

ANALYSIS OF SOCIO-ECONOMIC FACTORS INFLUENCING INFORMAL AND  
FORMAL MARKET PARTICIPATION BY BEEF CATTLE FARMERS IN MAKHADO  
LOCAL MUNICIPALITY, LIMPOPO PROVINCE, SOUTH AFRICA

By

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**DECLARATION**

I, Sivhiya Mulalo Penenia, hereby declare that the mini-dissertation submitted to the University of Limpopo for the degree of Master of Science in Agriculture (Agricultural Economics) is original and has not previously been submitted by me for the degree at this or any other university; it is my own work in design and that all materials contained herein have been duly acknowledged.

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Signature

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Date

## **DEDICATION**

I dedicate this study to my mother, Sivhiya Angelina and brother, Sivhiya Rodney who have been my support structure during my academic years.

## **ACKNOWLEDGEMENTS**

I would like to express my gratitude to God who sits in the heavenly seat. The one who held my hand whenever I tried to give up. He comforted me through all my hardship and gave me strength and courage to keep going. The word of God says, "There is a time for every activity under the heaven" (Ecclesiastes 3:1). I was also given the opportunity and time to do my study and for this I am grateful.

Secondly, I would love to express my heartfelt gratitude to my lovely supervisors, Prof A Belete and Mr LJ Ledwaba as well as Prof IB Oluwatayo and my friends, who walked with me patiently from the beginning to the end of this project. They all encouraged me to have perseverance. They also motivated and advised me on how to tackle obstacles in my learning and writing journey. I also acknowledge the Department of Agriculture, Forestry and Fisheries who sponsored me in my post graduate studies.

Finally, I acknowledge Tshitale farmers who worked well with me. If it had not been for the farmers who agreed to participate in this study, this project would not have been successful. Their cooperation throughout will never go unappreciated.

## **ABSTRACT**

The purpose of this study was to analyse socioeconomic factors influencing formal and informal market participation by beef cattle farmers. Cattle production plays an important role in the provision of food worldwide. It is important for farmers to participate in the market to improve their income and livelihood. Globally, it was discovered that livestock production contributes value to the economic development of various countries. Ethiopia is one of the countries that generate more income from the livestock production. In the study area, farmers participate in the lower level of market participation. They sell at informal markets rather than formal markets because of insufficient market channels. The farmers seldom sell since their sale depends on the availability of the market. Hence, it was important to analyse socioeconomic factors influencing informal and formal market participation by small-scale beef cattle farmers at Makhado Local Municipality.

The aim of the study was to analyse socioeconomic factors influencing informal and formal market participation of small-scale beef cattle farmers in Makhado Local Municipality. The objectives of the study were to identify, describe the socioeconomic characteristics of beef cattle, determine the level of market participation of the beef cattle and analyse the influence of socioeconomic factors in the participation of the beef cattle farmers in both the formal and informal markets in Makhado local municipality.

Structured questionnaires were used to interview 82 cattle farmers who participate in both informal and formal markets. Descriptive statistics were used to analyse socioeconomic characteristics of the cattle farmers. The logistic regression model was used to analyse factors that influence the participation of small-scale cattle farmers in both formal and informal markets. Lastly, the market participation index tool was used to analyse the percentage of each farmer's participation in different markets.

The descriptive statistical results were showing men dominating participation in the market than women. The findings illustrate that farmers participating in the market were mostly pensioners who depend on social grants. Most of them are married and

have low level of education. The study also revealed that most beef cattle farmers are engaged in cattle farming for the purpose of sale instead of consumption. The logistic regression model results shows the coefficients for the independent variables such as gender, family size and farming experience to be significant at 1%. Age, marital status, monthly income, and distance to the market were found to be significant at 5%. Membership association were found to be significant at 10%. Educational level, extension services as well as the market information were found to be insignificant. The market participation index tool results revealed that the participation of beef cattle farmers in level 1 was 74.39%, level 2 18.29%, level 3 3.66% and lastly, in level 4, it was 3.66%. Additionally, the study revealed that only 1 farmer had a minimum score of participation of 3 and another farmer scored the highest participation of 23 out of all 82 farmers who participated in different market channels namely, homestead, village market, auctions, town market and fresh produce market.

The study indicated various constraints faced by cattle farmers in both formal and informal markets. However, for a farmer to be a full participant all farmers should be able to participate in all the above-mentioned market channels. Additionally, for a farmer to increase his/her level of market participation, there is a need for each farmer to sell many cattle per year in different marketing channels mentioned above. It is also vital to increase the cattle productivity and to decrease identified constraints that negatively influence market participation of beef cattle farmers.

Furthermore, constraints influencing market participation of beef cattle farmers need to be addressed to increase the sale of cattle by farmers. This requires assistance by both government and non-governmental stakeholders. Government stakeholders include extension officers, agricultural experts and veterinaries, while non-governmental stakeholders include meat quality experts, agricultural cattle commercial farmers, and cattle farm managers.

**Keywords:** Market participation, Market information system, Market participation level, Market channel, Beef cattle farmers. Makhado Municipality.



## Table of Contents

DECLARATION.....	i
DEDICATION.....	ii
ACKNOWLEDGEMENTS.....	iii
ABSTRACT.....	iv
LIST OF ACRONYMS.....	x
LIST OF APPENDIXES.....	xi
CHAPTER ONE: INTRODUCTION.....	1
1.1. Background to the study.....	1
1.2. Problem statement.....	2
1.3. Rationale of the study.....	3
1.4. Aim.....	4
1.5. The objectives of the study were to:.....	4
1.6. Hypotheses of the study.....	4
1.7. Organisational structure of the study.....	4
CHAPTER TWO: LITERATURE REVIEW.....	5
2.1. Introduction.....	5
2.2. Definition of term(s).....	5
CHAPTER THREE: RESEARCH METHODOLOGY.....	16
3.2. Study area.....	16
3.3. Data source and sampling methods.....	19
3.4. Analytical techniques.....	19
3.4.1. Descriptive statistics.....	19
3.4.3. Logistic Regression Model.....	21
3.5. Summary of the chapter.....	22
CHAPTER FOUR: RESULTS AND DISCUSSION.....	23
4.1. Introduction.....	23



4.2.	Socio-economic characteristics of cattle farmers.....	23
4.3.	Market participation.....	26
4.4.	Total market participation index results (refer to appendix 2).....	26
4.5.	The market participation indexes each farmer scored in different levels in percentages.....	28
4.6.	Logistic regression results.....	28
4.8.	Interpretation of Logistic regression model results.....	29
4.8.1.	Variable that are significant.....	29
4.8.2.	Variable that are insignificant.....	32
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.....		34
5.1.	Introduction.....	34
5.2.	Research summary.....	34
5.3.	Conclusion.....	36
5.4.	Recommendations.....	37

## LIST OF TABLES

Table 3.1: Market participation index box.....	20
Table 3.2: Explanation of variable(s).....	22
Table 4.1: The summary of age, family size and monthly income.....	25
Table 4.2: The summary of market participation in different gender.....	26
Table 4.3: Analysis of the logistic regression model.....	29

## LIST OF FIGURES

Figure 2.1: An ideal of cattle market information system.....	13
Figure 4.1: Gender of small-scale farmers.....	23
Figure 4.2: Marital status of the farmers.....	24
Figure 4.3: Educational level of the farmers.....	24
Figure 4.6: The extension accesses.....	25
Figure 4.5: Market participation level.....	28

## **LIST OF ACRONYMS**

NAMC	National Agricultural Marketing Council
DAFF	Department of Agriculture, Forestry and Fisheries
GDP	Gross Domestic Product
SAPS	South African Police Services
FAO	Food and Agricultural Organization
USDA	United State Department of Agriculture
MoFA	Ministry of Food and Agriculture
CID	Council for International Development
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HS	Household stead
TM	Town Market
VM	Village Market
FPM	Fresh Produce Market
TMPI	Total Market Participation Index
RMPI	Replication of Market Participation Index
NMPWC	Number of Market Participation Index Within a given Category

## **LIST OF APPENDIXES**

Appendix A: Questionnaire

Appendix B: Total market participation index



## CHAPTER ONE: INTRODUCTION

### 1.1. Background to the study

Cattle are contributing to the production of food worldwide. According to the Department of Agriculture, Forestry and Fisheries (DAFF, 2018) shows that South Africa is continuously reducing imports and increasing the level of production. As a result, the consumption of beef produced locally is increasing the level of exports because of good market strategy (Sihlobo, 2019; Phillips, 2017; Steyn, 2017).

The Food and Agricultural Organization of the United Nations (FAO, 2017) indicated that market participation is an important ingredient for agriculture in developing countries. Small-scale cattle farming can be commercialised through active cattle market participation, and has potential to venture into the improved market. It will serve as the developing country's comparative advantage and modify its rural economies. Abede *et al.* (2018) note that the commercialisation farming of system leads to increased productivity and improved quality of produce that contribute to improved income generation through market participation. Globally, agricultural livestock has been identified to contribute positively towards the economic development of various countries, with Ethiopia being the most perfect example (Birmadima *et al.* 2019).

Market participation is one of the factors contributing to rural economic development. Market participation resolution in South Africa brought about income growth, associated farmers with change in lifestyle, led to consumer preference, and has offered new opportunities for the smallholder livestock farmers to integrate into the market economy (Coetzee *et al.* 2005).

According to Shibru (2017), Ethiopia's agricultural livestock contributed about 16.5% of National Gross Domestic Product and 35.6% of agricultural GDP of their total gross domestic product. Agricultural livestock also earned 15% from exports and 30% of agricultural employment. Agricultural livestock has a great impact towards the economic development of Ethiopia. Habitu *et al.* (2019) indicate that Ethiopia is one of the countries that has more cattle resources in the whole of Africa. The sector has contributed 20% and generated 37% to 87% of their household income. To

participate in the market, there must first be development of market infrastructure, provision of market incentives to small scale farmers and development of institutionalisation market information service to enhance the commercialisation of agriculture.

In South Africa, market participation resolutions brought about income growth, associated farmers with change in lifestyle, led to consumer preference, and has offered new opportunities for the smallholder livestock farmers to integrate into the market economy (Ndoro, 2015). Although many small-scale farmers in Makhado Local Municipality participate in crop production as their source of income, few small-scale farmers participate in beef production (Lifhasi, 2013). This skewed representation could be because crop production is less expensive than cattle production (Sikhweni and Hassan, 2013). Interestingly, few studies analysing beef market participation in this municipality has been conducted.

The study sought to analyse socioeconomic factors influencing informal and formal market participation by small-scale beef cattle farmers at Makhado Local Municipality of Limpopo Province in South Africa.

## **1.2. Problem statement**

According to DAFF (2012), beef is one of the products that contribute significantly to the global value of agricultural output in the livestock industry. Rural communities do not keep livestock for non-economic benefits such as social and cultural status. They produce livestock to enhance their income and sustain their livelihoods. The farmers encounter problems of cattle predators and lack of efficient market channels that continue to undermine the role of cattle farming in enhancing the income of small-scale farmers (Storicko, 2015; Kerley *et al.* 2018).

The researcher identified that beef cattle farmers in the study area are operating at a lower level of market participation. They sell their product at informal markets (village market) rather than the formal markets. Soji (2015) and Muswema *et al.* (2007) share the same sentiment that very few farmers participate in the market for cattle. It has, therefore, become important to analyse factors influencing market participation of small-scale cattle farmers in Makhado Local Municipality. Small-scale farmers



consume more of their produce and trade surplus to their local customers (Delgado *et al.* 2001). The farmers have potential to produce cattle. However, a small percentage of their cattle is sold in the informal and formal market. These farmers seldom sell since their sales of cattle has been mostly dependant on the availability of the market (DAFF, 2012). The accessibility of the market offers the opportunities for farmers to increase their profit, and increased profit or profit incentives encourages farmers to continuously produce and grow their farming enterprises (Mdlalose, 2016).

### **1.3. Rationale of the study**

Mmbando (2014) argues that market and most importantly improved market participation play an important role in improving small-scale farmer's income. The market has been identified to be one of the factors that impact the measure of performance of agriculture in developing countries. Improved market access can be a significant element of poverty alleviation tool and improved livelihood (Sigei, 2014). Poor infrastructure and lack of transport makes it harder for small-scale farmers to participate in the market (Mdlalose, 2016).

South African small-scale cattle farmers wish to operate on the formal market, but they do not have enough cattle to supply to this market. Hence, the informal market is still dominant against the formal market. Generally, cattle farmers target local traders and households to supply their produce because they do not have the constant market to supply their product and they do not meet the criteria of the formal market (Marandure 2015; Soji *et al.* 2014).

Commercial agricultural participation plays a vital role in unlocking the opportunities of improved or a better income for the farmers and their livelihood (Omiti *et al.* 2009). Small-scale beef cattle farmers have the potential to improve the economy of a country. Hence, in Zambia the traditional cattle or small-scale cattle farming contributes about 85% of the beef industry of the country (Chilala, 2015).

The focus of this study is, therefore, to identify, describe and analyse socioeconomic factors influencing the participation of beef cattle farmers in the informal and formal market. The results of this study may assist policymakers in designing and improving

agricultural marketing policies that seek to improve the participation of cattle farmers in the market.

#### **1.4. Aim**

The aim of this study was to analyse socioeconomic factors influencing informal and formal market participation of small-scale beef cattle farmers in Makhado Local Municipality.

#### **1.5. The objectives of the study were to:**

- i. Identify and describe the socioeconomic characteristics of cattle farmers in Makhado Local Municipality.
- ii. Determine the level of market participation of beef cattle farmers in Makhado Local Municipality.
- iii. Analyse the influence of socioeconomic factors in the participation of beef cattle farmers in both the formal and informal markets in Makhado Local Municipality.

#### **1.6. Hypotheses of the study**

- i. There is a low level of market participation by beef cattle farmers in Makhado Local Municipality.
- ii. Socioeconomic factors do not have influence on the market participation of beef cattle farmers in Makhado Local Municipality.

#### **1.7. Organisational structure of the study**

The study is organised into five chapters. The first chapter consists of the background of the study, problem statement, rationale, aim of the study, objectives, hypotheses, as well as the outline of the study. The second chapter is the literature review, and covers the introduction, definition of concepts, market participation, market participation gap between commercial and subsistence farmers, marketing challenges faced by farmers, gender equality in the livestock market, and the impact of effective use of market information system by cattle small-scale farmers. The chapter contains local and international studies which other authors and researchers have developed. The literature review in relation to the marketing of agriculture, livestock and beef is included. The third chapter is the research methodology. The chapter describes the study area, data collection method, sampling method and

analytical tools used to analyse the data. The fourth chapter involves the results and discussion of the findings. Lastly, the fifth chapter deals with summary, conclusion, policy recommendation as well as the conclusion of the study.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1. Introduction**

This chapter provides the definitions of concepts and is followed by a review of previous studies which will help in the understanding of how the study derived its conclusion and help in descriptive, summarising, evaluating and clarification of the research topic. It also gives a theoretical basis of the research and determination of the research topic. After the definition of concepts, the review identifies and describes the socio-economic characteristics of cattle farmers and constraints of market participation among cattle farmers of the existing literature. This is followed by previous studies done in South Africa and internationally.

### **2.2. Definition of term(s)**

#### **2.2.1 Marketing**

The America Marketing Association (2013) defines marketing sets of activities such as institutions and processes for creating, communicating, delivering and exchanging offerings that have value for customers, clients, partners, and society at large. It can also be described as a person or organisation with the need for specific product such as cattle. Additionally, the clients must have the ability as well the willingness to buy the product or services. The possible market for livestock is hikers, meat processor companies, organisations in need of meat for catering, retailers and more (Du Bothma and DuToit, 2016).

#### **2.2.2 Agricultural marketing**

Haji (2014) defines agricultural marketing as activities that are involved in the transformation, handling, storing, processing and transporting of agricultural products to the domestic customer or foreign consumer. Hassanzoy (2013) is of the view that agricultural marketing involves services and functions of different institutions and intermediaries where there are product markets and input markets. The agricultural

market should answer the five decision questions of what and how is the farmer going to produce, when and where to produce as well as the quantity of the product to be produced.

### 2.2.3 Marketing information system

Harmon (2003) defines marketing information system as a system designed specifically for marketing information that is formally collected, stored, analysed and distributed to managers in accord with their informational needs on a regular planned basis. The importance of the market information system is to support farmers with marketing decision making. Binayee (2001) indicates that the market information system has a different way of collecting, analysing and disseminating market information. These include market research, internal records and reports.

### 2.2.4. Market channel strategy

Nado (2017) states that a market channel is the route that farmers use to distribute agricultural products from the farm until it reaches the consumers. Market channels vary because the marketing channel strategy uses four components namely; place, product, price and promotion to make decisions on how to move products from the farmer to the market (Coughlan, 2010). In addition, market channels vary because of kinds of product, quality products, the degree of specialisation and customers' demand for the product.

### 2.2.5 Market facilities

Market facilities refer to a structure, place or facility that is designed and built to serve a specific function of marketing products. Market facilities cover the packaging, distribution, storage and ripening, amongst others, depending on the product being marketed to achieve convenience or service (Shilpi and Umali-Deiningner, 2008). Togarepi *et al.* (2016) note that it is disadvantageous to farmers if market facilities are situated far from where the farmers are producing.

Based on the above concepts, the study will adopt Du Bothma and DuToit (2016), who indicated the possibilities of market channels in such as hikers and restaurants that small-scale farmers could participate. Hassanzoy (2013) notes that the use of agricultural marketing is an important instrument that helps small-scale farmers on the economic decision of production. Harmon (2003) indicated the purpose of the

market channel system.

### **2.3. Market participation**

According to Food and Agricultural Organization (FAO, 2017), market participation efficient and effective activities in the market that encourage the sale of commodities. It indicates an increase in the purchasing of inputs and output traded in all levels of farming, subsistence farming and commercial farming.

Musah (2013) estimated factors that influence the probability and intensity of market participation in maize and groundnuts market. To estimate the level of market participation, the household commercial index was used. The average output was 23.77% lower index of maize because it was for consumption purpose. Groundnuts surpassed by 52.56% high commercial index. The outcome was influenced by the fact that maize is produced for staple food and does not gain the status of cash crop while groundnuts produced gain cash crop. The increment of maize production needs extension services, that will monitor the production and assist farmers to implement new agricultural technologies. Government, through the Ministry of Food and Agriculture (MoFA), should initiate profitability improving measures in order to expand the efficiency of maize and groundnuts as this would increase attractive excess rank of family unit. MoFA ought to build up rural funds plan to address smallholder needs for credit (Musah 2014).

Zakarias and Teshale (2018) used logistic regression to determine the market participation decision by pastoral households, and found that cattle market participation is significantly influenced by cattle owned, camel owned and gender. Cattle and camel owned affect the market participation positively, indicating that the increased production of both cattle and camel provoke market participation. To encourage the increment of cattle and camel production, the government needs to intervene in terms of cooperative formation, market, market route searching, updating of the market information, capacity building, linking producers to market, adopting value tools and the integrated approach of different stakeholder to improve farmers.

Sikhweni and Hassan (2013) indicate opportunities and challenges facing small scale cattle farmers living adjacent to the Kruger National Park, Limpopo Province, that there are no results showing that in rural areas, farmers produce livestock for non-market benefits such as cultural purpose or social status, but it is the other way round.

Negassa *et al.* (2011) emphasise that farmers produce livestock to enhance their income and to sustain their standard of living. The role played by livestock in terms of contribution to the income of small-scale farmers is affected by the number of transactions, which is very small and lack marketing channels. In this case, you will find that the farmers did not sell their cattle in a year. Hence, Sikhweni and Hassan (2013) suggest that there should be policies that can facilitate opportunities and challenges faced by farmers, and efficient market channels should be implemented as part of government goals.

#### **2.4. Market participation gap between commercial and small-scale farmers**

The failure of subsistence farmers to access the formal market and lack of market information has added to farmers getting a low income from their livestock produce. The market participation of small-scale farming is affected by barriers to supply to the formal market led by the volume at which they offer to the market and the distance to reach the formal market (Ngqulana, 2017).

South Africa is under threat of losing billions of rand because of the current discovered periodic outbreak of the transboundary and the high impact of disease of livestock. This continuously undermines the domestic trade and exportation of red meat product (DAFF, 2018). Although red meat is one of the industries that is growing in the agricultural sector, cattle slaughtered decreased by 5.4% as a result of a 32.2% increase in beef imports.

The United States Department of Agriculture (USDA, 2018) shows that South Africa remains number 13 as a world-wide beef producer, while the United States and Brazil continue to be leading countries to produce and export beef. The United States is forecast to increase by 6%, which is driven by the major demand of beef by

countries like South Korea, Japan, Canada and Mexico. This indicates that the global demand and competitive prices can drive increase in production (Bradfield, 2018; Cook, 2018).

## 2.5. Marketing challenges faced by farmers

Nyamushamba *et al.* (2017) indicates the importance of livestock production in the life of people in a sense that it adds value to their day to day life activities. It contributes in terms of the food chain, income of farmers and social benefits where it contributes to power and traditional beliefs of most African people. Livestock farmers are endlessly not reaching their maximum day to day activities because of the challenges they encounter (Sholto-Douglers *et al.* 2015).

Malika (2018) argues that livestock production is the main financial resource for most farmers. For the farmer to maximise their profit, they need the necessary equipment as well as technology to produce. Farmers face many challenges that hinder them to improve their livelihood besides intervening in the procedures of commercialisation.

Livestock farmers are frequently faced with the challenge of whether their animals should be sold, slaughtered or kept for better prices. Prices of agricultural products are influenced by many factors, particularly livestock and meat prices such as feeds cost, regularity, rainfall, seasonality, consumer preference or demand for the product etc. Because of the above factors, it leads to uncertainty as to when should farmers market their product since they should know the market price to enhance profit (Furnari *et al.* 2016).

In South Africa information about slaughtering and meat prices is not easy to access for small-scale beef farmers. Small-scale farmers decide on pricing their products based on inadequate information, and this affects their profit negatively. Hence, it is advisable that farmers use industry experts to help them with various ways of maximising profit at lower cost of production (Agribook, 2019).

It is a huge challenge to market livestock because of several factors such as entrepreneur skills, lack of infrastructure, transportation, funds, and limited information, leading to high marketing cost that affects access to the formal market negatively, limiting farmers to develop a successful strategy (Sotsha *et al.* 2018).

Rojas-Downing *et al.* (2017) indicates that South African farmers are not only facing the problem of environmental global changes, the issues are greater than livestock



farmers' ability. Small-scale farmers also have a problem in terms of accessing the domestic market and insufficient knowledge of what consumers require, livestock product features, industry price determination, alternative market channels and how to advertise their livestock products deriving from lack of market information (Schnettler *et al.* 2008; Lapar *et al.* 2003). Hence, it is necessary to empower livestock farmers and for them to have equitable access to market through the dissemination of information (training).

Dibaba (2017) indicates that government and non-government organisations should partner to improve efforts of constructing market infrastructure to enhance market access. Simultaneous efforts are needed to expand the flow of market information, strengthen market access to finance and related livestock services to enhance successful market engagement of smallholder farmers. Malika (2018) emphasises that to improve market participation and market efficiency that will improve the economy, there is a need for the government to come with a long-term incentive through extension services to support livestock small-scale farmers, and the availability of veterinary services to work closely with the farmers in order to help them with the treatment of diseases to reduce livestock loss and stillbirth.

Ndoro *et al.* (2013) argue for livelihood factors affecting market participation and the supply of volume decisions among smallholder farmers in Okhahlamba Local Municipality, South Africa: implications for agricultural extension programming. The results show that cattle market participation is significantly hindered by inadequate access to agricultural extension, limited productivity of local breed and non-compliance with cattle registration. The difference in the strategy explains the observed rate of market participation amongst small scale cattle farmers in Okhahlamba Municipality, where price signal is considered after-market participation has been made. The potential extension model required for South Africa is the public extension, and architecture to produce innovations that address complex challenges. The bottom-up approach gauges the need for a diverse extension approach for poor agricultural market development in South Africa.

## 2.6. Gender equality in the livestock market

Council for International Development (CID, 2012) argues that gender equality refers to the fact that people are equally able to make free decisions without boundaries established by stereotypes, and that their different contribution needs are valued. This means women having the same opportunity as men to lead, accessing properties and livestock ownership.

Almenberg and Dreber (2013) conducted a study on gender, stock market participation and financial literacy. The study found a gender gap between women and men using the six probit regression. Women significantly participate less in the stock market and score lower in financial literacy. To reduce the gender gap in the stock market participation between women and men, it is necessary to control financial literacy.

Kristjanson et al. (2010) revealed that women are vulnerable and have no access to land production. Livestock is the safety net that women own, helping the poor not to fall into the poverty pit. Livestock is the only asset that women own or control and can sell during household emergencies to close household gaps. Livestock plays a vital role in securing household insecurity. Mahmood *et al.* (2014) states that livestock is the non-land asset in rural areas and provide high returns through offspring. Since livestock is the only assets that women can easily own, they also have the potential to contribute to the reduction of the gender assets gap between households. It is easy for women to own livestock than to own the land either through purchase, inheritance, or other physical assets. Kohler-Rollefson (2012) notes that women are the most contributors in the agricultural economy, and can only be disadvantaged to own livestock because of stock theft, untimely death, safeguard and have challenges in terms of access to credit, own land, limited information of the market price system, leading to difficulty to the profitable market. If women were to be given the same level of resources, the production would increase (Njuki and Sanginga, 2013).

In India, livestock production is largely in the hands of women. Besides considerable involvement and contribution of women, considerable gender inequalities also exist in Indian villages. Therefore, there is a need to correct gender unfairness in the livestock sector. Efforts are needed to increase the capacity of women to negotiate

with confidence and to meet their strategic needs (Assan, 2014).

According to Patel *et al.* (2016), in India 69% of the livestock sector and marketing is handled by women. Mostly, animal husbandry is becoming feminised. Most of the agricultural activities are controlled by women, including 60% to 90% of the rural marketing, 80% of agricultural work, 80% of food producers and 10% of foodstuffs processing. Regardless of women involvement in the livestock production process, livestock is always ready for market. Women are still discriminated from accessing and owning technology, information, services, assets, land and livestock due to gender inequality (Njuki and Sanginga, 2013).

Furthermore, with evidence that women are too involved in the livestock sector, there is a need to correct gender unreasonableness so that women will be able to confidently negotiate and meet the strategic need to improve the livestock sector (FAO 2013).

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ, 2012) argues that women play a vital role in livestock production worldwide. It is estimated that poor women who keep and depend on livestock for income account for two-thirds of the 400 million. Many countries are still faced with the problem of women having to own properties or resources. Women and men have different objectives, so they need to be granted the opportunity to identify and address these objectives differently. Different societies are constituted by cultural norms that suppress women. Ownership of land and livestock is precious to women in most societies. To reduce the poverty level of women in the world can be done through initiatives of women empowerment by giving them land and right of ownership of properties (Schwartz 2005).

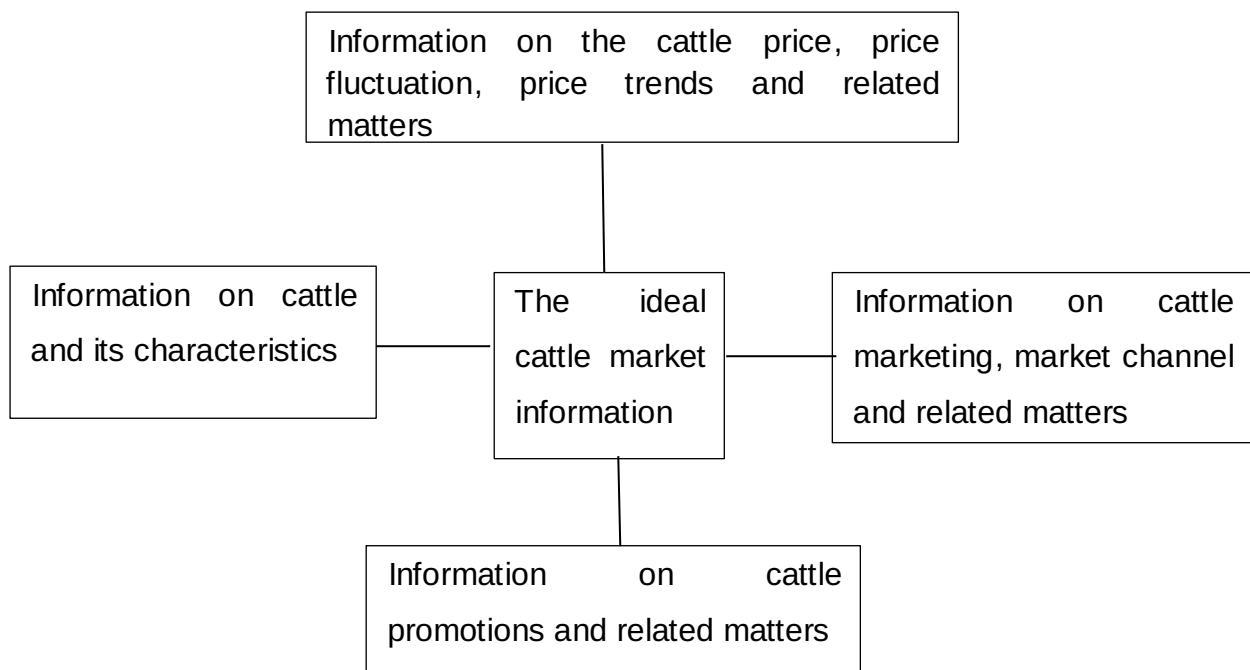
## **2.7. The impact of effective use of the market information system by cattle small- scale farmers**

Nkuba (2016) defines the market information system as the structure intended to assemble the conditions and agricultural market dynamics to various stakeholders through at least one market channel for decision making. Market information was developed to increase the transparency of markets by giving disadvantaged small-

scale farmers current price information because of remote areas where they are located.

Market information system plays an important role in improving the economic performance of farmers in the competitive markets by supplying the necessary information in different administration levels. Market information has an impact on the success of the marketing process. The market information system can serve as a tool used to identify, measure, forecast and analyse market segments by market management (Fraidhat 2012).

The development of rural farmers can be dependent on the improved, relevant and reliable information which can be provided through research, education, extension and agricultural market. Hence, it is essential for farmers to make decisions with the understanding of agricultural information system (Ogunkoya 2014).



**Figure 2.1: An ideal cattle market information system**

Source: Adopted from Ntshepe (2011)

The diagram above indicates the ideal of what should be included in the cattle market information system. Ntshepe (2011) indicate that there is a huge gap that needs to be filled in relation to market information for small scale cattle farmers. Farmers are struggling to access market information such as the market channel and price fluctuation, which has a positive influence on their participation on the market.

For a farmer to practise an effective market information system, one should have collaborated with such information stated above in the diagram. Having up to date information about inputs prices, as well as demand and price trends equips farmers with negotiating spot and help on where and when, how to purchase or sell as well as what to produce, and how much quantity should a farmer supply in the future (Amer *et al.* 2018).

## **2.8. The effect of market channel strategies on market participation**

Yumurtaci *et al.* (2016) describe marketing channels as a set of independent organisations that concentrate on the availability of product to the final consumer, connecting firms with the final consumer or end-user. The importance of the marketing channel strategy is to exchange goods, money and information. The decision made on which marketing channel strategy to use involve all channel members in person or online.

Ntshangase (2014) argues that most rural farmers must take into consideration the cost incurred during the process of making a decision on which market channel to use, which involve the transportation prices, profit and price of the product. The choice in which farmers choose to operate can pose a negative effect on market participation, which leads to lower earnings (Senyolo, 2007). Amongst the things that contribute to lower returns is that most emerging farmers are forced by remote areas to supply their products in informal markets, although some farmers operate in more than one market channel. Long-distance always discourages farmers from progressing to commercial farming (Montshe 2006).

Soe *at al.* (2015) indicate that for small-scale farmers to benefit from market channel strategies, there is a need to solve the problem of social, economic and technical constraints. The availability of market information boosts farmers with knowledge and decision making on the market channel in which they should participate. Hence, it is essential to identify technical and intuitional factors that are affecting the market channel of the farmers, which will help in policymaking and institution innovation ( Ntshangase, 2014).

## **2.9. The importance of market facilities on small-scale beef cattle**

Khapayi and Collier (2016) indicate the importance of market facilities on the study, factors limiting and preventing emerging farmers to progress to commercial agricultural farming in the King William's Town area of Eastern Cape Province, South Africa. Market facilities are important to farmers to facilitate a positive impact on the improvement of market access through an increased level of sale at the market. Farmers are facing the challenges of shortage of market facilities such as sale pen and loading ramps for livestock. Farmers can have potential to produce good quality products, but fail to reap deserving profit for these products because of insufficient market facilities.

Moyo (2010) indicates that in rural areas, there are limited modes of transportation that can be used by small-scale farmers to transport their final products to the market. There is a need for the government to balance the equation of the rural and urban areas by injecting transport during the peak market period. Farmers should also gain from urban market facilities.

Furthermore, small-scale farmers are failing to participate in the formal market that yield more returns. For farmers to contribute to their rural economic growth and development and transform to commercial farming sectors, factors such as market facilities should be addressed effectively (Ina livestock, 2014).

## **2.10. Summary**

The above literature shows factors influencing market participation in different countries. The factors influencing market participation may be similar in the country and may also differ due to location, resource and infrastructure, which are accessible by small-scale beef cattle farmers. This study seeks to analyse socioeconomic factors influencing informal and formal market participation by small-scale beef cattle farmers in Makhado Local Municipality of Limpopo in South Africa.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1. Introduction**

The research methodology gives a complete description of the methods used to conduct the research. It explains the different research instruments considered in data collection. This chapter provides an overview of methods used to sample, collect and to analyse data. The chapter also describes the selected study, the location, physical features and farming activities in the study area. It includes sampling procedures, data collection techniques, data analysis methods, market participation index box and the explanation of variables.

### **3.2. Study area**

The research was conducted in South Africa, Limpopo Province, which consists of five districts, Vhembe, Waterberg, Capricorn, Sekhukhune and Mopane Districts. The focus was in Makhado Local Municipality, which is part of Vhembe District, situated in the northern part of Limpopo Province in South Africa. In the south-eastern parts, the district borders Mozambique by Kruger National Park as well as Zimbabwe and Botswana in the north-west. Before it had Transvaal and areas which were under the administration of Venda and Gazankulu Bantustans (Municipality of South Africa, 2019).



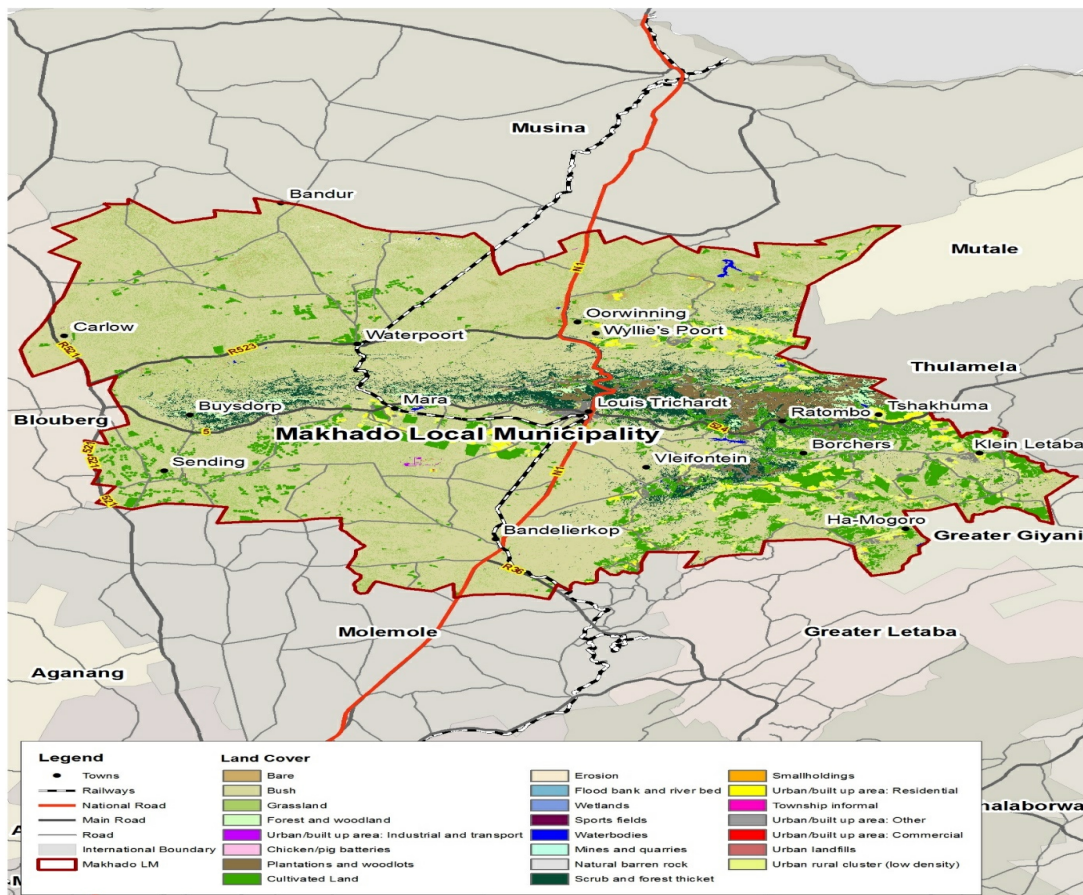
Limpopo province ■

**Figure 3.1: Map of Limpopo province**

**Source: Department of Road and Transport (2012)**

Makhado Local Municipality is within Vhembe District. The municipality's boundaries connect with other four municipalities: Musina Municipality in the north, Greater Giyani in the south, Thulamela in the east and Molemole in the west. Previously, it was called Louis Trichardt until the town council decided to change its name during the later municipal demarcation to Makhado Local Municipality. The municipality is predominated by rural areas, with legendary cultural hubs and multiple holiday resorts (Municipality of South Africa, 2019).





**Figure 3.2: Map of Makhado Local Municipality**

**Source: Department of Road and Transport (2012)**

The study specifically took place in Tshitale ward (Mphuphuledzhi, Lambani, Pfananani, Donkerhook and Mamphagi Villages). These villages are dominated by people who speak Tshivenda, Southern Sotho and Tsonga. The ward consists of facilities such as seven schools, Tshitale Department of Agriculture, post office facilities and the SAPS (South African Police Service). The ward consists of a population of 33 710 households (SRK consulting, 2011). The geographic

coordinates for the ward are S E . The economic activities of this area include agricultural production for both crops and livestock. Agriculture is still predominant, and farmers rely more on rainfall. Cattle and goats depend on open grazing, while pigs and chickens are fed indoor with household leftovers.

### **3.3. Data source and sampling methods**

Primary data was collected using structured questionnaires to obtain the required data for the study. A total of 82 cattle farmers were interviewed from the population of 147 cattle farmers in Tshitale (from captured data of Tshitale Department of Agriculture). Random sampling and proportionate sampling were used to select each farmer in Tshitale ward. Proportionate sampling formulae below were used to calculate the required number of cattle farmers from each Village. For example, if Donkerhook has 40 cattle farmers, to get 22 cattle farmers one must calculate the number of farmers to be interviewed using the proportionate sampling formulae below and do the same with other villages. Mamphagi is 17 from 30, Pfananani 23 from 41, Mphuphuledzhi 09 from 17 and Lambani 11 from 19 . In each village, the farmers were randomly selected.

Proportionate sampling formulae to calculate number of farmers in each village

Number of farmers in each village =  $\frac{\text{Sample size}}{\text{Total population}} \times \text{Village population}$

Example: Donkerhook farmers =  $\frac{82}{147} \times 40 = 22$  farmers.

### **3.4. Analytical techniques**

To achieve the objectives of the study, three analytical tools were used namely, descriptive statistics, logistic regression and total market participation index.

#### **3.4.1. Descriptive statistics**

Descriptive statistics was used to identify and describe the socioeconomic characteristics of cattle farmers at each village in Makhado Local Municipality. Graphs are used to illustrate and discuss the socioeconomic characteristics of cattle farmers and constraints affecting them in Makhado Local Municipality.

#### **3.4.2. The total market participation index**

The indexing was adopted to measure the level of market participation by beef cattle farmers in Makhado, and assisted in understanding the level at which the farmer operates from the market category, namely, household stead (HS), village market (VM), auction, town market (TM) and fresh produce market (FPM) (Gani and Adeoti, 2011). This is calculated as follows:

TMPI = Total market participation index

RMPI = Replication of market participation index

NMPWC = Number of market participants within a given category

TMPI = 100%

**Table 3.1: Market participation index box**

Herds	H S (1)	VM (2)	Auction (3)	TM (4)	FPM (5)	Age 5 yrs.	Age +/-5 yrs.	Consumer (1)	Trader (2)
0	-	-	-	-	-	-	-	-	-
≤2 (1)	X1	X2	X3	X4	X5	X1	X2	X1	X2
3≤5 (2)	X2	X4	X6	X8	X10	X2	X4	X2	X4
6≤8 (3)	X3	X6	X9	X12	X15	X3	X6	X3	X6
≥9 (4)	X4	X8	X12	X16	X20	X4	X8	X4	X8

Minimum score =  $X1+X1+X1= X3$

Maximum score =  $X4+X8+X12+X16+X20+X4+X8+X4+X8= X84$

When scores are below the minimum number of cattle sold and indices in market location and buyer, it implies that the farmers are not participating in the market. If the score is between the number of cattle sold and indices in the matrix market location and buyer compute the minimum score of 3, it implies the least of the market participation, and when the maximum score is 84, it implies the highest market participation in various markets. The level is categorised into 4 levels (1,2,3,4), depending on the number of herds sold per year (Gani and Adeoti, 2011).

The dependent variable is farmers who are either participating in the market or not, and will be measured by the livestock market participation characteristics, namely: livestock sale (household farmers who sell their cattle), on-farm livestock slaughtering (farmers are likely to slaughter their cattle for home consumption) and the livestock purchase (those farmers who purchase cattle purposeful for consumption, breeding and production) (Negassa *et al.* 2017).

### 3.4.3. Logistic Regression Model

The logistic regression model was used to address objective three, which is to analyse factors influencing market participation of beef cattle farmers in Makhado Local Municipality. In this case, the logistic regression helps in understanding how socioeconomic characteristics influence the market participation of cattle farmers. The logit model is used to predict a dichotomous outcome. This means that the problem that needs to be solved needs a method that can explain a binary endogenous variable (yes or no) by the set of covariates that determine the outcome of the decision (Hormer and Lemeshow 2000). The general logistic regression model can be as follows:

... ..

Where:

N = Number of regressors

= Logit of odds

= Market participation of the farmers (1)

and 1- = non-market participation of farmers (0)

to Explanatory variables that influence the dependent variable.

**Table 3.2: Explanation of variable(s)**

<b>Variables</b>	<b>Description of variables</b>	<b>Unit of measurements</b>
<b>Dependent:</b> Market participation	1 – If beef cattle farmers participate in the market. 0 – If beef cattle farmers do not participate in the market.	Dummy
<b>Independent variables</b>		
X <sub>1</sub> = Gender	1- Male, 0- Female	Dummy
X <sub>2</sub> = Age	Age of the household head	Years
X <sub>3</sub> = Marital status	1 - Married, 0 - Otherwise	Dummy
X <sub>4</sub> =Educational level	Years of schooling	Years
X <sub>5</sub> = Family size	The number of households	Actual number
X <sub>6</sub> = Farming experience	Years of farming	Years
X <sub>7</sub> = Income	Monthly Income of households	Actual amount
X <sub>8</sub> = Extension service	1 - Yes, 0 – otherwise	Dummy
X <sub>9</sub> = Membership association	1 - Yes, 0 – otherwise	Dummy
X <sub>10</sub> = Market information	1 - Yes, 0 – otherwise	Dummy
X <sub>11</sub> = Distance	Distance to the market	Km

### 3.5. Summary of the chapter

The study was conducted in 5 villages, namely Mphuphuledzhi, Lambani, Pfananani, Donkerhook and Mamphagi Villages under Makhado Local Municipality. The study used primary data and structured questionnaires. Descriptive statistics was applied to basic characteristics of beef cattle farmers. The logistic regression model was used and preserved against potential variables which influence market participation of beef cattle. The market participation index was used to measure the level at which beef cattle farmers participate in the market.

## CHAPTER FOUR: RESULTS AND DISCUSSION

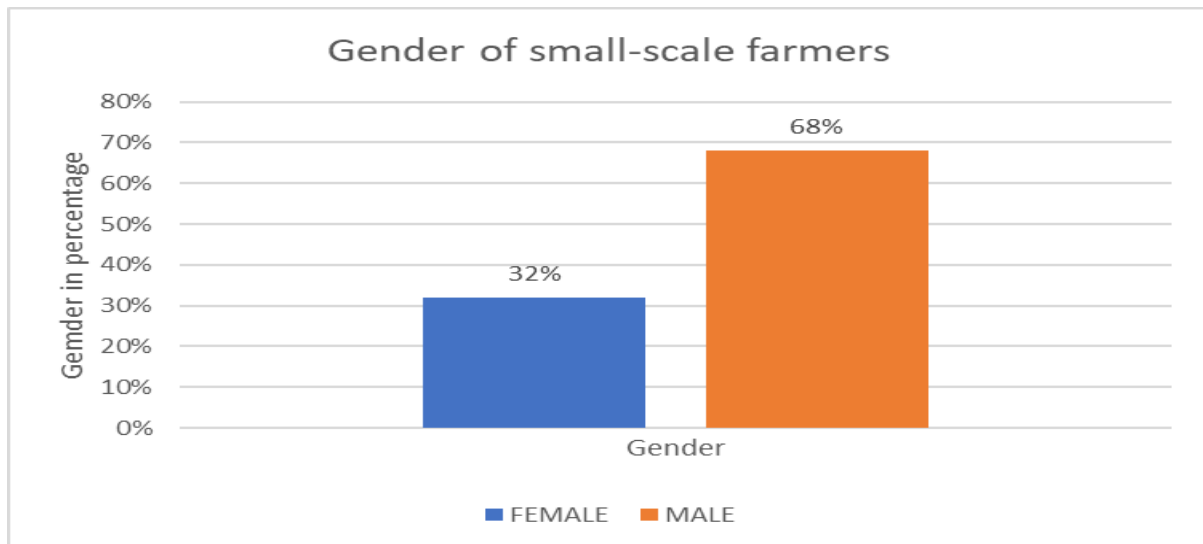
### 4.1. Introduction

This chapter summarises and presents the empirical and descriptive statistical analysis used as discussed in the previous chapter. Descriptive statistics was used to identify and describe the socio-economic characteristics of small-scale cattle farmers in Makhado Local Municipality. The chapter also discusses the socio-economic characteristics of the respondents.

The chapter further tested the hypothesis that socioeconomic factors do not have influence on market participation and there is a low level of market participation by beef cattle farmers in Makhado Local Municipality.

### 4.2. Socio-economic characteristics of cattle farmers

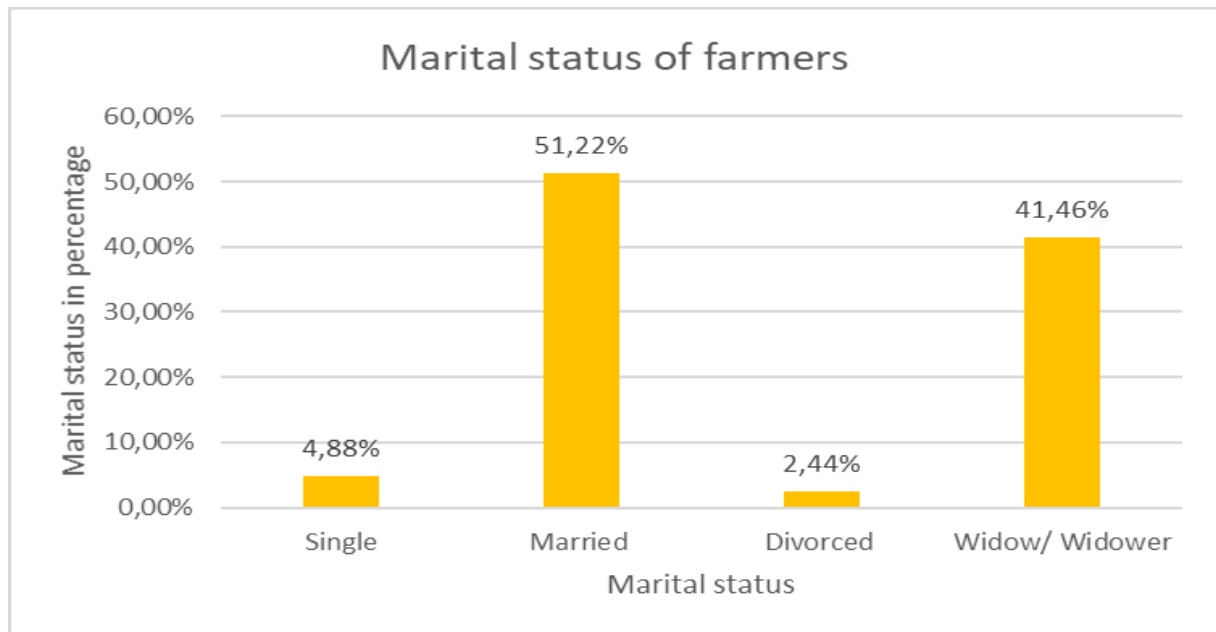
The section uses descriptive statistics to illustrate and interpret factors that determine market participation in Makhado Local Municipality. The variables discussed in this section explain characteristics of small-scale beef farmers, cattle production status, and the market performance of beef cattle farmers in Makhado Local Municipality.



Source: Data 2019

**Figure 4.1: Gender of small-scale farmers**

Figure 4.1 indicates the gender percentage of small-scale cattle farmers in Makhado Local Municipality. In the survey, males accounted for 68% of the participants over women who only comprised 32%. The results simply indicate that cattle production in Makhado Local Municipality is dominated by males.

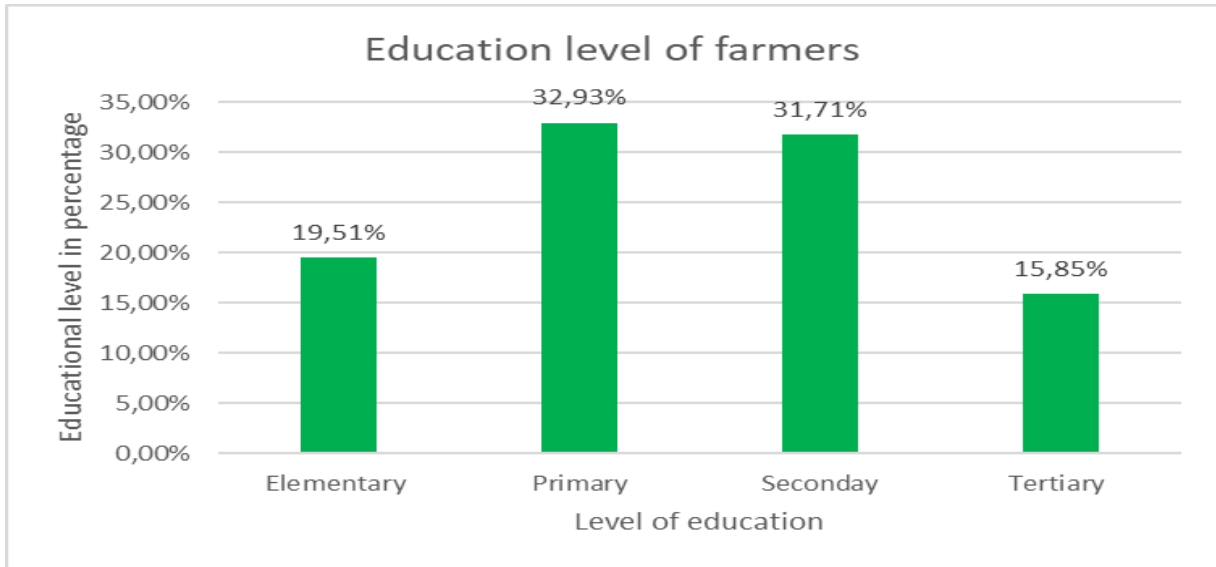


Source: Data 2019

**Figure 4.2: Marital status of the farmers**

Figure 4.3 reveals that most farmers who participated in the production of cattle in Makhado Local Municipality are married. The results indicate that farmers accounted for 4.88%, 51.22%, 2.44%, and 41.46%, single, married, divorced, and widow or widower, respectively.

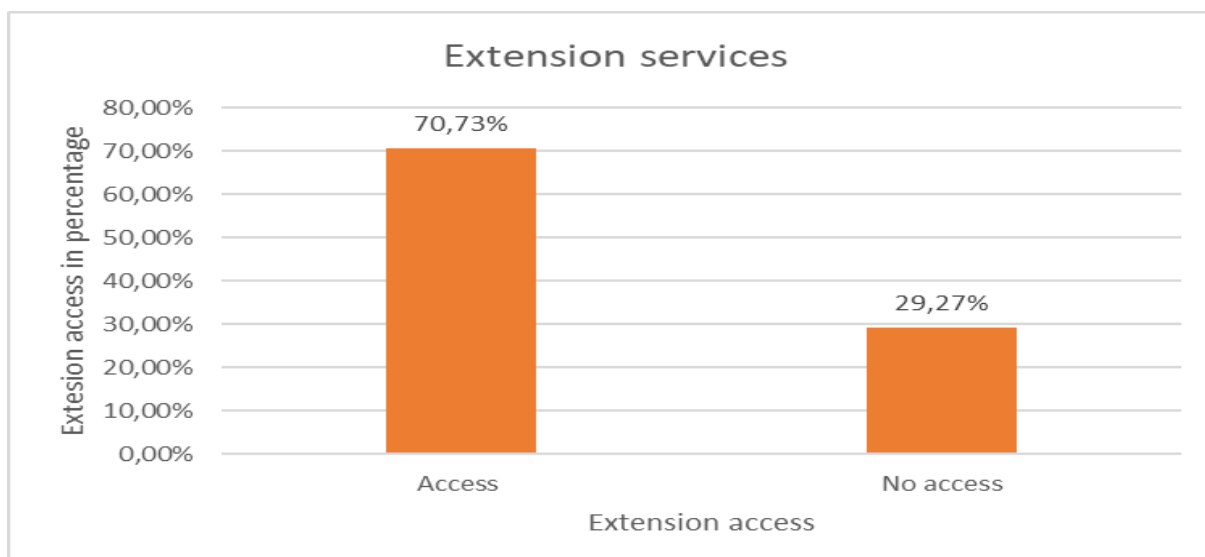




Source: Data 2019

**Figure 4.3: Educational level of the farmers**

Figure 4.4 indicates the educational level of beef cattle farmers in Makhado Local Municipality. According to the results, those with elementary education, those farmers who did not go to any formal school constituted 19.51% of the farmers. Although most farmers did not complete secondary level, those at primary level constituted 32.93%, while those who went up to secondary level computed 31.71% of farmers. Lastly, cattle farmers who furthered their education beyond secondary level constituted 15.85% of farmers. From the findings, most farmers can read and write since they had access to basic education.



Source: Data 2019

#### Figure 4.4: The extension access

Figure 4.6 indicates the percentage of the small-scale beef farmers who had access to and those who did not have access to, extension services in Makhado Local Municipality. The figure shows that from the 82 surveyed farmers, 70.73% small-scale cattle farmers have access to extension services while those with no access to extension services account for 29.27% participants.

**Table 4.1: Summary of family size, age and monthly income**

Variables	Min	Max	Mean	Std deviation
Age	35	94	65.26	13.683
Family size	1	11	4.95	2.388
Monthly income	600	60 000	9 908.11	14 466.835

Source: Data 2019

Table 4.1 indicates that , the youngest farmer was 35 years old and the oldest farmers was found to be 94 years old with the average age of 65 years and standard deviation of 13.683. The family size of farmers ranged from 1 to 11 members per household. The result from the study shows a standard deviation of 2.3388. The

survey had an average family size of 4.95 small-scale beef cattle farmers, indicating that most small-scale farmers stay with family members who are about five people per household in the study area. The total monthly income was found to be R600 minimum income and maximum income to be R60 000. Lastly the average monthly income of farmers is R9 908.11 with the standard deviation of R14 466.84. The standard deviation for the variable monthly income is expected to be higher than the mean because the data is widely distributed with a positive skewness.

#### 4.3. Market participation

**Table 4.2: Summary of market participation in terms of gender**

Gender	Market participation (%)	
	Market participants	Non-market participants
Male	56.10	13.41
Female	13.41	17.10
Total	69.51	30.51

Source: Data 2019

The table above indicates that, of the 69.51 % farmers who participated in the market, 56.10% are males while 13.41% represent females. The results also show that there are 30.51% farmers who did not participate in the market, of which 17.10% of them were female and 13.41% were male.

#### 4.4. Total market participation index results (refer to appendix 2)

In the section, the level of market participation was estimated using the total market participation index tool for small-scale beef farmers. The total number of participants were operating in five different markets, farm gate market, village market, auction market, town market and fresh produce market.

The total market participation index

TMPI = Total market participation index

RMPI = Replication of market participation index

NMPWC = Number of market participants within a given category

TMPI = 100%

### **61 respondents selling at most 2 cattle per year in different markets**

TMPI = 100%

TMPI = 74.39%

### **15 respondents selling 3 to 5 cattle per year in different markets**

TMPI = 100%

TMPI = 18.29%

### **3 respondents selling 6 to 8 cattle per year in different markets**

TMPI 100%

TMPI = 3.66%

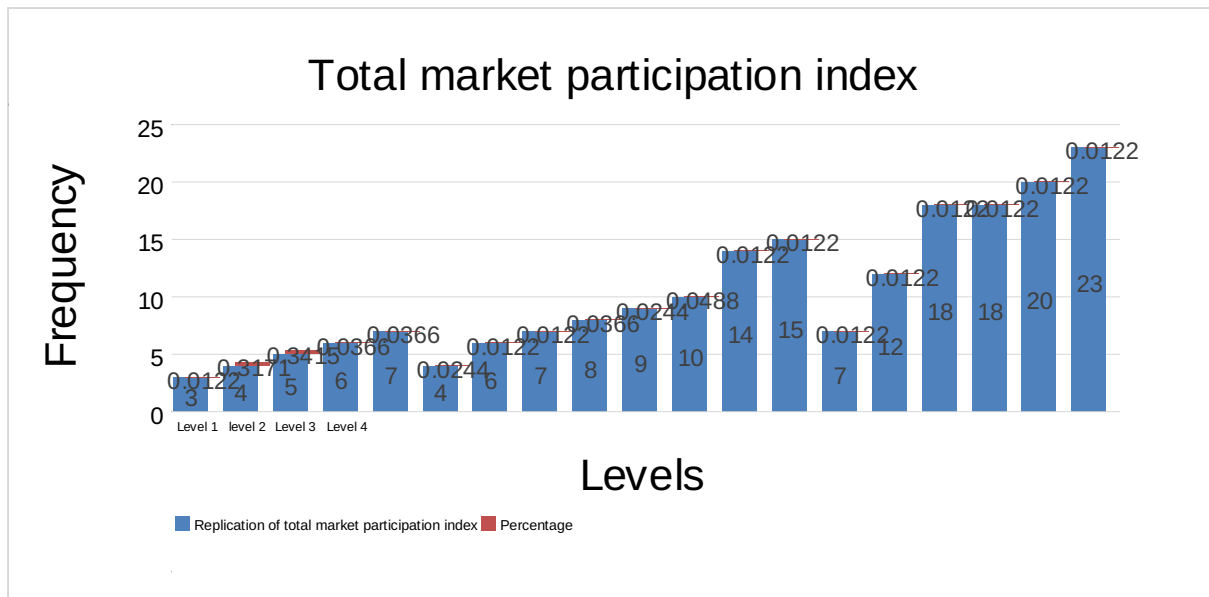
### **3 respondents selling at least 9 and more cattle per year in different markets**

TMPI 100%

TMPI 3.66%

The calculation above indicates the market index measured by the number of cattle sold in a different market. It contains four levels, one to four. Level 1 is measured by 2 or less cattle sold by small-scale cattle farmers per year, level 2 is between 3 to 5 cattle sold, level 3 is between 6 and 8 cattle sold, and level 4 is 9 or more cattle . The four-level of market participation represents the total sample of 82 beef cattle farmers who participated in the market. Each farmer had a different level. The results indicate that were 61 farmers who participated in level 1 accounting for 74.39%, level 2 had 15 farmers constituting 18.29% of the farmers, in level 3, there were 3 farmers contributing 3.66% and lastly is level 4, with the 3 farmers contributing 3.66%.

#### **4.5. The market participation indexes each farmer scored in different levels in percentages**



Source: Data 2019

**Figure 4.5: Market participation level**

Figure 4.7 indicates that only one farmer scored level 3 (1.22%) and is operating at level 1 which is a minimum level of market participation. The highest level of market participation (level 4) also had one farmer who scored level 23. The highest score when farmers are participating well in the market is supposed to be 84 maximum scores. Farmers surveyed could not compute half of maximum score as a result of those who participated mostly in the village market.

#### 4.6. Logistic regression results

The section contains the table of logistic regression model results. The logistic regression was tested to grasp variables that are significant and non-significant to market participation of beef small-scale farmers in Makhado Local Municipality. The logistic regression model shows the probabilities of factors that are influencing market participation significantly and insignificantly.

In summary, the results of the model indicates that -2 log likelihood is 64.203, R

squred is 50.9 and Chi-square is 81.7. The logistic regression model was run with 82 observations using eleven variables. The results show that out of 11 variables, 8 variables were significant. The variables include gender, age, family size, marital status, farming experience, monthly income, distance and membership association.

#### 4.7. Analysis of the logistic regression model

Variables	Coefficient	Standard error	Marginal effect ()	Wald	Significant level
Constant	-6.114*	2.409		6.442	0.011
Gender	1.620*	0.913	0.2706025	3.145	0.076
Age	0.068**	0.032	-0.0006534	4.572	0.033
Family size	0.256*	0.151	0.0163431	2.864	0.091
Marital status	1.720**	0.748	0.2282299	5.280	0.022
Educational level	0.055	0.106	-0.02203	0.291	0.590
Monthly income	0.000**	0.000	0.0000121	4.174	0.041
Farming experience	-0.046*	0.025	-0.0040815	3.495	0.062
Distance	-0.113**	0.057	-0.0111691	3.882	0.049
Extension service	21.390	25791.319	2.197403	0.000	0.999
Market information	-0.544	1.370	-0.0860048	0.158	0.691
Membership association	-20.296***	25791.319	-2.086009	0.000	0.000
-2 log likelihood				64.203%	
R squared				50.9%	
%cases correctly predicted				81.7%	
Chi-squared				19.420	

**Table 4.3: Analysis of the logistic regression model**

\*, \*\*, \*\*\* the mean difference is significant at 10%, 5% and 1% respectively.

Source: Data 2019

#### 4.8. Interpretation of Logistic regression model results

##### 4.8.1. Variable that are significant

Gender of the farmer

The gender of the household head was found to be at 10% level of significance, explaining the market participation of the farmers in Makhado Local Municipality. The gender of household has a positive sign on coefficient and significantly influences the market participation. A unit increase of male gender increases the odds of market participation with a marginal effect of 0.2706025. The results are also in line with a study by Hlomendlini (2015), who found increased in males to have potential to participate more in the market than females. This contradicts a study by Olwande and Mathengwe (2012), who say that a unit increase of female improves market participation.

#### Age

The age of farmers was found to be 5% level of significant and the coefficient was found to be positive, indicating the likelihood of age having a positive influence on market participation. The probability is that the older the farmer gets, the more likely they are to participate in agricultural activities. A unit increase of age influences the odds of market participation with -0.0006534 marginal effect. The result is in line with findings by Musah *et al.* (2014) and Sigei (2014), who argue that market participation declines with the age because older farmers are not risk-averse and struggle to adopt to new technology.

#### Family size

The family size of the farmer was found to be 10% level of significance and the coefficient of family size was positive, meaning the variable is more likely to affect market participation positively. The family size is directly proportional to the level of market participation. The larger the family, the more likely the distribution of farming-related activities within family members.. A unit increase of family size increases the probability of market participation with a marginal effect of 0.163431. The results are like those by Osmani and Hossain (2015) and Musah *et al.* (2014).

#### Marital status

The marital status of the farmer (married=1, otherwise 0) was found to be 5% level of significance. The coefficient was found to have a positive influence on market participation of farmers in the study area. A unit increase of married people increases the likelihood of market participation with a marginal effect of 0.2282299. Married

farmers had a positive influence on market participation. This is because married people normally help each other to develop everything in the house, including how to sell their products to increase household income. The results contradict findings by Akidi (2016) and Musah *et al.* (2014), who indicate that married people have more responsibilities that they need to accomplish daily, which affects household market participation negatively.

#### Monthly income

The results show that monthly income is statistically significant at 5%. The variable was found to be positive, indicating a positive influence on market participation. The implication is that a unit increase of farmer's monthly income increases the odds of market participation about 0.0000121 times. Increased farmer's income increases the probability of farmers to use the portion of the money to consult market specialists and to transport their cattle to town markets and auctions that will enhance their market participation. The results concur with findings by Musah *et al.* (2014).

#### Farming experience

Farming experience is a significant factor in determining farming productivity and product marketing. The coefficient was found to be negative at 10% level of significance. The implication of this finding is that a unit increase of farming experience has probabilities to decrease market participation about -0.0040815 times. The finding contradicts findings by Gani and Adeoti (2011).

#### Distance

The variable distance has influence on the market participation by Makhado Local Municipality farmers. The coefficient was found to be negative and the results show that it is significant at 5% level. A unit increase of long distance have the probability to decreases market participation with -0.0111691 marginal effect. The long-distance consequently fail farmers to supply their products to markets because of low income and no transport in rural areas, leading to a gradual decrease in market participation. The findings are like those by Baloyi (2010), Gani and Adeoti (2011), Musah *et al.* (2014), Mmbando (2014), Hlomendlini (2015) and Akidi (2016).



## Membership association

Membership association plays an important role in market participation of the farmer. The membership association was found to be significant at 1% level. The coefficient of the variable is negative, meaning that a unit increase of farmers belonging to membership association has a probability to decrease market participation with a marginal effect of -2.086009. The results contradict findings by Mmbando (2014) and Akidi (2016), who show that shared information amongst the farmers increases the sale of the product.

### **4.8.2. Variable that are insignificant**

#### Educational level

The educational level of beef cattle farmers in Makhado Local Municipality was found to be statistically insignificant. The coefficient was found to be positive although it is insignificant, which is unexpected because education is important to every farmer to develop in terms of new information available in the books, research and internet. The results are like Sigei (2014), Musah *et al.* (2014) and Liu *at al.* (2014), who argue that education improves the managerial skills and understanding of market-related concepts.

#### Extension services

Extension services for farmers are not significant meaning, a unit increase of extension services have no probability to increase the market participation. The findings were unexpected because extension officers are to serve as middlemen of farmers and researchers. They are entrusted with the knowledge of new technology which should be disseminated to farmers for them to be updated with recent information that transforms their participation both in production and market of their products. The results were supported by other researchers, Olwande and Mathengwe (2012), Mmbando (2014) and Hlomendlini (2015).

#### Market information

Market information was found to be insignificant with 0.691, which was not expected from the study. Market information is have no probability to add an important role on market participation. The results were unexpected from the variable because

insufficient market information hinders farmers from gaining confidence towards market-related concepts such as price, distribution and promotion information. This result contradicts with a study by Akidi (2016).

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1. Introduction**

The chapter concludes the summary of research findings, conclusion and recommendations based on the findings of the research.

### **5.2. Research summary**

This study analysed socioeconomic factors influencing informal and formal market participation by small-scale beef cattle farmers at Makhado Local Municipality of Limpopo Province in South Africa. Cattle are some of the livestock that contributes to the production of food worldwide. The researcher identified that beef in the study area participates in the lower level of market participation due to limitation of market access by small-scale beef cattle farmers. Hence the aim of the study was to analyse socioeconomic factors influencing informal and formal market participation of small-scale beef cattle farmers in Makhado Local Municipality.

The objectives of the research were to identify and describe socioeconomic characteristics of small-scale beef cattle farmers, determine the level of market participation of small-scale beef cattle and to analyse the influence of socioeconomic factors in both formal and informal market participation of beef cattle farmers in Makhado Local Municipality. The hypothesis of the study was that there is a low level of market participation by small-scale beef cattle farmers, and that socioeconomic factors do not have influence on market participation of small-scale beef cattle farmers in Makhado Local Municipality.

The literature review focused on the portion of key ideas and theories fundamental to market participation and how other factors are influencing market participation and its measures. The focus was to evaluate market participation, market participation

gap between commercial and subsistence farmers, marketing challenges faced by farmers, gender equality in the livestock market, the impact of effective use of market information system by cattle small-scale farmers, the effect of market channel strategies on market participation and the importance of market facilities on beef small scale farmers. Issues that were stated in the literature to be addressed need a joint effort of different stakeholders, small-scale cattle farmers, government, private agricultural companies and agricultural expertise.

The study was conducted in Limpopo Province, Makhado Local Municipality, specifically at Tshitale ward in five villages, Mphuhuledzhi, Lambani, Pfananani, Donkerhook and Mamphagi Villages. The targeted farmers were small-scale beef cattle farmers. A total of 82 farmers were surveyed using structured questionnaires. Random sampling and proportionate sampling were used to sample the farmers.

The data analysis was executed using excel (2016), STATA 12.1 and SPSS version 25. Descriptive statistics were applied to describe the characteristics of beef small-scale cattle farmers. The study used the logistic regression model to analyse factors that are influencing formal and informal market participation of small-scale beef cattle farmers. Furthermore, the market participation index was introduced to analyse the level of market participation of the farmers based on their supply of cattle in different market channels used.

Descriptive statistics were used to address objective number 1: to identify and describe the socioeconomic characteristics of cattle farmers in Makhado Local Municipality. Most of the beef cattle farmers in the study area are males. Majority of those farmers, both male and female, are also above 60 years old. In terms of education, most of them depend on the grant, have an elementary education as well as primary level education than secondary and tertiary. All farmers produce their cattle for certain reasons, but most produce for commercial purpose.

The market participation index was used to analyse objective 2: to determine the level of market participation of beef cattle farmers in Makhado Local Municipality. Farmers in the study area participate in a lower level of market participation. The study found that in a total of 82 farmers, only 1.22% scored the minimum level of market participation. No farmer is closer to reaching the maximum score level since most of them are selling their cattle at homestead and village market and few are selling in auction and town market.

Logistic regression was used to address objective 3: to analyse the influence of socioeconomic factors on beef cattle farmers in both formal and informal markets in Makhado Local Municipality. The logistic regression analysis was done using 11 variables. Out of these variables, 11, 7 variables are significant. Gender, family size and farming experience were significant at 10%. Age, marital status, monthly income and distance are found to be significant at 5%, and membership association is significant at 1%. However, educational level, extension services and market information are insignificant.

### **5.3. Conclusion**

The study surveyed 82 small-scale beef farmers in Makhado Local Municipality. Descriptive statistics were used to identify and describe the socioeconomic characteristics of small-scale beef farmers, which include gender, age, marital status, educational level, monthly income, extension services and family size. Evidence from descriptive statistics shows that men were dominant over women and youth did not participate in the production of cattle. The market participation index was used to establish the different levels of market participation in which farmers operate. There were no small-scale beef cattle farmers operating at the maximum level of market participation. However, out of 82 small-scale beef farmers surveyed, only one farmer operated at the minimum level. The rest of the farmers operated at the lowest level of market participation.

The research findings reveal that the variables that were positively significant include

gender, age, family size, marital status, and monthly income. This means the variable has a positive influence on market participation. Farming experience, distance and membership were found to be negatively significant, implying that they influence market participation negatively. Finally, the insignificant variables that do not have the relationship with market participation include educational level, extension services and market information.

Therefore, based on the results, the study rejects the null hypothesis that states that socioeconomic factors do not have influence on market participation of beef cattle farmers in Makhado Local Municipality. In addition, the study accepts the null hypothesis that states that there is a low level of market participation for beef cattle farmers in Makhado Local Municipality.

#### **5.4. Recommendations**

The study reveals that most farmers owning cattle in the study area were males compared to females because males are good caretakers of cattle. Hence most males are dominant in the study area. There is a need to encourage females to engage in cattle farming. The study recommends that women be empowered to engage in the cattle beef production. Cattle production provides for both male and female household heads with income, food, self-employment and nutritious security. When granted access to own cattle, women have probability to improve their confidence, decision making and help them to develop management skills.

The results further show that the majority of farmers that are participating in the market are old age group and do not have farmers who are youth representatives. If the government were to encourage youth farmers to participate in cattle farming for commercial purposes, where they give the youth at least two cattle which are ready to produce, they must return them after 5 years if there is no loss because cattle are ready to produce normally after two years. The assumption is that both cows would have given birth twice or three times. The provision of two cattle must be accompanied by technical advice and resources to support the production as well as

to avoid many youth farmers to leave the business because of failures.

The study revealed that membership association of small-scale beef cattle is significant and influence market participation negatively. The whole ward is sharing the membership association called Tshitale Farmers Association. The association also shares two extension offices. Some farmers lost interest in attending meetings of the association because they do not see the benefits of the association. Therefore, there is a need to improve the efficiency of the association which will increase market participation.

The study recommends that in the study area, they should be more farmers' days for cattle farmers to share and accumulate information. Researchers and experts of cattle production should be invited to farmers day to advise cattle farmers on when, how, where to produce, market their products and the pricing of their products. Small-scale beef cattle farmers should be informed on how to raise and feed beef cattle for market purposes. Lastly, veterinarians should also be invited for the purpose of educating farmers with diseases that affect cattle, leading them to death.

The study found that farmers in all five villages supply cattle to funerals, weddings, parties, traditional ceremonies and private buyers. Small-scale cattle beef farmers' main market is funerals and private buyers. The private buyer purchases one or more cattle per year from each farmer, hence the study recommends that there should be market information to help farmers to have access to available auctions, butcheries and abattoirs. In summary, for farmers to participate in the cattle market, it is important that cattle farmers be equipped with various market information.

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## APPENDICES

### Appendix 1: questionnaires

#### Annexure A: Questionnaire



**School of Agricultural and Environmental Sciences**

**Department of Agricultural Economics and Animal Production**

**MSc in Agricultural Economics research questionnaire**

**Analysing socioeconomic factors influencing informal and formal market participation among beef cattle farmers in Tshitale ward in Makhado Local Municipality, Limpopo Province**

The information provided by the respondent of the study will be confidential and shall only be used for this research and won't be given to the third party.

FARMERS SURVEY (2019)



Respondent's identity:

**SECTION A: DEMOGRAPHIC INFORMANTION**

Municipality	Ward	Village name	Farmer's name	Contact details

1. Gender .....
2. Age .....
3. Family size.....
4. Marital status

Married	Other, specify

5. Educational level: Informal education  or formal education

Elementary	ABET	Primary	Secondary	Tertiary

6. How many years have you went to school?

**SECTION B: CATTLE HERDS COMPOSITION**

1. Do you have farming experience? Yes  or No
2. How long have you been farming?
3. How did you acquire your cattle?

Bought	Other, specify

4. Who owns the cattle?

Father	Others specify

5. Why do you keep cattle?

Sale	Other, specify

**SECTION C: CATTLE MANAGEMENT AND INFRASTRUCTURE AVAILABILITY**

**1. How many cattle do you have?**

Calves	Cow	Bull

**2. How do you normally sell your produce?**

Herds	Sliced	Other

**3. Where do you supply your produce?**

Home stead	Farm gate	Village	Fresh produce	Traders	Others

**4. At what age do you sell your cattle?**

**5. How much do you sell your cattle?**

1. Bull , Cow , Calve

2. Total price

**6. Who determines the price?** Owner  or other (specify)

**7. How do you price your beef cattle?**

Size  or other, (Specify)

**8. What are the challenges when selling your produce?**

Stock theft or kill  and or other, (specify)

**9. How much did you spend from to sell your produce?**

**SECTION D: SOCIAL ASSETS**

1. Do you have access to extensions? Yes  or No

2. How many times in a year?

3. Membership organisation: Yes  or No

Saving clubs	Cooperatives	Others
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	(Farmers)	

4. Do you have access for farming credit? Yes  or No

5. Source of the credit:

6. Do you have sources to market information? Yes  or No

7. Source of information?

Extensions	Training	Government	School	Other

8. Infrastructure access:

8.1. Do you have access to these infrastructures? Yes  or No

8.2. If yes, specify

Fence	Cattle handling facilities	Dipping facilities	Sale pen	Electricity
Tanneries	Cellular network	Road	Abattoirs	Feeds and facilities

9. Transaction cost

9.1. How much did you spend on advertising your beef cattle?

9.2. How much did you spend when consultation on how to market your beef cattle?

9.3. How much do you spend on transportation of your produce?

## Appendix 2: Analysis of market participation index

Table of analysis of market participation index

Herd s	ID#	MARKET LOCATION					PERIOD OF SALE		BUYER (OTIONS)		T.M.P.I
		Home stead (1)	Village market (2)	Auction (3)	Town market (4)	FPM (5)	Age 5 yrs. (1)	Age+/- 5 yrs. (2)	Consumer (1)	Trade r (2)	
	58	1					1		1		3
	3		2				1		1		4
	4	1						2	1		4
	6	1						2	1		4
	7		2				1		1		4
	9		2				1		1		4
	11		2				1		1		4
	13	1						2	1		4
	15	1						2	1		4
	17	1						2	1		4
	18		2				1		1		4
	21		2				1		1		4
	30		2				1		1		4
	40		2				1		1		4
<2	41		2				1		1		4
	42		2				1		1		4



43		2		1		1	4
45		2		1		1	4
46		2		1		1	4
48		2		1		1	4
49		2		1		1	4
50	1				2	1	4
59		2		1		1	4
69		2		1		1	4
79		2		1		1	4
81		2		1		1	4
82		2		1		1	4
8		2			2	1	5
12		2			2	1	5
14		2			2	1	5
16		2			2	1	5
19		2			2	1	5
20		2			2	1	5
22			3	1		1	5
23		2			2	1	5
24		2			2	1	5
25		2			2	1	5
26		2			2	1	5

27		2				2	1	5
28		2				2	1	5
31	1	2			1		1	5
35		2				2	1	5
36		2				2	1	5
44		2				2	1	5
52		2				2	1	5
53			3		1		1	5
56		2				2	1	5
61	1	2			1		1	5
64		2				2	1	5
65		2				2	1	5
67		2				2	1	5
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70		2				2	1	5
77		2				2	1	5
78		2				2	1	5
80		2				2	1	5
1			3			2	1	6
60			3			2	1	6
71				4	1		1	6
5				4		2	1	7
10		2	3		1		1	7

	57	2	3		1		1	7
	34	2			1		1	4
	74	2			1		1	4
	68	2				2	2	6
	32	4			1		2	7
	63	4			2		2	8
	72	4			2		2	8
	76	4			2		2	8
	33	4			1	2	2	9
	66		3	4	1		1	9
	2		6		2		2	10
	39		6		2		2	10
	62	4				4	2	10
	75	4			4		2	10
	47			8		4	2	14
<b>3&gt;5</b>	38	2	6		1	4	2	15
	54	2			1	2	2	7
	73	6			3		3	12
<b>6&gt;8</b>	51	2	9		3	1	3	18
<b>&gt;9</b>	55		12			2	4	18

29		12		4		4		20
37	2	12		1	4	4		23

Source: Data (2019)