment procedures. The sample size was obtained by calculating using the following formula:

$$\frac{\frac{z^2}{e^2}p(1-p)}{1+\frac{[z^2*p(1-p)]}{e^2N}}$$

Where:

N = population size

E = Margin of error (as a decimal)

Z = confidence level (as a z-score)

P = percentage value as a decimal

3.6 Data analysis framework

The data was collected by individual interview using Cspro (CAPI) which is an interviewing technique in which a pre-designed semi-structured questionnaire.

Objective	Data type	Analytic tool
Number One: To map pig marketing channels used by the youth in Bindura district	Quantitative	Descriptive Statistics
Number Two:	Quantitative	Gross-margin analysis

To assess the gross marketing margin of pig producers amongst the youth in Bindura District		
Number Three: To evaluate factors influencing youth participation in pig production in Bindura District.	Quantitative	two limit Tobit model

3.6.1 Gross Margin Analysis

Viability of pig production was measured using the gross margin analysis because it shows the viability of producing the pigs. Gross Margin is the difference between the gross returns and the total variable (Olukosi and Erhabor, 1988). The Gross Margin (GM) formula is given as:

GM= TR – TVC …… (2)

GM= Gross margin per swine

TR = Total revenue per swine

TVC=Total variable cost per swine.

The estimation of GM will be served as a profit index of pig production in the study area.

3.6.2 Tobit Regression Model

The researcher will use Tobit regression where the dependent variable is market participation of pig farmers against a set of explanatory variables. The Tobit regression model was used to test market participation by the youth pig farmers in Bindura district. The dependent variable used in the analysis was market participation.

We can then compute pig market participation as the proportion of the value of pig sales to total value of pigs at the household, which can be computed as follows (Von Brann and Immink, 1994):

$$Market\ Participation = \frac{Total\ pig\ sales}{Total\ pig\ production}$$

Given the nature of market participation level, the farmers are said to be market participant if their proportion of value sold is more than 50% (Goletti, 2005; Ohen *et al*., 2013), thus, the researcher will define the binary response variable as Y =1 if the farmer's pig sales exceed a threshold or critical level of Y^* (50%) and Y = 0 if $Y \leq Y^*$. Here, the proportion of pig sold (say above 50%) out of the total pig production by the farmers in the production year used as the proxy of market participation during data collection period (Moyo 2010). The explanatory variables that were hypothesized to explain the probability of market participation of pig farmers were identified based on the theoretical framework and on past empirical work on market participation. The following explanatory variables were used during the analysis Price, Pricing information, Distance to the market, Extension visits, Distance to the market, Years of experience as a pig farmer and Method of payment.

$$\boldsymbol{Y_1 = \beta_0 + \beta_1 X_1 i + \beta_2 X_2 i + \beta_3 X_3 i + \beta_4 X_4 i + \beta_5 X_5 i + \beta_6 X_6 i + \beta_7 X_7 i + \beta_8 X_8 i + \beta_9 X_9 i + \beta_{10} X_{10} i + e_i} \quad \textbf{(3)}$$

3.6.3 Diagnostic Tests for the regression model

3.6.3.1 Multi-collinearity Test

Multi-collinearity is a problem that arises when some or all explanatory variables are correlated with one another, Gujarati (2004). It is the extent at which the explanatory variables in an econometric model depend on each other. The presence of multi-collinearity poses problems in econometric models since it results in wide confidence intervals for individual parameters, inefficient estimators having high variances and covariance making it difficult to make

estimations using Ordinary Least Squares (OLS). Multi-collinearity results in low t-ratios on coefficients which can lead to one committing type 11 error, that is, failure to reject the false hypothesis. The researcher employed the VIF test to test for the presence of multi-collinearity in the regression model using Stata 12.

3.6.3.2 Heteroscedasticity Test

According to Gujarati (2004), the econometric problem occurs when the error variances differs across observations. The problem arises due to the presence of outliers, improvement in data collection techniques. The common result when heteroscedasticity is present as implied by unbiased estimators with no minimum variance in the class of Best Linear Unbiased Estimators (BLUE). The researcher is going to employ the Breusch –Pagan test for heteroscedasticity test. It will be carried out on the hypothesis that there is constant variance across the regressors. The presence of heteroscedasticity will yield non-BLUE parameters and hence will use the White test (robust standard errors) if the variance is unknown and if its known will use the method of General Least Squares.

3.6.3.3 Model Specification Test

The model is correctly specified if it does not include irrelevant variables and does not contain measurement errors (Gujarati, 2004). After regressing and computing the multi-collinearity test as well as heteroscedasticity test, the researcher has to test for model specification to ensure that the model has adapted the right functional form. Model specification will be tested using the Ramsey Reset test under command Ovtest in stata 12. The decision will be based on the null hypothesis that the model has omitted variables using the pro > F which is greater than 0.05.

The computer program SPSS and STATA was used to generate descriptive statistics such as frequencies, percentages, means, and standard deviations. Results were used to summarize the information on the contribution cattle to household income as well as individual factors that affect contribution of cattle to the household income.

3.7 Conclusion

The regression model to be used in this research was outlined in this chapter. Also the variables in the model were justified and diagnostic test were identified. This chapter also highlighted data characteristics and sources. The next chapter will deal with results presentation and interpretation.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The empirical results which were obtained from the data collected are presented and interpreted in this chapter. The diagnostic tests and regression results were extracted from Stata 12 and interpreted accordingly. Tables were used to assist in representing the findings.

4.1 Presentation of summary respondents characteristics

The following section shows the presentation of the distribution of demographic and economic characteristics of the respondents.

Table 4.1: Summary of Demographic characteristics

Demographic Characteristics	Percentage
Sex	
Male	78.6
Female	21.4
Marital Status	
Single	36.2
Married	59.5
Divorced	4.3
Education level of lender	
No formal education	8.0
Primary	12.3

Secondary	64.9
Tertiary	14.8

Source: Survey results (2022)

During the study, respondents were asked to indicate their marital status. The implication of marital status to this study is that it is an institutional factor that has great influence on family matters. It was revealed that 59.5% and 36.2% were married and single for the pig producers respectively. Married couples are likely to be more productive compared to single people due to labour supply and hence can share farm duties in pig production activities. These results agree with that observed by Mtama (1997) who found that marriage has an effect on the production process as it increases labour availability in the household.

Results in Table 4.1 show a very high literacy level amongst the youth in the surveyed area. It was observed that 12.3% of respondents who are into pig production completed primary education, 64.9% had secondary education, and about 14.8% had completed tertiary education. Literacy level is very useful for a small-scale farmer to learn, use and adopt new appropriate agricultural technologies introduced, since most of technologies can be offered using foreign language. Furthermore, education is perceived as one of the factors that influence an individual's perception of intervention before deciding to take part. It also imparts the desire of an individual to learn more, to attend training and seek information regarding agriculture and non-farm activities (Luhosi, 1998).

4.2 Pig Marketing Channels

The characterization of the available marketing channels linking pig producers and consumers is shown on the figure below. The market channels also consist of intermediaries such as village collectors (middlemen), market collectors and retailers (restaurants etc.).

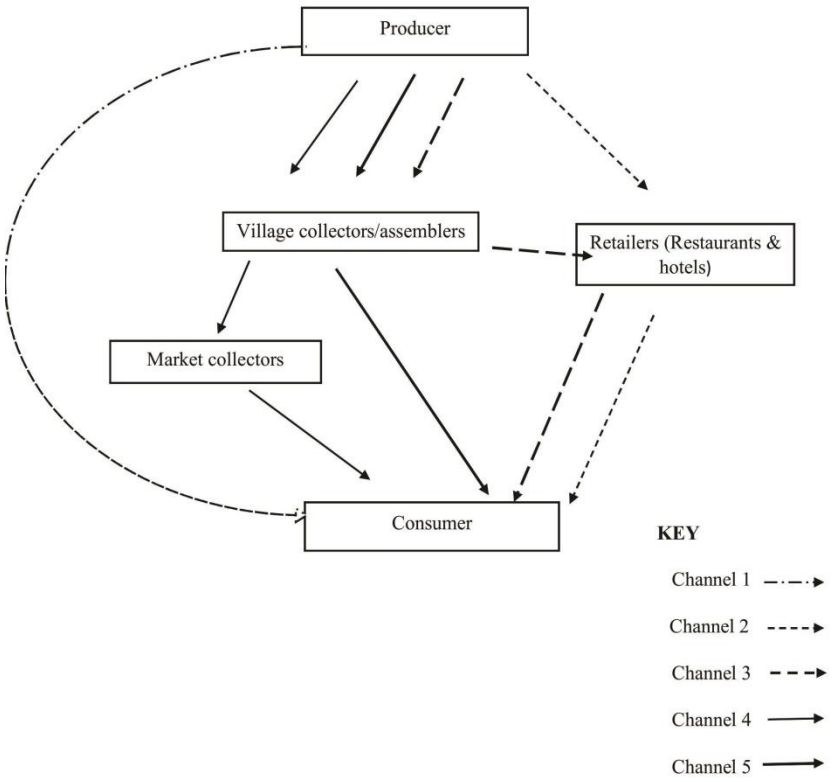


Figure 4.1: Marketing Channels for pigs in Bindura

There are five pig marketing channels that were identified between the producers and final consumers in Bindura district.

Channel 1: **Producers and consumers.** This channel was the shortest and direct marketing channel, which consist of producers, being the pig farmers and direct consumers. Consumers purchase pigs directly at the farm gate. Consumers here refer to fellow farmers around the producers, local government and other organizations employees (such as teachers, nurses, agric extension workers and shop employees) and sometimes passers – bye that may not really be resident in the villages. This is consistent with the findings of Akieyo *et al.,* (2014) in Kenya. Prices may also vary amongst the various consumers based on ability to buy and factors like employment status of the buyer. This often result in consumers like the afore mentioned employed consumers buying pigs at slightly higher prices than the fellow farmers as the producers perceive them being able to get the money and pay for the pigs. The duration and

interaction of producers and consumers in this channel usually happens within the same day as the two are close to each other.

Channel 2: **Producer, retailer and consumers**. This channel is almost similar to channel 1, the difference being retailers who are in between the two market players, producers and consumers. Retailers, in this context refer to local butcheries in the study area. They buy from producers, slaughter and sell as pig meat to consumers. With regards to pricing, consumers usually do not have any negotiating powers as the price of pig meat in the butcheries is fixed. An inquiry with one of the butcheries, indicated that the price of the pig meat is greatly determined by transport and clearance charges, with transport costs, recently soaring. In this channel, there is also some level of negotiations between the producer and the retailer. The activities in this channel represent some form of vertical integration, which is similar to the activities that were reported in a study by *Akieyo et al.*, (2014).

Channel 3: P**roducers, village trader, retailer and the consumers**. Results of this study revealed that this channel is common in large pig producing wards, where retailers make arrangements with selected local persons, which they refer to as their "agents", to source and aggregate pigs from farmers. Unlike in the first two channels, there is some form of organized marketing through the villager trader. The village trader buy pigs from fellow farmers around and communicates with the retailers once the desired numbers have been reached. Retailers (local butcheries) prefer this arrangement as they take advantage of having the village traders doing the negotiations with the producers, and hence getting the pigs at a cheaper price than if it was them doing the price negotiations with the farmers.

Channel 4: **Producers, village trader, market collector and consumers.** This channel presents a new term "market collector" which in this case refers to a person who collect pigs from village traders and sell them direct to consumers as live pigs at an organized date and place, referred to as "pig markets".

Channel 5: **Producer, village trader and consumer**. Supply of pigs in this channel depends on demand, seasons and price offered by other traders. This market channel is not common and is less developed.

4.3 Gross Marketing Margin of producers

Gross marketing margin of producers (GMMp) is the pig producer's share in final price was estimated and the results showed that, the average GMMp of pig marketing channels was 67.4 %. Marketing channel 1 had a higher GMMp of 79% while channel 3 had a least GMMp of 62%. High GMMp of 79% in channel 1, indicate that the producers had a good share in the final consumer prices. The main reasons for higher producer share being absence of intermediaries and low marketing cost as shown in Table 4.5. However, the pig marketing channels had an average TGGM of 34%. Channel 4 had higher TGGM of 40% while channel 1 had the least of 29%.

Table 4.2: Gross Marketing Margin of producers

	Marketing Channels				
Variable	1	2	3	4	5
Producer Price	3.40	3.50	3.20	3.20	3.20
Consumer Price	3.40	4.80	4.85	5.00	4.20
GMMp	**79**	**65**	**62**	**60**	**71**

[Source: Survey data, 2022]

4.4 Pigs sold

In terms of volume of pig sales, greater contribution is coming from sow, where farmers are selling an average of three sowers per year, followed by bows, an average of two goats and lastly porkers. Table below summarizes these findings.

Table 4.3: Summary of goats' sales

	Sower	**Bows**	**porkers**
Mean	2.89	1.87	0.70
Range	14.00	9.00	3.00

Source-Survey Results 2022

From an FDG conducted, it was noted that most consumers prefer sowers than bows; the preference is based on the different tastes of the meat, where mature bows meat has an "unpleasant" taste. Most consumers end up purchasing sowers because of that pleasant taste and better quality meat. Young porkers are kept for expanding the pig enterprise. As compared with sowers and bows; buyers rarely buy young porkers as a way of minimizing losses due to their high chances of mortality.

4.5 Most preferred pig buyers

Pig farmers also prefer to sell their commodity to certain buyers and not to others. From the FGD it was noted that all the buyers are not the same. For instance, the youth farmers indicated that some buyers pay cash and others pay on delivery. Mode of payment also varied amongst buyers, with some paying cash and some using electronic payments such as Eco cash and zipit. The figure below shows some of the most preferred pig buyers by the farmers.

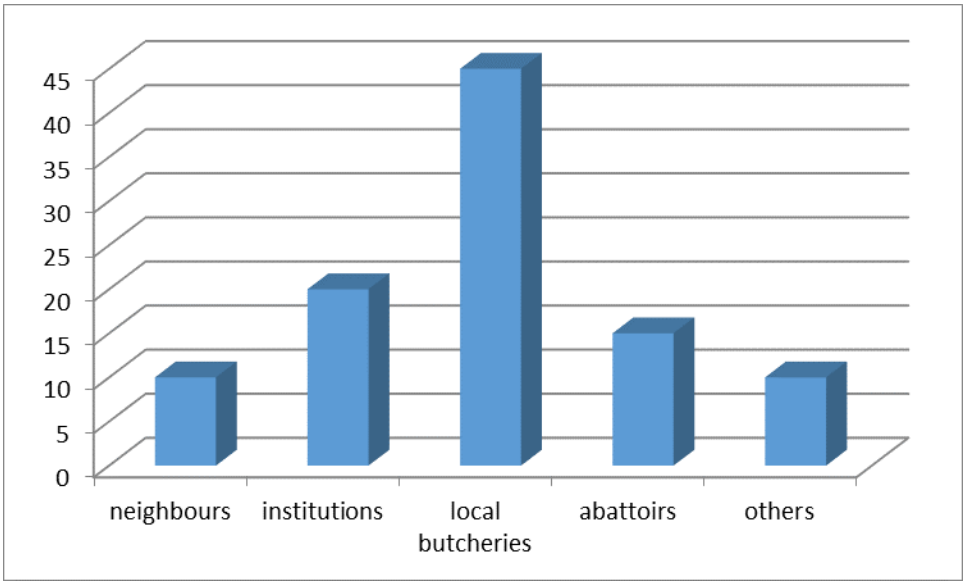


Figure 4.2: Preferred pig buyers

On analyzing the most preferred buyer by pig producers in Bindura district, results of the study indicated that the most preferred buyers are local butcheries, with 45% of the farmers preferring to sell their pigs to the local butcheries followed by institutions, abattoirs, neighbors and lastly

others. On further probing as to why pig farmers preferred local butcheries, main reason was the fact that they are better organized off takers, who also pay on time and also offer higher prices as compared to middlemen. For viable pig enterprise, local butcheries were identified as the most preferred buyer.

4.6 Factors influencing youth participation in pig marketing in Bindura District

4.6.1 Pre-diagnostic Test

The researcher had to test the presence of multicollineriaty before running the regression analysis. VIF and Tolerance where used to test for the presence of multicollineriaty and if the VIF value exceeds 10, the variables are highly collinear and the closer the Tolerance value to zero the greater the degree of collinearity and the closer the tolerance value to one, the greater the evidence of no collinear among independent variables. Following the above given evidences, VIF and Tolerance were used and it was noted that all mean Variance Inflation Factor were below 10 and Tolerance levels were close to one, hence there was no multicollineriaty problem detected.

4.6.2 Regression Estimates

Table 4.4: Regression Results

Model	Coefficients		Significance	Collinearity Statistics	
	B	Standard error		Tolerance	VIF
Constant	458.658	171.966	0.002***		
Price	0.425	0.023	0.007***	0.883	1.132
Pricing information	0.216	0.073	0.036**	0.136	7.371
Distance to the market	0.386	21.494	0.556	0.864	1.157
Extension visits	0.663	0.036	0.004***	0.767	1.304
Distance to the market	-8.112	6.267	0.038**	0.131	7.635
Years of experience as a pig farmer	-9.819	47.348	0.837	0.754	1.326
Method of payment	1.763	0.123	0.000***	0.622	1.607
R-square	0.689				
Adjusted R square	0.668				
Durbin Watson value	2.2				

Source: Generated by authors from 2021pig survey data using STATA.
Notes: -***; ** and * indicate p-values significant at 1 %, 5 % and 10 % levels respectively.

The panel provides the probit coefficients for market participation by the youth farmers who are into pig production, where it is shown that the price of the pork is positively and significantly related to the propensity to participate in pig market. These findings were also observed by Musara *et al.* 2018 that price had the expected positive and significant influence on the chances of farmers participating in pig marketing at the 1% level. Pricing information has a significant and positive effect on market participation by the pig farmers in Bindura district. The finding has also been observed in maize markets by Alene *et al*. (2008) and in banana market by Komarek (2010). If the farmers have access to pricing information this will result in them participating more in pig markets.

Even though smallholder farmers' initiatives for the development of their agricultural capacities have generally received support from the private sector and the non-governmental organizations, training by extension workers has been observed to positively and significantly affecting market participation by pig farmers in Bindura district. This is because these farmers who are trained

have the capacity and ability to make use of available market information to their benefit in the form of contractual arrangements. This result conforms to findings of Musara *et al*. (2013)

The coefficient of distance to nearest market is statistically significant and negatively related to market participation for pig farmers. Farmers located far from markets are less likely to participate in markets probably because of the restricted market access costs. As distance to the market increases, the proclivity of a pig farmer to participate in a market decreases. The variable distance to the market has a positive co-relationship with transaction costs incurred by the farmer in getting his produce to the market. Longer distances also imply that the search costs for the market also increase. Aggregating these costs would imply that farmers lose out on potential gains from pig marketing. This result conforms to findings of Ouma *et al.* (2010) in Rwanda and Burundi, where the probability of banana market participation decreases for farmers located far away from the market and also supported by Mmbando *et al* (2015) where the coefficient of distance to nearest market is statistically significant and negatively related to market participation. This reinforces the argument that poor market access for households located in remote areas raises costs associated with marketing and information. The results are consistent with findings from previous agricultural output and input studies such as Goetz (1992).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

In this study, decision to participate in pig marketing was found to be influenced by a number of factors, which include Price, Pricing information, Extension visits Distance to the market and Method of payment. Pig farmers in Zimbabwe remain susceptible to food insecurity and poverty. To combat these challenges there's need for the smallholder farmers to be market oriented. Markets have shown to be one tool for increasing household welfare measured through the proxy income. Physical linkage of areas of smallholder farmers to markets is a policy that could improve market participation by the pig farmers in the country. There is need to establish and maintain of roads since pig producers prefer markets far-away. The transactional costs of marketing of pigs by the producers could be reduced through promotion of collective marketing through being a member of an association group in-order to economize on transactional costs, develop market linkages and take advantage of collective bargaining power. Improvements of markets based on locations such as district level could benefit pig producers.

5.2 Recommendations

In view on the above findings, this study makes the following recommendations about market participation by youth pig farmers in Bindura district:

- The government and private sector companies should encourage more farmers to affiliate into marketing association as this has proved one key strategy that can be used to promote market information dissemination on pig marketing.
- There is potential to formalize the Producer – Consumer marketing channel, being the major channel identified in this study. This may reduce exploitation of smallholder farmers by middlemen who are currently buying pigs from farmers at lower prices.

- Farmers should use centralized contract models for direct marketing of pigs. This would reduce marketing costs and to increase producers share in the final consumer price. The adoption of this strategy will make the pig products more competitive as a result of vertical integration.
- Farmers should organize a body and perform group marketing. As an organized body they would acquire better bargaining power for their products over the middlemen that manipulate and control the price of pigs in the marketing system. These will increase farmers profit considerably.
- The government should develop market infrastructure like road communication and transport media will be helpful to decrease transport cost, thus marketing efficiency will increase.

5.3 Areas of Further study

This study identified conducted to assess the socio-economic factors affecting youth participation in pig marketing in Bindura district, there is the need for further research on the same area in other districts in Zimbabwe, considering benefits of the income obtained from pig marketing which this study did not include. There is also need for research on the contribution of pig production in poverty alleviation in rural area.

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APPENDIX

Appendix 1: Questionnaire for youth pig producers

This study is conducted to assess the socio-economic factors affecting youth participation in pig marketing in Bindura district**.** The information provided will assist in the formulation of policies and programs that will improve youth participation in pig marketing in the district. The information will be treated with strict confidentiality.

Questionnaire Identification

Questionnaire number……..

Respondent name (optional)……

Ward …….

Date……

Section A: Demographic details

1. Gender of the household head: 1= Male [ ] 2= Female [ ]

2. Age of household head 1= 15-20 [ ] 2= 21-25 [ ] 3= 26- 30 [ ] 4=31-35 [ ]

3. Marital status of household head

1=Single [ ] 2= Married [ ] 3=Divorced [ ] 4.Windowed [ ]

4. Household size [ ]

5. Level of educational

1= Primary [ ] 2= Secondary [ ] 3= Tertiary [ ] 4=Never attended [ ]

Section B: Marketing factors

6. How much did you sell each pig…….

7. How many pigs you sell per month……..

8. How do you market (sell) the pigs?

1= through traders/assemblers [ ] 2=through retailers [ ] 3= direct to consumers [ ]

9. Through which channel in (8) do sell most of your pigs?.....

10. Whose decision was if to sell through the channel above?

1= Husband [ ] 2= Wife [ ] 3= Husband & wife [ ] 4= Sons [ ]

11. Why did you choose the marketing channel in question (11)?

1= Offers high prices [ ] 2= Prompt payment [ ] 3= others (specify)…..

12. If you don't sell pigs at farm gate, how far is the market……km

13. What are the reasons for selling pigs?

1=Pay fees [ ] 2=pay medical bills [ ] 3=purchase food [ ] 4=purchase household items [ ]

14. How do you transport pigs to the market?

1= Using human labour [ ] 2= Using a farm animal cart [ ] 3=Using a pick up/ truck [ ]

15. What is the source of means of transport? 1= Own family [ ] 2= Hired means [ ]

16. How much does it cost you to deliver the pigs to the market? US$.....

17. Do you access credit facilities to boost your pigs business?

1= Yes [ ] 2= No [ ]

18. If yes to (17), how much money did you get?

Section C: Marketing costs

19. Please indicate marketing costs you face when you need to sell your pigs

Cost of Marketing for Different Channels (US$/Kg)

Item	
Transport Cost	
Feed Cost	

Storage Cost	
Labour Cost	
Packaging	
Handling	
Assembling Cost	
Processing Cost	
Market Charges	
Personal Expenses	
Others (electricity ,etc)	
Total Cost	

Section C: Pigs marketing constraints

20. What are the constraints do you face in marketing pigs?

1= Feed cost [ ]

2=High transport cost [ ]

3=Insufficient market access [ ]

4=Expired drugs [ ]

5=Small flock size [ ]

6= Low prices [ ]

7=Lack of information [ ]

8=Prevalence of diseases [ ]

21. Are you satisfied with pigs marketing channels in your area?

1= yes [ ] 2= No [ ]

22. What is your recommendation on pigs marketing system ……...

……..

……

……

……

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION

Appendix 2: Traders questionnaire

This study is conducted to assess the socio-economic factors affecting youth participation in pig marketing in Bindura district**.** The information provided will assist in the formulation of policies and programs that will improve youth participation in pig marketing in the district. The information will be treated with strict confidentiality.

Questionnaire Identification

Questionnaire number……..

Name of trader (Retailer, Middlemen, Assemblers etc.)……

Respondent name (optional)……..

Ward …….

Date……..

Marketing Characteristics

1. What is the means of payment for pigs used by traders?

1= Cash [ ] 2= Credit [ ] 3. =Cash and Credit [ ]

2. What are the criteria do you use in setting prices?

1= Cost incurred [ ] 2=supply and demand forces [ ] 3= others (specify) [ ]

3. What are promotion strategies do you use?

1= Good prices [ ] 2= Fair treatment [ ] 3= Advertising [ ] 4= others [ ]

4. How do you determine the price of pigs?

1= Negotiation [ ] 2=Availability [ ] 3= Season [ ] 4 =Other [ ]

5. Do you take any value addition activities? 1= Yes [ ] 2= No [ ]

6. What is your source of capital? 1= Loans [ ] 2= Friends [ ] 3= Own [ ]

7. How do you handle unsold stock of pigs?

1= Kept for next day [ ] 2= Sold at lower price [ ] 3= Sold at another market [ ]

8. What is your main source of inputs? 1= Agro Vet [ ] 2 = Local market [ ] 3 = other [ ]

Marketing Information

9. What type of trader you are?

1= Village Collector [ ] 2= Market collector [ ] 3= Retailer [ ] 4 = others [ ]

10. What is the main source of your pigs?

1=Producer [ ] 2=Village Collector/assemblers [ ] 3=Market Collectors [ ] 4= Retailers[ ]

11. What is your buying price in US$ per kg of pork……

12. What is your selling price of pigs in US$ per Kg?

13. Who are your main buyers?

1=Consumer 2= Retailers 3 = Market Traders 4= Village traders /assemblers

14. What are the means of transport do you use?

1=on treks 2= Trucks 3 = others (specify)

Marketing Cost

20. What costs you have incurred in your business in US$

Item	**Amount (US$)**
Transport Cost	
Feed Cost	
Storage Cost	
Labour Cost	
Packaging	
Handling	
Assembling Cost	

Processing Cost	
Market Charges	
Personal Expenses	
Others (electricity ,etc)	
Total Cost	

THANK YOU VERY MUCH