



**DETERMINANTS OF MARKET PARTICIPATION AND CHOICE OF MARKET
OUTLET FOR BROILER FARMERS IN LERIBE DISTRICT OF LESOTHO**

BY

KHUTLANG LEKHISA

**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE IN AGRIBUSINESS MANAGEMENT**

DEPARTMENT OF AGRICULTURAL ECONOMICS AND EXTENSION

FACULTY OF AGRICULTURE

SUPERVISOR:

DR BRIAN MUROYIWA

JULY 2022

DECLARATION

Declaration

I, Khutlang Lekhisa, hereby declare that this thesis is my original work and that other scholars' works referred to herein have been duly acknowledged. I also declare that this thesis is original and has not been submitted elsewhere for a university degree.

Signature:.....

Date:

CERTIFICATION AND APPROVAL

We, the undersigned, certify that the work reported herein meets the standard required for Thesis for the Degree of Master of Science in Agribusiness Management.

Name: Dr Brian Muroyiwa

Signature: Date

Supervisor

Name:

Signature: Date

Internal Examiner

Approval for the inclusion in the Library of the National University of Lesotho

Name:

Signature: Date

Head of Department of Agricultural Economics and Extension

Name:

Signature: Date

Dean of the Faculty of Agriculture

DEDICATION

This research is dedicated to my late mother in honour of the love of learning she instilled in me.

ACKNOWLEDGEMENTS

Above all, I wish to thank the Almighty God for His mercy, guidance and protection until the completion of this study. Thank you, God.

I also wish to acknowledge my supervisor, Dr B. Muroyiwa, for his perseverance, unreserved wisdom, and commitment to help me finish my research. His helpful advice, direction and support made this journey feasible. I would also like to extend sincere gratitude to all staff members in the Department of Agricultural Economics and Extension for their support since I enrolled with the National University of Lesotho.

Further, I want to express my profound gratitude to all extension officers for their valuable information and to the farmers who sacrificed their time to answer the interview questions. If it was not because of them, data collection would be a nightmare. I am also appreciative of my classmates, particularly Mr Setho Mokoaleli and Mr Sechaba Rakotsoane, who gave me great advice and memorable support during my study.

I wish to extend a special thanks to my colleague 'M'e 'Mathato Theresia Thibinyane for her selfless support in ensuring that this journey becomes a success. Thank you 'M'e Thibi. Again, I want to convey my gratefulness to my friend Kabelo Lehlohonolo for his selfless act of lending me his laptop until I completed my thesis.

Most importantly, I wish to thank my entire family for their unwavering support and encouragement during difficult times in my research, particularly during data collection. I thank you all my brothers and sisters! May God bless you!

ABSTRACT

Poultry marketing is an important tool for economic development and poverty eradication because of its potential for income generation and employment creation. However, broiler farmers in the country are locked out of available lucrative formal broiler markets and this forces them to sell their produce at the farm gate where prices are less lucrative. Therefore, this study examined the socio-economic, market and institutional factors that influence broiler farmers' market participation and the choice of market outlets in the Leribe district in Lesotho. A two-stage sampling technique was employed to select 114 respondents from five villages. The survey data was collected through a structured questionnaire. Heckman's two-stage model was used to analyse factors influencing farmers' market participation and the intensity of market participation while the MVP model was used to determine factors affecting the choice of market outlets by broiler farmers. The probit selection equation revealed that gender, farmer income, storage access, production experience, extension service, credit access and information access influenced farmers' market participation decisions and the second outcome equation revealed that gender, household size, off-farm employment and price influenced the intensity of market participation. The MVP model results revealed that gender, vehicle ownership, stock size contract agreement and extension access significantly influenced the choice of market outlets. Therefore, this study recommends interventions that will increase broiler production such as enhancing credit access, contract farming, group membership and institutional support. The study also recommends policies that will facilitate the adoption of quality assurance practices and procedures to improve farmers' access to the formal markets.

Keywords: Broiler farmers, market participation, participation intensity and market outlet choice

LIST OF TABLES

Table 1: Leribe broiler farmers sample frame.....	35
Table 2: Variables in the Heckman two-stage model	37
Table 3: Variables used in the Multivariate Probit (MVP) Model	42
Table 4: Gender distribution of farmers	49
Table 5: Age distribution of participants of the study.....	50
Table 6: Education level of broiler farmers in the study area.....	51
Table 7: Farmers' income distribution of study respondents.....	52
Table 8: Employment, vehicle ownership and storage access of the broiler farmers.....	54
Table 9: Mean and standard deviation of broiler farmers' characteristics in the study area	55
Table 10: Information distribution among broiler farmers	55
Table 11: Descriptive and T-test results of broiler farmers' market characteristics	56
Table 12: Institutional characteristics of broiler farmers.....	58
Table 13: Broiler market outlets utilised by farmers in the study area.....	60
Table 14: Gender, Age, Education level and Income distribution of farmers for each of the market outlet choices	63
Table 15: Mean (Std. Dev) of the socioeconomic and market characteristics of broiler farmers for each of the market outlets choices	64
Table 16: Vehicle and storage ownership among the different farmer market outlets' choice	65
Table 17: Institutional characteristics of broiler farmers in market outlets' choice.....	67
Table 18: The First step of the Heckman selection equation (Probit Selection)	69
Table 19: The Heckman two-step outcome equation results	73
Table 20: Overall model fitness, and correlation matrix of market outlet choices from the MVP model	76
Table 21: MVP estimated results for determinants of market channel choice variables	78

TABLE OF CONTENTS

DECLARATION	i
CERTIFICATION AND APPROVAL	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
LIST OF TABLES	vi
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS AND ACRONYMS	xii
CHAPTER 1	1
INTRODUCTION	1
1.1 Background	1
1.2 Statement of the research problem	2
1.3 Objectives of the study	4
1.3.1 Overarching Objective	4
1.3.2 Specific Objectives	4
1.4 Research Questions	4
1.5 Justification	4
1.6 Limitations of the study	5
1.7 Delimitation of the study	5
1.8 Definition of key terms	5
CHAPTER 2	6
LITERATURE REVIEW	6
2.0 Introduction	6
2.1 Theoretical Framework	6

2.2.1 Theory of Utility.....	6
2.2.2 Transaction Cost Theory	8
2.2 Conceptual framework	9
2.3 Broiler Production Systems.....	10
2.3.1 Organic Production Systems	11
2.3.2 Small-scale subsistence extensive poultry production systems.....	12
2.3.3 Semi/large intensive commercial production systems	12
2.3.4 Small/large scale extensive commercial poultry production systems	13
2.4 Marketing Channels in Developing Countries	13
2.5 Marketing outlets available accessible to smallholder farmers in Lesotho	14
2.6 Involvement of market intermediaries in broiler marketing	15
2.7 Empirical studies on determinants of farmers’ market participation	17
2.7.1 Socio-Economic factors	17
2.7.2 Marketing Factors	18
2.7.3 Institutional Factors	19
2.8 Factors influencing farmers’ choice of marketing outlets.....	20
2.9 Importance of market participation	23
2.10 Challenges in the marketing system in developing countries.....	24
2.11 Chapter Summary.....	26
CHAPTER 3	27
RESEARCH METHODOLOGY	27
3.0 Introduction	27
3.1 Study area	27
3.2 Research design	28
3.3 Data Collection Method (Instrumentation)	29

3.4 Reliability and Validity of Questionnaire	30
3.4.1 Reliability	30
3.4.2 Validity	31
3.5 Ethical issues	32
3.5 Sampling technique and sample determination size	33
3.6 Data Analysis	35
3.6.1 Descriptive Statistical Analysis	35
3.6.2 Econometric Analysis	35
3.6.2.1 Heckman Two-Stage Model	36
3.6.2.2 Multivariate Probit (MVP) Model	38
3.6.3 Hypotheses and description of variables in Heckman’s two-stage and MVP models	41
3.7 Chapter Summary	48
CHAPTER 4	49
RESULTS AND DISCUSSION	49
4.1 Introduction	49
4.2 Descriptive statistics of factors influencing farmers’ market participation decisions 49	
4.2.1 Socio-economic characteristics of broiler farmers in the study area	49
4.2.2 Market characteristics of farmers in the study area	55
4.2.3 Descriptive statistics of institutional characteristics of broiler farmers in the study area	57
4.3 Descriptive statistics on market outlet choice decisions of broiler farmers	60
4.3.1 Descriptive statistics of the socio-economic and market factors influencing farmers’ market outlet choice decisions	61
4.3.2 Descriptive statistics of institutional factors influencing the choice of market outlets available in the study area	66

4.4 Factors influencing broiler farmers’ market participation and the intensity of participation in broiler marketing.....	67
4.4.1 Factors influencing broiler farmers’ market participation	68
4.3.2 Determinants of broilers farmers’ intensity of market participation.....	72
4.5 Determinants of marketing outlet choice by broiler farmers	76
CHAPTER 5	82
SUMMARY, CONCLUSION, AREA OF FURTHER STUDY AND RECOMMENDATIONS.....	82
5.1 Introduction	82
5.2 Summary of the study.....	82
5.3 Conclusions of the study	85
5.4 Recommendations of the study	86
5.5 Area for further research	88
REFERENCES.....	90
APPENDIX 1: QUESTIONNAIRE.....	104

LIST OF FIGURES

Figure 1: Conceptual Framework, Adapted from: (Sigei, 2014; Otekunrin, Momoh and Ayinde, 2019)	9
Figure 2: Classification of poultry production systems, Adapted from (Mphahama, 2017)	11
Figure 3: Study area map	27

LIST OF ABBREVIATIONS AND ACRONYMS

FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GMO	Genetically Modified Organisms
IMR	Inverse Mills Ratio
MAFS	Ministry of Agriculture and Food Security
MVN	Multivariate Normal Distribution
MVP	Multivariate Probit model
NSDP	National Strategic Development Plan
OECD	Organisation of Economic Co-operation and Development
OLS	Ordinary Least Squares
SSA	Sub-Saharan Africa
USAID	United States Agency for International Development
WFP	World Food Programme

CHAPTER 1

INTRODUCTION

1.1 Background

Agriculture plays a key strategic role in the economic development of many developing countries through the creation of employment opportunities for both rural youths and women and it has also made a significant impact on the economy of developed countries in terms of development (Praburaj, 2018). Negerssa *et al.* (2020) opined that economic activities in Sub-Saharan Africa (SSA) had been dominated by smallholder agriculture and this important smallholder agriculture economic contribution in the region is expected to last for some years to come. According to Mulanda and Punt (2021), agriculture contributes the largest share of total economic output and is the main employer in economies in their early stages of development in developing countries. Agriculture contributes 4% to global gross domestic product (GDP) while in developing countries it accounts for more than 25% of GDP (Wold Bank, 2022). An increase in agricultural productivity has spill-over effects on other sectors of the economy since savings and income generated can be invested in other industries to create more employment opportunities (Mulanda and Punt, 2021).

In Lesotho, agriculture has been selected as one of the key priorities in the National Strategic Development Plan (NSDP) II because it still has a high potential for poverty reduction, employment generation, income improvement and assurance of food security. World Bank (2020) states that 70% of Lesotho's population resides in rural communities and the majority of these rural community dwellers make a living from agriculture. The agricultural sector in Lesotho remains the largest informal contributor to private employment creation accounting for 40% of the total employment and women dominate the labour force in agriculture (Akintunde and Oladele, 2019).

The poultry industry is the fast-growing sub-sector of agriculture in the developing world and this is attributed to several pulling and pushing factors. On the demand side, the issue of urbanisation, income increase and animal protein requirements particularly for chicken has a positive influence on the growth of poultry production (Gororo and Kashangura, 2016). The other reason for the increase in demand for broiler meat in developing countries is the relative

cheaper price of poultry meat than other meat products and by the year 2028, poultry meat consumption is expected to increase and will account for 42.1% of total meat consumption (OECD/FAO, 2019). On the supply side, efficiency in chicken production because of improvements in poultry nutrition, breeding production and processing technology stimulated the growth and development of the poultry industry (Gororo and Kashangura, 2016).

Poultry farming is highly practised in rural households in Lesotho, and it constitutes an important contribution to the development of the rural economy in most developing countries. The poultry industry remains an important sub-sector of agriculture like in many developing countries and it remains the main source of livelihood for village people and other small-scale farmers in the economy. Many rural communities are keeping poultry as a source of meat and eggs to feed their families, raise income from the surplus and create employment opportunities (WFP, 2020). Smallholder farmers who keep broilers as a source of employment and income dominate the poultry sector (Praburaj, 2018).

Market participation of smallholder farmers is believed to have a major impact in ensuring sustainable agricultural growth and development and this results in the continued structural transformation of the agriculture sector from subsistence farming to a more market-oriented commercial farming in the economy (Gomez, Laura and Louhichi, 2020). Therefore, market participation can be viewed to enhance poverty alleviation strategies and mitigate agricultural insecurity in Sub-Saharan Africa (Otekunrin, Momoh and Ayinde, 2019).

Economic development and increased farmers' productivity in many developing countries are directly linked to adequate access to markets (Adams, Caesar and Asafu-Adjaye, 2021) and this implies that ensuring continuous access of farmers to improved markets can be used as a strategy for agricultural commercialization and economic growth as a whole.

1.2 Statement of the research problem

Smallholder farmers' participation in the market plays a significant role in improving household welfare and rural development (Meemken and Bellemare, 2020). However, in Sub-Saharan Africa, there is typically low participation of farmers in the markets despite the significance of poultry production for economic growth and its potential to increase farmers' household income and livelihoods through income gains from the sale of their products in the markets (Sigei, 2014). Farmers in developing countries are faced with serious challenges in marketing their

agricultural products and this results in low participation of farmers in the market (Yankson, Owusu and Frimpong, 2016; Yaméogo *et al.*, 2018). Akrong, Mbogoh and Irungu (2021) argued that the low participation of farmers in the high-value market chain denies farmers an opportunity to maximize their income and livelihood from both poultry production and marketing. Ripley (2017) asserts that when smallholder farmers struggle to access profitable and value-added markets, this challenge prevents farmers from shifting from the subsistence nature of production to more commercial agricultural operations.

This situation is not different in Lesotho where the poultry industry is characterised by smallholder farmers who practice poultry farming as a source of both employment and income generation to improve their livelihoods (Bello, Nokotjoa and Paramaiah, 2009). The majority of smallholder broiler farmers in Lesotho are involved in intensive broiler production with the primary purpose of commercialising their broiler production. However, farmers involved in the broiler sub-sector have a poor linkage to high-value markets and this limited access forces farmers to sell their produce at the farm gate where there are low prices and this results in low market participation of broiler farmers in Lesotho. The poor market participation of farmers in the broiler market is evidenced by a heavy reliance of the country on broiler meat importation. According to Mphahama (2017), 90% of broiler meat sold in the formal market in Lesotho is imported from South Africa and this may be a signal of low market integration of local broiler producers. Ripley (2017) observed that smallholder farmers from the developing world find themselves excluded from more developed markets locally, in the region, capital and export value chains. Ripley (2017) further stated that smallholder farmers are excluded from improved markets due to low economies of scale, low awareness of market requirements and poor production practices that are not geared towards addressing the quality and quantity demanded and poor infrastructure which increases transaction costs and post-harvest losses. It is in the light of the aforementioned challenges confronting smallholder broiler farmers in Lesotho that this study attempted to bridge the information gap by explaining the underlying factors that influence market participation and the choice of market outlet among broiler farmers in the Leribe district of Lesotho.

1.3 Objectives of the study

1.3.1 Overarching Objective

The main purpose of this study is to identify and evaluate socio-economic, institutional and marketing factors influencing broiler farmers' market participation and the choice of market outlet in Leribe, Lesotho.

1.3.2 Specific Objectives

1. To profile the socio-economic, market and institutional characteristics of broiler farmers in the Leribe district.
2. To identify factors influencing broiler farmers' market participation and the intensity of participation in broiler marketing.
3. To determine factors affecting the choice of market outlets by broiler farmers.

1.4 Research Questions

1. What are the socio-economic, market and institutional characteristics of broiler farmers in Leribe?
2. What are factors that influence farmers' market participation and their intensity of participation in broiler marketing?
3. What factors affect broiler farmers' decisions regarding the choice of market outlet?

1.5 Justification

Improving the agricultural productivity of smallholder farmers through better market access can be an essential element for poverty reduction and livelihood improvement strategies. It has been argued that market-oriented production can benefit from specialization and comparative advantage, economies of scale, and frequent interaction and exchange of ideas among actors in the market (Otekunrin, Momoh and Ayinde, 2019). Small-scale farmers that are characterised by low market participation in commercial markets dominate the poultry sector in Lesotho and are constrained by several factors to participate in the market. Understanding factors that influence smallholder broiler farmers' market participation and market outlet selection will play a critical role in providing both insightful information and knowledge to the limited literature about Lesotho's broiler farmers' participation in markets. This will also serve to inform policymakers, extension service personnel and development partners in Lesotho in the formulation of responsive strategic policies to improve livelihoods and alleviate poverty among smallholder

farmers by identifying critical areas that need more focus in harmonizing and improving market participation of smallholder farmers. The study will also contribute to scholarly literature for students and other scholars who will embark on similar research work.

1.6 Limitations of the study

The study had significant difficulties during data collection due to a lack of funding. Participation of farmers in the study was also constrained due to the communities' widespread fear of personal contact caused by the Covid-19 outbreak. Most broiler farmers do not keep accurate farm records and rely on memory to respond to questions, which may have caused them to give estimations that may be inaccurate.

1.7 Delimitation of the study

Due to the lack of financial resources for this study, the research did not cover the entire country. Instead, it was only confined to small-scale broiler farmers in Leribe who are engaged in poultry farming and marketing.

1.8 Definition of key terms

Market participation: refers to any market-related activity that involves the exchange of broiler for money. Otekunrin, Momoh and Ayinde, (2019) defined market participation as the integration of subsistence or semi-subsistence farmers into the input and output markets for agricultural goods with the goal of increasing their income level and reducing poverty.

Participation intensity: For this study, this is a measurement of how actively farmers participate in the markets and it is measured in terms of broiler quantity sold in the markets.

Market outlet: is defined as a collection of independent enterprises and interrelated entities that are involved in the movement of agricultural commodities from producers to final consumers (Bannor, Ibrahim and Amrago, 2021).

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter explores the literature in order to investigate the determinants of market participation among smallholder broiler farmers in the Leribe district of Lesotho. Broiler farmers are constrained to access the formal markets and this results in low market participation of farmers in the broiler markets. This chapter, therefore, provides a detailed discussion of the theoretical and conceptual framework that underpins this research as well as poultry production systems in developing countries. This chapter further highlights a literature review of empirical studies on factors influencing market participation, and the factors influencing the choice of market outlets by farmers. This chapter also discusses broiler market outlets available in developing countries as well as in the study area. Finally, the chapter discussed the importance of farmers' participation in the market and the marketing challenges faced by smallholder farmers.

2.1 Theoretical Framework

Kivunja (2018) defined a theoretical framework as an organised structure that brings together concepts and theories from previously tested and published knowledge that researchers synthesized to provide a theoretical basis for analysing and interpreting the meaning embodied in the findings of the study. The main purpose of the theoretical framework is to give the researcher an insight into existing theoretical ideas that they can use to investigate and understand the research problem, and it gives a clear picture of what the researcher needs to investigate in the data to provide valuable answers to the research questions (Kivunja, 2018). Therefore this study will be built on two theories: Utility maximization theory to analyse broiler farmers' market participation and transaction cost theory to study broiler farmers' market outlet choice following the study by (Sigei, 2014) and (Okoye *et al.*, 2016) respectively.

2.2.1 Theory of Utility

Shi and Wang (2019) defined utility theory as a qualitative theory that is used to study the personal and psychological behaviour of economic agents in making decisions that will maximize their level of utility. This theory proposes that when a farmer is faced with numerous decisions such as to participate or not to participate in the market and choose among alternative

market outlets, the decision-making process will be informed by the highest level of utility a farmer is likely to enjoy as results of taking a certain decision among other alternatives (Sigei, 2014). Otekunrin, Momoh and Ayinde (2019) defined utility as a measure of a human's level of satisfaction because of choosing what they prefer the most among the available alternatives. Individuals choose alternatives that will maximize their level of utility within a given utility function (Aleskerov, Bouyssou and Monjardet, 2007). The utility function is therefore seen as a model that defines the producer's desired amount of risk in an exchange for wealth and this implies that farming households' decision to market their agricultural produce will result in a maximum level of satisfaction (Otekunrin, Momoh and Ayinde, 2019). According to Horowitz *et al.* (1994), the level of utility is highly dependent on the attributes of the available alternatives and individuals that are being studied.

Based on the theory of utility framework, a broiler farmer's decision to participate or not to participate in the market, the intensity of market participation and the choice among alternative market outlets are guided by the level of utility derived from each alternative available. This means that a farmer will only take a decision that has more net benefits or maximum utility. However, it is important to note that for a smallholder farmer to maximize their utility from how much to produce, consume, sell and choose the market outlet, such decision is subjected to constraints that include lack of financial access, resources availability and production function (Otekunrin, Momoh and Ayinde, 2019).

In this study, it is important to note that the level of utility or net benefits derived from decisions made by farmers will be observed indirectly through the choices made by each smallholder farmer (Sigei, 2014). Therefore, following the study by Sigei (2014) the utility model for broiler farmers can be stated as follows: Assume, U_j and U_k represent a farmer's utility for two choices which are denoted by Y_j and Y_k then the linear random utility model can be specified as equation 1:

$$U_{ij}(\beta_j X_i + e_j) > U_{ik}(\beta_k X_i + e_k), k \neq j \quad (1)$$

Where:

U_j and U_k are perceived utilities of broiler market participation and non-broiler market participation choices j and k respectively, X_i the vector of explanatory variables that influence

the desirability of each choice, β_j and U_k utility shifters and e_j and e_k represent the error terms that are independent and equally distributed (Sigei, 2014). In the case of broiler market participation, if a household decides to use option j , it follows that the perceived utility or benefit from option j is greater than the utility from other options (say k) depicted as in equation 2:

$$U_{ij}(\beta_j X_i + e_j) > U_{ik}(\beta_k X_i + e_k), k \neq \forall_i \quad (2)$$

The probability that a broiler farmer will decide to participate in the market, i.e. choose j alternative instead of k could then be defined as:

$$P(j|X) = P(\beta_j X_j + e_j > \beta_k X_k + e_k \text{ for all } j = 1, \dots, J; \neq i) \quad (3)$$

Where

$$X = (X_1, \dots, X_j) \text{ (Horowitz } et al., 1994).$$

2.2.2 Transaction Cost Theory

According to this theory, the active participation of smallholder farmers in the market is motivated by the transaction costs that are at their minimal level and individual farmers or institutions have in place marketing strategies that minimizes transaction costs (Otekunrin, Momoh and Ayinde, 2019). Transaction costs act as a barrier to market entry by smallholder farmers (Okoye *et al.*, 2016) and transaction costs are defined as hidden costs that are associated with the exchange of goods or transfer of property rights by farmers (Otekunrin, Momoh and Ayinde, 2019).

Transaction costs may be categorised as fixed and variable transaction costs (Okoye *et al.*, 2016). Fixed costs are not varying with the amount of output sold in the market and these types of costs include, searching for a trading partner, negotiating and bargaining, especially in the situation of imperfect information about prices, and contract arrangement and supervision and training (Otekunrin, Momoh and Ayinde, 2019). Variable transaction costs include those costs that are proportional to the marketed output and they include transportation costs and time spent in the exchange of goods and services.

Smallholder farmers in Sub-Saharan Africa face difficulty in marketing channel choice due to lack of access to reliable market information, poor road infrastructure, and lack of access to

transportation facilities and all these challenges increase transaction costs for farmers (Donkor *et al.*, 2021). Based on this theory, broiler farmers are likely to choose marketing outlets that will minimize their transaction costs while marketing their products.

2.2 Conceptual framework

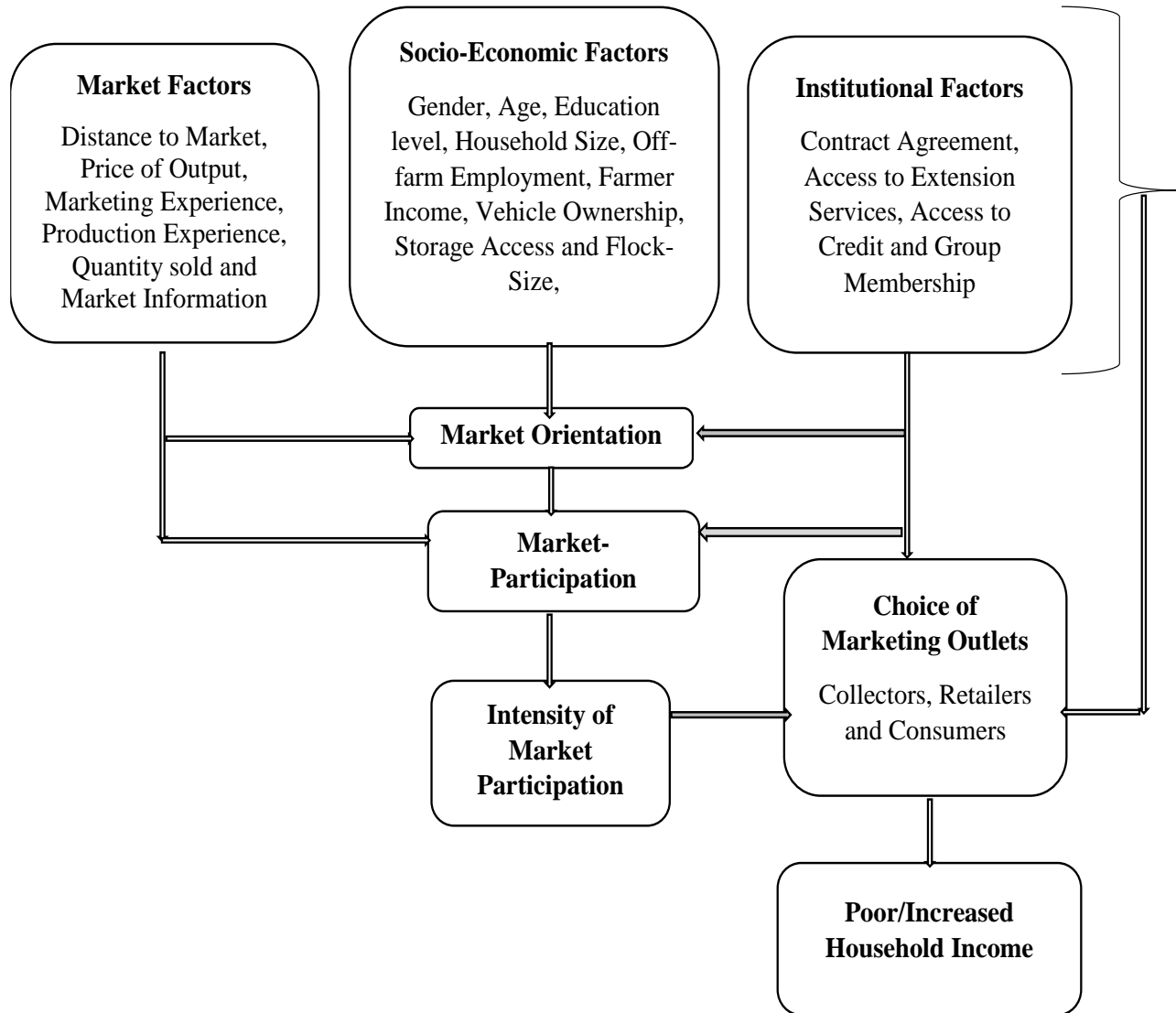


Figure 1: Conceptual Framework, Adapted from: (Sigei, 2014; Otekunrin, Momoh and Ayinde, 2019)

The conceptual framework is described as the structure that shows an interrelationship between explanatory variables and the research problem (Kivunja, 2018). It is the researcher's conceptualization of the research topic, how concepts are linked to the empirical research and the

main theories used to promote and understand the scientific knowledge presented by the researchers (Adom, Hussain and Joe, 2018). Conceptual frameworks can be represented in a form of a graphical diagram or a narrative form, showing the key variables or constructs to be studied and the presumed relationships between them and this allow the researcher to have their view about the phenomenon to be investigated (Adom, Hussain and Joe, 2018). The basis and premise of this study are on the belief that socio-economic characteristics of broiler farmers, institutional factors and market factors influence the market participation of broiler farmers and their market outlet choice.

As shown in **Figure 1** above, the socio-economic characteristics of farmers include the following: Gender, age, education level, household size, occupation, income, vehicle ownership and flock size. Institutional factors among others include; access to extension services, access to credit, market access and group membership while marketing factors comprise the following; distance to market, price of output, market information, and marketing experience. The above-mentioned socio-economic, institutional and marketing factors influence farmers' market orientation, which leads to actual market participation. After then, the decision to participate in the market leads to farmers deciding on the intensity of participation. After the decision has been made on the output level to be marketed, farmers choose the marketing outlet hence increasing or decreasing household income in the end. The proposed impact of the above explanatory variables on the three dependent variables being market participation, the intensity of participation, and market outlets choice is clearly articulated in **Tables 2 and 3** respectively.

2.3 Broiler Production Systems

The literature highlights different broiler production systems in the developing countries as depicted in **Figure 2** below and these include among others organic broiler production, small-scale subsistence extensive poultry systems, small/large scale intensive poultry systems and semi/large extensive poultry production systems (Fitsum and Aliy, 2014; Mphahama, 2017; Naushad *et al.*, 2021). Based on factors including flock size, management, the purpose of production, level of commercialization, and location, various methods of describing poultry production systems have been proposed (Alders *et al.*, 2018).

Various poultry production systems are being adopted by smallholder broiler farmers in the poultry industry, and the decision made by farmers is influenced by the need to meet the

expanding market for meat due to population growth and the improvement in the need for a balanced diet among populations (Jeni *et al.*, 2021), whereas Alders *et al.* (2018) claimed that the decision is based on the need to meet both environmental health and animal welfare standards. Public interest in organic and locally grown food sources has led to the pursuit of other management practices (Ricke and Rothrock, 2020). Consumer preferences for organic poultry products are related to the perceived greater quality and safety of meat derived from such systems coupled with high standards of animal welfare (Sossidou *et al.*, 2015).

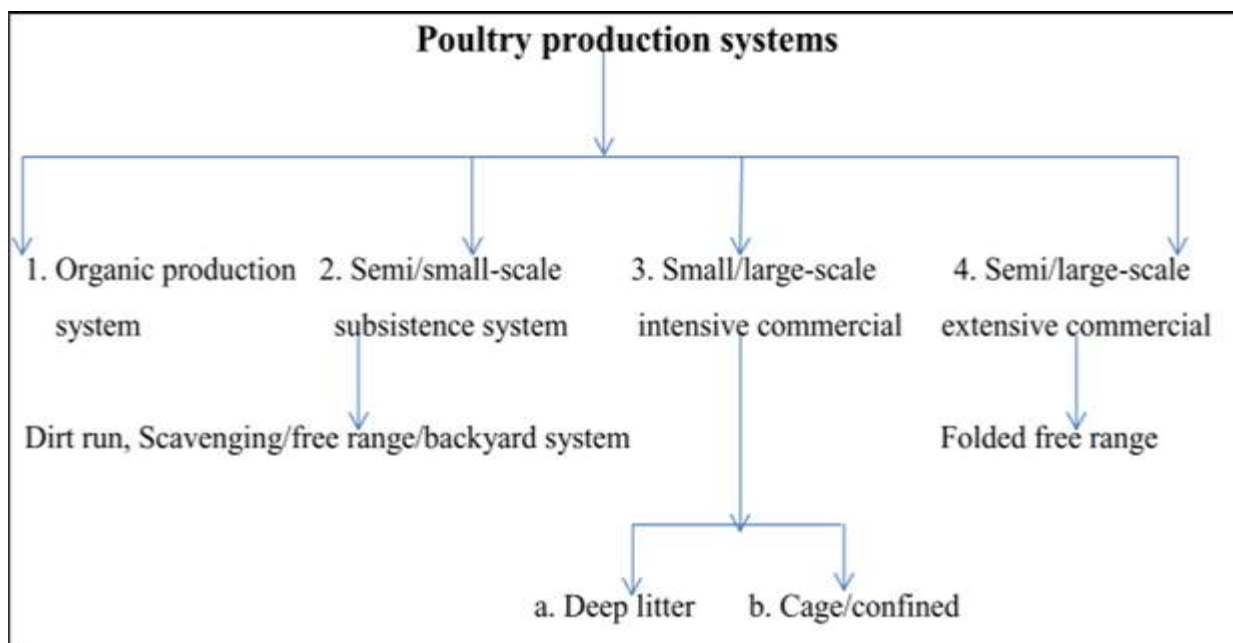


Figure 2: Classification of poultry production systems, Adapted from (Mphahama, 2017)

2.3.1 Organic Production Systems

This system is characterised by slow-growing broiler chickens raised in an open-sided, naturally ventilated broiler house. Concerning the organic systems, in general, chickens must have access to an abundance of fresh air, daylight and outdoor space. More specifically, every effort has to be made to allow chickens to live as natural a life as possible (Dal Bosco *et al.*, 2021). This system completely forgoes the use of conventionally grown feedstuffs, including genetically modified organisms (GMOs), animal by-products, and synthetic additives, and instead only provides birds with organically grown cereals, oil, seeds, and roughage (Mphahama, 2017). Birds at pasture consume herbs, roots, stems and invertebrates; providing poultry with green matter can reduce the supplementation of dietary vitamins and minerals, support gut fill and can be used as an

enrichment device. Poultry consumes 10-20% of their dietary requirements from fresh, dried, or ensiled grass depending on age, type of plant material and genotype (Sossidou *et al.*, 2015). There are also challenges associated with this system and thus According to Sossidou *et al.* (2015) it is essential to choose a genetic strain of bird which is selected for extensive pasture systems, and farmers are encouraged to choose birds selected for their ability to cope with the natural environment, with a well-developed immune system, low occurrence of injurious behaviours, suitable body conformation, skeletal development and growth rate.

2.3.2 Small-scale subsistence extensive poultry production systems

In this system, the chickens are typically raised in low-input, low-output, free-ranging systems where production is dedicated mainly to home consumption but also to provide the possibility to raise cash in case of emergency (Chaiban *et al.*, 2020). In semi-subsistence poultry systems, a small flock of local breeds are left to scavenge in backyards and garden areas and fed with locally available feeds and the feed picked up in the garden area is supplemented with a limited amount of home-produced grain such as maize and other food remains available in the household (Mphahama, 2017). Small-scale poultry production systems are mostly found in rural, resource-poor areas that often also experience food insecurity and 90% of smallholder farmers in developing countries especially in the rural area are keeping chickens under these systems (Mphahama, 2017; Wong *et al.*, 2017). These poultry production systems are mostly accessible to vulnerable groups of society and provide households with income and nutritionally-rich food sources. Farmers can sell different poultry products when they need cash, such as chicks, growers and broiler chickens. However, they also improve food security in indirect ways, such as enhancing nutrient utilisation and recycling in the environment, contributing to mixed farming practices, contributing to women's empowerment, and enabling access to healthcare and education (Wong *et al.*, 2017).

2.3.3 Semi/large intensive commercial production systems

The introduction of improved, exotic, genetic material is an important first step in the growth and development of the commercial poultry sector. Thus, an improvement in the area of technology and increasing scale of production units necessitated a shift from a traditional scale of broiler production systems using a dual-purpose indigenous breed to intensive and modernised commercial production systems using hybrid birds specially bred either for meat or for egg

production (Chatterjee and Rajkumar, 2015). Farmers can either produce broilers on a small or large scale with the primary pursuing of selling in the market and this system is commonly practised in urban areas (Fitsum and Aliy, 2014; Wong *et al.*, 2017). Due to an extensive selection for production qualities and changes in the environment where chickens are maintained, the commercialization of poultry farming has increased in Lesotho (Mphahama, 2017). This system largely relies on imported exotic breeds, which demand high inputs like feed, housing, health care, and a contemporary management system. To meet the increasing demand for chicken in big cities, this system is characterized by a greater level of productivity where poultry production is market-oriented (Fitsum and Aliy, 2014). More intensive poultry raising systems require reliable access to inputs, including commercial stock, feed, labour, and health services as well as efficient marketing channels (Wong *et al.*, 2017).

2.3.4 Small/large scale extensive commercial poultry production systems

The extensive system of poultry production commonly known as “free-range” is based on the practice of allowing the birds’ access to foraging areas outside the poultry house. These poultry rearing systems vary from country to country and they produce the smallest portion (5%) of poultry meat needed in the world (Dal Bosco *et al.*, 2021). There is increasing interest in such rearing systems as they provide a good image for the product and environmental sustainability, improved animal welfare, and meat quality with an annual trend of growth of about 10% (Mphahama, 2017; Wong *et al.*, 2017; Dal Bosco *et al.*, 2021).

2.4 Marketing Channels in Developing Countries

A marketing channel can be defined in various ways and according to Amanor-boadu, Nti and Ross (2016) can be defined based on farm location, farm size and as well as different actors in the supply chain of poultry products. Bannor, Ibrahim and Amrago (2021) describe a marketing outlet in agriculture as a set of independent and interrelated entities that are concerned with the flow of agricultural commodities from producers until they reach the final consumers while Wahyono and Utami (2018) explained marketing channels as an array of companies or people that are directly involved in the distribution of agricultural goods and services from producers to final consumers.

Numerous pieces of the literature show that there are various marketing systems and channels available to smallholder farmers in developing countries and this variance is brought by their

difference in terms of agriculture commercialisation. According to Wahyono and Utami (2018), marketing outlets can be divided into two categories that include direct marketing and indirect marketing outlets. In a direct market channel, agricultural commodities move directly from producers to immediate consumers (Pattern I) whereas in indirect channels products can be distributed from producers directly to retailers and then to consumers (Pattern II) or be distributed from producers to wholesalers to retailers to consumers (Pattern III).

The study conducted by Bannor, Ibrahim and Amrago (2021) in Ghana identified seven broiler market channels and these market outlets include direct-to-consumer; wholesalers; retailers; hawkers; chop bars; hotels, restaurants and institutions. The most profitable market outlet for poultry is wholesalers because they reduce transportation and feeding costs since they buy large quantities at once (Bannor, Ibrahim and Amrago, 2021). Farmers with small farms in most cases sell their products directly to consumers at the farm gate and the reason for major sales at the farm gate is to reduce transaction costs of selling in either in the village market or in the urban market (Adams, Caesar and Asafu-Adjaye, 2021).

2.5 Marketing outlets available accessible to smallholder farmers in Lesotho

The majority of smallholder farmers in developing countries such as Lesotho are located in remote areas characterised by poor road and market infrastructure and for this reason, their marketing activities are still performed traditionally (Rafoneke *et al.*, 2020). This isolation of farmers from improved markets increases their transaction costs and this creates a challenge for rural smallholder farmers when selecting market channels for their agricultural output (Rafoneke *et al.*, 2020). The most accessible markets for smallholder farmers in many developing countries are informal and they are referred to as being informal because they are set out of the tax systems and do not operate under any legal framework (Ferris *et al.*, 2014). These markets include farm gates, roadside sales, village markets and urban markets. These markets are particularly important in the development of agricultural commercialisation because they absorb a high volume of agricultural output such as crops, vegetables and meat products from smallholder farmers (Ferris *et al.*, 2014).

According to Rafoneke *et al.* (2020), the issue of high transaction costs and lack of market options restrict smallholder farmers in Lesotho participate in the high-value markets and this forces farmers to sell their produce at the farm gate and in their backyards. The other reason for

smallholder farmers to sell at the farm gate is that farmers lack the knowledge, skills and confidence to supply formal markets (Amani, 2014). Farmers that are using farm gates as their market outlets sell their products directly to individual consumers (Mphahama, 2017).

According to Mphahama (2017), the majority of smallholder farmers in Lesotho operate in village (local) markets for their poultry products whereby they are sold to individual households, friends and neighbours in the community, school feeding programmes and churches while few proportions of these farmers are taking advantage of market opportunities in urban markets. Mphahama observed that farmers operating in urban markets are selling their live birds or slaughtered along the roadside in the town, retailers and food restaurants or directly to consumers. Very few of these farmers negotiate a formal agreement to supply food for restaurants, hotels, guesthouses and private schools when their chickens are ready for the markets.

Poor market infrastructure, high transaction costs, lack of market information, and the inability of farmers to meet market requirements such as grades and standards constrain farmers to participate in the formal markets (Ferris *et al.*, 2014; Mphahama, 2017). According to Rantlo, Tsoako and Muroyiwa (2020), the participation of farmers in the informal market is significantly influenced by the dependence path and delayed payment from the formal markets. Many farmers in developing countries such as Lesotho are located in remote areas and this makes it difficult for them to access high-value market outlets thus forcing them to participate in informal market outlets such as farm gates, local markets and urban markets (Rafoneke *et al.*, 2020). Nxumalo *et al.* (2019) added that the informal markets gained more popularity in developing countries because farmers find it easy to transact with their customers because they are living in the same location and there is no need for intermediaries.

2.6 Involvement of market intermediaries in broiler marketing

An agricultural marketing system encompasses all the participants concerned with the marketing of undifferentiated or unbranded farm produce until reaches final consumers (Obiadi *et al.*, 2020). The marketing outlet or value chain actors that are involved in the flow of agricultural commodities from farmers to the final consumers include cooperatives, collectors, wholesalers and retailers.

Wholesalers: These types of market intermediaries can be described as a distributor of goods from the manufacturer or supplier to the retailers (Záboj, 2008). According to Islam *et al.*, (2017), in the poultry industry, wholesalers are bulk purchasers of live and slaughtered chickens and sell them directly to retailers. Wholesalers play an important role in improving the marketing performance in agriculture because they purchase a large volume of agricultural products than any other market actor in the village market (Islam *et al.*, 2017; Hawlet, Birhane and Alemayehu, 2019). Most producers choose wholesale markets over selling directly to consumers and retailers as this channel is the most convenient and also offers high returns (Soe, Moritaka and Fukuda, 2015).

Collectors: These are traders in assembly markets who collect agricultural produce from farmers in village markets and farms for the purpose of reselling it to wholesalers and retailers and some collectors are selling directly to individual consumers. For example, some broiler traders in the Leribe district purchase either live or slaughtered chickens from producers and sell them to retailers and consumers in rural areas where broiler production is not a common practice. Thus, collectors are very critical in assuring the marketing of broilers from farmers to different potential buyers and they reduce both market information and transport cost for farmers (USAID, 2016).

Cooperatives: An agricultural cooperative is a business partnership in which farmers combine their resources in order to enhance profits, reduce expenses, or share risks. Depending on the type of cooperative, a cooperative may also assume a marketing role by selling agricultural produce on behalf of farmers and farmers are only given their profits. According to Sori and Adugna (2022), cooperatives provide services to their members and assist farmers in reaching agreements with collectors to acquire agricultural produce at a competitive price while incurring the least amount of transport costs.

Retailers: These are intermediary market institutions which purchase bulk broiler products directly from producers, collectors and wholesalers with the primary purpose of selling to final consumers in quantities of their choice (Hawlet, Birhane and Alemayehu, 2019). There are stringent requirements in these types of value chain actors which includes standards and quality as well as the specified quantity that farmers must meet if they are to supply these market outlets.

Consumers: These include individuals such as community members and other independent institutions such as schools which buy poultry productions for immediate consumption. According to Amanor-Boadu, Nti and Ross (2016), some of the broiler producers prefer to sell directly to their nearby final consumers to reduce the transaction costs while on the other hand, consumers also prefer to buy directly from producers because they believe that farm-produce are healthier than supply from other market intermediaries.

2.7 Empirical studies on determinants of farmers' market participation

The purpose of this section is to provide a literature review on empirical studies that evaluated factors that determine the market participation of farmers in the agribusiness sector. According to Sigei (2014), these factors can be categorised into socio-economic, institutional and market factors and all of these factors are directly linked to farmers' market participation in formal and informal markets.

2.7.1 Socio-Economic factors

Kibara (2019) used the Double hurdle model to evaluate factors that affect pastoral smallholder farmers' markets and the extent of participation in the livestock market in Kenya. The results of the Probit Regression model indicated that three socio-economic factors such as gender, age, and education level and transport ownership had a significant impact on farmers' participation in livestock markets. In their study, gender was found to have a positive impact on the probability of market engagement by farmers where male-headed household farmers participated more than females. The possible reason for this difference in gender market participation is that male farmers are not constrained in resource accessibility as compared to female-headed households (Kibara, 2019). Education level had a positive influence on market participation. Acquisition of higher-level formal education improved farmers' negotiation skills and productive use of relevant information available. The study found the variable age to have a negative impact on farmers' market participation, which was contrary to prior expectation, and the explanation for this inverse relationship was that, as farmers get older they become more risk-averse and they lack energy and interest to participate in the market. Transport ownership in this study was another significant market participation determinant and the author argued that access to any mode of transport (vehicle) in farming reduces transportation costs and makes it easier for producers to deliver their agricultural produce at the required time.

Negerssa *et al.* (2020) conducted a study in Ethiopia to identify factors that influence the market participation among smallholder vegetable producers using the probit model and in their study socio-economic characteristics such as education level, family size and age of farmers were statistically significant determinants of market participation. Both age and family size were found to have a negative influence on market participation while education level was found to influence farmers' participation in vegetable markets. For the positive impact of education on market engagement, the argument is that education is a proxy for information access and farm management that, in turn, improves their productivity thus increasing the marketable output. Family size had a negative influence in this study, they argued that the number of people in the household increases family consumption thus reducing the marketable surplus, and they argued that older farmers are risk-averse and they lack access to market information and productive technology as opposed to younger farmers hence there is an inverse relationship between age and market participation.

Tarekegn and Kibreab (2017) evaluated determinants of poultry market participation decisions in Southern Ethiopia and among the significant variables, flock size was determined to have a positive influence on farmers' decision to participate in the market and the level of output sold in the market. These authors argued that the large poultry size on the farm ensures that family consumption does not significantly reduce the quantity to be sold in the market. The same results were found by Goitom *et al.* (2018) as they confirmed that flock size ensures a quantity that drives farmers to commercialize. The large size of poultry stock creates an opportunity for farmers to negotiate prices and increases the probability of farmers securing contracts (Goitom *et al.*, 2018).

2.7.2 Marketing Factors

Market factors such as market information access and distance to the nearest market were identified as major determinants in market participation among smallholder vegetable farmers by Negerssa *et al.* (2020). Access to market information was found to have a positive influence on vegetable farmers' decision to participate in the market and the reason for the influence was that continuous access to relevant and timely market information help farmers to make informed decisions that make it easier to be competitive in markets. The distance that farmers travel to deliver their produce to the markets was found to negatively affect the decision of farmers to

commercialize their production and the reason for this is that long-distance increases transportation costs, and other relevant transaction costs, and all of these make farmers reluctant to be the market participant.

Empirical findings by Khoza *et al.* (2019) in their study to identify socio-economic factors influencing farmers' decisions to participate in agro-processing markets in South Africa found income and farming experience to have a significant influence on market participation. The income of farmers had a negative impact on agro-processing markets and the possible reason for the impact is that majority of farmers receiving high non-farm income invest less in their farming activities while consuming a larger part of it. Income from an alternative source other than farming activities reduces farmers' incentive to participate in the markets (Gachuhi, Owuor and Gathungu, 2021). Though off-farm income was found to have a negative impact on the likelihood of market participation, the same study by Gachuhi, Owuor and Gathungu (2021) found it to have a positive relationship with the level of output sold in the market. The reason for this positive association is that non-farm income can be used to pay transportation costs to deliver the output to the markets. The farming experience was found to contribute positively to the probability of market participation and the argument was that farming experience is a proxy for farm management, market information access and marketing intelligence in competitive markets (Khoza *et al.*, 2019).

Information on the price of output was significant and had a positive impact on the extent of market participation in the study conducted by Sigei (2014) while evaluating determinants of market participation among small-scale pineapple farmers in Kericho, Kenya. The reason for this impact was that farmers who access price information before a sale can make informed decisions on the amount of output to be sold and the place to sell. Moono (2015) stressed that information on output price motivates farmers to participate in the market and opined that a higher price for their output ensures that they cover the transaction costs.

2.7.3 Institutional Factors

Goitom *et al.* (2018) found that access to extension services is among the important and significant institutional factors that have a positive impact on poultry market participation and the degree of output marketed. The probable reason for this is that extension services improve farmers' knowledge of modern technology and improve their productivity, management and new

production systems that ensure the constant supply of their output in the market. Tarekegn and Kibreab (2017) had the same results where they put forth that frequent access to extension services by smallholder farmers enables them to have a piece of knowledge about the improved poultry production systems and the use of improved breeds that are prolific hence increasing output level and market participation. Raidimi and Kabiti (2019) asserted that agricultural extension plays a critical role in transferring knowledge and expertise from national and global researchers to smallholders thus improving their farming performance and they can also act as a linkage between farmers and markets.

An empirical study by Donkor *et al.* (2021) while investigating determinants of rice farmers' participation in direct marketing channels revealed that access to credit had a significant influence on market participation. The study argued that constant access to credit facilities increases farmers' investment in agriculture through securing productive inputs and technology that improves their output level. These results are in line with the results obtained by Tura *et al.* (2016) where credit access by teff farmers in Ethiopia was found to have a significant positive impact on both market participation and intensity of marketed surplus and the reason for these was linked to the ability of credit in helping farmers to pay for all transaction costs on inputs and output.

Moono (2015) evaluated factors influencing the market participation of rice farmers in Zambia where membership in farmers' organisations had a significant and positive influence on the probability of market participation and intensity of output sold in the market. The reasons attributed to this impact are that farmers' organisations improve farmers' access to productive inputs, and access to market information and they enhance farmers' bargaining power while negotiating the prices for their out.

2.8 Factors influencing farmers' choice of marketing outlets

The decision of smallholder farmers on which market channel they can sell their agricultural products is one of the most important aspects of marketing. The market outlet choice has a direct impact on the profitability of their farming and it is critically important for farmers to understand the various characteristics of different market outlets available as this helps them to make informed decisions during marketing outlet selection (Soe, Moritaka and Fukuda, 2015).

According to Adugna *et al.* (2019), farmers' decisions to select a particular market outlet are affected by various factors which include institutional, socio-economic and technical factors among others. Understanding the factors that influence market outlet choice by smallholder farmers allows agricultural policymakers to formulate strategies that will improve agricultural production, investment and profitability (Abate, Mekie and Dessie, 2019). Abate, Mekie and Dessie (2019) further stressed that appreciation of the relationship between factors that influence the choice of market outlets and the market itself makes it easier for policy intervention.

According to Abate, Mekie and Dessie (2019), smallholder farmers ensures their maximum return from their agricultural businesses by making appropriate decisions about market outlet where they can sell their agricultural output. In addition, Adugna *et al.* (2019) argue that farmers' decisions about market outlet choices are guided by the transaction costs that they are likely to incur as a result of participating in that channel. Abate, Mekie and Dessie (2019) further highlighted that many challenges, which cannot be limited to inadequate and inappropriate market information, price fluctuations, limited traders, weak bargaining power of smallholder farmers, transportation costs, credit access, and physical infrastructures such as roads, storage facilities and markets influence market outlet decisions.

An empirical study conducted by Olufadewa, Obi-egbedi and Okunmadewa (2018) to examine the determinants of market outlet choice by smallholder poultry farmers in Nigeria identified factors such as household size, road condition, contractual arrangement and flock size in the farm to have an impact on the choice of the local market outlet whereas the level of education, price information, poultry farming experience and access to extension services were found to influence on urban market choice. In this study, household size was found to have a negative impact on farmers choosing a local market and the probable reason for this is that an increase in family size increases family consumption and this reduces the marketable output hence they opt for a farm-gate outlet to incur zero transportation costs. In contrast, Magogo (2015) found the household size to have a positive impact of impact on farmers' decisions to choose local and urban markets since a large family size means more labour to take agricultural commodities to the markets. Factors like contractual agreement, flock size and road condition increase the likelihood of farmers participating in local markets and urban markets. Olufadewa, Obi-egbedi and Okunmadewa (2018) identified level of education and poultry farming experience as some

of the factors that affect the choice of urban market outlets while access to extension services and price information motivate the use of urban poultry markets in place of the farm gate.

Empirical findings of Bannor, Ibrahim and Amrago (2021) indicated factors such as farming experience and farmers' organisation membership influenced the choice of the retail market outlet by broiler farmers. Farmers with more marketing experience have acquired more expertise on grades and standards and this increases their competency in the retail market. Group membership encourages farmers' participation in the retailers' market outlet. Group membership enables farmers to access inputs, credit and other capital resources to improve their involvement in retail markets. Experience in production and marketing enables farmers to adapt their marketing link, attempting to find other market channels which offer better returns (Wosene, Ketema and Ademe, 2018).

(Hawlet, Birhane and Alemayehu, 2019) used a multivariate probit model to analyse market choice decisions among tomato producers in South Gonder Zone, Ethiopia and factors such as age, distance to market, credit access, transport ownership, land size and household size were found to have a significant impact on farmers' decision on market outlet choice. The study revealed that older farmers and an increase in market distance increase farmers' participation in the farm gate as opposed to a local and urban market and this was related to the reason that older farmers are no longer active to travel long distances to find a market for their products and the market distance are directly proportional to transportation costs hence farmers are likely to sell to buyers at the farm gate. Olufadewa, Obi-egbedi and Okunmadewa (2018) agree that long distances poultry farmers travel to the market and lack of working capital are major constraints in poultry marketing. (Hawlet, Birhane and Alemayehu, 2019) found credit access and transportation facilities to improve farmers' choice of both local market and urban market outlets. In this study, farmers with transport and credit access are likely to sell their produce to wholesalers, retailers and other immediate consumers such as hotels and restaurants in the urban markets.

Different studies on farmers' market outlet choice revealed that gender had a positive influence on farmers' decisions to sell their produce at farm-gate, local and urban markets (Sigei, 2014; Rafoneke *et al.*, 2020). There is a gender disparity in terms of market outlet choice where male farmers participate more than females in the aforementioned channels and this is attributed to the

fact that female farmers are resource constraints and they spend much of their time on house chores therefore they do not have time to go and sell their products at distant markets (Rafoneke *et al.*, 2020). The difference in gender participation in agricultural production and marketing is brought by the fact that women have inequitable access to inputs, income diversification, credit access, productive technology and decision-making power during marketing (Musafili, Ingasia and Birachi, 2021).

Market information is another important factor that guides smallholder farmers in developing countries during their market outlet decisions. Access to information from different markets regarding products needed, at what quantity and quality needed, prices offered as well as the time they are needed is very key when smallholder farmers are making decisions about market channels they can dispose of their agricultural produce (Mukarumbwa *et al.*, 2018). Lack of access to market information among smallholder farmers makes it difficult to prioritise new and high-value markets and this forces farmers to use informal markets that offer low prices (Nugroho, 2021).

2.9 Importance of market participation

Market participation is seen as a strategic move that is geared towards connecting rural or subsistence farmers into the output and input market of agricultural products and this also helps in addressing the challenge of post-harvest losses among smallholder farmers in the economy to enhance their income and livelihood (Obiadi *et al.*, 2020). Farmers participating in agricultural markets derive numerous benefits that include an increase in their household incomes. This means that when farmers can dispose of their surplus produce in the markets, some of the revenue generated from output sales is used to cater for household needs while surplus income is reinvested into agricultural activities (Sigei, 2014). Therefore, market participation is very instrumental in commercializing agriculture in small-scale farming (Obiadi *et al.*, 2020).

Market participation is viewed as an important variable in the transformation of subsistence agriculture into commercial agriculture. According to Ingabire *et al.*, (2017), access to markets is a prerequisite to market-oriented production systems and this is one of the key features of commercial agriculture in the economy. Ingabire *et al.*, (2017) further state that agricultural commercialization is very effective in improving farmers' household income and in promoting

farmers' agricultural growth. Nxumalo *et al.* (2019) added that market participation is among important development issues since access to various market channels is an enabler for the poor to deal with poverty and equity issues, as access to markets is not only an economic issue but is also included in social, economic and political institutions. This means that market access can be referred to as a transmission mechanism that links poor farmers to improved economic activities that guarantee them better returns from their farming.

Agricultural transformation requires both sustained growth in productivity and market access which are very critical in ensuring growth in developing countries (Tsakok, 2018). Akidi, Wamala and Mugonola (2018) argue that increased agricultural productivity and commercialization are highly dependent on efficient and well-functioning markets that are well balanced in terms of transaction costs and information availability for smallholder farmers with low productivity and poor infrastructure.

2.10 Challenges in the marketing system in developing countries

Though market participation is shown to have greater importance in improving both agricultural production and farmers' livelihood, numerous challenges act as a barrier to market participation and access by smallholder farmers. According to Shiferaw, Hellin and Muricho, (2016), poor infrastructure and weak institutional strategies in developing countries are continuing to be key defining features of subsistence agriculture and these lead to high transaction costs and pervasive market imperfections. These authors further pointed out that the positive effects of market liberalization in developing countries are yet to be seen due to poor market reforms implementation, policy reversal and re-emergence of state marketing agencies targeted to improve agricultural markets.

Market liberalisation forced government withdrawal from agricultural markets to give way to the private sector for investment and this has left an institutional gap that subsequently resulted in a financial struggle for smallholder farmers due to underinvestment by the private sector in the agricultural sector (Shiferaw, Hellin and Muricho, 2016). The emergence of the private sector in the agricultural markets has created an unequal distribution of financial resources because more attention is primarily given to large commercial farmers leaving smallholder farmers exposed to high transaction costs and market failure. Thus, the lack of access to credit made it difficult for

farmers to acquire productivity-enhancing inputs since there is a constant increase in the costs of agricultural inputs (Shiferaw, Hellin and Muricho, 2016).

Thobani (2020) asserts that lack of market information is another common challenge among smallholder farmers especially those who are living in rural areas where communication infrastructure is relatively poor compared to urban communities. Effective and efficient marketing management is highly dependent on constant and timely access to reliable market information such as product price, quality and quantity demanded since this enables farmers to make the right decisions regarding what to produce and sell in the market (Negerssa *et al.*, 2020). Farmers' decisions about the products to be produced heavily rely on the availability of the market information, product price and distance to market (Thobani, 2020). Thus, lack of access to reliable market information about potential buyers leaves smallholder farmers exposed to high marketing risks and transaction costs that consequently force them out of the market if not in the industry as a whole (Thobani, 2020).

Extreme geographic isolation is one of the major challenges that is confronting smallholder farmers in developing countries. Mphahama (2017) highlighted that physical and economic distance is one of the greatest barriers that pronounce smallholder farmers' inability to participate actively in the improved agricultural markets that guarantee them higher returns. Therefore, this institutional gap created by geographical location in Sub-Saharan African countries has a disincentive effect on smallholder farmers that want to invest in high-productivity technology and marketing opportunities (Mphahama, 2017).

The problem of extreme geographic isolation of smallholder farmers is further exacerbated by poor rural infrastructure such as road and market infrastructure (Mphahama, 2017). Infrastructure such as roads and bridge networks in developing countries play a catalytic role in economic development through increased productivity and provision of service delivery to improve the quality of life among smallholder farmers (Gaal and Afrah, 2017). Regardless of the major role played by physical infrastructure in the economic participation of farmers in developing countries, Gaal and Afrah (2017) argued that there is a persistent challenge of inadequate roads and poor road access and this challenge results in high transportation costs, limits farmers to sell their products to local markets where they receive low prices and limits the opportunity of farmers to access high productive agricultural inputs from urban centres.

2.11 Chapter Summary

The theory of utility was adopted to understand the market participation decisions of farmers while transaction cost theory was also discussed in order to describe what guides farmers during the selection of appropriate market outlets for their produce in the market. The conceptual framework of the study which depicts the link between the variables of interest in the study was given. Broiler production systems such as organic, subsistence extensive, intensive commercial and extensive commercial systems were also discussed in this chapter. The empirical review of previous studies on market participation of farmers also provided a discussion on socio-economic, market and institutional determinants of both farmers' market participation and market outlets' choice of farmers in developing countries. The chapter also outlined the importance of market participation of farmers with more emphasis on income generation, agricultural commercialisation, poverty alleviation and economic development as a whole. The chapter lastly highlighted challenges faced by smallholder farmers in the marketing systems of developing countries. The methodology for the research is detailed in the following chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides a description of the study area and the research design adopted in this study. It also discusses the sampling technique and the target population of the study. Determination of sample size and sampling techniques that were employed are explained. This chapter further discusses data collection methods and instrumentation used for data collection and lastly, the analytical framework outlines the descriptive statistics and econometric model. The motivation for each econometric model employed for each objective of the study is also addressed and all the data variables used in each analytical model are highlighted

3.1 Study area

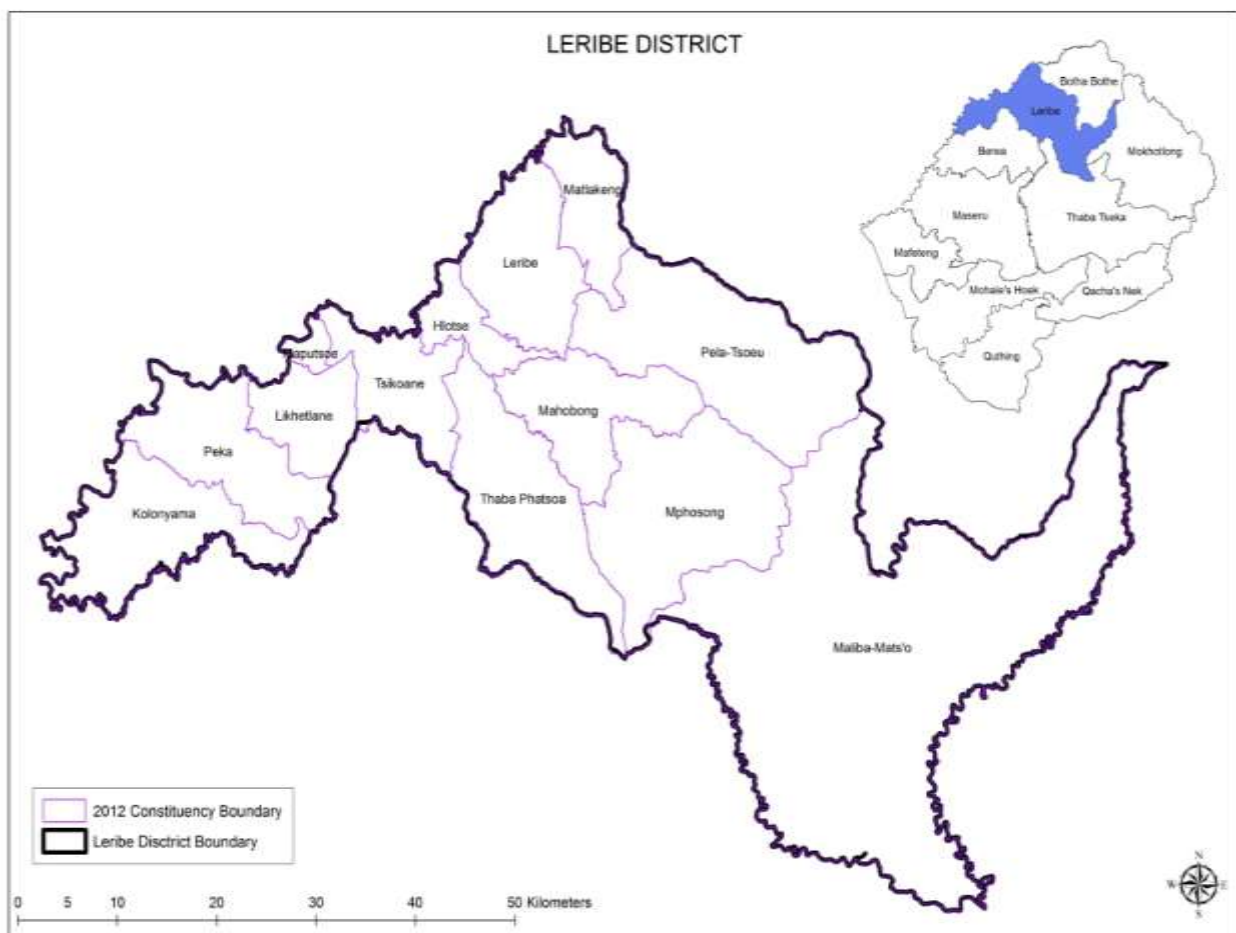


Figure 3: Study area map

The study area was the Leribe district which is located in the northern region of Lesotho as shown in **Figure 2** above. Leribe covers the area of 2,882km² between the longitude of 28°53'0'' South and longitude of 28°3'0'' East (Moeletsi and Walker, 2013) and it is made up of three agro-ecological zones; Lowlands (42%), Highlands (30%) and foothills (28%) (Bureau of Statistics, 2020). For efficient and effective agricultural supervision and administration in Lesotho, the Ministry of Agriculture and Food Security in all districts is divided into Resource Centres that cut across all the agro-ecological zones found in the districts. The study area is divided into the following seven agricultural Resource Centres: Hlotse, Maputsoe, Peka, Mahobong, Khabo, Tale and Pelaneng. Every centre, under the supervision of the Area Technical Officer, is charged to provide extension and other agricultural services to all farmers residing in the villages found within that specific Resource Centre.

In Lesotho, the rural population is characterised by high agricultural activities such as crop and livestock production and a heavy reliance on natural resources for livelihoods (FAO, 2019) and according to Rantšo and Seboka (2019), livestock production is a common practice in Leribe district and smallholder farmers are mainly keeping cattle, sheep and goats, pigs and poultry. A segment of vulnerable youths and women who are actively participating in poultry production as a source of employment, nutrition and income to improve their livelihood, dominate the poultry sub-sector. Many farmers are engaging in poultry production because of the relative ease of entry into this sector and the majority of farmers in the study area import day-old chicks' stock from South Africa via Maputsoe Border Gate while others are getting them from local intermediaries who source them from South Africa.

Though small-scale farmers are engaged in poultry production in high numbers in this district, they are still faced with the challenge of market access and this eventually denies them an opportunity to exploit and enjoy the potential benefits of participating in the commercial markets. Therefore, it is important to investigate the underlying causes of this market participation failure among farmers in this district.

3.2 Research design

According to Maree (2016) research design is a plan of framework that emanates from the underlying philosophical assumptions to select participants, data collection methods, and data analysis to be done. This quantitative study adopted the survey research technique to collect

primary data from broiler farmers through a set of questions designed by the researcher. According to Almeida *et al.*, (2017), surveys are commonly used in quantitative studies and they are very important in assisting researchers to acquire information about a certain phenomenon through a well-designed set of questions that are intended to reflect a group of individuals' opinions, perceptions, behaviours and characteristics. Almeida *et al.*, (2017) further stated that the survey method of data collection ensures high representativeness of the entire population in the study area and this method is less costly and time effective in comparison to the alternatives.

The study employed a probability-sampling technique to draw study participants from the sampling frame obtained from the Ministry of Agriculture and Food Security, Department of Livestock in Leribe. In probability sampling, every unit of a population of interest has an equal opportunity to be selected for the sampling unit and this improves the freedom of the researcher from collecting biased data (Taherdoost, 2016). There are different methods of probability sampling which include simple random sampling, systematic sampling, stratified sampling and cluster sampling (Maree, 2016). The choice of probability sampling method depends on the nature research problem, the time to conduct the survey, the availability of a good sampling frame and the characteristics of the population of interest (Maree, 2016).

Therefore, this study used a simple random sampling method to select participants for this research. The simple random sampling technique is commonly used based on the availability of a complete sample frame drawn from the targeted population though it may be expensive and time-consuming if participants listed from the sample frame are spread over a wide area (Taherdoost, 2016). Sampled villages will be used as a sampling frame for this study to identify broiler farmers.

3.3 Data Collection Method (Instrumentation)

Through the assistance of research assistants, the study collected primary survey data using a structured questionnaire that consists of both close-ended questions. According to Rantlo, Tsoako and Muroyiwa (2020), the use of a questionnaire is a relatively inexpensive and less time-consuming approach to obtaining information about a population being studied as opposed to interviews which are more expensive and time-consuming. Closed-ended questionnaire questions are easy and quick to answer, coding is easy and sensitive questions are easier to answer (Maree, 2016).

The study administered the questionnaire (interview schedule) in interviews with respondents which allowed the researcher to explain and interpret questions that respondents may find difficult to understand and respond to with correct and truthful answers (Nxumalo *et al.*, 2019).

3.4 Reliability and Validity of Questionnaire

According to Mohajan (2017), both the concepts of reliability and validity in quantitative research are equally important in increasing transparency and reducing the chance of researchers' bias and these concepts are also very instrumental in ensuring the accuracy of the research. Mohajan (2017) further emphasised that it will be difficult to describe the relationship between variables in the research without ensuring the reliability and validity of a research instrument. The relationship between reliability and validity is that an instrument can be reliable but not valid. However, the same instrument cannot be valid if it lacks an element of reliability (Ghazali, 2016). Checking the validity of an instrument is quite more challenging than confirming the reliability because validity is measured based on knowledge whereas reliability is more concerned with quantifiable and consistent scores (Ghazali, 2016).

3.4.1 Reliability

According to Maree (2016), reliability is the extent to which a measuring instrument provides consistent and repeatable results. Mohajan (2017) defined the reliability of an instrument as the measure of consistency, precision, repeatability, and trustworthiness of research. This means that the outcomes of the questionnaire should always show a strong element of consistency from results obtained from similar situations but in different circumstances. According to Ghazali (2016), there are various types of reliability which include among others, test-retest reliability, alternate form reliability and internal reliability.

Ghazali (2016) explained that test-retest reliability is a form of reliability achieved when the same instrument is administered to the same group of respondents on two different occasions and looks at the correlation coefficient between the two sets of scores obtained. Maree (2016) stated that the correlation coefficient should be close to one to ensure higher reliability and if it is close to zero the questionnaire should be corrected as it will not give reliable results. Good test-retest reliability results indicate a high internal validity of an instrument and this shows that the data obtained through such an instrument will be representative and stable over a certain period.

Based on the above information, the study adopted a test-retest method to ensure the reliability of the research instrument similar to a study by Kilangi (2012). The study was piloted with 20 respondents and the instrument was retested after two weeks. The two instrument scores were compared. An Intraclass Correlation Coefficient (ICC) of 0.99 was recorded and this shows an acceptable level of reliability of the instrument (Maree, 2016).

3.4.2 Validity

Gundry and Deterding (2019) asserted that, in quantitative research, it is important to ensure that whenever data is collected, such data support the inferences derived from it. This means that the instrument used in a study must be in a position to collect the data that will guarantee a quality standard of scientific research characterised by a high degree of validity. Gundry and Deterding (2019) further summarised the validity of an instrument as an evaluative judgement of the extent to which empirical evidence and theoretical concepts fully support the completeness and appropriateness of inferences made based on the test scores or modes of assessment employed.

The validity measure of an instrument refers to the extent to which it measures what it is intended to measure and there are also different types of validity. These include face, content, construct and criterion validity (Maree, 2016). According to Kilangi (2012), the validity of a research instrument reflects a relationship between the content of an instrument, indicators used to measure the concepts and the phenomenon to be observed.

Maree (2016) describes the Content Validity of the instrument as the degree to which an instrument covers aspects of the entire content of the particular construct that it is intended to measure. Mohajan (2017) asserted that content validity ensures that the questionnaire taps into all different elements, items and all other key focus areas that the research seeks to address in the population of interest. This means that the questions must effectively probe all the factors that are responsible for a certain problem that needs to be addressed and this instrument must accurately have a clear scale to measure the impact of such factors over the constructs to be measured. Maree (2016) stated that content validity could be ensured by sending a provisional questionnaire to experts to have their opinions and recommendations about it.

The face validity of a questionnaire measures the extent to which an instrument appears to measure what it intends to measure (Maree, 2016). Mohajan (2017) defines the concept of face validity as the easiest and least accurate method for determining validity, and it relies entirely on

professional knowledge and the assessor's familiarity with the subject matter. Though face validity is considered a less precise measure of instrument validity, it plays a crucial role in research as it ensures a good physical layout of the questionnaire which makes it easier for respondents to answer, argued Mohajan (2017). This type of validity cannot either be quantified or tested because it is more concerned with how the instrument looks valid however qualified experts from the relevant field can assess the instrument and ensure that it has complete face validity (Kilangi, 2012).

In this study, the data collection instrument was sent to experts at the Department of Agricultural Economics and Extension, National University of Lesotho (NUL) for both content validity and face validity. All comments and other opinions concerning the improvement of the questionnaire were adopted (Kilangi, 2012).

3.5 Ethical issues

Ethical considerations in every research conducted are critically important in designing the questionnaire, data collection, data presentation and in both report writing and publishing. Fleming and Zegwaard (2018) asserted that it is important that researchers have to adhere to all ethical issues as set out in the institutional research guidelines before data collection and during reporting to avoid suspension from the institution due to non-compliance to the institution staff code of conduct. Failure to comply with the institution's Research Ethics Committee can result in delays or failure to conduct the research due to a lack of approval of the research proposal by the Research Ethics Committee.

According to Kilangi (2012), in the quantitative research design, it is important to ensure and secure all ethical requirements which include informed consent from all the relevant stakeholders, the confidentiality of the information received and stating the potential consequences of the study during the survey. There is always a certain level of risk in every research that involves people and their personal information and all of these are believed to have potential harm to study participants (Kilangi, 2012). Therefore, it is extremely important to take into consideration all the potential risks that were likely to affect the study participants and take all the necessary measures to minimize such risks.

Informed consent remains the cornerstone of much ethical research work and this aspect of ethical consideration requires that all study participants be fully furnished with the information

that relates to the study (Fleming and Zegwaard, 2018). This information includes what will be required from them, how the information provided will be used and any detailed possibility of consequences should there be any. Fleming and Zegwaard (2018) summarized informed consent as a contract between the researcher and the participants where the researcher is bound to provide full details about the purpose of the research. The participants are also required to provide explicit and active signed consent forms with an understanding that they are not forced to participate in the study and as such, they can withdraw from the study at any point.

The other key aspect of research is the confidentiality and anonymity of the sensitive or private information and identity of the participants to protect them against any potential harm. Bos (2020) defined confidential information as any piece of information that the research participants wish should not be shared with the members of the public and such participants have a right to disclose information of their own will. Fleming and Zegwaard (2018) emphasized that researchers must maintain the confidentiality of any information that study participants may feel private to avoid violating the dignity and interests of such individuals. To address the issue of confidentiality in this study, the participants will be assured in the consent form that their information will be kept between the university and the researcher.

The National University of Lesotho (NUL) through the Department of Agricultural Economics and Extension provided an ethical permission for this research, and from there, it sought informed consent from the Ministry of Agriculture and Food Security (MAFS) in Leribe to conduct a survey and interview study participants. During the time of survey data collection, researchers worked with the study participants under the guidance of Area Extension Officers from respective Agricultural Resource Centres and other local community leaders such as Area Chiefs and local government Councillors. Every respondent in this survey had the option to participate, and those who chose not to participate were all replaced.

3.5 Sampling technique and sample determination size

The study targeted villages with a high level of broiler production and marketing, and information about such villages in the Leribe district was obtained from the Department of Livestock Services in the Ministry of Agriculture and Food Security.

Therefore, a two-staged sampling technique was employed to select a sample of respondents for this study. In the first stage, five villages in Leribe where poultry farming and marketing are a

common practice were selected using the purposive sampling method and this method was informed by the information received from the Department of Livestock Services in the Ministry of Agriculture and Food Security. Based on this information, sampled villages included Hlotse, Maputsoe, Mahobong, Peka and Tale. In the second stage, a simple random sampling technique was used to draw respondents from the list of broiler farmers for each sampled village in this study. Microsoft Office Excel was used while running a randomization exercise to select respondents from the available lists of broiler farmers.

To determine the sample size for this study, the researcher used Yamane’s formula. This was similar to Abate and Addis (2021) where the Yamane formula was used while determining sample size in their study to evaluate factors affecting the intensity of market participation of smallholder sheep producers in northern Ethiopia. The total number of broilers farmers that were interviewed from their respective villages is shown in **Table 1** below.

Yamane’s Formula:

$$n = \frac{N}{(1 + Ne^2)} \tag{4}$$

Where:

n = Sample size

N = Total household population of the sampled respondents

e = Error term (0.05).

Based on the information received from the Department of Livestock Services, MAFS about villages with a high level of broiler production, the total population of broiler farmers from sampled villages equates to 158 as shown in Table 1 below.

Sample Size Calculation:

$$n = \frac{158}{(1 + 158 * 0.05^2)} = 113.261 \approx 114 \tag{5}$$

Table 1: Leribe broiler farmers sample frame

No	Name of the Village	Total Population	Population Proportion	Sample Size (n)
1	Hlotse	50	0.32	36
2	Mahobong	15	0.09	11
3	Maputsoe	60	0.38	43
4	Peka	20	0.13	14
5	Tale	13	0.08	9
	Total	158		114

Source: Ministry of Agriculture and Food Security (2021); Author's Computation (2021)

3.6 Data Analysis

The survey data collected in this study were analysed using both descriptive and econometric analysis.

3.6.1 Descriptive Statistical Analysis

Kaur, Stoltzfus and Vikas (2018) stated that descriptive statistics are very instrumental in summarizing data in a very simple and organized manner and this makes it easier to describe a relationship between the variables studied in research. Therefore, to describe the socio-economic, market and institutional characteristics of broiler farmers in the Leribe district, this study employed the use of descriptive statistics such as frequencies, percentages and means. Inferential statistics such as the Chi-square test and T-test were also employed to measure the relationship between the dependent and independent variables.

3.6.2 Econometric Analysis

Econometric analysis is equally important in that it uses mathematical modelling, statistical modelling and economic theory to test economic phenomena. Mathematical modelling of economic phenomena and processes is a key and important tool for economic analysis and forecasting (Rakhmanov *et al.*, 2020). Therefore, objectives two and three were analysed using Heckman's two-stage model and the Multivariate Probit (MVP) model respectively.

3.6.2.1 Heckman Two-Stage Model

To analyse factors influencing broiler farmers' market participation and their level of participation in the poultry market the study used the Heckman Two-Stage Model. According to Akrong, Mbogoh and Irungu (2021), farmers are faced with a two-step decision-making process: the first step is the decision on whether to participate in the market or not and the last step is to decide on the intensity of participation. This study followed Sigei (2014) where this model was used to determine factors that influence farmers' market participation and their intensity of participation in pineapple marketing in Kenya. Heckman's model is mostly used by many researchers because it corrects the challenge of selection bias. In this model, the Inverse Mills Ratios computed from the regression coefficients in the selection equation (Probit Regression Model) are included in the second outcome equation (OLS) with other independent variables to estimate the intensity of market participation and this is done to correct the selection bias that arises in the second stage of Heckman two-stage model (Otekunrin, Momoh and Ayinde, 2019). The application of Heckman's model, according to Abdullah *et al.* (2019), corrects the fact that non-market participants are not a random sub-sample of the population.

The first step in the model is to estimate the probability of the farmer's decision to participate in the broiler market or not and this process can be estimated using a Probit Regression model stated as follows:

$$P_{(1,0)} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e \quad (6)$$

Where a discrete decision of a farmer to participate in the market is denoted by $P_{(1)}$ and the decision of a non-participant is denoted by $P_{(0)}$, β_0 is a constant, β_{1-n} are parameters to be estimated, X_{1-n} are the vector of explanatory variables and e denotes the normally distributed error term.

The second step, which involves a decision on the intensity of participation in broiler markets, is estimated using an OLS as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + e \quad (7)$$

Where Y denotes the quantity of broiler sold, β_0 is a constant, β_{1-n} are parameters to be estimated, X_{1-n} are the vector of explanatory variables and e denotes a standard error.

Therefore, the first selection equation (Probit) of the Heckman model that was used to identify socioeconomic, institutional and market factors that influence broiler farmers' decision to participate in the market stated as follows:

$$P_{i(1,0)} = \beta_0 + \beta_1 Gender + \beta_2 Age + \beta_3 Hsize + \beta_4 farmInc + \beta_5 VeOw + \beta_6 DstMkt + \beta_7 Price + \beta_8 Cred + \beta_9 Info + \beta_{10} ExtSer + \beta_{11} ProExp + \beta_{12} GrpMemb + \beta_{13} Contract + \beta_{14} Storage + \varepsilon_i \quad (8)$$

The outcome equation (OLS) in the second step of the Heckman model that was used to identify factors that influence the intensity of farmers' participation in the broiler market is stated as follows:

$$Y_i = \beta_0 + \beta_1 Gend + \beta_2 Age + \beta_3 Hsize + \beta_4 Off_Empl + \beta_5 VeOwn + \beta_6 Storage + \beta_7 StkSize + \beta_8 MktExp + \beta_9 DstMkt + \beta_{10} Pric + \beta_{11} Contract + \beta_{12} Cred + \beta_{13} ExtSer + \beta_{14} GrpMemb + \beta_{15} Info + \varepsilon_i \quad (9)$$

Table 2: Variables in the Heckman two-stage model

Variable code	Variables Description	Variable Type	Variable Measurement	Expected sign
<i>Dependent variables</i>				
TypFarmr	Type of a farmer	Dummy	Market Participant [1], Non-Market Participant [0]	
IntPart	Intensity of Participation	Continuous	Quantity sold in the market	
<i>Independent Variables</i>				
Gend	Gender	Categorical	Male[1], Female[2]	+/-Ve

Variable code	Variables Description	Variable Type	Variable Measurement	Expected sign
Age	Age of the farmer	Categorical	<18[1], 19-30[2], 31-40 [3], 41-50 [4], >51[5]	+/-Ve
Educ	Level of Education	Categorical	No education[1], Primary[2], Secondary[3], Tertiary[4]	+Ve
Hsize	Household Size	Continuous	Number of people	+Ve
Off-farm	Off-farm employment	Dummy	Yes[1], No[0]	+/-Ve
FarmInc	Farmer Income	Categorical	<5,000[1], 5,000 - 10,000[2], 10,000 - 15,000[3], >15,000[4]	+Ve
VehOwn	Vehicle Ownership	Dummy	Yes[1], No[0]	+Ve
Storage	Storage Access	Dummy	Yes[1], No[0]	+Ve
Contract	Contract Agreement	Dummy	Yes[1], No[0]	+Ve
StkSize	Stock size	Continuous	Number of Birds kept	+Ve
DstMkt	Distance to market	Continuous	In kilometres	+/-Ve
GrpMemb	Group Membership	Dummy	Yes[1], No[0]	+/-Ve
ExtScrv	Extension Access	Dummy	Yes[1], No[0]	+Ve
Cred	Credit Access	Dummy	Yes[1], No[0]	+Ve
Pric	Price of a bird	Continuous	In maloti (M)	+Ve
Info	Access Information	Dummy	Yes[1], No[0]	+Ve
MktExp	Marketing experience	Continuous	In years	+Ve
ProdExp	Production Experience	Continuous	In years	+Ve

Source: (Sigei, 2014; Khoza *et al.*, 2019; Otekunrin, Momoh and Ayinde, 2019; Irene, Stephen and Basil, 2018)

3.6.2.2 Multivariate Probit (MVP) Model

Farmers participating in different marketing outlets are more likely to choose one or more than two types of sales outlets at the same time in the study area and the selection of various

marketing outlets as well as their simultaneity use usually depends on farmers' willingness to maximize the level of utility and minimization of transaction costs (Hawlet, Birhane and Alemayehu, 2019). The selection of market outlets is also affected by the socio-economic characteristics of farmers, and institutional and marketing factors in the study area (Hawlet, Birhane and Alemayehu, 2019).

To analyse factors influencing the marketing outlet choice by broiler farmers, the researcher is interested in establishing the likelihood that farmers will choose certain market outlets and as well as their simultaneous use. Thus, the study intended to estimate the probability that a certain market channel can be adopted by farmers given a set of influencing factors and this study investigated farmers' decisions on marketing outlets available in both developing countries and Lesotho in particular as identified by the literature. These market outlets include Cooperatives(1), Collectors(2), Wholesalers(3), Retailers(4) and Consumers(5). Based on the transaction cost theory, broiler farmers in the study area chose market outlets with minimized associated transaction costs (Donkor *et al.*, 2021).

Several studies used different econometric models such as Multinomial Logit/Probit (MNL or MNP) and Multivariate Logit/Probit (MVL or MVP) models to predict the influence of the set of explanatory variables on the discrete categorical dependent variables. A study by (Sigei, 2014; Magogo, 2015; Mukarumbwa *et al.*, 2018; Nxumalo *et al.*, 2019; Kiprop *et al.*, 2020) used the MNL model to identify factors affecting the choice of marketing outlets by producers while marketing their agricultural produce. Whereas in studies by (Arinloye *et al.*, 2015; Abate, Mekie and Dessie, 2019; Dlamini-Mazibuko, Ferrer and Ortmann, 2019; Hawlet, Birhane and Alemayehu, 2019; Ermias, 2021) MVP was employed while determining a set of influencing factors on producers' market outlet choice.

Multinomial models are only appropriate if farmers are obliged to choose only one outcome from the set of mutually exclusive and collectively exhaustive alternative lists of market outlets available in the study area (Ermias, 2021). However, it is important to take note that in this study, broiler farmers' market outlet selections are not mutually exclusive and collectively exhaustive. Therefore, there is a possibility of simultaneous use of market outlets and the potential correlation among these marketing outlet selection decisions. Thus, the use of multinomial models will not consider the possibility of interdependence and simultaneity use of

market outlets because they have an assumption of independence among the outcome variables (Dessie, Abate and Mekie, 2018).

Since the choice of the marketing outlet decisions by broiler farmers are interdependent and there is also a problem of simultaneous use of market outlets (Ermias, 2021), the appropriate model for this study will be the multivariate probit model. According to (Dlamini-Mazibuko, Ferrer and Ortmann, 2019) using a univariate model will be misleading since they ignore the possibility of interdependence among choice decisions and the potential correlations between the set of outcomes variables thus leading to biased and incorrect estimates of parameters and standard errors. Taking into account this problem, the multivariate probit method simultaneously models the impact of a set of independent variables on each of the different market outlet choices while allowing for the potential correlation between unobserved disturbances, as well as the relationship that exists between the different marketing outlets (Abate, Mekie and Dessie, 2019; Dlamini-Mazibuko, Ferrer and Ortmann, 2019).

Following Abate, Mekie and Dessie (2019), the selection of appropriate market outlet i by farmer j is Y_{ij}^A defined as the choice of farmer j to transact market channel i ($Y_{ij}^A = 1$) or not ($Y_{ij}^A = 0$) is expressed as follows:

$$Y_{ij}^A = \begin{cases} 1 & \text{if } Y_{ij}^A = X_{ij}^A \alpha_{ij}^A + \varepsilon^A \geq 0 \Leftrightarrow X_{ij}^A \geq -\varepsilon^A \\ 0 & \text{if } Y_{ij}^A = X_{ij}^A \alpha_{ij}^A + \varepsilon^A < 0 \Leftrightarrow X_{ij}^A < -\varepsilon^A \end{cases} \quad (10)$$

where α_{ij}^A is a vector of estimators, ε^A a vector of error terms under the assumption of normal distribution, Y_{ij}^A the dependent variable for market outlet choices simultaneously and X_{ij}^A the combined effect of the explanatory variables.

Since the market outlet choice decisions by smallholder broiler farmers in the study are affected by a similar set of independent variables, the econometric specification of the multivariate probit model is stated as follows:

$$\left\{ \begin{array}{l} \text{Cooperatives}_j = \chi_1' \beta_1 + \varepsilon^A \\ \text{Collectors}_j = \chi_2' \beta_2 + \varepsilon^B \\ \text{Wholesalers}_j = \chi_3' \beta_3 + \varepsilon^C \\ \text{Retailers}_j = \chi_4' \beta_4 + \varepsilon^D \\ \text{Consumers}_j = \chi_5' \beta_5 + \varepsilon^E \end{array} \right. \quad (11)$$

Where Collectors_j , Retailers_j and Consumers_j are binary variables taking values 1 when farmer j selects Collectors, Retailers and Consumers respectively, and 0 otherwise; X_1 to X_5 are the vector of variables; β_1 to β_5 are the vector of parameters to be estimated and ε disturbance term.

In a multivariate model, the choice of several market outlets is possible, the error terms jointly follow a multivariate normal distribution (MVN) with zero conditional mean and variance normalized to unity, and the symmetric covariance matrix Ω is given by:

$$\Omega = \begin{bmatrix} 1 & p_{12} & p_{13} & p_{14} & p_{15} \\ p_{21} & 1 & p_{23} & p_{24} & p_{25} \\ p_{31} & p_{32} & 1 & p_{34} & p_{35} \\ p_{41} & p_{42} & p_{43} & 1 & p_{45} \\ p_{51} & p_{52} & p_{53} & p_{54} & 1 \end{bmatrix} \quad (12)$$

Where p_{ij} represents the correlation between different types of market outlets available in the study area.

The variables that were used in the MVP model while modelling the probability of farmers' market outlet choice in the study are presented in **Table 3** below.

3.6.3 Hypotheses and description of variables in Heckman's two-stage and MVP models

This section will discuss how the above independent variables are expected to influence broiler farmers' market participation and their market outlet choice in the poultry market in Lesotho.

Table 3: Variables used in the Multivariate Probit (MVP) Model

<i>Dependent variables</i>			Expected Sign				
			Cooperatives	Collectors	Wholesalers	Retailers	Consumers
<i>Independent Variables</i>	Variable Type	Measurement					
Market outlets							
Gender	Categorical	Male[1] Female[2] Less than 5,000[1], 5,000 - 10,000[2], 10,000 - 15,000[3], Greater than 15,000[4]	+ve	+ve	+ve	+ve	+ve
Farmer income	Dummy	15,000[4]	+ve	+ve	+ve	+ve	-ve
Vehicle Ownership	Dummy	Yes[1] No[0]	+ve	+ve	-ve	+ve	-ve
Flock Size	Continuous	Number of Birds	+ve	+ve	+ve	+ve	-ve
Storage Access	Dummy	Yes[1] No[0]	+ve	+ve	+ve	+ve	+ve
Contract Agreement	Dummy	Yes[1] No[0]	+ve	+ve	+ve	+ve	+ve
Distance to market	Continuous	In kilometres	-ve	-ve	-ve	-ve	+ve
Extension Access	Dummy	Yes[1] No[0]	+ve	+ve	+ve	+ve	+ve
Credit access	Dummy	Yes[1] No[0]	+ve	+ve	+ve	+ve	+ve
Information Access	Dummy	Yes[1] No[0]	+ve	+ve	+ve	+ve	+ve

Source: (Sigei, 2014; Negerssa *et al.*, 2020)

Gender of the farmer

The gender of the farmer will be captured as a dummy variable that will be measured by assigning one (1) to the male farmer and two (2) to a female farmer. Gender is expected to have either a positive or negative influence on market participation and market outlet choice. Males are expected to be more market-oriented than female farmers and men are also expected to sell more of the commodities in the local and urban markets whereas females are hypothesized to sell

at farm-gate. Women are restricted to social and capital resources in their households hence they are less likely to participate in broiler markets as opposed to men (Musafili, Ingasia and Birachi, 2021).

Age of the farmer

The age of the farmer is hypothesized to have either a positive or negative impact on the decision to participate in the market and the level of market participation. The probable reason for the expected positive influence on market participation is that older farmers are thought to have enough experience to seek out market information and have stronger negotiating abilities, which ensures they have access to better markets and contract acquisition (Kibara, 2019). In addition, Adugna *et al.* (2019) asserted that old age farmers establish a long-lasting market relationship with their clients thus making a business a success and Thobani (2020) added that the age of the farmer can be directly linked to the farming experience of the farmer, thus as age increases farmers increase their productivity. However, Negerssa *et al.* (2020) put a different opinion that young farmers are active and successful in market participation because of receptiveness to production technology and improved farming systems that increase their output level.

Household size

The family size will be captured as a continuous variable indicating the number of people living and eating together in a household. This variable is hypothesised to have a negative impact on the probability of broiler market participation and intensity of participation. Large household size increases family consumption thereby reducing the marketable surplus (Negerssa *et al.*, 2020).

Broiler farmers' household size is also expected to have a positive influence on market channel choice. Larger family sizes are likely to sell most of their produce to distant markets such as village markets and urban markets because the abundant labour and more people in a household mean that they can identify different market opportunities. Hawlet, Birhane and Alemayehu, (2019) pointed out that an increase in the size of the household increases the opportunity for farmers to their commodities in different market channels other than farm gate.

Flock size

Flock size is a continuous variable that is measured by the average number of chickens that a farmer keeps on their farm or backyard. It is anticipated that flock size will increase the probability of farmers participating in the market and it is also expected to increase the marketable surplus. More marketable supply is also expected to increase broiler sales in both local and urban markets. Goitom *et al.* (2018) put forth that a large flock size is an incentive for commercialization among farmers. Farmers with a large quantity of output would prefer to sell to market outlets such as collectors and wholesalers because they buy in bulk at a fair price (Malit, Mathenge and Muluvi, 2021). Therefore, the hypothesised sign for this variable is positive on both market participation and sales intensity and this variable is also expected to influence the participation of farmers in the formal markets.

Farmer Income

Non-farm income refers to the amount of income received by farmers from non-agricultural-related activities. This explanatory variable will be captured as a continuous variable measured in maloti that a farmer receives in a month and it is expected to have a positive influence on the probability of farmers participating in broiler markets and the extent of such participation. According to Khoza *et al.* (2019) and Gachuhi, Owuor and Gathungu (2021), smallholder farmers receiving high non-farm income increase their investment capacity in their farming operations and this increases their output.

Vehicle Ownership

Access to reliable transport that is used on the farm makes it easier for farmers to transport their agricultural produce to the market at a convenient time and with reduced transportation costs (Mphahama, 2017). Therefore, in this study, ownership of the vehicle will be captured as a dummy variable indicating access to means of transport and it is expected to have a positive influence on market participation and the level of participation. According to Hawlet, Birhane and Alemayehu, (2019), there is a high likelihood that farmers owning a vehicle will sell more of their products to distant markets in the urban area. Transport ownership reduces the cost of transportation and its associated problems while providing timely delivery of the goods to the market channel of choice (Sori and Adugna, 2022). Therefore, the vehicle ownership variable is expected to have a positive influence on all market outlets.

The education level of the farmer

The level of education of smallholder farmers will be captured as a dummy variable and it is expected to have a positive influence on farmers' market participation and market channel choice. Moono (2015) stated that farmers with a higher level of education are likely to participate actively in the market because of their ability to utilize available market information and opportunities in the market industry and farmers with a higher level of education have strong negotiation skills that make them competitive in the market share. Tarekegn and Kibreab (2017) added that farmers with a higher level of education are in a position to participate in improved markets because of a better level of awareness and understanding of the importance and advantages of taking part in the economically active markets.

Distance to the poultry market outlet

Distance travelled by farmers to the market will be measured in kilometres and it is proposed to have a negative influence on the probability of farmers' participation and the intensity of market participation. According to Goitom *et al.* (2018), the longer the distance to the nearest market results in high transaction and transportation costs which usually discourage farmers to participate in the markets. The further the distance from the farm increases travelling time which also reduces the willingness of smallholder farmers to participate in the markets and this factor of time issue forces farmers to sell their products at the farm gate (Camara, 2017).

In terms of market outlet choice, distance is expected to influence farmers' willingness to sell their produce to consumers and collectors instead of retailers. Farmers in most cases dispose of their produce at the nearest market outlet from the production site and this is done to avoid high transaction costs (Abate, Mekie and Dessie, 2019). Increasing distance from the nearest market increases transportation and information costs thus reducing farmers' likelihood to supply distant markets (Sori and Adugna, 2022).

Access to market information

Access to market information is hypothesized to have a significant positive influence on market participation. This means that an increase in the amount of market information that broiler farmers receive is expected to increase the probability that they can invest more in market participation. According to Abate, Mekie and Dessie (2019), access to output market prices,

market quality and quantity and other market requirements help farmers to make informed decisions while marketing their agricultural output. According to Sori and Adugna (2022), adequate access to market information improves farmers' decisions on market outlet choices that are likely to give better returns and as a result farmers are expected to choose formal markets.

Price of output

Output price was recorded as a continuous and independent variable that will be measured in the number of maloti that farmers per chicken sold in the market. According to Sigei (2014) and Moono (2015), the higher market price for agricultural produce in the economy acts as an incentive for farmers to commercialise their farming. Therefore, this variable is hypothesised to have a positive relationship with broiler market participation and the level of output in the market. Farmers are likely to select market outlets that offer a better price in the market (Honja, Geta and Mitiku, 2017).

Marketing Experience

Marketing experience is a continuous variable measured by the number of years that a broiler farmer spent in marketing poultry and it is hypothesised to have a positive impact on the likelihood of farmers participating in broiler markets and the intensity of participation. According to Sigei (2014) experienced farmers in marketing are believed to have established good relationships with traders and customers thereby making it easy to find markets for their products and they have good bargaining prowess. Experience in broiler marketing is also expected to have a positive influence on market choice outlet decisions and farmers with more years have a high likelihood to participate in lucrative markets in urban and local markets than at the farm gate because of established networks in these markets (Magogo, 2015).

Access to Credit

Boiler farmers' access to credit is measured as a dummy variable which is expected to have a positive impact on both the market participation and intensity of surplus in the market. This means that farmers who have access to credit and other financial assistance are likely to participate in the broiler market. Access to credit increases smallholder farmers' investment capacity in agriculture and enables them to adopt improved technology which eventually increases their marketable surplus (Tura *et al.*, 2016; Donkor *et al.*, 2021).

Contractual Agreement

Small-scale farmers could increase their financial returns by converting from their conventional subsistence-based farming practices to contract farming (Ray, Clarke and Waley, 2021). The availability of contractual agreements in agriculture is likely to increase the formal market participation of farmers (Olufadewa, Obi-egbedi and Okunmadewa, 2018). Besides enabling farmers' access to credit and lower interest rates, the other benefit of contract farming is the transfer of knowledge about good agricultural practices, which raises farmers' productivity and improves their participation in profitable markets (Ray, Clarke and Waley, 2021). Therefore, a contract agreement is expected to have a positive influence on farmers' market participation and the choice of formal market outlets available in the study area.

Access to extension services

Access to extension services is expected to have a positive impact on both market participation and intensity of participation. According to Mphahama (2017), access to extension services provides farmers with information related to product markets, prices and market requirements. Extension services are considered a supportive system for the development of the agricultural economy in rural areas (Raidimi and Kabiti, 2019). Apart from linking farmers to improved agricultural markets, extension deals with training smallholder farmers on product value-adding activities that will increase their competitiveness in the markets as compared to the sale of raw agricultural products (Raidimi and Kabiti, 2019). Extension services fill knowledge and the information gap that constrain smallholders to adopt new technologies that will increase their productivity thereby increasing their surplus produce to be marketed (Mphahama, 2017; Raidimi and Kabiti, 2019).

Membership in farmers' organisations

Membership of farmers in any agricultural organisation whether farmers' groups or agricultural cooperatives was captured as a dummy variable indicating whether farmers have a membership or not and this variable is hypothesized to have a positive influence on the probability of broiler farmers' market participation and intensity of marketed surplus. Agricultural cooperatives or farmers' groups play a key role in marketing the agricultural produce of farmers, they provide market information and they can establish collection centres where their commodities can be

sold directly to potential buyers and this motivates farmers' integration in the market (Moono, 2015).

3.7 Chapter Summary

The study was conducted in the Leribe district of Lesotho. The study used a survey method to collect data, and a structured questionnaire was designed and used to collect primary data. Ultimately, a total of a randomly selected sample size of 114 broiler farmers was interviewed in the study area. To analyse each of the objectives presented in the previous introductory chapter, descriptive statistics and econometric analysis were adopted. Descriptive and inferential statistics were used to describe the socio-economic, market and institutional characteristics of broiler farmers. Furthermore, Heckman's two-stage model was adopted to analyse factors influencing broiler farmers' decisions on market participation and the intensity of participation. Lastly, the MVP model was employed to identify factors influencing the market outlets' choice of broiler farmers in the study area. The findings of the study are presented and discussed in the following chapter.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

Descriptive results of socio-economic, institutional and market characteristics that affect both market participation and choice of marketing outlets are presented in this chapter. The results of the econometric analysis involving the use of the Heckman two-stage model and Multivariate Probit (MVP) model to identify factors that influence market participation, the intensity of market participation and the choice of marketing outlets by broiler farmers in the Leribe district will be presented and discussed in this chapter.

4.2 Descriptive statistics of factors influencing farmers' market participation decisions

In this section, descriptive statistics such as frequencies, percentages, means and standard deviations were used to describe socio-economic, marketing and institutional factors influencing broiler farmers' market participation. The aforementioned factors are presented in a tabular form in the following sub-sections. Additionally, the sub-sections also present results on the relationship between the variables of interest in this study and market participation using the Chi-square test and the T-test.

4.2.1 Socio-economic characteristics of broiler farmers in the study area

Table 4: Gender distribution of farmers

Gender	Non-Market Participants		Market Participants		N%	χ^2	p-Value
	Freq.	%	Freq.	%			
Male	2	5.6	11	14.4	11.4	1.781	0.182
Female	34	94.4	67	85.6	88.6		
Total	36	100	78	100	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

As shown in **Table 4** above, out of 114 broiler farmers in the study area, 36 (32%) were non-market participants while 78 (68%) participated in broiler marketing. Out of all non-market participants, 5.6% were males while females constituted the majority with 94.4%. In the market

participants' category, 14.4% and 85.9% of farmers were males and females respectively. This result shows that 85.6% of the market participants were females while men accounted only for 14.4% of this category. It is also important to note that in the study area, the poultry sector is dominated by female farmers (88.6%) while 11.4% represent the proportion of men. Though the importance of women is overlooked in developing countries, they are very instrumental in the development of many economic sectors including agriculture. Women are involved in both agricultural and non-agricultural enterprises to generate income and improve the livelihoods of their families (Chukwujekwu, Ogonna and John, 2021). Female farmers are more likely to participate in output markets because they are responsible for both the household's financial and social obligations (Dube, 2020). In terms of gender distribution with regard to the market participation decision, the chi-square test result is insignificant with a p-value of 0.182 and this confirms that there is no relationship between gender distribution and market participation decisions. This result is in agreement with the finding of Tarekegn and Kibreab (2017) where the relationship between gender and market participation was statistically insignificant and the only contrast with their results is that the majority of farmers were males in their study while in this study females farmers dominate the poultry sector.

Table 5: Age distribution of participants of the study.

Age	Non-Market Participants		Market Participants		χ^2	p-Value
	Freq.	%	Freq.	%		
19-30yrs	2	5.6	9	11.5	5.337	0.149
31-40yrs	4	11.1	13	16.7		
41-50yrs	6	16.7	22	28.2		
Above 51yrs	24	66.7	34	43.6		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

From **Table 5** above, the results of the study indicate that the majority of non-participants (66.7%) were aged 51 and above while 16.7%, 11.1% and 5.6% were aged between 41-50, 31-40 and 19-30 years respectively. Among market participants, 43.6%, 28.2%, 16.7% and 11.5% of

farmers were aged above 51 years, 41-50, 31-40 and 19-30 years. These results show that majority of older farmers (above 51) were non-market participants. The proportions of farmers in both categories were increasing with an increase in age groups and while comparing the age distributions, many of the market participants were farmers aged 50 years and below whereas the majority of non-market participants were aged 51 years and above. However, the result of the chi-square test indicated that the age distribution with regard to market participation decisions is statistically insignificant with a p-value of 0.149 and this shows that age distribution does not have a significant relationship with the farmers' market participation decisions in the study area.

Table 6: Education level of broiler farmers in the study area.

Education level	Non-Market Participants		Market Participants		χ^2	p-Value
	Freq.	%	Freq.	%		
No Education	0	0	0	0	16.695***	0.001
Primary	16	44.4	16	20.5		
Secondary	19	52.8	33	42.3		
Tertiary	28	2.8	29	37.2		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

Table 6 above presents the education level of broiler farmers in the study area and this result shows that none of the farmers had no education. Among non-market participants in the study area, a proportion of 44.4%, 52.8%, and 2.8% had primary, secondary and tertiary as their highest level of education respectively while 20.5%, 42.3% and 37.2% of farmers in the market-participant category had primary, secondary and tertiary as their highest level of education respectively. These results show that farmers with high education levels were market participants. This is also supported by the chi-square result which shows that the education levels of farmers are significantly different in light of the market participation decisions at a 1% probability level. This implies that the education level of the farmer influences market participation decisions. Educated farmers may have good managerial and risk management skills which in turn may increase their marketable surplus. The other important reason for this result could be that the high employment rate in Lesotho forced many Basotho nationals to venture into

broiler marketing as a way of making a living. Kiprop *et al.* (2020) added that farmers with high education levels have a high potential of accessing quality information that enables them to access profitable markets.

Table 7 below shows the monthly income distribution of farmers among market participation categories. The majority (72.2%) of non-market participants are having a monthly income below M5000.00, 19.4% with monthly income between M5, 000.00-M10, 000.00 and only 8.3% of non-market participants have an income between 10,000.00-M15,000.00. In the non-market participants' category, no farmers were earning more than M15, 000.00. Among broiler farmers participating in markets, 26%, 21.8%, 50% and 1.3% had a monthly income below M5000.00, between M5000.00-M10, 000, M10, 000.00-M15, 000 and above M15, 000.00 respectively. The chi-square test result is significant with a p-value of 0.0001 and this indicates a significant relationship between market participation and farmer incomes. The study concluded that farmers participating in broiler markets have higher monthly income levels compared to non-market participants. High-income level among farmers increases their capital investment in broiler production thus increasing their marketable output. According to Dube (2020), income enables farmers to afford the purchases of improved technology and other productivity-enhancing inputs which eventually lead to high output.

Table 7: Farmers' income distribution of study respondents

Farmer Income(M)	Non-Market Participants		Market Participants		χ^2	p-Value
	Freq.	%	Freq.	%		
Less than 5,000	26	72.2	21	26.9	24.393***	0.001
5,000-10,000	7	19.4	17	21.8		
10,000-15,000	3	8.3	39	50.0		
Above 15,000	0	0	1	1.3		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

Off-farm employment status of broiler farmers is shown in **Table 8** below. 80.6% of farmers who did not participate in broiler markets were not involved in any off-farm activities and only a smaller proportion accounting for 19.4% were employed in non-farming activities. The majority (65.4%) of broiler farmers participating in markets were involved in off-farm employment while the remaining 34.6% were only employed in agriculture. The chi-square result shows that the off-farm employment distribution among farmers' market participation decisions is significantly different at a 1% probability level. This implies that there is a significant relationship between market participation and involvement in non-agricultural activities that contribute to off-farm income. Expansion into different sources of livelihood shows that there is a need for an alternative source of income among market participants that will be complementary to farm income and the off-farm income may also be used to increase the investment in farming. However, Rashidin *et al.* (2020) had a different view that the high level of uncertainties in agricultural production as well as the perishability nature of agricultural products many farmers prefer to invest in other sectors with minimized risks.

The chi-square results in **Table 8** below show significant differences in vehicle ownership and storage access between market participants and non-market participants at a 1% significance level. These results indicate that a large proportion of market participants had access to vehicle and storage facilities than non-market participants. The study findings show that 41% and 96.2% of the market participants had vehicle ownership and storage access respectively while among non-market participants only 11.1% owned vehicles and 58.3% had access to the storage facility. Lack of access to transportation equipment and high transportation costs are among the challenges constraining farmers' market participation. Therefore, transportation ownership by broiler farmers enables them to transport their products to distant markets without any hurdle hence there are more farmers with vehicle access participating in markets. Transport ownership among farmers reduces the proportion of transaction costs and this increases the probability of farmers' integration into markets (Tura *et al.*, 2016).

In terms of storage access, 96.2% of the market participants had access to storage facilities while only 58.3% of non-market participants had access to storage facilities (**Table 8** below). The chi-square result of storage access among farmers' market participation decisions is significant with a value of 0.001 indicating that more farmers participating in the broiler markets had access to

storage than non-market participants. There is an increase in the demand for healthy food consumption in developing countries and adequate access to storage enables farmers to provide quality poultry products and maintain food safety as required by the food markets (Biwas *et al.*, 2018). According to Oluwatayo, Machethe and Senyolo (2016) lack of access to appropriate storage facilities constrain farmers from supplying the broiler markets with poultry meat and other products. Therefore, this shows it is very critical for broiler farmers to have adequate access to a storage facility in the study area.

Table 8: Employment, vehicle ownership and storage access of the broiler farmers

Variable	Non-Market Participants		Market Participants		χ^2	p-Value
	Freq.	%	Freq.	%		
Off-Farm Employment						
No	29	80.6	27	34.6	20.800***	0.001
Yes	7	19.4	51	65.4		
Total	36	100	78	100		
Vehicle Ownership						
No	32	88.9	46	59	10.202***	0.001
Yes	4	11.1	32	41		
Total	36	100	78	100		
Storage Access						
No	15	41.7	3	3.8	26.948***	0.001
Yes	21	58.3	75	96.2		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

The mean number of farmers' household sizes for non-market participants was 4.47 while for market participants was 4.32 and the chi-square test revealed that the difference in mean between these two categories is insignificant with a p-value of 0.693 as shown in **Table 9** below. This implies that the average size of the farmers' households is not significantly different among both non-market and market participants. The mean for average broiler kept by farmers in the non-participant category was 349.72 while the stock size for market participants was 1325. The

difference in the mean of these two categories is statistically significant at a 1% level of significance with market participants having a large average flock size produced in a year as compared to non-market participants. Large poultry size kept in a year cushions farmers against family consumption thereby creating a high marketable surplus thus enabling farmers to commercialize their poultry farming and the large flock size also helps farmers to negotiate bulk selling, prices and contract agreements (Tarekegn and Kibreab, 2017; Goitom *et al.*, 2018).

Table 9: Mean and standard deviation of broiler farmers' characteristics in the study area

Variable	Non-Market Participants		Market Participants		T-test	p-Value
	Mean (Std. Dev)		Mean (Std. Dev)			
Household size	4.47 (2.158)		4.32 (1.776)		0.395	0.693
Stock –Size	349.72 (116.281)		1325.00 (2187.301)		-2.667***	0.009

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

4.2.2 Market characteristics of farmers in the study area

This section provides descriptive statistics on market characteristics of broiler farmers in the study area and inferential statistics such as chi-square and T-test were used to interpret the normal distribution of frequencies and means in market participation decisions of broiler farmers as shown in **Tables 10 and 11**.

Table 10: Information distribution among broiler farmers

Variable	Non-Market Participants		Market Participants		χ^2	p-Value
	Freq.	%	Freq.	%		
Information Access						
No	16	44.4	6	7.7	21.36***	0.001
Yes	20	55.6	72	92.3		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

The results in **Table 10** above present information access distribution among non-market participants and market participants in the study area. The results revealed that 44.4% of non-participants never had access to market information while 55.6% of farmers in this category had access to information. In the category of market participants, 92.3% of farmers had access to market information and only 7.7% of farmers had no access to market information. The chi-square test indicated that market information is significantly different among non-market and market participants at a 1% significance level. This implies that more farmers in the market participant category had access to market information compared to non-market participants. Adequate access to up-to-date market information and the efficient flow of information between farmers and the markets is very critical for farmers to commercialise their farming. Updated and relevant market information enables farmers to align their production with the quality and quantity demanded in the markets. Adequate access to market information assists farmers in finding buyers and developing products that meet the needs of consumers, improves price transparency, and increases farmers' market participation and negotiating power in agricultural markets (Nugroho, 2021).

Table 11: Descriptive and T-test results of broiler farmers' market characteristics

Variable	Non-Participant	Participant	T-test	p-Value
	Mean (Std.Dev)	Mean (Std.Dev)		
Production Experience	7.61 (6.460)	8.41 (7.620)	-0.55	0.587
Quantity Sold	324.58 (97.059)	1240.13 (2153.682)	-2.543**	0.012
Price	96.81 (7.574)	94.29 (12.026)	1.150	0.252
Marketing Experience	6.97 (5.794)	8.26 (7.625)	0.447	0.655
Distance to Market	14.22 (13.691)	13.691 (13.093)	-0.897	0.372

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

Table 11 above presents the mean distributions of farmers' production and marketing experience, the quantity of broilers sold in the market, broiler price and the mean for average distance to the nearest market. The T-test results on farmers' production and marketing experience, price and distance to the nearest market show that their p values are statistically insignificant and this implies that their means were not similar among non-market and market

participants. However, the T-test result for quantity sold in the market reveals that the mean distribution between market participants and non-market participants is different at a 5% level of significance. Therefore, the conclusion can be made that market participation can influence the quantity sold since there is a significant difference between the mean quantity sold by non-market participants and market participants.

4.2.3 Descriptive statistics of institutional characteristics of broiler farmers in the study area

This section covers descriptive statistics on institutional characteristics of farmers such as contractual agreement, credit access, extension service access, and group membership concerning market participation. The chi-square test was also employed to test the relationship between these characteristics and the market participation decisions of farmers.

All of the non-market participants had no contract agreements in the study area (**Table 12** below). In the market-participant category, the majority of farmers (97.4%) also did not have contract agreements while only a small proportion of farmers (2.7%) had contractual agreements with the buyers. The chi-square result shows that contract agreement is statistically insignificant with a p-value of 0.332 and this implies that there was no difference in terms of use of contract farming agreements among non-market and market participants.

The majority of non-market participants (80.6%) did not have access to credit and only 19.4% of the farmers acquired credit for broiler production. Among market participants, 64.1% of farmers accessed credit while 35.8% did not have access to credit. From the results of the chi-square test pertaining to credit access of farmers in the study area, there is a difference between market participants and non-market participants at a 1% level of significance, the results indicate that more market participants had access to credit facilities than the non-market participants in the study area. The reason for this significant relationship between credit accessibility and market participation could be that credit availability in agriculture helps farmers pay for the transaction costs and it also increases farmers' investment capacity in agriculture through securing productive inputs and technology which eventually improves their level of output.

Table 12: Institutional characteristics of broiler farmers

Variable	Non-Participants		Participants		χ^2 Value	p-Value
	Freq.	%	Freq.	%		
Contract agreement						
No	36	100	76	97.4	0.940	0.332
Yes	0	0	2	2.6		
Total	36	100	78	100		
Credit Access						
No	29	80.6	28	35.9	49.650***	0.001
Yes	7	19.4	50	64.1		
Total	36	100	78	100		
Extension Access						
No	23	63.9	22	28.2	13.127***	0.001
Yes	13	36.1	56	71.8		
Total	36	100	78	100		
Group Membership						
No	29	80.6	46	59	5.097**	.024
Yes	7	19.4	32	41		
Total	36	100	78	100		

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively. Source: Author's Survey (2022).

The majority of non-market participants (80.6%) did not have access to credit and only 19.4% of the farmers acquired credit for broiler production. Among market participants, 64.1% of farmers accessed credit while 35.8% did not have access to credit (**Table 12**). From the results of the chi-square test pertaining to credit access of farmers in the study area, there is a difference between market participants and non-market participants at a 1% level of significance, the results indicate that more market participants had access to credit facilities than the non-market participants in the study area. The reason for this significant relationship between credit accessibility and market participation could be that credit availability in agriculture helps farmers pay for the

transaction costs and it also increases farmers' investment capacity in agriculture through securing productive inputs and technology which eventually improves their level of output.

Access to extension services was possible among market participants. The results in **Table 12 above** show that 71.8% of farmers had access to extension services while 28.2% of broiler farmers in this category did not have access to extension services. In contrast, only 36.1% of farmers in non-market participants had access to extension services while the majority (63.9%) did not receive extension services. The chi-square test result reveals that a relationship between extension services and market participation is significant with a p-value of 0.001 indicating that more farmers participating in broiler markets had access to extension services than farmers in the category of non-market participants. Extension services in agriculture empower farmers with relevant skills and knowledge on marketing activities which then influence their market participation. Goitom *et al.* (2018) added that extension services improve farmers' knowledge of modern technology and improve their productivity, management and new production systems that ensure the constant supply of their output in the market.

The majority of farmers (59%) participating in broiler markets were not members of any farmers' group or association while 41% of the market participants had a membership. Similarly, 80.6% of non-market participants' farmers did not have any group membership and only 19.4% of this category had group or association membership. However, the chi-square test results show that group membership distribution between market participants and non-market participants is significantly different with a p-value of 0.024. Though the majority of farmers were not members of any agricultural groups or cooperatives in both categories, the results of the chi-square test indicate that more market participants had a membership when compared to non-market participants. Membership of farmers in agricultural groups such as associations or cooperatives is very important in influencing farmers' market participation and the intensity of participation. Agricultural groups allow for an exchange of marketing information among partners and thus reducing the cost of information search by farmers (Nwafor, Ogundeji and Westhuizen, 2020). Marketing in groups also helps farmers to bargain and negotiate contract agreements, prices and other terms of trade (Meemken and Bellemare, 2020).

4.3 Descriptive statistics on market outlet choice decisions of broiler farmers

The section covers the descriptive statistics such as frequencies, means, standard deviations and percentages of the marketing outlets available to broiler farmers as well as the socio-economic, marketing and institutional factors influencing farmers' market outlet choice decisions in the study areas.

Table 13: Broiler market outlets utilised by farmers in the study area

Market Outlets	Frequency (n)	Percentage (N%)
Cooperatives	-	-
Wholesalers	-	-
Collectors	4	3.5
Retailers	18	15.8
Consumers	111	97.4

Source: Author's Survey (2022).

As shown in **Table 13** above, out of five possible broiler market outlets in the study area, only three market outlet choices were used by broilers in the study area. The majority of broiler farmers (97.4%) used consumer market outlets while retailers and collectors market outlets were used by 15.8% and 3.5% of the farmers respectively. The results in **Table 13** show that cooperatives and wholesalers' market outlets are absent on the menu of market outlets for farmers in the study area and it is evident from this result that broiler farmers in the study area are still struggling to access formal markets. According to Mphahama (2017), poultry farmers in Lesotho are less likely to participate in the formal markets because they are unable to meet different market quality and standards requirements in the formal market sector. Challenges such as lack of access to financial resources, inadequate extension contact, lack of relevant and timely market information and high transportation costs are among to challenges that farmers face in the poultry sector (Olufadewa, Obi-egbedi and Okunmadewa, 2018).

Even though the majority of farmers in the study area sell their produce in informal market places, broiler farmers still had no access to other informal market outlets including street vendors, and other informal and semi-formal food eateries. Farmers are unable to meet some of

the strict product specifications and requirements of these kinds of informal markets. Some of these informal market outlets which should be within the reach of the farmers normally require farmers to supply them with specific parts of the chicken they produce the meals with such as quarter legs and wings, however, farmers in the research area prefer to sell full chickens and this mismatch of products on the supply and the demand side among exchange partners makes it difficult for farmers to participate in these markets. Furthermore, farmers in the study area admitted to being price takers in these types of market outlets, and that the predetermined price is so low that only a few farmers are attracted. Producers that frequently receive accurate selling price information from a variety of sources choose the proper market channel where they may anticipate making a profit (Sori and Adugna, 2022).

4.3.1 Descriptive statistics of the socio-economic and market factors influencing farmers' market outlet choice decisions

This section will cover the descriptive statistics of both socio-economic and market characteristics of broiler farmers' market outlets' choice decisions in the study area. Frequencies, percentages and means will be used to show the distribution of gender, age, education level, farmer income level, household size, stock size, distance to market, vehicle ownership and storage access across collectors, retailers and consumers' marketing outlets.

Table 14 below displays the gender, age, education and income distribution among broiler farmers' by the category of market outlets' choice. From the results, females dominated the market outlets available with 75%, 77.8% and 90.9% of them supplying collectors, retailers and consumers respectively. While on the other hand, 25%, 22.2% and 9.9% of men participating in broiler markets use collectors, retailers and consumers as their market outlets respectively. These results also show that females are unable to penetrate the formal markets hence the majority of them end up selling their produce directly to consumers. Limited access to financial resources and productive farm inputs by females (Chukwujekwu, Ogonna and John, 2021) may be among the major reasons why female farmers are still constrained to access the formal markets.

In terms of the age distribution of the farmers by category of preferred market outlet, **Table 14** shows that the majority of older farmers (52.3%) aged above 51 years use the consumers' market outlets to sell their broilers. The retailers' markets outlet is utilised by 33.3% of farmers aged between 41 and 50 years while the collectors market outlet has the highest proportion of farmers

(50%) aged between 19 and 30 years of age who use it as the preferred market outlet. These results indicate that farmers aged below 50 years are participating in the formal markets and most of the older farmers above 51 years use consumers' market outlets. Negerssa *et al.* (2020) argued that older farmers are risk-averse and lack access to relevant market information hence they prefer informal market outlets such as marketing directly to consumers. The other possible reason for this inverse relationship between age and market participation according to Kibara (2019) could be that as farmers age they lack the energy and interest to participate in the markets.

Regarding education distribution within market outlets chosen by farmers, the results indicate that 50% of broiler farmers that have a tertiary qualification supplied retailers market. In the collectors' market outlets category, the majority of farmers (50%) have primary education while in the consumers' category 45.9% of broiler farmers have a secondary education as the highest qualification. These results indicate that farmers who have the highest education level sell their produce to retailers. Educated farmers have a higher ability to produce more broiler chickens to sell in the market than less-educated farmers because they can easily understand and apply extension services provided by experts in broiler production. Education enables farmers to access and interpret the relevant market requirements and information, it improves their negotiation skills and all of these help farmers to make informed market outlet choice decisions that have a high potential for maximum returns (Kibara, 2019; Endris, Haji and Tegegne, 2020).

Concerning the farmers' monthly income distribution categorising the farmers according to their market outlet choice decision, farmers with a high-income level use informal markets and sell directly to consumers. Under this category of market outlet, 0.9%, 36.8%, 19.8% and 42.3% of farmers are getting a monthly income above M 15, 000.00, between M10, 000.00 - M15, 000.00, between M5, 000.00- M 10,000.00 and below M5000.00 respectively. While for those who sell through retailers, 22.2% of those farmers were the highest income earners getting a monthly income between M10, 000.00 - M15, 000.00 and 33.3% had an income level between M5, 000.00- M 10,000.00 while a large proportion of farmers (44.4%) in this market through this outlet category get the lowest monthly income below M5000.00. Out of all the farmers using collectors as the market outlet for their produce, no one is getting a monthly income above M10, 000.00. 75% of these farmers earn a monthly income between M5, 000.00- M 10,000.00 while 25% of them earn a monthly income of less than M5000.00 (see **Table 14 below**).

Table 14: Gender, Age, Education level and Income distribution of farmers for each of the market outlet choices

Variable	Collectors		Retailers		Consumers	
	Freq.	%	Freq.	%	Freq.	%
Gender						
Male	1	25	4	22.2	11	9.9
Female	3	75	14	77.8	100	90.9
Total	4	100	18	100	111	100
Age(Years)						
19-30	2	50	4	22.2	9	8.1
31-40	1	25	4	22.2	16	14.4
41-50	1	25	6	33.3	28	25.2
Above 51	0	0	4	22.2	58	52.3
Total	4	100	18	100	111	100
Education Level						
Primary	2	50	4	22.2	32	28.8
secondary	1	25	5	27.8	51	45.9
Tertiary	1	25	9	50	28	25.2
Total	4	100	18	100	111	100
Farmer Income (M)						
Less than 5,000	1	25	8	44.4	47	42.3
5,000-10,000	3	75	6	33.3	22	19.8
10,000-15,000	0	0	4	22.2	41	36.8
Above 15,000	0	0	0	0	1	0.9
Total	4	100	18	100	111	100

Source: Author's Survey (2022)

The mean size of farmers' households who sold their broilers to collectors, retailers and consumers is 4.50, 3.89 and 4.41 respectively (**Table 15** below). Concerning stock size, farmers who used retailers' as the market outlets had the highest average stock of 2136 broiler chickens produced in a year while farmers producing an average stock of 1245 in a year used collectors. Consumers' market outlets were used by farmers who had the lowest average stock in a year. Farmers with the highest marketable surplus prefer to use the formal markets since they buy in bulk as opposed to consumers.

Table 15: Mean (Std. Dev) of the socioeconomic and market characteristics of broiler farmers for each of the market outlets choices

Variable	Collectors	Retailers	Consumers
	Mean (Std.Dev)	Mean (Std.Dev)	Mean (Std.Dev)
Household size	4.50 (2.52)	3.89 (1.61)	4.41 (1.89)
Stock –Size	1245.00 (565.77)	2136.39 (4305.65)	841.35 (721.86)
Distance to Market (km)	6.00 (6.06)	16.11 (16.39)	13.66 (13.32)
Price(M)	90.00(14.14)	89.17(14.48)	95.90(9.61)

Source: Author's Survey (2022)

Farmers supplying retailers with broiler products travel the longest average distance to the nearest market outlet (16.11km) followed by farmers using consumer market outlets as they travel 13.66km. The long distance between farmers and retailers could be one of the reasons why few producers are supplying the retailers compared to consumers as this long distance could potentially increase the transportation costs. The only group of market participants who travels the shortest distance (6km) to the markets are farmers supplying collectors (**Table 15**).

Price plays an important role in improving broiler marketing as it determines the income received by farmers and it acts as an incentive for farmers' decisions to supply the market outlets which attract more profit. The results in **Table 15** show that farmers selling to consumers, collectors and retailers' market outlets received M95.90, M90.00 and M89.17 for their chickens respectively. The results indicate that farmers selling their chickens to consumers' market outlets fetches the highest price.

In the **Table 16** as shown below, the majority of broiler farmers using formal markets own vehicles while the majority in the informal market do not. In the formal markets, out of all farmers selling their broilers to collectors, 75% own a vehicle while 25% of the farmers do not have vehicles, 61.1% of farmers who sell their produce through retailers have access to a vehicle and the remaining 38.9% do not own a vehicle. In contrast, the majority of farmers (69.4%) participating in consumer market outlets did not have a vehicle and only 30.6% of them owned a vehicle.

In terms of storage access of broiler farmers participating in these three marketing outlets, the majority of farmers indicated ownership of storage facilities. All farmers (100%) supplying the collectors had storage access, and 88.9% and 83.8% of farmers selling to retailers and consumers respectively also had storage access. On the other hand, there is only a small proportion of farmers who market their produce to retailers (11.1%) and consumers (16.2%) who did not have access to a storage facility.

Table 16: Vehicle and storage ownership among the different farmer market outlets' choice

Variable	Collectors		Retailers		Consumers	
	Freq.	%	Freq.	%	Freq.	%
Vehicle Ownership						
No	1	25	7	38.9	77	69.4
Yes	3	75	11	61.1	34	30.6
Total	4	100	18	100	111	100
Storage Access						
No	0	0	2	11.1	18	16.2
Yes	4	100	16	88.9	93	83.8
Total	4	100	18	100	111	100

Source: Author's Survey (2022)

4.3.2 Descriptive statistics of institutional factors influencing the choice of market outlets available in the study area.

This section will provide descriptive statistics on institutional factors that affect broiler farmers' market outlets' choice decisions in the study area. Frequencies and percentages will be used to describe the distribution of contractual agreements, extension services, credit and market information access of broiler farmers in different marketing outlets.

The results in **Table 17** below reveal that 25% and 5.6% of farmers that have contract agreements sold their broilers to collectors and retailers respectively. The results also show that most of the farmers using these marketing outlets did not have a contractual agreement with the buyers, as it can be seen that 75%, 94.4% and 100% of the farmers selling to collectors, retailers and consumers were not contracted respectively. Regarding extension services access by farmers, 88.9%, 59.5% and 50% of farmers who supplied retailers, consumers and collectors had access to extension services respectively.

Credit access is another important factor that influences the marketing outlet choice of farmers. In this study, the results show that the majority of farmers (66.7%) who had access to credit were selling their broilers to the retailers while 50% and 50.5% of the farmers with credit access used collectors and consumers respectively. Credit access in agriculture plays a significant role in improving the sector as it eliminates capital constraints experienced by smallholder farmers. Regardless of the credit importance and high demand in the agricultural sector, credit access from formal sources is frequently a problem for smallholder farmers due to a lack of qualified collateral or other strict requirements from financial institutions (Chandio *et al.*, 2020).

Market information plays a critical role in assisting farmers to choose market outlets that will maximize their profitability. According to Olufadewa, Obi-egbedi and Okunmadewa (2018), market information such as price information assists poultry farmers to know the existing market price and price trends and this kind of information enables farmers to decide on how they can maximize returns efficiently. In this study, the majority of farmers participating in all three market outlets had access to market information. **Table 17 shows that 75%, 88.9% and 80.2% of farmers who marketed their produce in collectors, retailers and consumers' market outlets had access to market information.**

Table 17: Institutional characteristics of broiler farmers in market outlets' choice

Variable	Collectors		Retailers		Consumers	
	Freq.	%	Freq.	%	Freq.	%
Contract Agreement						
No	3	75	17	94.4	111	100
Yes	1	25	1	5.6	0	0
Total	4	100	18	100	111	100
Extension Access						
No	2	50	2	11.1	45	40.5
Yes	2	50	16	88.9	66	59.5
Total	4	100	18	100	111	100
Credit Access						
No	2	50	6	33.3	55	49.5
Yes	2	50	12	66.7	56	50.5
Total	4	100	18	100	111	100
Information Access						
No	1	25	2	11.1	22	19.8
Yes	3	75	16	88.9	89	80.2
Total	4	100	18	100	111	100

Source: Author's Survey (2022)

4.4 Factors influencing broiler farmers' market participation and the intensity of participation in broiler marketing.

The Heckman two-stage model was employed to identify factors influencing the decision of farmers to participate in the broiler market and their intensity of participation in broiler marketing. The model was fitted with socio-economic, marketing and institutional factors that were hypothesized to influence both farmers' decisions on participation and the extent of participation in broiler marketing in the study area.

4.4.1 Factors influencing broiler farmers' market participation

The probit model which is the first step of the Heckman two-stage model was used to identify factors influencing the farmers' decisions to participate in the broiler market. As shown in **Table 18**, the probit model was fitted with the following explanatory variables: Gender, Age, Household Size, Farmer Income, Vehicle Ownership, Storage Access, Production Experience, distance to the nearest market, Price, Contract Agreement, Credit Access, Extension Access, Group Membership and Market Information Access. Out of these fourteen variables, only seven variables were found to have a significant influence on farmers' decision to participate in broiler marketing. These variables include the following: Gender, Farmer Income, Storage Access, Production Experience, Credit Access, Extension Access and Market Information Access.

The overall Heckman two-stage model showed high goodness of fit with an adjusted R^2 of 0.9961 and this indicates that the model fits the data well with a 99.61% prediction of the observed outcomes. The inverse Mills ratio in the second outcome equation was also significant at a 10% level of significance and this implies that there was an element of bias in the selection process which the Heckman two-stage model corrected.

Gender: Contrary to the prior expectation of the study, the coefficient for gender (**-2.373**) has a negative influence on market participation at 5% level of significance with a p-value of 0.052. This negative coefficient marks a negative relationship between gender and the decision to participate in the market. These results show that male farmers are less likely to participate in broiler marketing in the study area compared to females. It is common practice in Lesotho for men to focus more on raising livestock like cattle, sheep, and goats while women tend to raise pigs and poultry, female farmers are therefore more likely to engage in broiler marketing than male farmers. This result is in line with the finding by Goitom *et al.* (2018) where females participated more than men in broiler marketing and this finding was attributed to the fact that females have more time and good management practices which in turn increases poultry production thus leading to an increased marketable surplus. Poultry farming in the developing world is mainly considered to be the task of the female and the income generated from poultry selling is used to cover minor expenses in the household (Toramo, 2018).

Table 18: The First step of the Heckman selection equation (Probit Selection)

Probit Selection Estimates				
Variable	Estimate	Std. Error	t Value	Sig.
(Intercept)	0.787	3.152	0.25	0.804
Gender	-2.373*	1.203	-1.973	0.052
Age	-0.349	0.241	-1.449	0.151
Household Size	0.138	0.112	1.226	0.224
Farmer Income	0.706***	0.24	2.942	0.004
Vehicle Ownership	0.638	0.661	0.965	0.337
Storage Access	1.851***	0.68	2.722	0.008
Production Experience	0.062*	0.035	1.789	0.077
Distance To Market	-0.007	0.014	-0.528	0.599
Price	-0.005	0.028	-0.163	0.871
Contract Agreement	1.069	601.249	0.002	0.999
Credit Access	1.176**	0.461	2.553	0.013
Extension Access	0.829*	0.431	1.923	0.058
Group Membership	0.373	0.466	0.799	0.427
Information Access	1.528***	0.57	2.682	0.009
Selection Variable: Market Participant				
R-Squared	= 0.997			
Adjusted R-Squared	= 0.9961			

Source: Own survey (2022).

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively.

Farmer income: The coefficient for the variable farmers' monthly income (0.706) has a positive influence on market participation at 1% level of significance with a p-value of 0.004. The positive coefficient implies a positive association between farmers' income and the probability of farmers' decision to participate in the markets. This result indicates that an increase in the income level of broiler farmers increases their likelihood of market participation in the broiler industry. According to Khoza *et al.* (2019), smallholder farmers receiving high non-farm income

increase their investment capacity in their farming operations and this increases their output to be sold in the market. This result is contrary to the finding by Gachuhi, Owuor and Gathungu (2021) where the income level of farmers was found to have a significant and negative influence on farmers' decision to commercialize their farming and this was attributed to the fact that farmers with high-income levels may not find any need to diversify their sources of income.

Storage access: The coefficient for the variable farmers' access to storage facilities (**1.851**) in the study area has a positive influence on market participation at 1% level of significance with a p-value of 0.008. This positive coefficient suggests that farmers' access to storage facilities positively influences the probability of farmers participating in the market. The reason for this is that broiler chickens are normally raised for a certain period (4-8 weeks) and when they are ready for market, if not sold live, they are slaughtered and kept in storage facilities and this helps farmers to overcome the challenge of postharvest losses through spoilage. According to Oluwatayo, Machethe and Senyolo (2016), access to storage facilities helps broiler farmers to avoid losses that could be incurred from production costs if the broilers were left to grow for more weeks if not bought.

Production experience: The coefficient for the variable broiler production experience (0.062) has a positive influence on market participation at 10% level of significance with a p-value of 0.077. This positive coefficient implies that as the number of years in broiler farming increases, the probability of farmers participating in the market also increases. Experienced farmers have acquired more skills and knowledge on poultry management practices, and productive inputs and have established strong market linkages and all of these create a better chance for them to succeed in their marketing activities. This finding is supported by the study of Oluwatayo, Machethe and Senyolo (2016) and Khoza *et al.* (2019) where many years in broiler farming had a positive and significant influence on farmers' likelihood of market participation. Broiler production experience is seen as a proxy for effective farm management, access to information and marketing intelligence in competitive markets (Khoza *et al.*, 2019).

Credit access: As expected, the coefficient for the variable credit access of farmers (**1.176**) has a positive influence on market participation at 1% level of significance with a p-value of 0.013. Holding all other factors constant, this positive coefficient indicates that access to credit increases the probability of farmers' decision to participate in the market. This positive influence

of credit access could be attributed to the fact that farmers' access to credit either from formal or informal sources improves their investment capacity in broiler production and access to productive inputs thereby creating more surplus that can be sold into the market. These results are in line with the findings by Tura *et al.* (2016) where access to credit was found to have a positive impact on improving farmers' likelihood of market participation because it improved the economic power of producers to cultivate more land and buy more inputs thereby maximizing their production.

Extension services: The coefficient for the variable extension services access (**0.829**) has a positive influence on market participation at 10% level of significance with a p-value of 0.058. This positive coefficient marks a positive association between extension access and market participation decision, all other factors are constant. This implies that continuous access of farmers to extension services through public and private extension workers, NGOs, printed and electronic media on modern poultry production practices, inputs, diseases control and market information increases farmers' probability of deciding to participate in the market. The reason for this impact is that adequate access to extension services enables poultry farmers to adopt the improved production technologies and systems that make them competent in the market. Goitom *et al.* (2018) added that access to poultry extension services improves farmers' knowledge of modern poultry production systems and management issues which increases their poultry production hence the participation in poultry markets. This finding of this study is similar to the study by Tarekegn and Kibreab (2017) where frequent access to extension services had a positive and significant impact on farmers' decision to participate in poultry markets.

Market Information: The coefficient for the variable market information (**1.528**) has a positive influence on market participation at 1% level of significance with a p-value of 0.009. The positive coefficient implies a positive effect on the market information on the probability of farmers' participation in the broiler market, *ceteris paribus*. This result is consistent with the prior expectation that access to market information will have a positive influence on farmers' likelihood of broiler market participation. The availability of market information to farmers helps them align their production with the market demand and it also assists them to produce the quality and quantity that is needed by the market. These findings concur with the empirical study by Mukarumbwa *et al.* (2018) where market information was found to enhance vegetable

farmers' market participation in the urban markets. Abate, Mekie and Dessie (2019), put forward that access to output market prices, market quality and quantity and other market requirements help farmers to make informed decisions during the production and marketing of their agricultural output.

4.3.2 Determinants of broilers farmers' intensity of market participation

To identify determinants of the intensity of market participation by broiler farmers in the Leribe district, OLS was employed in the second step of the Heckman outcome equation. As shown in **Table 19** below, only five variables (Gender, Household Size, Off-Farm employment, Stock-Size and Price) were identified to have a significant influence on the farmers' intensity of market participation.

Gender: Different from prior expectations of this study, the variable gender of the farmer has a negative influence on the intensity of market participation at 5% level of significance. This negative result indicates that when the gender of the farmer is male this reduces the intensity of market participation by reducing the quantity of broilers supplied by 122.713 units while all other factors are held constant. Male farmers in Lesotho are involved in many agricultural activities other than broiler farming which is believed to be a business for women and this may imply that farmers have limited time to market their broilers. Due to the perception in Lesotho that raising chickens is a profession best left to women, male farmers are less patient to deal with hurdles encountered in broiler marketing and as a result, the amount of broilers sold is decreased. This is similar to the study of Ingabire et al. (2017) where there was a negative and significant association between gender and the intensity of market participation of smallholder farmers.

Household size: The variable household has a positive influence on the intensity of market participation at a 1% significance level. The household size which is an indicator of labour availability has a positive influence on the intensity of market participation. Household size influences the volume of broilers supplied in the poultry market. This positive coefficient suggests that a unit increase in the farmer's household size increases the intensity of market participation by increasing broilers sold in the market by 24.896 units, all other factors being equal. Farmers with a larger number of household members sell more of the broilers in the market compared to small-sized households and this could be because there is a need to generate

more income to meet other social needs in the households. Large household size may also mean more labour to produce and take the output to the markets and they might have also established different market networks and numerous sources of market information hence large-volume sales. This finding concurs with the finding by Khoza *et al.* (2019) where household size was found to have a positive and significant influence on the intensity of smallholder farmers' participation in the agro-processing industries in South Africa.

Table 19: The Heckman two-step outcome equation results

Outcome Estimates				
Variable	Estimate	Std. Error	t Value	Sig.
(Intercept)	-319.437	161.285	-1.981	0.051
Gender	-122.713**	61.32	-2.001	0.049
Age	-13.775	18.629	-0.739	0.462
Household Size	24.896***	9.26	2.688	0.009
Off-Farm Employment	65.099*	35.075	1.856	0.067
Vehicle Ownership	-18.424	38.848	-0.474	0.637
Storage Access	89.415	84.413	1.059	0.293
Stock Size	0.974***	0.01	98.133	<.001
Marketing Experience	0.598	2.373	0.252	0.802
Distance To Market(KM)	-1.314	1.222	-1.076	0.285
Price(M)	2.711*	1.614	1.68	0.097
Contract Agreement	186.739	143.682	1.3	0.197
Credit Access	46.963	35.951	1.306	0.195
Extension Access	-13.836	38.203	-0.362	0.718
Group Membership	-25.809	33	-0.782	0.436
Information Access	46.296	66.048	0.701	0.485
Inverse Mills Ratio	122.753*	65.166	1.884	0.063

Outcome Variable: Quantity Sold, Sigma: 131.1102, Rho: 0.9363

Source: Own survey (2022).

***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively.

Off-farm employment: Off-farm employment among broiler farmers in the study area has a positive influence on the intensity of market participation at a 10% significance level. This positive result implies that a unit increase in the off-farm employment of farmers increases the number of broilers supplied to the poultry market by 65.099 units, *ceteris paribus*. Therefore this result shows farmers employed in non-agricultural activities in the economy supply more poultry to the market compared to none participants in off-farm activities. This may be due to the fact that smallholder farmers with work options outside of agriculture have access to a variety of revenue sources, which are subsequently invested in poultry farming, increasing their output and giving them more excess to sell on the market. According to Musafili, Ingasia and Birachi (2021), many smallholder farmers in rural areas work in different non-farm industries to diversify their sources of income in addition to agriculture to supplement their limited agricultural income for a living. The finding of this study is consistent with the finding by Tura *et al.*, (2016) where farmers engaging in non-farming activities sold more output in the market.

Stock size: The total number of broiler chickens owned by smallholder farmers in a year has a positive influence on the intensity of farmers' market participation at a 1% level of significance. The positive result shows that a unit increase in the stock size kept by farmers each year increases the volume of broilers sold in the market by 0.974 units with all other factors constant and this means that farmers owning a large number of broiler chickens sell more chickens in the market and this is because they are in a better position to negotiate contracts and meet the demands of buyers. Goitom *et al.* (2018) in their study stated that a large stock size owned does not only create a marketable surplus but also helps farmers to negotiate bulk selling and better prices. This result is similar to the finding of Moono (2015) where the quantity of rice produced was positively related to the intensity of market participation among rice farmers.

Price: The price of chicken in the market has a positive impact on the intensity of market participation by farmers in the broiler market at a 10% significance level. The positive result suggests that a unit increase in the price of a chicken increases the number of broilers sold in the market by 2.711 units, with all other factors held constant. Higher sales price acts as an incentive for broiler farmers to supply more broiler in the market to recover their production and transaction costs and this also helps them to make a living out of broiler farming. According to Kyaw, Ahn and Lee (2018), higher output prices motivate farmers to increase their production to

maximize their profit. This result is supported by the finding of Abate and Addis (2021) where a positive and significant relationship existed at a 1% level of significance between sheep price and the total number of sheep sold in the market in Ethiopia.

Credit access: The results of this study reveal that the coefficient of the variable access to credit for the farmers is insignificant with a p-value of 0.195. This indicates there is not enough evidence from the study data to show that farmers' access to credit can improve their level of participation in the market. The possible explanation for this unanticipated result is that majority of farmers in the study area though they indicated to have access to credit facilities, most of them were getting credit from informal sources such as friends and relatives and the funds were not enough to increase capital investment in the broiler production. Chandio *et al.* (2020) argued that smallholder farmers are mostly restricted access to formal sources of credit due to the unavailability of credit institutions and stringent requirements such as qualified collateral among others and Ogundeji *et al.* (2018) added that high-interest rates also act as barriers to farmers' likelihood of accessing credit in the financial institutions. Therefore, access to inadequate credit for farmers does not have any significant influence on the quantity supplied in the market.

Extension access: The coefficient of the variable farmers' access to extension services is insignificant with a p-value of 0.718. This result indicates that farmers' access to extension services has no influence on the intensity of market participation, although the priori expectation was that access of farmers to extension services will have a positive influence on market participation intensity. The probable reason for this unexpected result could be that the extension agents do not provide farmers with relevant information regarding productive technology and good management practices that increase their marketable surplus According to Rantlo, Tsoako and Muroyiwa (2020), a high extension staff to farmer ratio makes it difficult for farmers participating in the markets to access extension services frequently. Lack of access to the Market Information System (MIS) in the study area could be another reason for the insignificance of extension service. MIS harmonise the market information sharing between farmers, extension agents and the markets, and this protects farmers from exploitation by traders as a result of asymmetric market information (Nugroho, 2021).

4.5 Determinants of marketing outlet choice by broiler farmers

Econometric analysis was used to investigate factors influencing the farmers' choice of broiler market outlets at their disposal. There are three market outlet choices that farmers used to sell their broilers and the multivariate probit model was estimated jointly for three binary outcome variables namely, Collectors, Retailers and Consumers outlets. The model was fitted with eleven independent variables of which six of them were observed to be statistically significant in influencing farmers' decision of choice of marketing outlet as depicted in **Table 21** below.

The result of the Wald test (Wald χ^2 (33) =2395.40, p=0.000) is statistically significant at a 1% significance level (**Table 20**). This shows that the coefficients estimated in the model are jointly significant and the explanatory power of variables included in the model is acceptable. Thus, a conclusion is made that the model fit is reasonably good (Mwembe *et al.*, 2021).

Table 20: Overall model fitness, and correlation matrix of market outlet choices from the MVP model

No. of observations	=114			
Log likelihood	= -55.681371			
Wald chi2(33)	=2395.40			
Prob > chi2	=0.0000***			
Likelihood ratio test of rho21 = rho31 = rho32 = 0				
chi2(3)	=22.946			
Prob > chi2	= 0.0000***			
	Collectors	Retailers	Consumers	
Collectors	1			
Retailers	-0.083	1		
Consumers	-0.266**	-0.229*	1	

Source: Author's Survey (2022). ***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively.

The result of the likelihood ratio test of the null hypothesis in the model is statistically significant at a 1% probability level. This means that the null hypothesis of independence among market outlet decisions is rejected and the farmers' decisions to choose market outlets for their produce are interdependent (Abate, Mekie and Dessie, 2019). The rho values ($\rho_{21}=\rho_{31}=\rho_{32}=0$) in the likelihood test ratio are all equal to zero and this indicates that all error terms in the model follow a normal distribution with a zero conditional mean. Therefore, this further proves that there is a good model fit and interdependence of market outlets choice in the study area (Honja, Geta and Mitiku, 2017; Mwembe *et al.*, 2021).

As shown in **Table 20** above, estimated coefficients in the Pearson Correlation matrix between the choice of collectors and consumers' market outlets and the correlation between the choice of retailers and consumers' market outlets are negative and statistically significant at 1% and 5% respectively. These results suggest that broiler farmers using consumers' market outlets are less likely to sell their products either in the collectors or in the retailers' market outlets.

Table 21 below presents the estimated Multivariate Probit model results of the broiler farmers' choice of available market outlets where they sell their broilers. The results of the MVP indicate that out of eleven predictor variables included in the MVP model, six variables influence the farmers' choice of broiler market outlet at 1%, 5% and 10% significance levels. The probability of choosing a collectors' market outlet in the study area is influenced by four variables (contract agreement, vehicle ownership, gender and flock size), and the retailers' market outlet is influenced by three variables (Extension access, Vehicle ownership and farmer income) while only one variable (flock size) had an influence on consumers market outlet choice. The figures in parenthesis represent standard errors while the figures outside represent the coefficients of independent variables.

Gender: The coefficient for gender (**7.633**) has a positive influence on farmers' choosing the collectors market outlet at 1% level of significance. This positive coefficient implies that being a female farmer increases the likelihood of selling broilers to the collectors' market outlets at a 1% level of significance. The probable reason for this is that many female farmers in the study area are keeping poultry as their main source of income and they try by all means to access markets that will buy in bulk to minimize loss due to overspending on feeds and spoilage during storage and also to reduce transportation costs. This result is not in line with the finding of Endris, Haji

and Tegegne (2020) where the male gender had a positive and significant impact on farmers' likelihood to use collectors as their vegetable market outlet.

Table 21: MVP estimated results for determinants of market channel choice variables

Variables	Coefficient(Standard error)		
	Collectors(1)	Retailers(2)	Consumers(3)
Gender	7.633(2.005)***	-0.253(0.554)	0.000 (1.046)
Household Size	0.421(0.270)	-0.103(0.116)	0.330(0.227)
Farmer Income	-0.807(0.715)	-0.466(0.217)**	-0.037(0.320)
Vehicle Ownership	6.726(3.895)*	0.965(0.398)**	0.000(0.588)
Stock Size	-0.0001(0.0004)*	0.0003(0.0003)	-0.0007(0.0002)*
Storage Access	0.000(1.542)	0.0006(0.586)	0.000(0.926)
Contract Agreement	20.011(4.641)***	-2.196(7.881)	0.000(1.769)
Distance To Market	-0.031(0.070)	0.014(0.012)	0.044(0.032)
Extension Access	-0.484(0.915)	0.901(0.445)**	0.000(0.620)
Credit Access	0.799(1.692)	0.390(0.361)	0.000(0.553)
Information Access	-2.015(1.888)	-0.134(0.547)	0.000 (0.997)
Constant	-20.914 (3.123)	-0.898(1.195)	0.875(2.155)

Source: Author (2022). ***, ** and * indicate statistical significance level at 1%, 5% and 10%, respectively.

Farmer Income: The coefficient for the variable farmers' income (**-0.466**) has a negative influence on farmers' choosing the retailers' market outlet. This result indicates a negative association between the farmers' income and the probability of farmers selling their broilers to retailers at a 5% significance level. This result implies that the probability of farmers participating in the retailers' market outlet decreases with the increase in the level of farmer's income, *ceteris paribus*. The possible reason for this outcome could be that farmers with high-income levels are not investing part of their income into improved broiler production practices and this makes it hard for them to meet formal market requirements such as quality and standards. Farmers may also be driven away by lower prices offered by the formal markets. Nxumalo *et al.*, (2019) opined that farmers must agree to lower prices in an exchange for longer-

term purchasing arrangements, access to services and social investments in the informal market. This result is in contrast with the finding of Mugenzi, Owour and Bett (2021) where the high-income level of potato farmers positively influenced the choice of collectors and consumers' market outlets.

Vehicle ownership: The coefficients for vehicle ownership among broiler farmers selling their chickens to collectors (**6.726**) and retailers (**0.965**) in the study area has a positive influence on farmers' choosing the collectors and retailers' market outlet. These results imply a positive influence of vehicle ownership on farmers' decision to choose to sell their produce to collectors and retailers at 10% and 5% significance levels respectively. Farmers with transport access can take their products to different markets in the industry and this is a good option for poultry producers since it allows them to sell their produce quickly thereby reducing the extra feeding and refrigeration costs. Additionally, having a vehicle makes it easier for farmers to deliver their goods to markets on time and lowers transportation costs. This result is consistent with the study of Dlamini-Mazibuko, Ferrer and Ortmann (2019) where transport ownership positively influenced the probability of farmers' decisions to choose retailers' market outlets for their output. The availability of produce transportation facilities enables farmers to select appropriate marketing channels and supply products for preferable markets regardless of their location (Sori and Adugna, 2022).

Stock size: The coefficients of the variable stock size for farmers selling to collectors (**-0.0001**) and consumers (**-0.0007**) market are both negative and significant at a 10% level of significance. The negative coefficients imply an inverse relationship between stock size and the farmers' decision to choose both collectors' and consumers' market outlets to sell their output. The results suggest that farmers who keep a high average number of broilers each year are less likely to sell to consumers and collectors market outlets. The possible explanation for these negative correlations could be that individual consumers buy in small quantities and this makes it difficult for producers to sell their broilers within a reasonable time which can lead to increased cost of production and loss through spoilage. Additionally, consumers are buying chickens on credit, and some of them fail to make their payments on time or fail to pay at all and this has a detrimental influence on farmers' marketing operations.

Farmers with a large quantity of production prefer to dispose of their output to market channels that buy in bulk such as collectors and wholesalers (Honja, Geta and Mitiku, 2017; Wosene, Ketema and Ademe, 2018). However, the coefficient of variable stock size (**-0.0001**) for farmers selling to collectors is negative and significant. This result implies a negative influence of stock size on farmers selling to collectors' market outlets at a 10% level of significance. One possible explanation for this result is that collectors are taking farmers' produce at dictated prices and this is believed to reduce farmers' profit margins. This result contradicts the finding of Addis, Tegegn and Ketema (2019) where the quantity of wheat produced positively influenced the likelihood of farmers' decisions to supply collectors' market outlets.

Contractual agreement: The coefficient for the variable contract agreement (**20.011**) of farmers participating in the collectors' market outlet is positive and significant. This positive association between contractual agreement and collectors market outlets means that broiler farmers who have access to contract marketing are more likely to prefer collectors market outlets than any other channel available in the study area at a 1% level of significance. The contractual agreement with collectors involves bulk purchases and it also creates a guaranteed market for broiler farmers thus reducing transaction costs as well as other marketing costs for farmers. Contract farming is very important in addressing the issue of market failures and reduces the marketing risks facing smallholder farmers (Meemken and Bellemare, 2020). Farming under a contractual agreement enables farmers to make informed economic decisions about what to produce, quantities and quality because of the less costly and smooth flow of information regarding market requirements between buyers and sellers (Rantlo, Tsoako and Muroyiwa, 2020).

Extension services: The coefficient for access to extension services (**0.901**) of farmers participating in the retailers' market outlet is positive and significant. This result implies a positive influence of extension service on farmers' decision to choose the retailer market outlet at a 10% significance level. This positive correlation implies that increased access to extension services by broilers farmers increases their probability of choosing retailers as their market outlet for broilers. One possible explanation for this result could be that extension services give farmers timely and pertinent market information, such as market demands, price, and quantity, and that by equipping them with this information, farmers are better prepared to engage in the retailer market outlet. Frequent access to agricultural extension services for farmers improves their

knowledge, skills and intellectual capacity which helps them to improve their production and select both appropriate and profitable market outlets (Ahmed *et al.*, 2017). This result agrees with Taye, Degye and Assefa (2018) who found that extension access has a positive and significant impact on retailer choice by onion farmers in Ethiopia.

Market information: The coefficient for market information access of broiler farmers was expected to have a positive influence on the farmers' participation in formal market outlets such as collectors and retailers. According to Abate, Mekie and Dessie (2019), access to market information such as prices, market quality and quantity and other market requirements help farmers to make informed decisions while marketing their agricultural output. Access to reliable market information helps to reduce transaction costs associated with searching for trading partners, contracting and enforcing the contract (Mgale and Yunxian, 2020). However, the MVP results revealed that the coefficients for market information access of farmers are insignificant for all available market outlets in the study area. This indicates that information received by farmers did not have a significant influence on farmers' choice of any market outlet utilized by farmers in the study area. This insignificant influence on the choice of market outlets could be a result of a lack of access to MIS services by farmers. MIS gathers, analyses and disseminates market information such as prices, quantities and other valuable market information relevant to farmers, traders and other value chain actors (Mgale and Yunxian, 2020; Nugroho, 2021). Thus, lack of access to reliable market information sources does not improve farmers' decisions in market outlets choice. Furthermore, the other possible explanation for these results could be that farmers in the study area are constrained by a lack of financial resources, skills and technical supervision to adhere to the standards and quality assurance practices required in the formal market. According to Rahmat, Cheong and Hamid (2016), developing countries are unable to access and adopt best agricultural practice technology due to inadequate resources as a result of inequalities perceived in their economy.

CHAPTER 5

SUMMARY, CONCLUSION, AREA OF FURTHER STUDY AND RECOMMENDATIONS

5.1 Introduction

This chapter provides the summary, conclusion, implications of the study results, recommendations and areas for further study. The recommendations of the study are on the basis of the conclusions the study reached based on the results of the study that the previous chapter presented. The first chapter of this study outlines each of the objectives of this study and the findings of the study for each of the objectives were used to draw up conclusions for this study. The study provides the policy prescriptions of the study based on the conclusions of this study. These recommendations will assist broiler farmers' in increasing market participation in formal markets and enhance farmers' choice of appropriate marketing outlets that will improve their livelihoods. The recommendations will inform the government on possible areas of intervention to support broiler production and marketing in the country.

5.2 Summary of the study

This study focused on the factors influencing farmers' market participation decisions, the intensity of market participation and the choice of market outlets for broiler farmers in the Leribe district of Lesotho. The study targeted villages with a high level of broiler production and marketing, and information about such villages in the Leribe district was obtained from the Department of Livestock Services in the Ministry of Agriculture and Food Security. A random sampling technique was used to select a total of 114 smallholder broiler farmers from five villages who were then interviewed and their distribution across the villages was as follows: Hlotse (36), Maputsoe (11), Mahobong (43), Peka (14) and Tale (9).

To address the first objective of the study, descriptive statistics such as frequencies, percentages and means were used to describe the socio-economic, market and institutional characteristics of farmers and inferential statistics such as the Chi-square test and T-test were also employed to test the relationship between the afore-mentioned farmers' characteristics and the market participation decision.

Descriptive statistics revealed that most farmers in the study area were females (88.4%) while male farmers accounted only for 11.4%. This is because women in Lesotho are involved in many

economic activities including agriculture and non-agricultural enterprises to generate income and improve their livelihoods in their respective households. In terms of the market participation decisions of farmers, many farmers (68%) are participating in broiler marketing while 32% of farmers were non-market participants.

Compared to non-market participants, most market participants had higher levels of income and education qualifications. 72% of non-market participants has a monthly income of less than M5000.00 while 50% of market participants were earning between M10, 000.00 and M15, 000.00. In terms of education, only 2.8% of non-market participants had tertiary qualifications while 37.2% of market participants had tertiary qualifications. The chi-square test and T-test results revealed that there is a significant relationship between market participation decisions and the socio-economic characteristics of farmers such as education level, farmer income, off-farm employment, vehicle ownership, access to storage and stock size. A significant relationship also existed between market participation decisions and farmers' market characteristics such as access to information and the quantity of broilers sold in the market. However, the results of the study also revealed that marketing experience, price and distance to the market were not significantly different between non-market participants and market participants.

As opposed to the non-market participants' group, the study revealed that most market participants had adequate access to extension and credit services. Though the results revealed that farmers had access to credit services, the results also revealed that many farmers accessed credit from informal sources of credit. In terms of institutional characteristics of farmers such as group membership and contract marketing in the study area, descriptive statistics results showed that many market participants did not have any group membership and were not engaged in contract farming. Constant conflicts and disputes among group members where females dominate are among the reasons why most farmers in the study area were not participating in agricultural groups or associations.

The study also observed that broiler farmers are struggling to access the formal markets and this challenge is evident since many market participants sell their broilers in the informal markets. Only a small portion of farmers was selling directly to collectors (3.5%) and retailers (15.8%) and the rest were selling their produce directly to consumers. Possible reasons for constrained participation of farmers in the formal markets could be a lack of access to financial resources,

market information and relevant extension advisory services. Farmers' inability to meet the quantity and quality standards required in the formal markets could also be a plausible reason why smallholder farmers are locked out of the formal markets. Though many broiler farmers were participating in the informal markets, the study revealed that they could not exploit all the informal market outlets available in the study area because they could not meet certain specifications of the products needed in such markets.

To identify factors influencing broiler farmers' market participation decisions and the intensity of broiler marketing in the study area, the Heckman two-stage model was adopted. The empirical findings of the first step selection equation revealed that the following socio-economic, marketing as well institutional factors had a significant influence on farmers' decisions to participate in broiler markets: Gender had a negative influence while farmer income, storage access, production experience, extension services, credit and market information access had a positive influence on farmer's decision to participate in the market. In the second outcome equation of the Heckman two-stage model, gender has a negative influence on farmers' intensity of participation while household size, off-farm employment, stock size and price had a positive influence on farmers' intensity of market participation.

To determine factors influencing the choice of market outlets by broiler farmers in the study area, the MVP model was employed. Farmers were selling their chickens to the following three market outlets: collectors, retailers and consumers. The correlation between the choice of collectors and consumers' market outlets and the correlation between the choice of retailers and consumers' market outlets are negative and statistically significant. This implies an element of interdependence among market outlets utilized by farmers in the study area existed. Thus, farmers selling their produce to collectors and retailers are less likely to sell their produce to the consumers' market outlet. The empirical results of the MVP model showed that the broiler farmers' choice of market outlets was influenced by gender, farmer income, stock size, vehicle ownership, contract agreement and extension access. Gender, vehicle ownership and contract agreement positively influenced the choice of collectors' market outlet while stock size had a negative influence. Concerning the choice of retailers' market outlet vehicle ownership and extension services access had a positive effect while on the other hand, stock size was negatively influencing the choice of consumer market outlet.

5.3 Conclusions of the study

Most farmers in the study are involved in broiler marketing, and women dominate in the broiler industry in the Leribe district of Lesotho. As a result, the study draws the conclusion that there is a challenge of the gender gap in broiler production and marketing, which necessitates the adoption of appropriate measures to address this issue in the study area. It is vital to strengthen gender parity in broiler production and marketing through encouraging the participation of men in the industry.

Most smallholder broiler farmers in the research area are selling their broilers in the informal markets though they are still unable to take advantage of all available informal market outlets. In addition to that, the study draws the conclusion that farmers continue to experience barriers to accessing formal markets. This failure is attributed to farmers' inability to satisfy formal market requirements, lack of access to financial resources, market information, and impertinent extension advisory services. Therefore, steps must be taken to increase farmers' access to the lucrative formal markets that are accessible to improve the broiler sector in the study area.

In terms of broiler marketing performance in the study area, the study concludes that the sector is still at the emerging stage since many farmers are characterised by low production and marketed output. This low production is believed to be among the compelling reasons that force farmers to sell their produce in the consumer market outlet. Broiler farmers in the study area are primarily concerned with selling live and whole slaughtered chickens, which suggests that there is still room for growth in the poultry sector's processing and packaging industries. As a result, it is necessary to implement programs and strategies that will help increase broiler production and marketing to improve the poultry industry.

Most market participants did not have any group membership and were not engaged in contract farming. Most of the farmers in the research area did not participate in agricultural groups or associations due, among other things, to ongoing disagreements among group members where females predominate. Thus, the failure of farmers to organise themselves into groups or to acquire group membership from the existing farmers' organisations costs farmers the potential for output aggregation and bargaining power in the poultry market hence making it difficult for them to penetrate the formal markets.

Farmers in the study area still face constraints in accessing adequate credit facilities that will help improve their productivity and enhance their market participation because of the unavailability of credit facilities that are specifically tailored for smallholder farmers and the stringent requirements such as collateral security and high-interest rates on loans required by the financial institutions. Besides these stringent measures, generally, there is a lack of affinity by local financial institutions to extend credit to the agriculture sector. This status quo is evident in the unequal distribution of financial resources between the agricultural sector and other non-agricultural sectors in the economy.

According to the empirical findings of this study, there is still potential for increasing participation of farmers in the broiler markets. Improving farmers' access to institutional services such as credit, extension and information services and contract farming will result in the improvement of participation of farmers in both formal and informal markets and improve the farmers' choice of appropriate market outlets. The findings of this study also suggest that farmers still have a possibility to enhance broiler production and marketing if they can effectively utilise their production knowledge and skills, transport ownership, and revenue from off-farm work, which will eventually influence their participation in the market.

5.4 Recommendations of the study

Based on the major findings and conclusions presented above, the following policy recommendations for the government and different value chain actors supporting broiler marketing in the Leribe district are made:

Recommendations for broilers farmers

1. Increasing number of broiler produced

The study encourages farmers to increase the number of broilers produced in order to improve their market participation intensity and seek veterinary assistance from the Ministry of Agriculture and Food Security in the Department of Livestock Services to improve their level of productivity, thus increasing their intensity of participation in the market.

2. Improving collective action and group membership, and improve on conflicts management

The study encourages farmers to organise themselves into groups and get membership in existing farmers' organisations or cooperatives. This would make it easier for members to share useful market information and extension services, which will help them advance their understanding of poultry production and marketing. Further, farmers' organisations help in moderating the challenge of a high extension-farmer ratio in the study area because many farmers can be reached at once. The study also recommends farmers improve their leadership and conflict management skills as all of these will result in effective and efficient agricultural groups or associations.

3. Utilisation of all informal market outlets available in the study area

The study also revealed that the market outlets available in the informal market were underexploited. Therefore, farmers are encouraged to extend their marketing activities toward the informal market outlets such as informal restaurants, informal food catering service providers, street vendors and other informal food eateries available in the study area.

Recommendations for local financial institutions and other NGOs

1. Establishment of credit facilities for smallholder farmers and capital investments in the broiler sector

The study recommends financial institutions in the private sector set up micro-credit for smallholder farmers with affordable interest rates to improve their ability to service the loans. The need for better and flexible credit facilities is also crucial in not only encouraging farmers to commercialise their farming but also enabling them to participate in more lucrative and organised formal markets.

2. Establishment of funding for processing and packaging projects/firms

There is a need for NGOs and other development partners to consider financial investments in the poultry sector, especially in processing and packaging to improve the market infrastructure of the poultry industry. Such interventions will also increase the market opportunities for broiler farmers.

Recommendations for the Ministry of Agriculture and Food security, and the Government

1. Linking smallholder broiler farmers with formal Markets

Ministry of Agriculture through the department of marketing, and extension services should link farmers to improved markets. Agricultural extension programmes should provide market-oriented extension services that will enhance farmers marketing skills and knowledge. Frequent training of farmers on poultry production and marketing with more emphasis on Good Agricultural Practices (GAP) and other market requirements will enable farmers to access the formal market.

2. Encouraging contract farming

The government through the Ministry of Agriculture and Food Security and Ministry of Small Business Development, Cooperatives and Marketing should adopt policies that will encourage contract farming between smallholder farmers and the formal markets outlets available in the country. Contract farming agreements ensure guaranteed farmers access to productive inputs which will thus enhance their competence in the formal market. Besides improving farmers' production and marketing, this initiative will also relieve the country from heavy reliance on chicken meat importation.

3. Adoption of Market Information System

Department of Marketing should adopt the use of a Market Information System (MIS) as this will improve farmers' access to timely, relevant and up-to-date market information concerning market prices and other market requirements. Adequate access to reliable and relevant sources of market information such as price helps farmers choose appropriate market outlets that are likely to improve their profitability.

4. Operationalization of Lesotho Standards Institution

The Government of Lesotho must operationalize the Lesotho Standards Institution activities in the meat and poultry products sector, and this will enable farmers to prove accreditation in the international food systems. Farmers' ability to meet the international quality standards will facilitate their participation in local and international formal markets.

5.5 Area for further research

The main purpose of this research was to identify and assess socio-economic, institutional, and marketing factors which influence broiler farmers' market participation and choice of market

outlets in the Leribe district of Lesotho. As a result, other scholars should expand the research and investigate the profitability of the market outlets available to broiler farmers, as well as the transaction costs associated with the selection of each market outlet available in the study area.

REFERENCES

- Abate, D. and Addis, Y. (2021) 'Factors affecting the intensity of market participation of smallholder sheep producers in northern Ethiopia: Poisson regression approach', *Cogent Food and Agriculture*, 7(1), pp. 1–11. doi: 10.1080/23311932.2021.1874154.
- Abate, T. M., Mekie, T. M. and Dessie, A. B. (2019) 'Determinants of market outlet choices by smallholder teff farmers in Dera district, South Gondar Zone, Amhara National Regional State, Ethiopia: a multivariate probit approach', *Journal of Economic Structures*, 8(39). doi: 10.1186/s40008-019-0167-x.
- Abdullah, Rabbi, F., Ahamad, R., Ali, S., Chandio, A. A., Ahmad, W., Ilyas, A., & Din, I. U. (2019) 'Determinants of commercialization and its impact on the welfare of smallholder rice farmers by using Heckman's two-stage approach', *Journal of the Saudi Society of Agricultural Sciences*, 18(2), pp. 224–233. doi: 10.1016/j.jssas.2017.06.001.
- Adams, A., Caesar, L. D. and Asafu-Adjaye, N. Y. (2021) 'What Informs Farmers' Choice of Output Markets? The Case of Maize, Cowpea and Livestock Production in Northern Ghana', *International Journal of Rural Management*, (April), pp. 1–22. doi: 10.1177/0973005221994425.
- Addis, Y., Tegegn, B. and Ketema, M. (2019) 'Determinants of wheat market outlet choice of smallholder farmers: the case of Dembecha District, Amhara National Regional State, Ethiopia', *Journal of Poverty, Investment and Development*, 50, pp. 10–20. doi: 10.7176/jpid/50-02.
- Adom, D., Hussain, E. K. and Joe, A. A. (2018) 'Theoretical and conceptual framework: mandatory ingredients of a quality research', *International Journal of Scientific Research*, 7(1), pp. 93–98. Available at: <https://www.researchgate.net/publication/322204158%0ATHEORETICAL>.
- Adugna, M., Ketema, M., Goshu, D., & Debebe, S. (2019) 'Market outlet choice decision and its effect on income and productivity of smallholder vegetable producers in Lake Tana Basin, Ethiopia', *Review of Agricultural and Applied Economics*, 22(1), pp. 83–90. doi:

10.15414/raae.2019.22.01.83-90.

- Ahmed, J., Umare, A., Mahamed, N., Galane, O., Desse, K., Agricultural, F., Ababa, A., Extension, A., Agricultural, F., & Ababa, A. (2017) 'Factors affecting groundnut market outlet choice in moisture stress area of Babile district, Eastern Ethiopia: Multivariate Probit Approach', *International Journal of Agricultural Science, Research and Technology in Extension and Education Systems (IJASRT in EESs)*, 7(2), pp. 91–101.
- Akintunde, M. A. O. and Oladele, O. I. (2019) 'Effect of information communication technologies on information access in Lesotho extension system', *Merit Research Journal of Agricultural Science and Soil Sciences*, (February). doi: 10.5281/zenodo.2551618.
- Akrong, R., Mbogoh, S. G. and Irungu, P. (2021) 'What factors influence access to and the level of participation in high value mango markets by smallholder farmers in Ghana?', *Heliyon*, 7(3), pp. 1–9. doi: 10.1016/j.heliyon.2021.e06543.
- Alders, R. G., Dumas, S. E., Rukambile, E., Magoke, G., Maulaga, W., Jong, J., & Costa, R. (2018) 'Family poultry: Multiple roles, systems, challenges, and options for sustainable contributions to household nutrition security through a planetary health lens', *Maternal and Child Nutrition*, 14(S3), p. e12668. doi: 10.1111/mcn.12668.
- Aleskerov, F., Bouyssou, D. and Monjardet, B. (2007) *Utility maximization, choice and preference, Utility Maximization, Choice and Preference*. doi: 10.1007/978-3-540-34183-3.
- Almeida, F., Superior, I., Gaya, P., Queirós, A., & Faria, D. (2017) 'Strengths and limitations of qualitative and quantitative research methods', *European Journal of Education Studies*, 3(9), pp. 368–387. doi: 10.5281/zenodo.887089.
- Amani, S. (2014) *Smallholder Farmers' Marketing Choices, P4P Global Learning Series*. Rome.
- Amanor-Boadu, V., Nti, F. K. and Ross, K. (2016) *Structure of Ghana's Chicken Industry in 2015*. Manhattan, KS 66506: Department of Agricultural Economics, Kansas State University.

- Arinloye, D. A. A., Pascucci, S., Linnemann, A. R., Coulibaly, O. N., Hagelaar, G., Omta, O. S. W. F., Pascucci, S., & Linnemann, A. R. (2015) 'Marketing channel selection by smallholder farmers marketing channel selection by smallholder', *Journal of Food Products Marketing*, 21(4), pp. 337–357. doi: 10.1080/10454446.2013.856052.
- Bannor, R. K., Ibrahim, N. and Amrago, E. C. (2021) 'Examining the influence of commercialisation and postharvest losses on the choice of marketing outlet among poultry farmers', *Scientific African*, 12(e00792), pp. 1–10. doi: 10.1016/j.sciaf.2021.e00792.
- Bello, H. M., Nokotjoa, R. T. and Paramaiah, C. (2009) 'An analysis of poultry investment function: A case study of Lesotho.', *ICFAI Journal of Agricultural Economics*, 6(3/4), pp. 56–65. Available at: <http://login.ezproxy.lib.umn.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=buh&AN=41994520&site=ehost-live>.
- Biwas, C., Comes, C., Juliana, S., Alex, L., & Debabrata, B. (2018) 'Safer post-harvest processing, proper storage and transport of broiler products to the retail markets', *Journal of Food Processing & Beverages*, 6(2), pp. 01–04. doi: 10.13188/2332-4104.1000023.
- Bos, J. (2020) *Research Ethics for Students in the Social Sciences, Research Ethics for Students in the Social Sciences*. Switzerland: Springer Nature Switzerland AG. doi: 10.1007/978-3-030-48415-6.
- Bureau of Statistics (2020) *Lesotho District Profiles*. Maseru, Lesotho.
- Camara, A. (2017), 'Market participation of smallholders and the role of the upstream segment : evidence from Guinea' International Food Policy Research Institute, Cheikh Anta Diop University
- Chaiban, C., Robinson, T. P., Fèvre, E. M., Ogola, J., Akoko, J., Gilbert, M., & Vanwambeke, S. O. (2020) 'Early intensification of backyard poultry systems in the tropics: a case study', *Animal*, 14(11), pp. 2387–2396. doi: 10.1017/S175173112000110X.
- Chandio, A. A., Jiang, Y., Rehman, A., Twumasi, M. A., Pathan, A. G., & Mohsin, M. (2020)

- ‘Determinants of demand for credit by smallholder farmers’: A farm level analysis based on survey in Sindh, Pakistan’, *Journal of Asian Business and Economic Studies*, ahead-of-p(ahead-of-print). doi: 10.1108/jabes-01-2020-0004.
- Chatterjee, R. N. and Rajkumar, U. (2015) ‘An overview of poultry production in India’, *Indian Journal of Animal Health*, 54(2), pp. 89–108.
- Chukwujekwu, A. O., Ogonna, O. O. and John, N. N. (2021) ‘On the challenges faced by female members of agricultural cooperatives in southeast nigeria’, *Journal of Agricultural Extension and Rural Development*, 13(2), pp. 94–106. doi: 10.5897/jaerd2021.1227.
- Dal Bosco, A., Mattioli, S., Cartoni Mancinelli, A., Cotozzolo, E., & Castellini, C. (2021) ‘Extensive rearing systems in poultry production: The right chicken for the right farming system. A review of twenty years of scientific research in Perugia University, Italy’, *Animals*, 11(1–25). doi: 10.3390/ani11051281.
- Dessie, A. B., Abate, T. M. and Mekie, T. M. (2018) ‘Factors affecting market outlet choice of wheat producers in North Gondar Zone ’, *Agriculture & Food Security*, pp. 1–8. doi: 10.1186/s40066-018-0241-x.
- Dlamini-Mazibuko, B. P., Ferrer, S. and Ortmann, G. (2019) ‘Factors affecting the choice of marketing outlet selection strategies by smallholder farmers in Swaziland’, 11(5), pp. 569–577. doi: 10.1080/20421338.2018.1554323.
- Donkor, E. A., Garnevska, E., Siddique, M. I., & Donkor, E. (2021) ‘Determinants of rice farmer participation in the direct marketing channel in Ghana’, *Sustainability (Switzerland)*, 13(9), pp. 1–14. doi: 10.3390/su13095047.
- Dube, L. (2020) ‘Factors Influencing Market Participation by Smallholder Farmers in Masvingo and Manicaland Provinces, Zimbabwe’, *International Journal of Agricultural Economics*, 5(6), p. 313. doi: 10.11648/j.ijae.20200506.20.
- Endris, E., Haji, J. and Tegegne, B. (2020) ‘Factors Affecting Vegetable Producers Market Outlet Choice in Case of Habru District, North Wollo Zone, Ethiopia’, *European Business & Management*, 6(1), pp. 1–9. doi: 10.11648/j.ebm.20200601.11.

- Ermias, D. (2021) ‘Econometric analysis of factors affecting market outlet choice of mango fruit producers in Hadero Econometric analysis of factors affecting market outlet choice of mango fruit producers in Hadero’, *Cogent Food & Agriculture*, 7(1). doi: 10.1080/23311932.2021.1891660.
- FAO (2019) *FAO Lesotho, Contributing to Agriculture , Food Security , Nutrition and Rural Development*. Maseru.
- Ferris, B. S., Robbins, P., Best, R., Seville, D., Buxton, A., Shriver, J., Wei, E., Robbins, P., Best, R., Seville, D., & Wei, E. (2014) *Linking Smallholder Farmers to Markets and the Implications for Extension and Advisory Services*. MEAS Discussion 4.
- Fitsum, M. and Aliy, M. (2014) ‘Poultry Production System and Role of Poultry Production in Tigray Region , Northern Ethiopia : A Review’, *Journal of Biology, Agriculture and Healthcare*, 4(27), pp. 154–160.
- Fleming, J. and Zegwaard, K. E. (2018) ‘Methodologies, methods and ethical considerations for conducting research in work-integrated learning’, *International Journal of Work-Integrated Learning*, 19(3), pp. 205–213.
- Gaal, O. H. and Afrah, A. N. (2017) ‘Lack of infrastructure: The impact on economic development as a case of Benadir region and Hir-shabelle, Somalia’, *Developing Country Studies*, 7(1), pp. 49–55. Available at: www.iiste.org (Accessed: 9 September 2021).
- Gachuhi, M. W., Owuor, G. and Gathungu, E. (2021) ‘Determinants of intensity of soybean commercialization among smallholder farmers in butere, kenya’, *Review of Agricultural and Applied Economics*, XXIV(2), pp. 101–111. doi: 10.15414/raae.2021.24.02.101-111.
- Ghazali, N. H. M. (2016) ‘A Reliability and Validity of an Instrument to Evaluate the School-Based Assessment System: A Pilot Study’, *International Journal of Evaluation and Research in Education (IJERE)*, 5(2), p. 148. doi: 10.11591/ijere.v5i2.4533.
- Goitom, G., Bezabih, E., Berhanu, G., Ababa, A., & Ababa, A. (2018) ‘Factors That Determine Poultry Market Participation Decision and Its Supply to the Market in Adwa Wereda , Central Zone of’, *Journal of Economics and Sustainable Development*, 9(5), pp. 1–11.

- Gomez, S., Laura, P. and Louhichi, R. K. (2020) *The Role of Smallholder Farms in Food and Nutrition Security*, Springer Nature Switzerland AG. Springer Nature Switzerland AG. doi: 10.1007/978-3-030-42148-9.
- Gororo, E. and Kashangura, M. T. (2016) ‘Broiler production in an urban and peri-urban area of Zimbabwe’, *Development Southern Africa*, 33(1), pp. 99–112. doi: 10.1080/0376835X.2015.1113123.
- Gundry, D. and Deterding, S. (2019) ‘Validity threats in quantitative data collection with games: A narrative survey’, *Simulation and Gaming*, 50(3), pp. 302–328. doi: 10.1177/1046878118805515.
- Hawlet, M. K., Birhane, Z. and Alemayehu, G. (2019) ‘Determinants of market outlet choice decision of tomato producers in Fogera woreda, South Gonder zone, Ethiopia’, *Cogent Food and Agriculture*, 5(1), p. 1709394. doi: 10.1080/23311932.2019.1709394.
- Honja, T., Geta, E. and Mitiku, A. (2017) ‘Determinants of market outlet choice of the smallholder mango producers: The case of Boloso Bombe Woreda, Wolaita Zone, Southern Ethiopia: A Multivariate Probit Approach’, *Global Journal of Science Frontier Research(:D) Agriculture and Veterinary*, 17(2).
- Horowitz, J. L., Bolduc, D., Divakar, S., Geweke, J., Gönül, F., Hajivassiliou, V., Koppelman, F. S., Keane, M., Matzkin, R., Rossi, P., & Ruud, P. (1994) ‘Advances in random utility models report of the workshop on advances in random utility models duke invitational symposium on choice modeling behavior’, *Marketing Letters*, 5(4), pp. 311–322. doi: 10.1007/BF00999207.
- Ingabire, C., Mshenga, M. P., Langat, K., Bigler, C., Musoni, A., Butare, L., & Birachi, E. (2017) ‘Towards commercial agriculture in Rwanda: Understanding the determinants of market participation among smallholder bean farmers’, *African Journal of Food, Agriculture, Nutrition and Development*, 17(4), pp. 12492–12508. doi: 10.18697/ajfand.80.16825.
- Irene, L. A., Stephen, K. W. and Basil, M. (2018) ‘Determinants of smallholder indigenous

- chicken farmers market participation decisions and value of sales in Gulu district’, *Journal of Development and Agricultural Economics*, 10(8), pp. 271–278. doi: 10.5897/jdae2018.0941.
- Islam, S., Begum, J., Hossain, M. I., & Khatun, M. (2017) ‘Marketing of live poultry in northwest of dhaka city: A value chain analysis’, *American Journal of Food and Nutrition*, 5(1), pp. 28–40. doi: 10.12691/ajfn-5-1-4.
- Jeni, R. El, Dittoe, D. K., Olson, E. G., Lourenco, J., Seidel, D. S., Ricke, S. C., & Callaway, T. R. (2021) ‘An overview of health challenges in alternative poultry production systems’, *Poultry Science*, 100(7), p. 101173. doi: 10.1016/j.psj.2021.101173.
- Kaur, P., Stoltzfus, J. and Vikas, Y. (2018) ‘Descriptive statistics’, *International Journal of Academic Medicine*, 4(1), pp. 60–63. doi: 10.4103/IJAM.IJAM.
- Khoza, T. M., Senyolo, G. M., Mmbengwa, V. M., & Soundy, P. (2019) ‘Socio-economic factors influencing smallholder farmers’ decision to participate in agro-processing industry in Gauteng province, South Africa’, *Cogent Social Sciences*, 5(1). doi: 10.1080/23311886.2019.1664193.
- Kibara, M. J. (2019) ‘Household-level livestock market participation among Southern rangeland Kenyan pastoralists’, in *Economic Policy and Crisis Management*, pp. 40–59.
- Kilangi, A. M. (2012) *The Determinants of ICT Adoption and Usage among SMEs, The Determinants of ICT Adoption and Usage among SMEs: The Case of Tourism Sector in Tanzania*. VU University.
- Kiprop, E. K., Okinda, C., Akter, A., & Geng, X. (2020) ‘Factors influencing marketing channel choices for improved indigenous chicken farmers: insights from Baringo, Kenya’, *British Food Journal*, 122(12), pp. 3797–3813. doi: 10.1108/BFJ-11-2019-0841.
- Kivunja, C. (2018) ‘Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field’, *International Journal of Higher Education*, 7(6), pp. 44–53. doi: 10.5430/ijhe.v7n6p44.

- Kyaw, N. N., Ahn, S. and Lee, S. H. (2018) 'Analysis of the factors influencing market participation among smallholder rice farmers in Magway Region, Central Dry Zone of Myanmar', *Sustainability (Switzerland)*, 10(12). doi: 10.3390/su10124441.
- Magogo, J. R. (2015) *An Analysis of Marketing of African Indigenous Vegetables*. Egerton University.
- Malit, J. O., Mathenge, M. W. K. and Muluvi, A. (2021) 'Social Networks and the Choice of Market Outlets among Aquafarmers in Kenya', *Open Access Library Journal*, 08(12), pp. 1–21. doi: 10.4236/oalib.1108133.
- Maree, K. (2016) *First Steps in Research*. 6th edn. Pretoria: Van Schaik Publishers.
- Meemken, E. M. and Bellemare, M. F. (2020) 'Smallholder farmers and contract farming in developing countries', *Proceedings of the National Academy of Sciences of the United States of America*, 117(1), pp. 259–264. doi: 10.1073/pnas.1909501116.
- Mgale, Y. J. and Yunxian, Y. (2020) 'Marketing efficiency and determinants of marketing channel choice by rice farmers in rural Tanzania: Evidence from Mbeya region, Tanzania', *Australian Journal of Agricultural and Resource Economics*, 64(4), pp. 1239–1259. doi: 10.1111/1467-8489.12380.
- Moeletsi, M. E. and Walker, S. (2013) 'Agroclimatological suitability mapping for dryland maize production in Lesotho', *Theoretical and Applied Climatology*, 114(1–2), pp. 227–236. doi: 10.1007/s00704-012-0829-1.
- Mohajan, H. K. (2017) 'Two Criteria for Good Measurements in Research: Validity and Reliability', *Annals of Spiru Haret University. Economic Series*, 17(4), pp. 59–82. doi: 10.26458/1746.
- Moono, L. (2015) *An Analysis of Factors Influencing Market Participation Among Smallholder Rice Farmers In Western Province, Zambia*. University of Nairobi.
- Mphahama, L. E. (2017) *Production Systems, Profitability and Participation in the Mainstream Markets by Smallholder Broiler Chicken Farmers of Maseru district in Lesotho*.

University of Forthare.

- Mugenzi, P., Owour, G. and Bett, H. K. (2021) 'Factors influencing smallholder potato farmers' choice decisions of market outlets in Musanze and Nyabihu Districts, Rwanda: A Multivariate Probit Model', in *ICAE 2021 -International Conference Of Agricultural Economists*.
- Mukarumbwa, P., Mushunje, A., Taruvinga, A., Akinyemi, B., & Ngarava, S. (2018) 'Analysis of factors that influence market channel choice of smallholder vegetable farmers in Mashonaland east province of Zimbabwe', *International Journal of Development and Sustainability*, 7(2), pp. 734–754. Available at: www.isdsnet.com/ijds.
- Mulanda, S. M. and Punt, C. (2021) 'Characteristics of Zambia's agricultural sector and the role for agricultural policy: Insights from CGE modelling', *Structural Change and Economic Dynamics*, 58, pp. 300–312. doi: 10.1016/j.strueco.2021.06.008.
- Musafili, I., Ingasia, O. and Birachi, E. A. (2021) 'Dynamics of gender preferences for farm investment strategies in Rwanda: A best-worst scaling experiment', *British Journal of Environmental Studies*, 1(1), pp. 32–43. doi: 10.32996/bjes.
- Mwembe, A. M., Owuor, G., Langat, J., Mshenga, P., Mbega, A., Owuor, G., Langat, J., & Mshenga, P. (2021) 'Factors affecting market outlet choice of agroforestry based mango producers in Kwale and Kilifi counties , Kenya: The application of the Multivariate Probit model factors affecting market outlet choice of agroforestry based mango producers in Kwale and ', *Cogent Food & Agriculture*, 7(1). doi: 10.1080/23311932.2021.1936367.
- Naushad, K., Naushad, M., Fahad, S., Faisal, S., Shehzad, F., & Khan, U. (2021) 'Poultry farming industry contribution in the world economy', (September). doi: 10.13140/RG.2.2.22054.86081.
- Negerssa, G. R., Negash, R., Bekele, A. E., & Nemera, D. B. (2020) 'Smallholder market participation and its associated factors: Evidence from Ethiopian vegetable producers', *Cogent Food and Agriculture*, 6(1), pp. 1–15. doi: 10.1080/23311932.2020.1783173.

- Nugroho, A. D. (2021) 'Agricultural market information in developing countries: A literature review', *Agricultural Economics*, 67(11), pp. 468–477. doi: 10.17221/129/2021-agricecon.
- Nwafor, C. U., Ogundeji, A. A. and Westhuizen, C. van der (2020) 'Adoption of ICT-based information sources and market participation among smallholder livestock farmers in South Africa', *Agriculture (Switzerland)*, 10(2). doi: 10.3390/agriculture10020044.
- Nxumalo, K. K. S., Oduniyi, O. S., Antwi, M. A., & Tekana, S. S. (2019) 'Determinants of market channel choice utilised by maize and sunflower farmers in the North West province, South Africa', *Cogent Social Sciences*, 5(1), p. 1678451. doi: 10.1080/23311886.2019.1678451.
- Obiadi, A. J., Nwankwo, F. O., Ezeokafor, U. R., & Ekwere, G. E. (2020) 'The effect of institutional factors in marketing of agricultural products by cooperative farmers', *Business and Management Research*, 9(1), pp. 43–56. doi: 10.5430/bmr.v9n1p43.
- OECD/FAO (2019) *OECD-FAO Agricultural Outlook 2019-2028*. OECD Publishing, Paris/Food and Agriculture Organization of the United Nations, Rome. doi: 10.1787/agr_outlook-2019-en.
- Ogundeji, A. A., Donkor, E., Motsoari, C., & Onakuse, S. (2018) 'Impact of access to credit on farm income: policy implications for rural agricultural development in Lesotho', *Agrekon*, 57(2), pp. 152–166. doi: 10.1080/03031853.2018.1483251.
- Okoye, B. C., Abass, A., Bachwenkizi, B., Asumugha, G., Alenkhe, B., Ranaivoson, R., Randrianarivelo, R., Rabemanantsoa, N., & Ralimanana, I. (2016) 'Effect of transaction costs on market participation among smallholder cassava farmers in central Madagascar', *Cogent Economics and Finance*, 4(1), pp. 1–20. doi: 10.1080/23322039.2016.1143597.
- Olufadewa, M. S., Obi-egbedi, O. and Okunmadewa, F. Y. (2018) 'Determinants of Choice of Market Outlet Among Smallholder Poultry Farmers in Oyo State , Nigeria', *Alanya Academic Review Journal*, 2(2), pp. 177–193. doi: 10.29023/alanyaakademik.341418.
- Oluwatayo, I. B., Macheche, T. A. and Senyolo, M. P. (2016) *Profitability and Efficiency*

- Analysis of Smallholder Broiler Production in Mopani District of Limpopo Province, South Africa, Journal of Agribusiness and Rural Development.* University of Limpopo. doi: 10.17306/jard.2016.17.
- Otekunrin, O. A., Momoh, S. and Ayinde, I. A. (2019) ‘Smallholder farmers’ market participation: concepts and methodological approach from Sub-Saharan Africa’, *Current Agriculture Research Journal*, 7(2), pp. 139–157. doi: 10.12944/carj.7.2.02.
- Policy notes (2015) Transnational Corporations.* doi: 10.18356/8f079d2f-en.
- Praburaj, L. (2018) ‘Role of agriculture in the economic development of a country’, *International Journal of Commerce*, 6(3), pp. 1–5. doi: 10.5281/zenodo.1323056.
- Rafoneke, L., Mshenga, P., Owuor, G., & Rantlo, A. (2020) ‘Influence of transaction costs on choice of marketing outlets among smallholder peach farmers in Lesotho’, *African Crop Science Journal*, 28(Supplement ,s1), pp. 175–185. doi: <https://dx.doi.org/10.4314/acsj.v28i1.13S>.
- Rahmat, S., Cheong, C. B. and Hamid, M. S. R. B. A. (2016) ‘Challenges of developing countries in complying quality and enhancing standards in food industries’, *Procedia - Social and Behavioral Sciences*, 224(August 2015), pp. 445–451. doi: 10.1016/j.sbspro.2016.05.418.
- Raidimi, E. N. and Kabiti, H. M. (2019) ‘A review of the role of agricultural extension and training in achieving sustainable food security: a case of south africa’, *Angewandte Chemie International Edition*, 6(11), 951–952., 47(3), pp. 120–130.
- Rakhmanov, S., Turgunov, T. T., Kusharov, Z. K., & Mengnorov, A. A. (2020) ‘Econometric methods for solving problems of analysis and forecasting dynamics of yield of agricultural crops’, *IOP Conference Series: Earth and Environmental Science*, 614(1). doi: 10.1088/1755-1315/614/1/012165.
- Rantlo, A. M., Tsoako, M. and Muroyiwa, B. (2020) ‘Institutional factors influencing diary farmers participation in formal and informal milk markets in Maseru Urban, Lesotho’, *Journal of Agricultural Extension*, 24(1), pp. 48–59.

- Rantšo, T. A. and Seboka, M. (2019) ‘Agriculture and food security in Lesotho: Government sponsored block farming programme in the Berea, Leribe and Maseru Districts’, *Cogent Food & Agriculture*, 5(1), p. 1657300. doi: 10.1080/23311932.2019.1657300.
- Rashidin, M. S., Javed, S., Liu, B., & Jian, W. (2020) ‘Ramifications of Households’ Nonfarm Income on Agricultural Productivity: Evidence From a Rural Area of Pakistan’, *SAGE Open*, 10(1). doi: 10.1177/2158244020902091.
- Ray, N., Clarke, G. and Waley, P. (2021) ‘The impact of contract farming on the welfare and livelihoods of farmers: A village case study from West Bengal’, *Journal of Rural Studies*, (June). doi: 10.1016/j.jrurstud.2021.06.003.
- Ricke, S. C. and Rothrock, M. J. (2020) ‘Gastrointestinal microbiomes of broilers and layer hens in alternative production systems’, *Poultry Science*, 99(2), pp. 660–669. doi: 10.1016/j.psj.2019.12.017.
- Ripley, M. (2017) *Improving market access for smallholder farmers: What works in out-grower schemes-evidence from Timor-Leste*. Available at: www.ilo.org/sme.
- Shi, G. and Wang, Q. (2019) ‘The application of utility theory in the decision-making of marketing risk management’, *Advances in Economics, Business and Management Research (AEBMR)*, 62(Iafsm 2018), pp. 303–310.
- Shiferaw, B., Hellin, J. and Muricho, G. (2016) ‘Markets access and agricultural productivity growth in developing countries: Challenges and opportunities for producer organizations’, *Economic Democratization, Inclusiveness and Social Capital*, (February), pp. 103–122. doi: 10.4337/9781784719388.00013.
- Sigei, G. K. (2014) *Determinants of Market Participation Among Small -Scale Pineapple Farming in Kericho County, Kenya*. Egerton University.
- Soe, W. P. P., Moritaka, M. and Fukuda, S. (2015) ‘An analysis of the factors influencing marketing channel choice by paddy rice farmers in Myanmar’, *Journal of the Faculty of Agriculture, Kyushu University*, 60(2), pp. 535–542. doi: 10.5109/1543425.

- Sori, O. and Adugna, M. (2022) ‘Determinants of groundnut producers’ market channel choice in Western Oromia region, Ethiopia’, *Journal of Agriculture and Food Research*, 7(2022), p. 100277. doi: 10.1016/j.jafr.2022.100277.
- Sossidou, E. N., Dal Bosco, A., Castellini, C., & Grashorn, M. A. (2015) ‘Effects of pasture management on poultry welfare and meat quality in organic poultry production systems’, *World’s Poultry Science Journal*, 71(2), pp. 375–384. doi: 10.1017/S0043933915000379.
- Taherdoost, H. (2016) ‘Sampling Methods in Research Methodology; How to Choose a Sampling Technique for Research’, *International Journal of Academic Research in Management (IJARM)*, 5(2), pp. 18–17. doi: 10.2139/ssrn.3205035.
- Tarekegn, K. and Kibreab, Y. (2017) ‘Determinants of poultry market participation decisions : The case of producers in Kaffa and Bench Majji Zones , Southern’, 8(3), pp. 23–29.
- Taye, M., Degye, G. and Assefa, T. (2018) ‘Determinants of outlet choices by smallholder onion farmers in Fogera district Amhara Region, Northwestern Ethiopia’, *Journal of Horticulture and Forestry*, 10(3), pp. 27–35. doi: 10.5897/jhf2018.0524.
- Thobani, C. (2020) *Effects of Collective Action on Market Participation and Food Security among Smallholder Farmers in Msinga Local Municipality*. University of Kwazulu Natal. Available at: <https://researchspace.ukzn.ac.za/handle/10413/19476>.
- Toramo, N. L. (2018) ‘Determinants of market participation performance among poultry product producers : The Case of Lemo District of Hadiya Zone, Southern Ethiopia’, *Journal of Economics and Sustainable Development*, 9(5), pp. 12–24.
- Tsakok, I. (2018) *The Pivotal Importance of Good Access to Markets for Farmers Policy Brief*. Available at: <http://documents.worldbank.org/curated/en/866331525265592425/pdf/> (Accessed: 4 August 2021).
- Tura, E. G., Goshu, D., Demisie, T., & Kenea, T. (2016) ‘Determinants of market participation and intensity of marketed surplus of teff producers in Bacho and Dawo districts of Oromia State , Ethiopia’, *Journal of Agricultural Economics and Development*, 5(2), pp. 20–32. Available at: <http://academeresearchjournals.org/journal/jaed>.

- USAID (2016) *Resilience and Economic Growth in the Sahel – Accelerated Growth (REGIS-AG), Value Chain and End Market Assessment: Poultry*.
- Wahyono, N. D. and Utami, M. M. D. (2018) ‘An analysis of marketing channels on broiler carcass in Jember Regency’, in *IOP Conference Series: Earth and Environmental Science* 207. IOP Publishing, pp. 0–6. doi: 10.1088/1755-1315/207/1/012026.
- WFP (2020) *Lesotho Annual Country Report 2020: Country Strategic Plan 2019-2024*. Lesotho.
- World Bank (2022) *Agriculture Overview: Development news, research, data | World Bank, World Bank*. Available at: <https://www.worldbank.org/en/topic/agriculture/overview> (Accessed: 15 August 2022).
- Wong, J. T., de Bruyn, J., Bagnol, B., Grieve, H., Li, M., Pym, R., & Alders, R. G (2017) ‘Small-scale poultry and food security in resource-poor settings: A review’, *Global Food Security*, 15(April), pp. 43–52. doi: 10.1016/j.gfs.2017.04.003.
- Wosene, G., Ketema, M. and Ademe, A. (2018) ‘Factors affecting market outlet choices of pepper producers in Wonberma district, Northwest Ethiopia: multivariate probit approach’, *Cogent Food and Agriculture*, 4(1), pp. 1–13. doi: 10.1080/23311932.2018.1558497.
- Yaméogo, T. B. *et al.* (2018) ‘Socio-economic factors influencing small-scale farmers’ market participation: Case of rice producers in Dano’, *Sustainability (Switzerland)*, 10(12). doi: 10.3390/su10124354.
- Yankson, P. W. K., Owusu, A. B. and Frimpong, S. (2016) ‘Challenges and Strategies for Improving the Agricultural Marketing Environment in Developing Countries: Evidence From Ghana’, *Journal of Agricultural and Food Information*, 17(1), pp. 49–61. doi: 10.1080/10496505.2015.1110030.
- Záboj, M. (2008) ‘Agricultural and food wholesale and retail trade in the intra-community trade’, *Agricultural Economics- Czech Republic*, 54(9), pp. 419–430.

APPENDIX 1: QUESTIONNAIRE

QUESTIONNAIRE

TITLE: DETERMINANTS OF MARKET PARTICIPATION AND CHOICE OF MARKET OUTLET FOR BROILER FARMERS IN LERIBE DISTRICT OF LESOTHO

Questionnaire Number:

[FOR OFFICIAL USE ONLY]

You are one of the several smallholder broiler farmers selected to participate in this study. The objective of this study is to identify and evaluate socio-economic, institutional and marketing factors influencing broiler farmers’ market participation and the choice of market outlet in Leribe. The findings of this study will inform policymakers in making strategic policies geared towards improving smallholder broiler farmers’ market participation and access to market outlets that guarantee higher farming returns thus ensuring improved farmers’ livelihoods. The information you provide will be very useful in influencing the findings of this study. Your participation in this study is voluntary. If you decide to participate, all information provided will be treated as STRICTLY CONFIDENTIAL and will be used for research purposes only.

Enumerator Name:..... Date:.....

GEOGRAPHIC LOCATION

Name of the Farmer	:.....
Contacts:	:.....
Constituency	:
Resource Centre:	:.....
Village Name	:.....

SECTION A: SOCIO-ECONOMIC CHARACTERISTICS OF THE FARMER

A1. Gender of the farmer (Tick on the appropriate box)							Male [1]	
							Female [2]	
A2. Indicate your age group in years (tick as appropriate)								
<18[1]		19-30[2]		31-40[3]		41-50 [4]		>51[5]
A3. Marital Status(Tick where appropriate)								
Single[1]		Married[2]		Divorced[3]		Widowed[4]		
A4. Household Size.....								
A5. Are you the head of the household?								
Yes[1]			No[0]					
A6. Indicate the level of education								
No Education[1]		Primary[2]		Secondary[3]		Tertiary[4]		
A7. How many years of schooling?.....								
A8. Do you have any off-farm employment?								
Yes[1]		No[0]						
A9. If yes in A8, what is your employment status?								
Self-Employed[1]		Formal Employment [2]		Part-Time worker[3]		Pensioner[4]	Other[5]	
A10. Please indicate household monthly income in Maloti (M)								

<5,000[1]		5,000 - 10,000[2]		10,000 - 15,000[3]		>15,000[4]	
A11. Do you have a vehicle that is used in your farming?							
Yes[1]		No[0]					
A12. How many batch stocks of broiler chickens do you keep in a year?							
A13. Please indicate the average number of broiler chickens per batch							
A14. Indicate the average number of broiler chickens you keep in a year							
A15. How long have you been keeping broiler chickens (in years).....							
A16. Which breed do you keep?							
Indigenous breeds [1]		Exotic Breeds[2]		Mixed breeds[3]			
A17. Do you own any of the following means of transport? If yes, indicate by ticking any of the option(s) provided.							
Yes [1]				No [0]			
Transportation Assets				Tick			
Vehicle[1]							
Motorbike[2]							
Bicycle[3]							
Wheelbarrow[4]							
Ox-cart[5]							
Other(specify).....							

SECTION B: BROILER MARKETING AND MARKET CHANNEL CHOICE

B1. Do you sell your broilers?					
Yes[1]		No[0]			
B2. If yes, indicate the average number of chickens sold in the previous year					
B5. How much is the price for live chicken? (M)					
B6. How much is the price for slaughtered chicken? (M).....					
B7. Which of the following market outlets do you sell your broilers to? Please indicate if there is any contractual agreement with the market outlet and how broilers are sold (<i>tick as appropriate</i>).					
Market Outlet	Tick	Contractual Agreement(<i>tick</i>)	Product Type(<i>tick</i>)		
			Alive[1]	Slaughtered[2]	Both[3]
Cooperatives[1]					
Collectors[2]					
Wholesalers[3]					
Retailers[4]					
Consumers[5]					
B8. Do you have access to a cold storage facility?					
Yes[1]		No[0]			
B9. If you are not selling at the farm-gate outlet, how long is the average distance to the nearest market outlet where you sell your chickens? (in km).....					

B10. How is the chicken price set during sales?							
Market Driven[1]		I set the Price[2]		Buyer Dictate Price[3]		We negotiate[4]	
B11. If you are the one who set the price, how do you decide on the selling price of the chicken? (tick the appropriate)							
Price Setting Strategy				Very Important[1]	Important[2]	Not Important[3]	
a) It depends on the price of other local farmers[1]							
b) It depends on the weight of the chicken[2]							
c) It depends on the market I sell to[3]							
d) It depends on the production costs[4]							
e) It depends on the transaction costs[5]							
B12. How do most of your customers rate a price for your broilers? (tick)							
Very Expensive[1]							
Somewhat Expensive[2]							
Moderate Price[3]							
Somewhat Cheap[4]							
Cheap[5]							
B13. How do you transport your products to the markets? (means of transport)							
MEANS OF TRANSPORT				TICK WHERE APPLICABLE			
Own Transport[1]							
Hired Transport[2]							
Public Transport[3]							
By Foot [4]							
Customers Collect for themselves[5]							

Other (specify)		
<p>B14. Which challenges do you encounter the most when marketing your broilers? Tick the appropriate and rate them using the Likert scale below.</p>		
Market Challenges	Tick	Rate
Lack of market information[1]		
Lack of access to formal markets[2]		
Inability to have contractual agreements[3]		
Poor institutional support[4]		
Long-distance to the market outlet[5]		
Lack of storage facilities[6]		
Lack of transport[7]		
Poor access to credit[8]		
Other(specify)		
<p>Likert Scale: 1=strongly agree, 2= Agree, 3= Neutral, 4= Disagree, 5=Strongly Disagree</p>		
<p>B15. How many years have you been engaged in broiler marketing?</p>		

SECTION C: ACCESS TO CREDIT AND EXTENSION SERVICES AND GROUP MEMBERSHIP

<p>C1. Have you ever applied for credit for the production of broiler?</p>				
Yes[1]		No[0]		
<p>C2. If yes, was the credit availed?</p>				
Yes[1]		No[0]		

C3. If you have accessed credit, indicate the source of credit			
Formal Sources[1]		Informal Sources[0]	
Commercial banks[1]		Friends[1]	
Agricultural Cooperatives[2]		Family members and relatives[2]	
Micro-finance Institutions[3]		Money lenders[3]	
Other (specify).....		Farmers Association[4]	
.....		Other (specify).....	
C4. Do you have access to Extension Services?			
Yes[1]		No[0]	
C5. If yes, which of the following are your sources of extension information/services?			
Extension Officers[1]		Printed Media[2]	
Public Extensions Workers[1]		Agricultural Newspapers[1]	Electronic Media[3]
Private Extension Workers[2]		Agricultural Magazines[2]	Televisions[1]
NGOs[3]		Brochures/Leaflets[3]	Radio[2]
Others[4]		Others[4]	Facebook[3]
			Internet[4]
			Others[5]
C6. What services do you get from the above-mentioned sources? (tick the appropriate)			
Services	Tick	Services	Tick
Diseases control and treatment[1]		Production supervision[6]	
Input sources and costs[2]		New technologies and methods[7]	

Broiler processing[3]		Market requirements. E.g. Quality and standards[8]	
Information on new market trends [4]		Other(specify)	
Price information[5]			
C7. If you have access to extension officers, how often do you have contact with them? (tick)			
Daily[1]		Quarterly[4]	
Weekly[2]		Annually[5]	
Monthly[3]		Other(specify)	
C8. Are you a member of any farmers' organization/cooperative?			
Yes[1]		No[0]	
C9. If yes, which of the following organization(s) do you belong to? (tick the appropriate)			
ORGANISATION	TICK	NAME	
Agricultural Cooperatives[1]			
Community Groups[2]			
Poultry Associations [3] e.g. BAPOFA			
Other (specify)			
C10. If YES, how do the cooperative(s)/farmer organisation(s) help you in marketing your produce? (tick the appropriate)			
SERVICES	TICK		
Provides market information[1]			
Access to credit[2]			
Input Acquisition[3]			
Extension services[4]			
Lobby with Markets[5]			

Training[6]		
Other(specify)		

SECTION D: MARKETING INFORMATION

D1. Do you have access to market information?						
Yes[1]		No[0]				
D2. Do you receive market information before selling?						
Yes[1]		No[0]				
D3. What are your sources of information? Please <i>tick</i> the appropriate box and <i>rate</i> them according to their importance as your sources of information using the <i>Likert Scale</i> below.						
SOURCES	Rate	TYPE OF MARKET INFORMATION				
		<i>Buyers</i> <i>[1]</i>	<i>Prices</i> <i>[2]</i>	<i>Market</i> <i>demand [3]</i>	<i>Market</i> <i>opportunities</i> <i>[4]</i>	<i>Other (specify)</i>
Extension Officers[1]						
Peer Farmers[2]						
Cooperatives[3]						
Family and Friends[4]						
Media [5]						
Traders[6]						
Other(specify)						

LIKERT SCALE: 1= Very Important, 2= Somewhat Important, 3= Neutral, 4=Somewhat Unimportant, 5=Very Unimportant