DETERMINANTS OF CHALLENGES OF SMALLHOLDER AND EMERGING SHEEP AND GOAT FARMERS IN THABO MOFUTSANYANA DISTRICT MUNICIPALITY, FREE STATE PROVINCE

By

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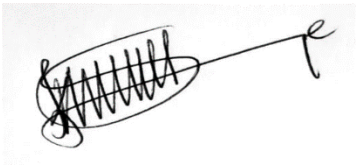

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I ensure that proper credit is given to the work of others referenced in this dissertation. Furthermore, Chapter 2 of the dissertation has been published in the Asian Journal of Agriculture and Rural Development as “Factors Influencing Managerial Challenges for Smallholder and Emerging Sheep and Goat Farmers in the Thabo Mofutsanyana District, Free State Province, South Africa” by authors *Kgomongwe MN, Mthombeni D.L and Antwi MA.

Kgomongwe M.N is the student and author of the declaration, and the supervisor is a co-author. This study was conceived by both authors. I carried out all the work conducted with the aim to identify and analyse the determinants of managerial challenges for smallholder and emerging sheep and goat farmers in the Thabo Mofutsanyana district, Free State by highlighting key factors in order to establish a conducive and favourable setting for farmers to improve production and income. Furthermore, I gathered data, analysed it and produced the results and made recommendations.

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May the good Lord continue to bless you all.

DEDICATION

This dissertation is dedicated to my late mother, Mmatshipi Martha Kgomongwe who passed away in 2004, just after I completed matric, and to my handsome boys for their love and encouragement throughout my pursuit for education. I hope this achievement will fulfil the dream my mother envisioned for me and that it will encourage my children to further their studies.

ABSTRACT

Developing countries rely heavily on smallholder and emerging farmers to ensure food security but despite this, farmers face many challenges that hinder them from producing efficiently, forcing them to focus on home consumption over market-driven farming, to ensure a sustainable and self-reliant farming practice. Smallholder farmers remain with challenges in securing capital to purchase agricultural inputs, pay for transport to sell agricultural outputs, and to invest in agricultural machinery. Sometimes farmers find themselves in difficult situations where they are forced to get credit from illegal moneylenders, at high interest rates or sell their produce at a reduced price to receive cash, and they still need to cover their expenditure for survival. Amongst others, farming resources, land as well as comprehensive agricultural support restrict smallholder and emerging farmers' access to valuable markets.

The aim of this study was to identify and analyse the determinants of challenges of smallholder and emerging sheep and goat farmers in the study area by highlighting key factors in order to create an enabling environment for the farmers to improve livestock management, production, income and valuable markets. A stratified random sampling technique was used to select 145 participants from a pool sampling frame of 251 participants. A semi-structured questionnaire was used to collect the data by interviewing 145 selected smallholder farmers. The Statistical Package for Social Science (SPSS), version 28.0, was used to analyse the data. Descriptive statistics and the probit regression model were used to analyse the determinants of the managerial, production, marketing and financial challenges for smallholder and emerging sheep and goat farmers. The results of the study show that only 19% of the participants had business plans and the absence of business plans impacted on farm and livestock management negatively. The probit results indicated that the age of the respondents, off-farm activities and access to market information had a positive and significant association with managerial challenges. This implies that the older a farm owner gets the more they will likely experience managerial challenges. It is recommended that youth and women must be encouraged to engage in sheep and goat farming for better management and that farmers must focus their attention on livestock farming instead of off-farm income-

generating activities. The Department of Agriculture and municipalities should initiate extension programme that focus on farm and livestock management as well as access to market information.

Furthermore, the results indicate that 89% of farmers aspire to increase production, however challenges such as size of land (29%), distance to the market (21%) and no access to the market (17%) are some of the factors that hinder farmers from achieving their goal of increasing scale of production. The results also indicate that 42% of farmers do not receive veterinary services while about 63.4% do not access feed in times of drought. Additionally, the results indicate that age, size of household, level of education, role of respondent, farm management records, cost per trip to the market, total number of sheep sold in 2019 have a positive and significant association with production challenges, with all other factors held constant. This implies that the older a farm owner gets the more likely they will experience production challenges. To manage production challenges, farmers need the support of younger people i.e., youth in the farm and must hire farm managers and utilise farm management records effectively. The more a farmer spends on trips to the market, they are more likely they will experience marketing challenges. An increasing size of household negatively impacts on farmers' finances and time as a farmer will dedicate the two to the family instead of on farm production. Farmer must not sell sheep in high numbers so that they do not compromise the breeding herd.

The study's results indicate that only 28% of participants have received financial support from the Department of Agriculture and Rural Development (DARD), while 17.12% of participants applied for loans and about 8% of loan applications were rejected. The results revealed that access to financial support impacts negatively on the farm and livestock business. Furthermore, the probit results indicated that gender, age, level of education, engage in off-farm income generating activity, have farm business plan, access to agricultural information, size of land, cost per single trip to the market, total number of sheep sold have a positive and significant association with financial challenges. It is therefore recommended that farmers be encouraged to have business plan, sell more sheep, and focus on the farm instead of off-farm income generating activities for better financial management. DARD and municipalities should initiate funding programmes that focus on farm, sheep, and goat livestock as well as production.

The results also show that 59% of respondents indicated that there are other markets closer to the farm than where they are currently selling livestock and 63% of farmers have access to market information. Distance to the market, being unable to supply required quantities and not having contracts with markets are amongst the reasons for farmers not being able to supply other markets closer to their farm. The results indicate that from the challenges experienced, of respondents have a challenge with the size of land (15%), lack of transport (12%) and lack of finance (3%). Therefore, the results suggests that amongst others, farmers who are involved in day-to-day operations of the farm and have access to market information have a negative and significant association with marketing challenges, with all other factors held constant. The results indicate that the respondents have identified markets that are closer to their farms than where they are currently selling; however, majority of the respondents are selling their produce at the local market and around the community to avoid spending a lot of money per trip to the market. The findings also show that access to market information can improve farmers' marketing challenge if used effectively.

Keywords: sheep and goats, livestock, smallholder and emerging farmers, managerial challenges, marketing, production, financial challenges, funding, extension services, probit regression model

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LIST OF ABBREVIATIONS AND ACRONYMS

AAMP	Agriculture and Agro-processing Master Plan
AET	Agricultural Education and Training
AgriSA	Agriculture South Africa
AI	Artificial Intelligence
AISA	Africa Institute of South Africa
BEE	Black Economic Empowerment
BFAP	Bureau for Food and Agricultural Policy
CAES	College of Agriculture and Environmental Sciences
CASP	Comprehensive Agricultural Support Program
CDF	Cumulative Distribution Function
COGTA	Department of Cooperative Governance and Traditional Affairs
CSD	Commission on Sustainable Development
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform & Rural Development
DARD	Department of Agriculture and Rural Development
DBSA	Development Bank of Southern Africa
DESTEA	Department of Economic development, small business, Tourism and Environmental Affairs
DPME	Department of Planning, Monitoring & Evaluation
DoA	Department of Agriculture
EU	European Union
FAO	Food and Agricultural Organization
FS	Free State province
FSDARD	Free State Department of Agriculture and Rural Development
GDP	Gross domestic product
GGP	Gross geographic product
GPV	Gross Production Value
IFC	International Finance Corporation
ITA	International Trade Administration
LRAD	Land Redistribution for Agricultural Development

MLRM	Multiple Linear Regression Model
NAMC	National Agricultural Marketing Council
NDA	National Department of Agriculture
OLS	Ordinary Least Squares
PLAS	Proactive Land Acquisition Strategy
QLFS	Quarterly Labour Force Survey
RECAP	Recapitalisation and Development Program
ROI	Return on Investment
SA	South Africa
SAPs	Sustainable Agricultural Practices
SDGs	Sustainable Development Goals
SPSS	Statistical Package for the Social Sciences
Stats SA	Statistics South Africa
UNISA	University of South Africa
WEF	World Economic Forum

CHAPTER ONE

1.0 INTRODUCTION

1.1 Introduction and Background of the study

Agriculture remains a major source of food security, employment, and revenue. In terms of employment, the sector employs many people compared to other sectors worldwide. Moreover, agriculture contributes to eliminating poverty in rural areas where majority of the world's poor reside (Sankatane, 2018; Molotsi et al., 2019). Agriculture serves as the foundation for emerging countries' economies. Small farmers provide more than 70% of the world's food supply (FAO, 2014; Kabane, 2020), which means there is a high demand for developing farming (Numonjonovich et al., 2022).

Between 2020 to 2022, Sierra Leone was registered as the agricultural sector's highest contributor to the GDP with almost 60 percentage (%), followed by Ethiopia (38%) and Niger (36%) and the countries with the lowest GDP were Libya, Djibouti, Botswana, Equatorial Guinea, and South Africa. In 2022, Sub-Saharan Africa's (SSA) contributed 17% to the GDP which was an increase of over 2% points compared to 2011. Africa also saw an increase in the primary sector employment as there were 230 million people employed in 2021 compared to 197 million in 2011. In the same period, globally, Africa contributed 43% of the working population (Galal, 2024).

The African continent contributes 38% of total agricultural exports, followed by Europe (32%), Asia (21%) and Americas (8%). In Europe, the most prominent export destinations for South Africa's agricultural products were the Netherlands and United Kingdom (UK), Italy, Germany, Spain, and Russia accounting for 40%, 22%, 7%, 7%, 6% and 4%, respectively. In Asia, China was the leading export destination for agricultural products shipped from South Africa, accounting for around 23% of total exports, followed by United Arab Emirates (18%), Malaysia (7%), Vietnam (7%), and Japan (6%). The Americas' most important export markets were Mexico (41%), the United States of America (36%), and Canada (18%). Botswana was the most significant market for South Africa's

agricultural export revenues, accounting for 16%, followed by Namibia (15%), Mozambique (13%), and Zimbabwe (12%) (NAMC, 2023).

Of the 16.9 million households in South Africa, approximately 2.3 million engage in agricultural activity. This translates to a 13.8% national prevalence of agricultural households, with the Eastern Cape (28%), followed by Limpopo, KwaZulu Natal, Mpumalanga, and Free State with 24.1%, 18.6%, 18.2% and 16.6% respectively having the highest prevalences, while the Western Cape (3.6%) and Gauteng (4.9%) have the lowest (Stats SA, 2016). In quarter two (Q2) of 2021, the sector accounted for 5.8% of the nation's employment, or 862 000 people, and 3% of GDP. This was an expansion of 1.2% marking the fourth consecutive quarter of growth. This followed a revised 1.0% increase in real GDP in quarter one (Q1) of 2021 (January-March). The official job loss rate was 34.4% in Q2 of 2021. The results of the Quarterly Labour Force Survey (QLFS) for Q2 of 2021 revealed that the number of employed persons declined by 54 000 in Q2 of 2021 (Stats SA, 2021).

The total gross value of agricultural production for 2022/23 was estimated at R426 440 million (an increase of 5,5%) compared to R404 062 million in 2021/2022. The increase was mainly attributed to an increase in the value of animal products and horticulture. The agricultural production's gross value comprised of animal products (42,8%), field crops (29,3%) and 27,9% of horticultural products (DARLLD, 2023). Table 1 below presents statistics of agriculture and related services per province. The province with the largest income from sales of goods and services in the agriculture as well as related services industry in 2022 was Western Cape with R78,6 billion (or 19,1% of the industry total), followed by Free State (R57,2 billion or 13,9%), Gauteng (R48,7 billion or 11,8%), Mpumalanga (R47,2 billion or 11,5%) and North West (R44,0 billion or 10,7%) (Stats SA, 2022).

Table 1: Statistics on agriculture and related services by province

Province	Sales of goods & service	Contribution	Salaries & Wages	Contribution	Total employees (Number)	Contribution
Western Cape	78 608 653	19	14 350 263	26,8	211 564	25,9

Eastern Cape	38 013 832	9,3	4 986 334	9,3	80 268	9,9
Northern Cape	20 408 046	5,0	3 057 381	5,7	61 769	7,6
Free State	57 193 064	13,9	4 385 810	8,2	81 927	10,1
KwaZulu-Natal	42 163 222	10,3	6 422 523	12,0	105 463	12,9
North West	44 004 967	10,7	3 850 584	7,2	53 666	6,6
Gauteng	48 652 272	11,8	5 172 622	9,7	48 805	6,0
Mpumalanga	47 150 312	11,5	5 228 655	9,8	67 175	8,2
Limpopo	34 671 687	8,4	6 028 810	11,3	103 881	12,8
Total	410 866 055	100,0	53 482 982	100,0	814 518	100,0

Source: Data from Statistics South Africa (2022)

The largest contributor to salaries and wages was Western Cape with R14,4 billion (or 26,8% of the industry total), followed by KwaZulu-Natal (R6,4 billion or 12,0%) and Limpopo (R6,0 billion or 11,3%). In terms of employment, Western Cape was the largest contributor with 211 564 employees (or 25,9% of the industry total), followed by KwaZulu-Natal (105 463 or 12,9%), Limpopo (103 881 or 12,8%) and Free State (81 927 or 10,1%), (Stats SA, 2022).

The largest proportion of farms was in livestock farming (13 639 or 33,9% of the total), followed by mixed farming (12 458 or 31,1%) and field crops (8 559 or 21,3%). The province with the highest number of farms in 2017 was Free State (7 951 farms or 19,8% of the national total), followed by Western Cape (6 937 or 17,3%), Northwest (4 920 or 12,3%) and Northern Cape (4 829 or 12,0%). The provinces with the lowest number of farms in 2017 were Gauteng (2 291 or 5,7%), Mpumalanga (2 823 or 7,0%) and Limpopo (3 054 or 7,6%) (Stats SA, 2020). The agricultural sector contributed around 10% to South Africa's total export earnings in 2019 at a value of $10.7 billion, meat, mohair and wool are amongst products that are being exported by SA (ITA, 2020). South Africa contributes almost 50% to the Southern African goat population with approximately 5.62 million animals distributed throughout nine provinces (NAMC, 2024).

In 2020, the Eastern Cape recorded the highest number of goats accounting for 39% of the total flock followed by Limpopo (17%), KwaZulu–Natal (13%), North West (13%) and Mpumalanga and Gauteng recorded a lesser number of 1.5% and 0.4% respectively. The

distribution of sheep livestock was led by Eastern Cape with approximately 30% with Northern Cape, Free State and Western Cape contributing 24%, 20% and 12% respectively. These four provinces constitute 86% and the other five Provinces share the remaining 14% of the country's sheep numbers (DALRRD, 2021).

In the 2020/21 financial year, the Eastern Cape province contributed 24,9% of the country's wool, followed by the Free State, Western Cape, and Northern Cape with 20,2%, 15,7%, and 9,5% respectively. The contribution was mainly because of the number of sheep per province (NAMC, 2022). South Africa's sheep stock amounted to 21.43 million heads in 2022 which was a decline of around 30,000 heads compared to 2021 (Cowling, 2024). South Africa produces approximately 53% of the world mohair clip. More than 90% of South African mohair is exported to countries like Italy, China and the UK. The mohair price is also linked to international economies. In 2022, South Africa saw a stable production at 2,3 million kg. During the last half of 2022, the mohair price started to decline. The drop in price may be associated with the war between Ukraine and Russia as it had a direct economic impact on the countries purchasing South African mohair (DALRRD, 2023).

Gross farming income from all agricultural products increased by 17,3% to R445 450 million for the period ended 30 June 2023, as compared to R379 864 million in the previous period, mainly due to the increase in income from field crops, animal, and horticultural products by 39,0%, 9,4% and 8,8%, respectively. The average prices received by the farmers for their agricultural products increased by 10,7%. This was the result of the increase in prices of field crops by 15,6% and animal and horticultural products by 9,2% each. The increase of 9,2% in average price of animal products was driven by the increase in the prices of poultry meat by 16,0%; dairy products by 15,1% and slaughtered stock by 2,5% (DALRRD, 2023).

Looking at the Free State, about 17% (946 638) of households were involved in agriculture (Stats SA, 2016). The economy of the Free State province is dominated by agriculture, mining and manufacturing. Despite being the food basket of the country, the agricultural sector in the Free State Province is comprised of smallholder farming and commercial farming (FS DARD, 2023). The Land Act of 1913 is to blame for this dualistic

farming practice as well as Cooperate Society Act of 1939; and Marketing of Agricultural Act of 1968 that excluded Black population from mainstream agriculture thereby creating commercially viable and resource-rich sector dominantly for white population.

Table 2 below shows District of production per product in the Free State Province. The Table shows that all districts in the province are involved in crop farming while Lejweleputswa, Fezile Dabi, Thabo Mofutsanyana also farm in red meat and dairy. Furthermore, the table indicates that farmers in Thabo Mofutsanyana are involved in different productions i.e. fruit, vegetable, livestock, dairy and wool which is unique compared to other districts.

Table 2: Districts of production per product in Free State Province

District	Product
Lejweleputswa	Maize, Sunflower, red meat, vegetables, peanuts, and dairy
Fezile Dabi	Maize, sorghum, sunflower, red meat, peanuts, and dairy
Thabo Mofutsanyana	Maize, wheat, potatoes, sunflower, red meat, dry beans, fruits, wool, dairy and cherries
Xhariep	Wheat, potatoes, red meat, vegetables, peanuts, and wool
Mangaung	Red meat, vegetables, and wool

Source: FSDARD Final Annual Performance Plan, 2019

The limited policy support as well as financial and non-financial government programmes compound the challenges faced by emerging and smallholder sheep and goat farmers in the country. The latest research conducted by the National Agricultural Marketing Council (NAMC) and Bureau for Food and Agricultural Policy (BFAP) as part of developing the Agriculture and Agro-processing Master Plan (AAMP), indicates the deregulation of the agricultural marketing system in 1996 without creating safeguard measures to develop emerging and smallholder farmers perpetuated the struggle of these farmers. Other policy programmes such as the Agricultural Strategic Plan of 2001 identified the policy, marketing, financing, and farmer support gap required to ensure smallholder and emerging farmer are integrated into formal agricultural value chains and prosperous to create jobs, generate foreign earning and contribute to food security in the country. The existing literature on production, financial, marketing and managerial challenges, coupled

with policy and support inadequacy indicates that there is insufficient knowledge in understanding the determinants of emerging and smallholder sheep and goat farmers challenges.

To understand the elements of challenges of smallholder and emerging farmers of sheep and goat, the study was conducted in Thabo Mofutsanyana district in the Free State province as the demographics, socio-economic and general farming characteristics in Thabo Mofutsanyana District were relevant to the research questions. Moreover, the significant agricultural potential of the district as it is known for various agricultural activities, including livestock farming (e.g. cattle, sheep, goats etc.), crop production and farming. Furthermore, the district has previously received government support initiatives aimed at improving agriculture, making it an interesting area to study the effectiveness of these programs and policy implementation. Additionally, the district is easily accessible, which made it easier to collect data and engage with stakeholders.

The selection of Thabo Mofutsanyana District provided an opportunity to identify and analyse challenges of smallholder and emerging farmers in the goat and sheep livestock farming through identifying and analysing production, marketing, finance and management challenges; analyse the determinants of the production, marketing, financial and managerial challenges of the farmers and establish the structural relation between the farmers' annual income from sheep and goat sales and their demographic and socio-economic characteristics. The study therefore provides findings and recommendations that can benefit the municipalities, communities and contribute to the district's development and economy of the province. The findings of this study will also aid policymakers to formulate appropriate policy interventions to sustain smallholder and emerging sheep and goat livestock farmers against production, management, marketing, and financial challenges to achieve the sustainable development goal (SDG) of ending hunger and poverty by 2030. This research seeks to identify gaps in the existing literature in order to inform policies and strategies for supporting smallholder and emerging farmers of sheep and goat livestock.

1.2 The Research Problem

Because of the dualistic nature and historical imbalance caused by e.g., Land Act of 1913; Cooperate Society Act of 1939; and Marketing of Agricultural Act of 1968, smallholder and emerging livestock farmers of sheep and goats are still lagging behind. For over 100 years, the colonial and apartheid regimes systematically undermined smallholder agriculture by limiting access to land, the regimes prevented the black majority population from surviving on agriculture alone. The system ensured cheap labour for mines and settler farms and that black people were overcrowded in homelands with land degradation, (Fischer, 2024). In South Africa including the study area, smallholder and emerging livestock farmers face numerous challenges that limit their economic potential.

Although many regulations and programs state otherwise, South African small-scale farmers have endured years of official neglect. Inadequate support in production and marketing for smallholder farmers and households that primarily practiced agriculture for sustenance was created by the dismantling of Bantustan agricultural development corporations (Fourie et al., 2018; Sankatane, 2018). Research specifically and holistically focused on the determinants of challenges of sheep and goat smallholder and emerging/developing farmers in the study area has not been done. This has resulted in information gap in the literature of this field regarding the subject matter in the study area.

Essentially informed policies to address the challenges facing the target farmers require a thorough research study. Therefore, the results and recommendations of this study will go a long way to serve as basis for informed policy decisions aimed at addressing the challenges faced by the smallholder and emerging sheep and goats' farmers in the study area.

1.3 Rationale or Purpose of the study

The study provides the following:

i. An understanding of the determinants regarding production, marketing, finance, and managerial challenges faced by smallholder and emerging

farmers of the goat and sheep livestock and thus bridge the existing information gap on the afore-mentioned issues.

ii. Findings of the study will propose policy-based solutions which if adopted may improve smallholder farmers' support and bridge other resource gaps that are currently in existence in the study area and the province.

iii. The recommendations from the study if adopted may empower smallholder and emerging sheep and goats' farmers and possibly unleash potential and innovative ideas that exist within the farmers to broaden economic participation and foster inclusive growth of the historically marginalised smallholder and emerging livestock farmers.

1.4 Research questions

The study was guided by the following research questions informed by the research problem:

i. What are the major challenges facing the smallholder and emerging farmers of the sheep and goat's livestock in Thabo Mofutsanyana district?

ii. What are the main determinants of production, marketing, financial and managerial challenges as well as farm income of the smallholder and emerging farmers of the sheep and goat livestock in study area?

1.5 Aims and Objectives of the study.

The aim of this study was to identify and analyse the determinants of production, marketing, financial, and managerial challenges of smallholder and emerging sheep and goat producers in the Thabo Mofutsanyana District and highlight key factors which if addressed will create an enabling environment for the farmers to improve the production and income.

The specific objectives of the study are to:

i. Analyse the demographic, socio-economic and the general farming characteristics of the target farmers in the study area.

ii. Identify and analyse production, marketing, finance and management challenges of smallholder and emerging farmers in the goat and sheep livestock farming in the study area.
iii. Analyse the determinants of the production, marketing, financial and managerial challenges of the farmers.

1.6 Hypothesis of the study

It was hypothesised that:

i. Demographic and socio-economic factors do not significantly influence the production, marketing, financial and managerial challenges of emerging and smallholder sheep and goat farmers in the study area.
ii. The smallholder and emerging sheep and goats farmers' income are significantly influenced by the demographic and socio-economic factors.

1.7 Ethical considerations

A system of moral principles known as research ethics is said to be concerned with how closely research processes conform to professional, legal, and social duties to study participants (Polit & Beck, 2004; Mokone, 2016). The author's proposed ethical guidelines were meticulously adhered to, throughout the entire research process. In line with the University of South Africa (Unisa) regulations. The study ensured standardization and uniformity in its procedures, maintaining consistency across respondents' interactions. The Head of Department, Department of Agriculture and Rural Development in the Free State province granted permission for the study to be conducted at the Thabo Mofutsanyana District. Participants/ respondents were thoroughly informed and consulted about the research objectives and their rights were respected. Their personal information remained confidential, and data collected, together with the findings were exclusively used for the study's intended purpose. The interviews were conducted with professionalism, respect and dignity, adhering strictly to the scope of the study.

1.8 Theoretical framework

To identify and analyse determinants of challenges faced by smallholder and emerging sheep and goat livestock farmers in the study area, the study adopted the Maslow's hierarchy of needs. The theory is relevant and fits the demographics and socio-economic characteristics of the smallholder and emerging farmers as well as the objectives of the study. Most of the support offered to smallholder and emerging farmers require farmers to be at a certain level of development such as farming technologies and techniques. While these techniques can be of assistance to farmers, they may not address the farmers' immediate needs as smallholder and emerging farmers as they are not homogenous (Horsten, 2023). Figure 1 below shows different levels of needs for smallholders and emerging farmers of sheep and goats' livestock.

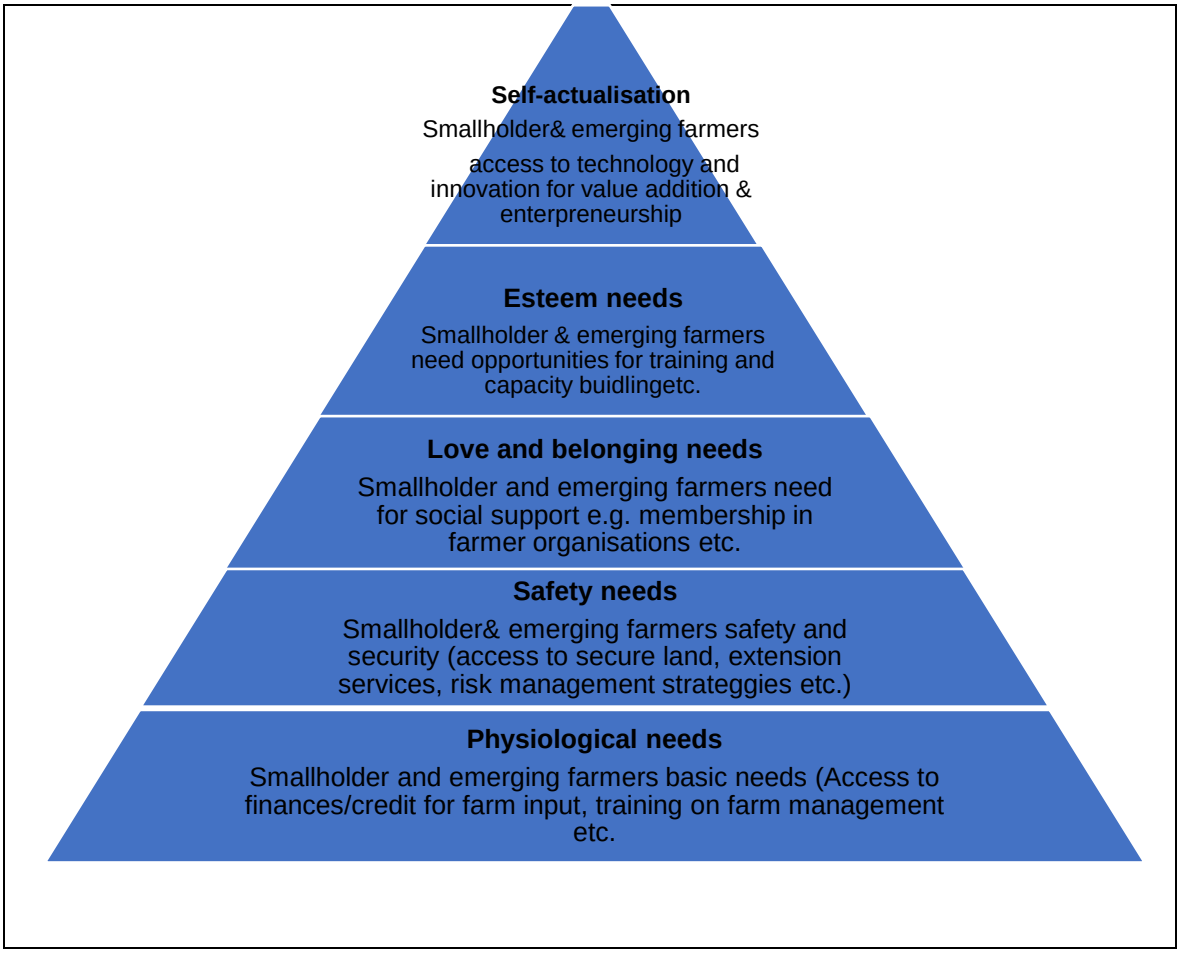

Figure 1: Maslow's hierarchy of needs, data from the study (Author)

1.8.1 Smallholder and emerging farmers managerial needs

Figure 1 shows that the physiological/ basic needs of smallholder and emerging farmers include access to training on farm management and farm records keeping instead of relying only on traditional farming. Once basic needs are satisfied, safety needs must be taken care of. This is a level where risk management strategies such as contingency plan, access to extension services and advisory support are put in place. This is important to allow a farmer to guide in implementing knowledge acquired at the first level (basic needs-training). It is important for farmers to feel accepted by communities and farmer groups, therefore acquiring membership in farmer organisations and peer-to-peer learning and mentorship programmes ensure that a farmer has sense of belonging. Esteem needs is the next level of needs, this is where a farmer wants to be recognised for their management skills and achievement in sheep and goat livestock farming and seeks opportunities for leadership development. The level of self-actualisation is reached by a farmer when they are achieving their full potential and start implementing their own initiatives in the farm. At this stage, a farmer is ready to be exposed to technology and innovation as this will improve farm management, productivity, opportunities for entrepreneurship and value addition in farm management.

1.8.2 Smallholder and emerging farmers production needs

Figure 1 shows that the physiological/ basic needs of smallholder and emerging farmers for production challenges are access to quality inputs (e.g. animal feed, machinery & equipment), basic knowledge of sheep and goat livestock and general production in livestock farming. Once basic needs are satisfied, safety needs of a farmer must be addressed. Farmers need access to a sizeable, secure and safe land with water management systems or access to irrigation. where they will not be exposed to animal theft or farm murders. Furthermore, it is at this stage where a farmer requires strategies for dealing with issues such as disease management and climate change. Farmers also want to feel belonging needs to be satisfied as they want to learn more from those with more experience, thereby forming part of social support networks for knowledge sharing and have membership in farmer groups/ cooperatives. Once a farmer has gathered

enough information and support, they implement what they have learnt, and it is at this level where a farmer must satisfy feeling of accomplishment. They therefore want to be recognised for their production skills and achievements; and they seek opportunities for training and capacity building on sheep and goat livestock production. The next and final level of self-actualisation is reached when a farmer is capable of operating on their own and being performing creative production activities. It is at this level when a farmer is ready to access technology and innovation for improved productivity, opportunities for value addition and processing.

1.8.3 Smallholder and emerging farmers marketing needs

Figure 1 shows that the physiological/ basic needs of smallholder and emerging farmers are access to market information, price data, basic knowledge of marketing principles and practices. Once basic needs are satisfied, safety needs must be taken care of. This is a level where a farmer must acquire market risk management strategies. Smallholder and emerging farmers must feel accepted by farmer groups and social support networks for market information and advice, as well as membership in farmer organisations/ cooperatives. Esteem needs is the next level of needs, this is where a farmer wants to be recognised for their marketing skills and achievements, and to be provided opportunities for market training and capacity building. The level of self-actualisation is reached by a farmer when they are achieving their full potential and start implementing their own initiatives in the farm. At this stage, a farmer is ready to be exposed to technology and innovation for improved to market access, opportunities for access to valuable market.

1.8.4 Smallholder and emerging farmers financial needs

Figure 1 shows that the physiological/ basic needs of smallholder and emerging farmers are basic knowledge of financial management practices, microfinance programs for inputs and farm expenses. Basic needs are followed by safety needs, this is a level where a farmer must acquire financial risk management strategies such as farm insurances, access to financial advisory services and market information systems for price stability. It

is important for farmers to have social support networks for financial information and advice and to be part of the farmer organisations/ cooperatives. Esteem needs is the next level of needs, this is where a farmer wants to be recognised for their financial management skills and achievements and require opportunities for financial training and capacity building. The level of self-actualisation is the last level of the hierarchy, and this level is reached by a farmer when they are achieving their full potential and start making a profit, savings and investment. It is at this point where a farmer can access technology for improved financial management, opportunities for entrepreneurship and financial value addition.

Applying Maslow's Hierarchy of needs to address these different levels of need, can assist smallholder and emerging farmers overcome their managerial, production, marketing and financial challenges. Moreover, policy interventions can be developed to address different levels of needs per specific challenge to ultimately improve the situation.

1.9 Conceptual Framework

The principle of this research is that the determinants of challenges experienced by the smallholder and emerging farmers, while being different from one another, it is necessary to apply a holistic approach when analysing them. Approximately three decades ago, Yudelman (1987) had already observed sustainable agricultural production systems as a major concern for research and policy makers in both developed and developing countries. The Constitution of the Republic of South Africa, Act 108 of 1996 'The Constitution' highlighted land reform as one of the key deliverables to the previously disadvantaged masses and this was mostly Black communities (GCIS, 2019). More than 20 years later, implementation of land reform has not been completed. In March 2018, the Parliament of South Africa voted for a bill that allow expropriation of land without compensation; however legislation requires amendment of the Constitution of the Republic. The legislative process was ongoing in 2019 and early 2020 before countries implemented hard lockdown in March due to COVID-19 pandemic (OECD, 2020).

In line with the view of Yudelman (1987), Medugu et al. (2006) similarly concluded that several human activities such as inappropriate technology, overpopulation, pollution, overgrazing, deforestation, and mining are a result of poor policy regulation. This study will apply the quantitative method to analyse determinants of challenges faced by smallholder and emerging livestock farmers of sheep and goat. The quantitative system approach is used to develop the typology of farm households because of its strength in objectively identifying groups based on probability theory (Van Averbeke et al., 2006). The conceptual framework will be based on the readily available literature and provide a direction on considerations for policy formulation and implementation thereof; as well as to outline the importance of all sector players aiding aspiring and small-scale goat and sheep farmers.

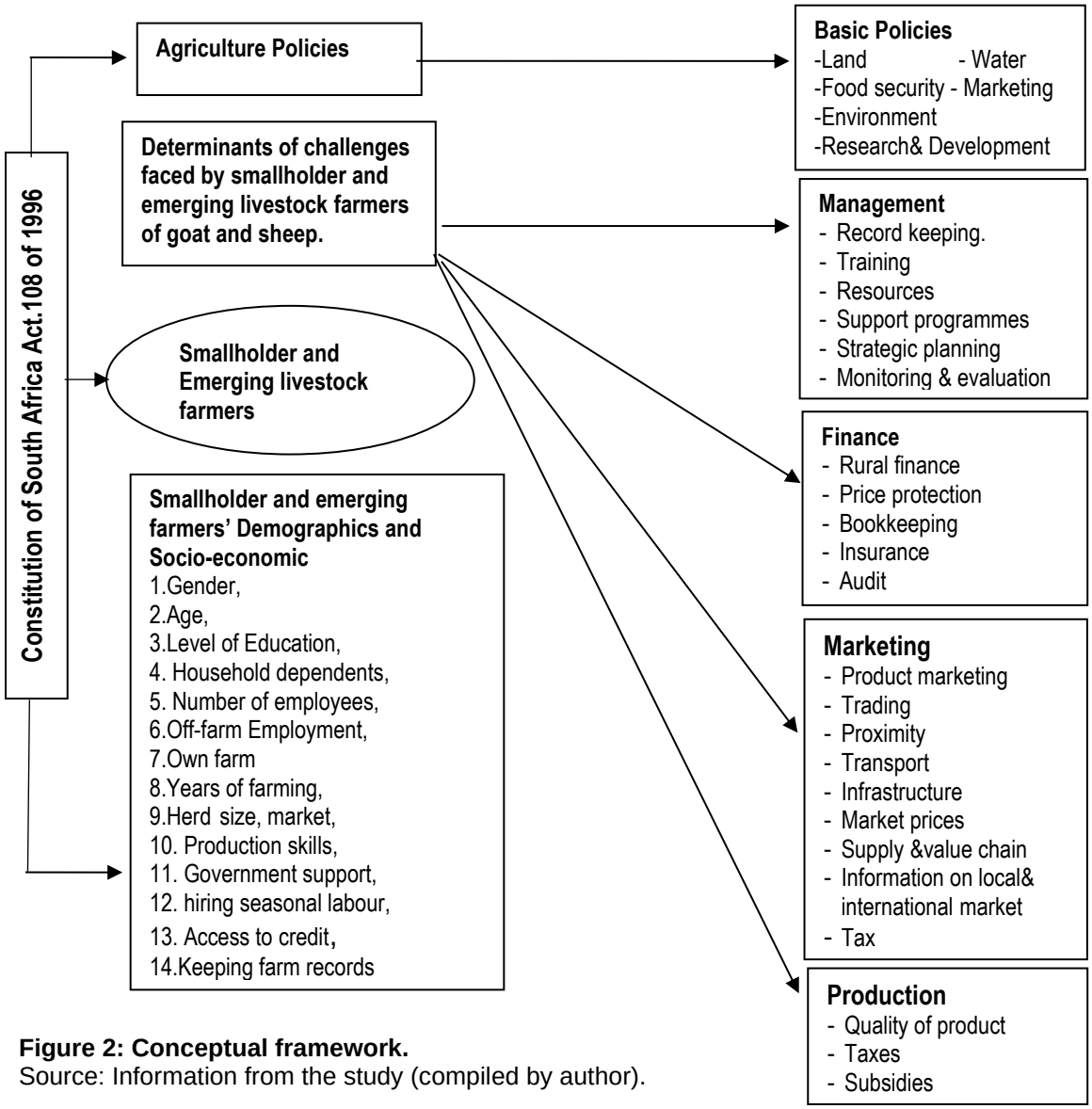

Figure 2: Conceptual framework.
Source: Information from the study (compiled by author).

1.10 Delimitation of the Study

The study will only involve the smallholder and emerging sheep and goat farmers under the umbrella of the Department of Agriculture in the six Local Municipalities of the Thabo Mofutsanyana District Municipality, in the Free State province.

1.11 Chapters arrangement in the dissertation

Chapter 1 of the dissertation focused on the introduction and background of the study while Chapter 2 presents the literature review aspects of the study including the conceptual and theoretical framework. Chapter 3 focuses on the research design and methodology; and Chapter 4 presents the results and discussion of the study.
The summary, findings, conclusions and recommendations will be presented in Chapter 5. The appendices constitute the last chapter.

1.12 Summary of Chapter

Chapter 1 presented the introduction and background of the study, and the impact of the agricultural sector on global economies. The chapter highlighted the important roles played by smallholder and emerging farmers of sheep and goat livestock in the economy, such as poverty alleviation and food security in the rural communities. Furthermore, the study outlined and presented the following essential components: problem statement, the research questions, aim and objectives of the study, hypotheses of the study, theoretical and conceptual frameworks providing a comprehensive foundation for research investigation.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviewed local and international literature on challenges faced by smallholder and emerging farmers of sheep and goat livestock. The chapter presents definition of concepts, international overview of smallholder and emerging farmers; and determinants of challenges (i.e. management, production, marketing and finance) of smallholder and emerging sheep and livestock farmers in the Thabo Mofutsanyana district, Free State province, and summary of the chapter.

2.2 Definition of concepts

Smallholder farmer are producers who keep livestock, raises fish, or cultivates crops on a limited scale, rely on family or relatives' labour to meet production needs, and keep portion of the produce for household consumption. In the developing world, a smallholder farm is a family-owned enterprise operating on up to 10 hectares, or 24 acres, with most smallholder farmers cultivating less than 2 hectares, or 5 acres, of land (Knight, 2022). This definition is adopted in this study because it accommodates emerging farmers as the definition allows for variation on the size and scale of land at hand versus land used for production, however, the definition does not incorporate finances element which is one of the important aspects when defining smallholder farmers.

The study therefore also took into consideration the definition by the Department of Agriculture in South Africa. The department defines smallholder farmers as farmers who produce for household consumption and markets, subsequently earning ongoing revenue from their farming businesses, which form a source of income for the family. These farmers have the potential to expand their operations and to become commercial farmers but need access to comprehensive support e.g., technical, financial, and managerial instruments (DAFF, 2015). For the purpose of the study, both definitions were adopted as they fit the demographics and socio-economic and farming characteristics of the

smallholder and emerging sheep and goat livestock farmers at the Thabo Mofutsanyana, Free State province.

Due to South African history, agriculture industry was divided into two groups i.e., Commercial farmers are characterized by large-scale production and are mostly white people; while smallholder farmers are characterized by the small-scale production and are mostly Black people who resided in the in homelands. The reason for engaging in farming between these two groups differs, small-scale farmers produce to improve household food security while commercial farmers produce to sell agricultural products in order to make income (Zantsi et al., 2019). A group of smallholder farmers who are market-oriented and want to commercialize their produce are known as emerging smallholders, and they fall between smallholder and commercial farmers (Zantsi, 2021).

The challenges are obstacles and difficulties that smallholder and emerging farmers come across in their sheep and goat livestock farming. These obstacles hold these farmers back from being able to manage their farms successfully and improve productivity in their farms. Small-to-medium farmers lack sufficient funds, operate in an improper infrastructure.

2.3 Global overview of smallholder and emerging farmers

Smallholder and emerging farmers play are vital role in achieving global food security as they produce third of the world's food supply, despite the risks and challenges they face (WEF, 2022). The International Finance Corporation (IFC) reported an estimation of 570 million farms worldwide with almost 475 million being smallholder farms, representing 84% of all farms and operating about 12% of all farmlands. Almost 80% of the farms are in low-and middle-income regions in Asia and the Pacific (excluding Central Asia), Sub-Saharan Africa (9%), Eastern Europe and Central Asia (5%), Middle East and North Africa (2%) and the Americas (1%) (World Bank, 2019).

Dhillon et al. (2023) conducted a study to review the major barriers to small-scale farming and to review the status and potential opportunities offered by advanced technologies that can benefit small-scale holders. The study noted additional contributions of small-

scale farming to food security such as direct and indirect environmental, social, cultural, and economic benefits by improving crop diversification, job security, and self-sufficiency. However, small-scale agriculture faces several challenges which are further exacerbated by climate change, population increase, water scarcity, and soil degradation. The findings of the study showed that economics, marketing, climate change, lack of awareness, educational resources, infrastructure, information, and technology are the major challenges to small-scale farming. It is difficult for South African smallholder farmers to engage in the contemporary economy because most of them have limited access to marketplaces for selling their produce, finance, and insurance (Von Loeper et al.,2016).

Despite these challenges and the critics by some literature (e.g. Maxwell et al., 2001; Collier, 2009), small farms are not declining, instead, they are multiplying, and becoming more dominant in some countries (Hazell, 2020). A study conducted by the Évora University in Portugal, acknowledges the importance of these farmers. The study analysed 800 small farms across 25 regions in the European Union (EU) and 100 small farms across five regions in Africa and found that small farms produce more food than statistics show. Furthermore, the study argues that the underestimation comes probably from official statistics which does not account for food used on the farm to feed family, friends or animals and food grown on farms often meet between 25% and 40% of that farm's own requirements. Moreover, the study states that if the true value of small farms were better understood, more governmental and financial support would be provided (Gillman, 2019).

Ritchie (2021) differs with reports that indicate that smallholder farmers produce 70-80% of world food, however this is not correct as recent studies suggest that this figure is too high and that smallholder farmers produce around one-third of the world's food, which is less than half of what is being presented on the reports. Moreover, the study found that 84% of the world's 570 million farms are smallholding with farms less than 2ha in size (Lowder et al., 2016). The identified problem was that the terms 'family farm' and 'smallholder farm' are used interchangeably whereas family farms do produce around 80% of the world's food and can be of any size (Ritchie, 2021).

A study conducted by Ricciardi et al. (2018) on global food production, mapped by farm size covering 154 crop types across 55 countries. The study covered amount produced across different farm sizes, types of crop and the use of crops (e.g., whether eaten as food, animal feed etc.). The findings of the study presented cumulative total of three metrics (agricultural land, crop production and food supply) with increasing farm size and found that smallholder farms with 2ha or less use 24% of the agricultural land, produce 29% of crops and provide 32% of the world's food. The results show that small-holder farmers produce less than half of previous claims. Lowder et al. (2021) is aligned to the conclusion that small farms produce one-third of the world's food while family farms produce 70-80% of world's food as they can be of any size and most labour is supplied by the family.

Increasing productivity of smallholder farming is important for countries that are transitioning from poverty to middle-income. Smallholders should not all receive the same kind of support as they are not a homogenous group. Pienaar (2013); Tshoni (2015); Fanadzo et al. (2018) found that smallholder farmers are not a homogeneous group when they defined smallholder farmers. A holistic approach to enhance agriculture and develop rural economies requires a strong focus on agricultural finance (Lindsjö et al., 2021; McIntosh et al., 2018).

2.4 Determinants of challenges of smallholder and emerging sheep and goat livestock farmers in Thabo Mofutsanyana district, Free State province

The determinants of challenges of smallholder and emerging sheep and goat farmers include managerial, production, marketing and financial challenges. These challenges are interconnected and have a great impact on the development and productivity of a farm. Small scale farmers are a key to ending hunger; however, they are increasingly facing barriers to profitability (Fan et al., 2020).

2.4.1 Managerial challenges

The determinants of managerial challenges of smallholder and emerging farmers include lack of general farm management and business skills, training or education, limited

access to extension services and advisory support amongst others. Given that smallholder and emerging farming is essentially a household-based operation and family is the primary labor force on the farms, household dynamics turn out to affect farm decision making. The farms are a legacy, transferred from one generation to the next. Limited job prospects lead some individuals to pursue farming as means of livelihood. In farming households, men take a lead in making key decisions on farming practices and marketing strategies, especially when it comes to cash crops. However, women often have autonomy over their pwn plots, primarily focusing on food crops. Notably, there is a going trend of female-headed farms, particularly in Asia, where women now lead over 20% of smallholder and emerging households in certain regions (World Bank, 2019).

Being a farm owner requires not only training through hands-on experience but also business acumen and strategic management skills amongst others. A study to explore post-quota Ireland shed light on the complexities of farm employment relations. The study explored the interplay between the social, cultural and economic factors that shape the experiences of farm workers and employers. The findings of the study revealed that farm workers derived a sense of self-esteem from taking on managerial roles and receiving acknowledgement and appreciation from their employers for their skills and achievements. This recognition and responsibility led to enhanced job satisfaction and a greater sense of fulfilment among farm workers. During the interviews, the author found that the employers recognised that farm workers are not as motivated and committed to the farm as farm owners (Deming et al., 2020).

A study conducted by Fourie et al. (2018) analysed a total of 40 small-scale farmers to assess management practices of emerging sheep production systems and the results revealed key constraints faced by small-scale farmers including: (i) insufficient knowledge of animal health; (ii) insufficient backing from the government and stakeholders; (iii) insufficient land for growth; (iv) antiquated farming machinery; (v) insufficient abilities in reproduction and production management; and (vi) inadequate marketing abilities. The findings also highlighted the vital role that agricultural extension officers play in helping small-scale farmers improve their sheep production systems because of their advantageous location, which allows them to offer training and advising services to address these issues.

Education level has a profound impact on agricultural production, particularly in the formal market, where competition is intense among smallholder, emerging and commercial farmers. In this context, education plays a crucial role in determining the success and sustainability of agricultural enterprises, as it influences farmers' ability to adopt best practices, as it influences farmers' ability to adopt best practices, innovate and adapt to changing market conditions (Reinhardt, 2018). Post-1994, South Africa introduced a formal Agricultural Education and Training (AET) system. The purpose of AET was to transform the sector by supporting farmers who were previously marginalised; however, implementation was not properly done as critical activities such as farmer training and basic skill education were not provided (DOA, 1996; NDA, 2002). The ASSAF Science, Technology, Engineering and Mathematics (STEM) Education Standing Committee findings aligns with the findings by DOA (1996). ASSAF carried out a study to determine and resolve the issues plaguing South Africa's agricultural education and training industry. Given the significant role this industry must play in achieving the Sustainable Development Goals of the UN, the report is crucial. The study's main conclusions included the following: insufficient funding for training at the practical level; weak industry ties to comprehend training needs; insufficient numbers and quality of educators with the necessary training to teach agriculture at the school level; and weak connections within the research (teaching, extension support). The research integrated the gathering and evaluation of global practices into the framework of South Africa (ASSAF, 2017). It is clear that lack of expertise and understanding of practical inputs that a farmer may utilize to increase their productivity is the cause of their low output (Ngcobo, 2019).

A study conducted by Ferreira (2018) in Nigeria revealed that the use of technologies by farmers has a positive impact. The opposite applied on another study conducted in Nepal that found that education is not the only means of learning to rely on instead cognitive ability of the farmers can be used. The study's findings showed that farmers with at least 7 years of education recorded about 31.1 % increase in wheat production on average without controlling their cognitive skills (Ngcobo, 2019). It is evident that there are variations on the significance of education in the growth and development of smallholder and emerging farmers. Given the above, it may be summarised that the success of

smallholder farmers is not entirely dependent on the education but also on the ability of the farmer to have some level of literacy (Pienaar and Traub, 2015).

Smallholder farmers have limited business management and entrepreneurial skills. A study conducted by Hicks (2023) found that one of the biggest challenges they have adopting regenerative practices is the cost of farm inputs and the labour required to apply them. As a result, many smallholders tend to under apply inputs and rely on family versus hired labour. These farmers also tend not to value family labour i.e., cost of their time and this leads to inaccurate assessments of the financial viability of their operations. This practise shows that smallholder farmers apply traditional practices in their farms or households. Another example is conducting soil analysis, smallholder farmers do not do it but rather rely on traditional practices (Hicks, 2023).

2.4.2 Production challenges

The determinants of production challenges include climate change, soil degradation, water scarcity, electricity supply, pest control and limited access to technology amongst others. To produce for the market, it requires production resources. Lack of these resources as well as comprehensive agricultural support limits the ability of smallholder and emerging farmers' access to markets. Smallholder and emerging farmers mainly make sales from selling at local markets such as farmers market. It is anticipated that higher agricultural output will enhance household and national food security, which is a concern in Southern Africa (Aliber, 2009).

An example of this is the agricultural drought that affect agricultural production and livestock production. According to GCIS (2015), With 40% less rainfall on average annually than the global average, South Africa is among the 30 driest countries in the world and faces severe water scarcity. South Africa has an average annual rainfall of less than 500mm while the world is about 850 mm. In 2015, South Africa experienced the worst driest year since 1992. As pastures dry up and water becomes scarce, farmers face the difficult choice of reducing their livestock numbers or incur additional costs to access water for their animals. Free State was the second province to declare drought as a disaster on 04 September 2015, after North West province. The findings presented

by Bahta (2021) indicated that the economic damage caused by this drought accounted for 2 billion USD and agricultural production declined by 8.4% that was attributed to drought conditions. The sheep livestock industry was one of the industries that were severely affected by drought with a reduction of 15% in the national herd. Livestock in South Africa declined by 1.21% Compound Annual Growth Rate, from 44.4 million of livestock numbers in 2012 to 42.3 million of livestock numbers in 2016 due to drought. It is evident that there is also poor management of livestock. These challenges highlight the urgency of implementing adaptation strategies to ensure the resilience of the agricultural sector in the face of climate change (NuWater, 2024).

Another common issue facing South African farmers that reduces production is electricity constraints. In 2022, loadshedding reached the highest stage of stage 6, and there was a loss of 1 054 hours (47.7% of the time) in production. This challenge risked the private-public efforts to drive an inclusive and competitive agricultural sector, job losses and cost of living. In the third quarter there was a decline of 2.1% in GDP from an average contribution of 2.8% excluding food manufacturing and up-and-down stream in the sector which makes up to 7% (NAMC, 2023). In the same year (2022), agricultural sector was reported to have lost around R23 billion in 9 months since there was a decrease in productivity due to loadshedding. In the last quarter of 2022, the sector growth contracted by 3.3% which was above the overall reduction of 1.3% (Agri SA, 2023).

NuWater (2023) conducted a study to understand a relationship between climate change and water resources in South Africa and how they affect one another. To do this, the state of water resources and potential implications for the future of the country were analysed. The study found that water resources are under pressure because of climate change as the country relies on surface water e.g., dams and these dams are experiencing significant decreases in water levels which is concerning. An example is the Vaal Dam which is reported to have reached its low of below 30% capacity due to prolonged drought and reduced rainfall exacerbated by climate change. The study identified energy sector; and sustainable land and water management as key areas of focus for mitigation by reducing reliance on fossil fuels and contribute to global efforts to combat climate change. Notably, South Africa has made significant strides in transitioning towards renewable energy sources, such as solar and wind power. To sustain land and

water management, the study recommended promotion of deforestation, prevention of soil erosion, and implementation of sustainable agricultural practices.

In the last few decades, agriculture has seen a lot of technological advancements, unfortunately access to these advancements has not always been economically viable for small or medium farm operations e.g., smart cellular phones, drones etc. A study conducted by Dhillon (2023) found that technologies such as unmanned aerial vehicles (UAVs), the IoT (internet of things), irrigation automation and the use of smartphones are already becoming mainstream in small-scale farming and other technologies like robotics, artificial intelligence (AI), yield monitoring, and food traceability have potential opportunities to solve the challenges that hamper the success of small-scale growers. The difficulties experienced by smallholder and emerging farmers impact on the capacity to increase production and move towards a profitable farming system. These challenges lead farmers to undertake lower-risk and lower-yielding agricultural activities that perpetuate a cycle of poverty, including those with little or no profit. Consequently, high production constraints make agriculture unattractive to young people (Fan et al., 2020). As countries develop, agriculture's role as an employer decline, and the average farmer becomes older and more wage oriented (Christiansen et al., 2020).

A study conducted by Datta et al. (2023) contends that there is an idea that young people are not interested in agriculture, however, youth is not exiting the agriculture sector. The findings of the study indicate that several African youths in agriculture is expected to rise in the coming years, given that young people are agile, educated, and adaptive to changing conditions. This means that they are likely to be key in the transformation of agriculture. The study recommended that it is important for private sector to support youth to engage meaningfully in agricultural activities, leading to a mutually beneficial relationship through rural youth profiling such as identifying their needs and address gaps.

2.4.3 Marketing challenges

The determinants of marketing challenges experienced by smallholder and emerging farmers are limited access to market information and valuable markets, price volatility and fluctuation, competition and inadequate marketing facilities amongst others. High transaction costs and insufficient property rights frequently limit markets. Small-scale farmers have several challenges when trying to reach markets, including inadequate infrastructure and insufficient knowledge, insufficient expertise, and inability to conclude contractual agreements (Cheteni, 2017; Cheteni, Mushunje & Taruvinga, 2014).

Most of literature argue the impact of transaction costs when reviewing smallholder market participation in growing economies. Literature reveals that transactional costs affect the smooth entry of smallholder farmers into profitable and valuable markets. Smallholder farmers are mainly found in the rural areas with poor infrastructure therefore they usually stay away from market participation due to the increasing transaction costs that are required (Mmbando, 2014). According to Mmbando et al. (2015) argue that transaction costs which are seen as one of the constraints experienced by smallholder and emerging farmers to participate in the market and are also used to define smallholders' farmers. The variations that exist in transaction costs in addition to other different levels of access to assets and services to reduce these transaction costs are likely the driving factors that lead to mixed market participation among smallholders.

A study conducted by Mmbando (2014) reviewed the impact of marketing costs on smallholder market participation. The findings of the study revealed that distance to market is similar to transaction costs as they both limit smallholder and emerging farmers to participate in valuable market. This means that an increase in a distance to the market, increases transaction costs. Mmbando et al. (2015) argued that transaction costs greatly deprive market participation while more access to market information enhances it. Another view showed that the likelihood of market participation and marketed surplus is a direct result of a distance between smallholder farmer's farm and the market.

Contrary to this, absence of market information and poor state of roads influence market participation. For example, whenever there are harsh weather conditions, communal

roads are inaccessible, and farmers who do not have vehicles will be forced to hire transport and this leads to high transportation costs (Mmbando et al., 2015). Some smallholder and emerging farmers use of their own vehicles to deliver their livestock to the market. These farmers are in a better position to search for more lucrative markets, and their produce is of a better quality which enables them to get a better price for their produce (Maoba, 2016). Inadequate transformation is a major constraint and challenge for smallholder farmers (Mitiku, 2014).

A study conducted by Ngcobo (2019) analysed 100 smallholder farmers in KwaZulu-Natal using regression model to examine factors that impact marketing access amongst smallholder farmers in the study area. The study found that information sharing sessions on market trends are neglected and farmers who attend these sessions do not have a clear understanding of how they can be involved in market participation. Furthermore, the study found that land tenure, poor infrastructure, inadequate financial support and lack of extension services hinder market participation.

2.4.4 Financial challenges

The determinants of financial challenges faced by smallholder and emerging farmers are limited access to credit, high interest rate and transactional costs, inadequate financial literacy, limited access to insurance and risk management tools amongst others. Increasing agricultural production, implementing new farming methods and enhancing the distribution of rural income require availability of sufficient financing (Abhishek et al., 2021; Memon et al., 2016). Farmers often need funds for adoption of new technologies and to buy inputs (Ullah et al., 2022). To meet these needs, they must either utilize their savings or borrow money (Omobitan & Khanal, 2022). In a case where farmers do not have cash in hand or savings, they must access credit. The financial constraints faced by small-scale farmers, low income and high cash expenses, require utilization of agriculture credit as an indispensable source for arranging the required investment (Kumari & Garg, 2023; Nyebar et al., 2023).

The ability of remote regions to offer sustainable financial services is a challenge in developing and underdeveloped countries (Weng et al., 2020). The geographical isolation

of these remote areas compounds the difficulty in establishing and maintaining accessible financial infrastructure. Some of the constraints that impede seamless delivery of financial services to rural populations farmers from accessing formal credit include limited physical connectivity and underdeveloped technological frameworks (Ojo, 2023). Many small farmers are excluded from productivity-enhancing financial services, such as loans and saving accounts, and are thus unable to secure much needed capital and lack the buffer against adversity and shocks that financial services offer. In rural areas, where most smallholders reside, access to formal financial services is particularly limited due to dispersed demand, the high cost of service in low-population areas; weak administrative capacity of rural banks; agriculture-specific risks such as variable weather patterns, pests and price fluctuations that affect whole communities, and lack of formally defined property and land-use rights to act as collateral for loans (Fan, 2020).

Khan et al. (2024) conducted a study in 31 developing and underdeveloped countries to explore the constraints to agriculture finance. The study found that despite an extensive but dispersed literature on constraints to agricultural finance, a comprehensive framework remains missing, making it difficult to conceptualize and resolve these constraints. The constraints framework therefore categorized constraints into three distinct groups: supply side, demand-side and infrastructure related constraints. These factors are interconnected and influence each other in complex ways. The study is aligned to findings from most of the literature, however; it argues that targeted interventions as proposed by other authors come with pros and cons. It is, therefore, important to strike a balance because in some instance,

i. A farmer will access funds to increase agricultural productivity and preserving ecological integrity, however; the potential for unintended consequences arises when development initiatives prioritize short-term gains over long-term sustainability.
ii. In addition, access to credit and financial inclusion is used as a tool to advance the socioeconomic sustainability of the farmers, however, credit ties poor and small-scale farmers into a vicious cycle of unsustainable debt. For instance, during unpredictable factors such a crop failures or market fluctuations, small-scale farmers usually struggle to meet repayment obligations which ultimately lead to a perpetuating cycle of debt.

iii. Most of the small-scale farmers in the underdeveloped and developing countries do not have adequate financial literacy, hence insufficient understanding of loan terms, interest rates and financial management usually results in mismanagement of borrowed funds. Consequently, farmers face challenges in optimizing the use of credit for activities that could enhance productivity or improve the overall efficiency of their agricultural practices.

The study recommended that the proposed innovative participatory financing schemes should be introduced to enable farmers to seek financing on profit and loss sharing basis. Moreover, the small-scale producers usually need, not only flexible financing, but also support in value chain integration (Khan et al., 2024). It may be concluded that access to funding by smallholder and emerging farmers is significant to productivity and the likelihood for it to remain a challenge is high. There is a need for both business and government to see how best this challenges can be unlocked.

2.5 Policy reform in Agriculture, South Africa

Following 1994, South African agricultural policy widened its scope to encompass burgeoning smallholder and traditional tribal farming groups in addition to the fully developed, contemporary commercial farming sector. To meet the requirements of this most vulnerable segment, government organizations such as the Agricultural Research Council, the Land Bank, and the Department of Agriculture hurriedly underwent restoration to cater to the requirements of the neediest group. In its 1997 White Paper, the democratic government approved a land reform program. Reforms to agricultural policies aim to guarantee that agriculture advances these national goals by means of the following: a rise in agricultural output and productivity that will strengthen the industry's contribution to the expansion of the national economy (South African Government, 1998). Agricultural policies play a critical role in determining the availability and stability of food supplies for individuals and communities (Barel-Shaked, 2024). The land reform policy has three pillars namely: (i) Land restitution which aims to give people back (compensation) the land they had been unfairly dispossessed after the Native Land Act of 1913; (ii) Land redistribution that aims to provide the poor with access to land for residential and productive uses, in order to improve their income and quality of life; and

(iii) Land tenure that targets mainly poor people especially women and youth to have a reasonable opportunity to gain access to land with secure rights, in order to fulfil their basic needs for housing and productive livelihoods. The land redistribution program of the land reform targeted to redistribute 30% of land to Black people by 2014 (DPME, 2014).

Lencucha et al. (2020) conducted a study to review government policies and agricultural production. An analysis on the literature (113 articles) published between January 1997 and April 2018 were included. Studies that collected qualitative data to supplement the quantitative analysis were also included. About 45 studies examined the impact of policy on agricultural production, while the remaining articles assessed land allocation, efficiency, rates of employment including on- and off-farm employment, and farm income among others. The study found that input, output and technical support had an impact on production, income and other outcomes. Although there were important exceptions, largely attributed to farm level allocation of labour or resources, financial supports were most evaluated. This type of support resulted in an equal number of studies reporting increased production as those with no effects. Declining farm income is another challenge facing most smallholder farmers in developing countries and farmers enhance their level of income through participation in off-farm activities. However, this turns to lower farm income and productivity if it leads to a loss-labour effect or enhance farm income and productivity if it improves the liquidity position of the farm household (Anang et al., 2023).

Ehlers et al. (2021) conducted a study on the impact of digital technologies on agricultural policies and its efficiency in addressing sustainability in farming. It develops and applies an analytical framework that focuses on the effects of digitalisation in distinct policy dimensions, drawing on theoretical insights and examples from practice in a European context. The findings reveal that digital agricultural policy does not simply replace analogue technologies used in traditional agricultural policy, but it also offers new options for agricultural policy, including innovative ways to effectively and efficiently address challenges. It offers opportunities for more effective spatial targeting and tailoring of instruments, including results-based subsidies. Moreover, digital data can be generated strategically using respective instrument designs to support policy learning and adaptation of designs. The study further found that information intensive instruments and

designs generally benefit most from digitalisation while transaction costs decrease. Digitalisation could also move agricultural policy from direct intervention to information-based governance. However, the analysis suggests that institutional constraints and interests, as well as the capabilities of the actors involved require attention in research and practice of digitalisation of agricultural policy.

Recognising difficulties faced by the land reform program to achieve its goals, government of South Africa have introduced various programs over the years to promote land and agrarian reforms. These programs include:

i. Land Redistribution Program in 2001 that enabled emerging farmers and interested groups to obtain a grant for the purchase of land from willing sellers, to be used for both residential and agricultural production purposes.
ii. In 2004, a Comprehensive Agricultural Support Program (CASP) was introduced aiming to improve the productivity of emerging farmers by providing them with agricultural inputs, infrastructure and technical trainings.
iii. Proactive Land Acquisition Strategy (PLAS) was introduced in 2009 to accelerate the pace of land reform; and
iv. In 2010 a Recapitalisation and Development Program (RECAP) was introduced to enable land reform beneficiaries to access infrastructure, inputs and technical support in order to use their acquired land productively.

The PLAS was approved in 2003 to contribute to food security, job creation and poverty alleviation through land and agrarian reform projects. The programme aimed to support local planning, improve coordination, equip beneficiaries, acquire high potential land; improved beneficiary selection, improve land planning & ensure productive land use. A scientific analysis of PLAS in the Free State concluded that insufficient criteria was implemented when selecting beneficiaries, post-settlement support system of PLAS was poorly monitored and only a small percentage of beneficiaries benefitted from PLAS (DRDLR, 2019). The CASP was launched in 2004, with the aim of providing post settlement support to the targeted beneficiaries of land reform and to other producers who have. Studies conducted on CASP found that farmers under agrarian reform who benefited from CASP saw a significant increase in their income compared to those who

did not. It was discovered that institutional and socioeconomic factors affected CASP participation (Phatudi-Mphahlele, 2016). For the financial year 2022/23, Free State received R190.4 million under CASP and implemented 18 projects that benefited 2 412 beneficiaries to the total allocation of R 62.7 million and 11 programmes to the value of R 127.6 million (FSDARD, 2022).

RECAP was designed to focus on land reform farms acquired since 1994 that have received little or no support but are potentially sustainable. These farms, considered distressed, are offered technical and financial support. This program aims to provide support to beneficiaries of land restitution, redistribution, and land tenure reform programs. A study conducted by the South African government found that many beneficiaries chose cash compensation instead of land restoration and where land was returned, very little development took place. Furthermore, the study found that respondents often don't understand the restitution process as it is all communicated in English therefore there may be a need to translate restitution documents into other languages, which would provide clarity to those in the program (DPME, 2024).

2.6 Summary of Chapter

Background information on Thabo Mofutsanyana District Municipality in the Free State Province and the definition of terms were provided in the chapter. Moreover, an assessment of the literature on smallholder and emerging sheep and goat farmers in the study area, and from both domestic and foreign sources on sheep and goat livestock farming/farmers was conducted.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides an overview of the research design and the region in which it was carried out (Thabo Mofutsanyana District Municipality, Free State Province, South Africa). Along with the sampling process, data gathering methodology, data collection tools, and data processing techniques, it also provides information about the population of the study area. This chapter also covers the kinds of measurements that were made on the variables and the analytical methods that were used.

3.2 The study area

The study was conducted in the Thabo Mofutsanyana district municipality of the Free State province. The district was chosen because its demographics, socio-economic and general farming characteristics were relevant to the research questions. Furthermore, the significant agricultural potential of the district as it is known for various agricultural activities, including livestock farming (e.g. cattle, sheep, goats etc.) and crop production farming. Additionally, the district had previously received government support aimed at improving agriculture, making it an interesting area to study the effectiveness of these programs. Additionally, the district was easily accessible which made it easier to collect data and engage with stakeholders.

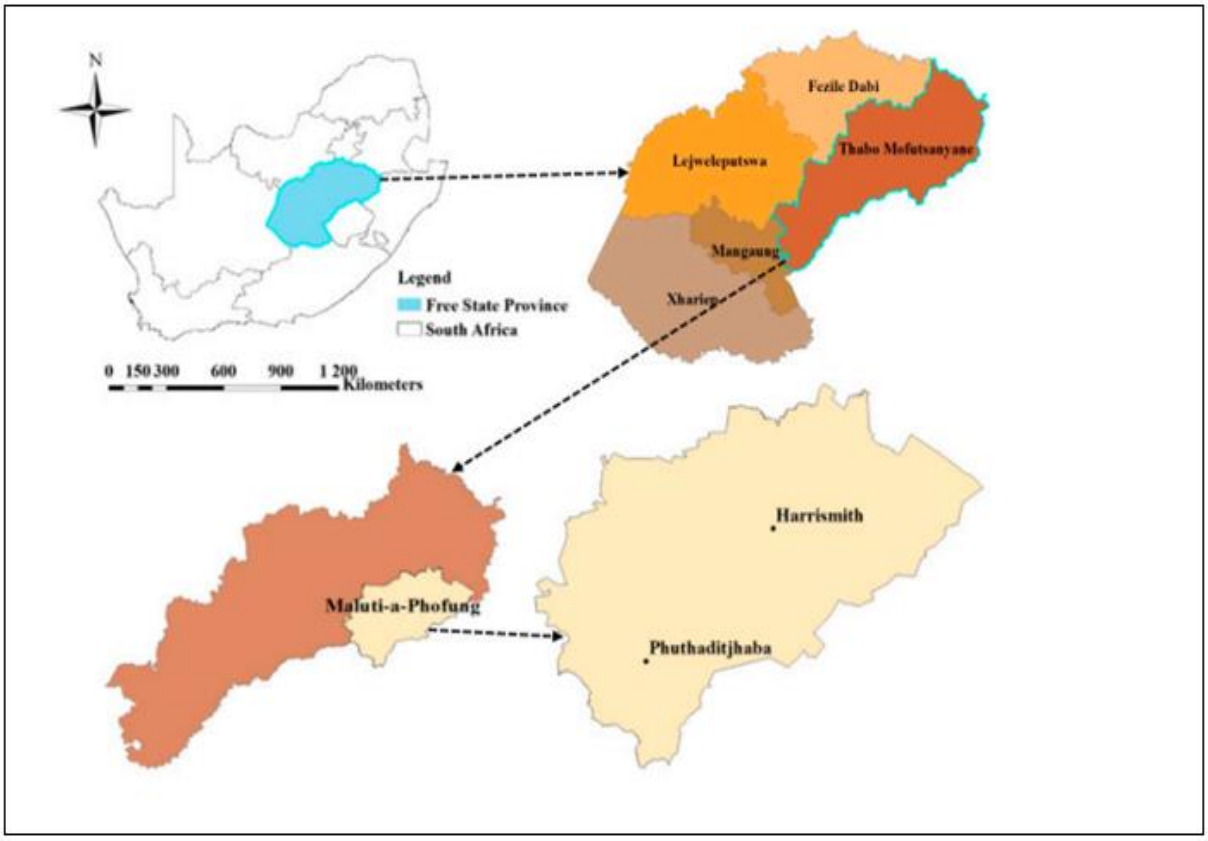

Figure 3: Map of South Africa, Free State Province
Source: Myeni et al., Barriers affecting sustainable agricultural productivity of smallholder farmers in the Eastern Free State of South Africa.

The district chosen for the study (Thabo Mofutsanyana) forms part of the Free State (FS) province known as the heart of the country as it is situated in the centre of South Africa. It shares borders with 7 other provinces and internationally with Lesotho (N8 Corridor). Its location provides it a competitive and investment advantage, making it easy to trade locally and internationally. It is made up of 4 districts, 19 municipalities, 1 metro with 79 towns. The Free State Province is the third largest of South Africa's nine provinces, representing nearly 10.6% of the land area, but only 5.7% of the population (approximately 2.9 million) situated between latitudes 26.6◦ S and 30.7◦ S and between longitudes 24.3◦ E and 29.8◦ E. In 2017, the province has a highest number of farms (7 951 farms or 19,8% of the national total), followed by Western Cape (6 937 or 17,3%), North West (4 920 or 12,3%) and Northern Cape (4 829 or 12,0%). The provinces with the lowest number of farms in 2017 were Gauteng (2 291 or 5,7%), Mpumalanga (2 823 or 7,0%) and Limpopo (3 054 or 7,6%) (Stats SA, 2020). Furthermore, a quarter of the country's arable land is in the Free State and agriculture is central to the economy of the

province. The province accounts for 15.2% of the country's agricultural production (Sihlobo, 2019).

Thabo Mofutsanyana is one of the districts in this province, located in the eastern part of the Free State Province and semi-arid region with a dispersed settlement pattern. Thabo Mofutsanyana District Municipality shares borders with Fezile Dabi District Municipality in the North West, to its west its Lejweleputswa and to its south-west its Mangaung. To its south-east, Thabo Mofutsanyana shares borders with KwaZulu Natal province and to its north-east it's Mpumalanga province. In 2019 the district Municipality had land size of 32, 734 km², with total population of 739 305 which was an increase from 736 812 in 2018 (COGTA, 2023). The district had a growth rate of 0.5% per annum which was lower than then provincial (0.6%) and national rate (1.5%). In terms of gender, about 53.3% were female and 46.7% were male.

About 20 066 people in the district had no schooling, 53 880 had matric only, 6 365 had matric and degree. Unemployment rate was at 32% while share below lower poverty line was at 52.1%. The Free State is losing most of its residents as they relocate to other provinces and poor health outcomes of the remaining residents has a negative impact on the economy of the province. Records reveal that majority of prime members of the Free State working force are the ones who are relocating to other provinces to for better opportunities. There are high rates of unemployment and poverty that exceed national averages, only one-third of the working age adults are employed. Long term unemployment rates are above national averages with deep diversities between population groups. It is estimated that unemployed youth without education, skills or training are at least 150 000 (OECD, 2021).

Figure 3 below shows the map of Thabo Mofutsanyana District Municipality and the six (6) local municipalities, namely: Phumelela, Nketoana, Maluti-a-Phofung, Dihlabeng, Setsoto and Mantsopa.

Figure 4: Map of Thabo Mofutsanyana District Municipality

https://municipalities.co.za/map/110/thabo-mofutsanyana-district-municipality, retrieved 26 March 2022

3.3 Research design

Research Design and Statistical Analysis delivers thorough coverage of the design principles and statistical concepts necessary to make sense of real data (Myers et al., 2010). Research design holds for thorough planning of the methods to be used for the collection of relevant data and the techniques to be used in the analysis, keeping in position the objective of the research and the audibility of staff, time, and money. This study followed the post positivism philosophy, deductive research approach, quantitative methodological choice, survey research strategy with cross-sectional time horizon data collection.

3.4 Data

The study included both primary and secondary data. A semi-structured questionnaire was used to conduct a survey in order to gather the primary data and a questionnaire was pre-tested with five people (refer to item 3.8).

3.5 Population of the study

The study focuses on all smallholder and emerging sheep and goat livestock farmers in the Thabo Mofutsanyana district of the Free State province. To be eligible to participate, the respondents must be a smallholder or emerging sheep and goat farmer or farm manager, eighteen years and above and willing to participate in the study. The Department of Agriculture in the respective local municipalities provided information about smallholder sheep and goat farmers as presented in Table 3 below.

Table 3: Population of the study

Smallholder and Emerging farmers of Sheep & Goats in the Thabo Mofutsanyana District Municipality		
Local Municipality		**Smallholder and Emerging farmers of Sheep & Goats**
1	Dihlabeng Local Municipality	21 = (15 sheep + 6 goats)
2	Setsoto Local Municipality	06= (5 sheep + 1 goats)
3	Maluti-a-Phofung Local Municipality	183= (116 sheep + 67 goats)
4	Phumelela Local Municipality	23= (13 sheep + 10 goats)
5	Mantsopa Local Municipality	12= (9 sheep + 3 goats)
6	Nketoana Local Municipality	06= (4 sheep + 2 goats)
TOTAL		**251=** (162 sheep + 89 goats)

Source: Data from the Department of Agriculture in the study area, 2023.

3.6 Sample size and Sampling technique

In this study, stratified random sampling technique was used to select the representative sample of smallholder and emerging sheep and goat livestock farmers. Proportionate sampling is often used (Table 3) where there is a great deal of variation within a population in terms of numbers. Its purpose is to ensure that every specified area is adequately represented (Ackoff, 1953). The list of sheep and goat smallholder and

emerging farmers was obtained from the Department of Agriculture of the district as presented in Table 3 above. Krejcie & Morgan (1970) formula presented below was employed to determine sample size for the study since the target population is uniform and finite.

$$S = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

***Where*:**

S = Required Sample size

X = Z value (e.g., 1.96 for 95 percent confidence level)

N = Population Size

P = Population proportion (expressed as decimal) (assumed to be 0.5 (50percent)

d = Degree of accuracy (5percent), expressed as a proportion (.05); It is margin of error

After determining the sample size, the sample will be selected randomly through numbered pieces of papers representing farmers in a form of lottery for each local municipality. From Table 4, the population of the target farmers is 251; so, inserting the 251 in the formula above, the sample size is 145. The number of the farmers in the respective local municipalities vary, therefore proportionately the distribution is as presented in Table 4 below.

Table 4: Sample of smallholder and emerging sheep and goat farmers in local municipalities of the Thabo Mofutsanyana District

Local Municipality		**Smallholder and Emerging farmers of Sheep & Goats**	**Sample per local municipality**
1	Dihlabeng Local Municipality	21	(21/251) x 145 = 12
2	Setsoto Local Municipality	06	(6/251 x 145 = 3.5
3	Maluti-a-Phofung Local Municipality	183	(183/251) x 145 = 106
4	Phumelela Local Municipality	23	(23/251) x 145 = 13
5	Mantsopa Local Municipality	12	(12/251) x 145 = 7
6	Nketoana Local Municipality	6	(6/251) x 145 = 3.5
TOTAL		**251**	Sample size = **145**

Source: Data from the Department of Agriculture in the study area, 2023.

Pieces of papers representing the names of the farmers in each local municipality as shown in the last column of Table 4 was done based on the farmers list obtained from the Department of Agriculture and Rural Development (DARD) for the corresponding local municipality. The papers were folded and placed in a plastic container, shaken and the specified sample for the municipality were picked randomly/lottery.

3.7 Data collection

To collect data, a semi-structured questionnaire (Appendix A) was created with consideration for the specific objectives of the research. The sections of the questionnaires were created in accordance with a particular purpose and objective: -

Section A focused on questions to collect information on farmer demographic, socio-economic and farming characteristics.

Section B focused on the farmers' sheep and goats' production, financial, marketing and managerial aspects.

Section C develop questions regarding production, marketing, financial and managerial challenges of the smallholder sheep & goats livestock farmers.

3.8 Issues of validity and reliability

The questionnaire was assessed for validity from three selected experts in the field of agricultural economics; such review indicates whether the questions in the questionnaire are guided by particular objective or not. While the reliability of the questionnaire was tested using five respondents in the study area in trial/ pre-test (the five respondents were not included in the main survey). The comments and suggestions from the five respondents (if realistic and relevant) were used to improve the reliability of the questionnaire. Each interview lasted between 40 and 50 minutes per respondent.

3.9 Ethical considerations

i. Interviews were done per appointment.
ii. Aims and objectives of the research were explained to participants.
iii. Participation in the survey was voluntary.

iv. Consent forms were prepared according to University of South Africa (UNISA) ethics policy.
v. The questionnaire was in English, but the interviews were conducted in the main local language (Sesotho) understood by the farmers.
vi. The interview questionnaires were administered by the researcher to ensure thorough explanation of questions to the respondents for best possible responses.
vii. Confidentiality of respondents' views were assured.
viii. Names and contact details of respondents were not reflected on the questionnaire.
ix. A letter of authorization to carry out the study in the district was received from the Department of Agriculture.
x. The researcher complied with the prevailing Covid-19 protocols at the time of the data collection.
xi. The researcher was accompanied by a colleague for just in case and for protection. (They were not involved during the interview).
i. The data in the questionnaires were kept in a locked cabinet; while the data on computer have a password; and used only by the researcher and the supervisor.

Ethical clearance certificate is attached as Appendix B.

3.10 Data analysis

All fully completed questionnaires were coded and captured using excel and transferred to the IBM SPSS version 28. Descriptive statistics were used to summarise and present the data in the form of frequency tables, percentages, charts, and graphs for the respective objectives.

All the responses for the open-ended/qualitative questions were also coded and summarised using descriptive statistics. The responses of the Likert scale questions for the respective main variables for managerial, marketing, production and financial challenges were presented in the questionnaire (e.g., Likert scale questions for production challenges are presented in the Table 5 below).

Table 5: Production challenges of smallholder and emerging sheep and goat farmers

No	Production challenges	5.Very Satisfied	4.Satisfied	3.Neutral	2.Dissatisfied	1.Very Dissatisfied
1	Size of farmland					
2	Practical designed breeding programme					
3	Grazing environment					
4	Prevention of livestock contagious diseases					
5	Profitability of farm production					
6	Value adding opportunities					
7	Herd size of the animals					
8	Production resources such as pasture, infrastructure and water					
9	Access to comprehensive agricultural support for the smallholder/emerging sheep & goat farmers					
10	Climate change and water scarcity					
11	Prolonged drought					
12	Supplementary feed for livestock					
13	Access and adaptation of modern technologies					
14	Stock theft					
15	Human resources/labour availability					
16	Consistency in production					
17	Quantities of animal production and quality of animals					
18	Livestock farming expertise of owner					
19	Land tenure					
20	Mean					

Source: Information from the study (Author)

The Probit regression model was used to analyse determinants of the production, financial, marketing, and managerial challenges among the sheep and goat smallholder and emerging farmers. The probit model was used since the dependent variables were in the form of binary. Factors influencing farmers annual income from sheep and goat

sales was analysed using the Multiple Linear regression model. The Multiple Linear regression model was used since the dependent variable annual income was continuous.

3.11 The Binary Probit Regression Model

The response/dependent variable *Y* of the study objective on determinants of the respective production, marketing, financial and managerial challenges is *binary* that is it can have only two possible outcomes which is denoted as 1 and 0.
In this study for instance, farmers having production challenges were denoted as 1 while those having no production challenges were denoted as 0 (same applies to the managerial, marketing and the financial challenges respectively). The level of the respective challenges experienced by the farmers vary due to differences in their demographic, socio-economic aspects and farming characteristics. The problem may be very high for some farmers while it can be very low or even non-existent among other farmers.

Therefore, the Likert scale of 1 to 5 were employed for farmers to indicate the level of their satisfaction for the respective challenge variables (1. Very dissatisfied; 2. dissatisfied; 3 Neutral; 4. Satisfied; 5 Very satisfied). The mean of the scores for questions/responses under the respective main challenges were determined (e.g., main production challenge have 21 sub-questions/ variables as shown in the table above). The mean for the sub-questions/ responses were determined by adding the scores and dividing by the number of questions. The scores less than the average were classified as 1; while scores equal to the average, and more than the mean were classified as 0 (thus a farmer not experiencing the challenge). The vector of regressors *Xi*, comprising of socio-economic and demographic factors and farming characteristics (in the Table below) of farmers are assumed to influence/ associated with the outcome *Y*. Specifically, we assume that the probit model takes the form:

$$\Pr(Y=1 \mid X) = \Phi(X'\beta),$$

Where Pr denotes probability and Φ is the Cumulative Distribution Function (CDF) of the standard normal distribution. The parameters β are typically estimated by maximum likelihood. The probit model as a latent variable model with an auxiliary random variable is expressed as:

$Y^* = X'\beta + \mathcal{E}$,

where $\varepsilon \sim N(0, 1)$. Then Y can be viewed as an indicator for whether this latent variable is positive:

$$Y = 1_{\{Y^*>0\}} = \begin{cases} 1 & \text{If } Y^* > 0 \quad \text{i.e. } -\mathcal{E} < X'\beta, \\ 0 & \text{Otherwise.} \end{cases}$$

The use of the standard normal distribution causes no loss of generality compared with using an arbitrary mean and standard deviation because adding a fixed amount to the mean can be compensated by subtracting the same amount from the intercept, and multiplying the standard deviation by a fixed amount can be compensated by multiplying the weights by the same amount.

To see that the two models are equivalent, note that:

$$\begin{aligned} \Pr(Y = 1 \mid X) &= \Pr(Y^* > 0) = \Pr(X'\beta + \mathcal{E} > 0) \\ &= \Pr(\mathcal{E} > -X'\beta) \\ &= \Pr(\mathcal{E} < -X'\beta) \qquad \text{(by symmetry of the normal dist.)} \\ &= \Phi(X'\beta) \end{aligned}$$

The model $\{y_i, x_i\}_{i=1}^n$ is estimated by the Maximum likelihood approach.

Suppose data set contains n independent statistical units corresponding to the model above.

Then their joint log-likelihood function is:

$$\ln L(\beta) = \sum_{i=1}^{n} \left[y_i \ln \Phi(x'_i \beta) + (1 - y_i) \ln (1 - \Phi(x'_i \beta)) \right]$$

The estimator $\hat{\beta}$ which maximizes this function is consistent, asymptotically normal and efficient provided that E[XX'] exists and is not singular. This log-likelihood function is globally concave in β, and therefore standard numerical algorithms for optimization will converge rapidly to the unique maximum. The independent variables to be used in the analyses are presented in the table below.

Table 6: Variable labels and their expected effects

Independent variables	Variable description	Expected effect
X_1	Gender (male=1, female=0)	+
X_2	Age (Number of years)	-
X_3	Household dependents (number)	+
X_4	Level of education (Number of years)	+
X_5	Off-farm Employment (Yes=1, No=0)	+
X_6	Own farm (Yes=1, No=0)	+
X_7	Years of farming experience (continuous)	+
X_8	Herd size (number/count)	+
X_9	Do you have a reliable market? (Yes=1, No=0)	+
X_{10}	Livestock production skills (Yes=1, No=0)	+
X_{11}	Do extension officers visit the farm? (Number of visits per season)	+
X_{12}	Do you hire seasonal labour? (Yes=1, No=0)	+
X_{13}	Do you have access to credit? (Yes=1, No=0)	+
X_{14}	Do you keep farm records? (Yes=1, No=0)	+
X_{15}	Do you belong to any farmer association? (Yes=1, No=0)	+
Y (dependent variable)	Challenge variable (0=Score≥average score (mean), 1=Score<average score (mean))	

Source: Data from the study

3.14 Summary of chapter

Primary data was collected through a survey using questionnaire. The Statistical Package for Social Sciences (SPSS) Version 28.0 computer programme was used in analysing the data. The descriptive statistics and the Binary Probit Model analysis were used for the analyses of the study.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Introduction

Chapter four features a presentation and discussion on the results of the study. The discussion is characterised by the descriptive statistics and determinants of managerial, production, financial and marketing challenges of smallholder and emerging farmers sheep and goat farmers in Thabo Mofutsanyana District Municipality. Despite the contribution of agriculture in the economy, literature suggests smallholder and emerging farmers still struggle with economics, marketing, climate change, lack of awareness, educational resources, infrastructure, information, and technology (Dhillon, 2023). Moreover, limited access to credit and insurance, and markets in which to sell farm produce and the cost of farm inputs and the labour required to apply them are the major challenges to small-scale farming (Von Loeper, 2016 and Hicks, 2023)

The study addresses the following questions: What are the major challenges facing the smallholder and emerging farmers of the sheep and goat livestock in study area? and what are the main determinants of production, marketing, financial and managerial challenges of the smallholder and emerging farmers of the sheep and goat livestock in study area.

The information discussed was generated from a sample size of 145 respondents which included both males and females who are either farm owners or farm managers. Descriptive statistics was employed in analysing the smallholder and emerging sheep and goat farmers demographic and socio-economic characteristics as well as their managerial, production, marketing and financial challenges. Furthermore, the Likert scale was used to gauge the level of satisfaction that farmers derive from challenge variables. The Probit regression model was used to analyse determinants of managerial, production, marketing and financial challenges among the smallholder and emerging sheep and goat farmers.

The chapter is organized into four sections: an overview of the chapter; results and discussions of the study; respondents' demographic and socioeconomic characteristics; and a summary of the chapter.

4.2 Demographics and socio-economic information of the respondents of the study

Descriptive statistics, such as frequencies, percentages, and standard deviations, were used to describe the respondents' demographic and socioeconomic data and were displayed as charts and tables.

4.2.1 The role of the respondents on the farm

Figure 5 presents information about the role of the smallholder and emerging sheep and goat farmers involved in the study.

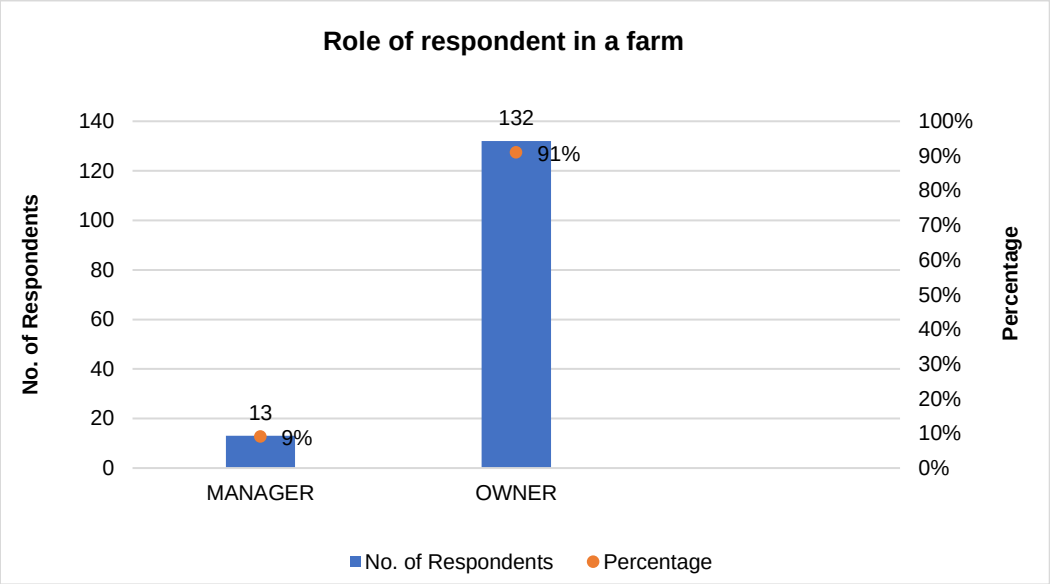

Figure 5: The role of respondent on the farm.

From the results, farm owners were found to be the main respondents of the questionnaires accounting for 91% of the sample size, while farm managers constituted the remaining 9%. The results came as expected mainly because farmers understand that the success of their farms depend on their commitment. The results are in

concurrence with Deming et al. (2020) study that found that an employer is aware how employees may not have the same level of motivation on the farm as himself (employer).

4.2.2 Gender of respondents

Figure 6 presents information about the gender of the respondents in the study. The results show that male respondents were found to be the main smallholder and emerging farmers of sheep and goat livestock accounting for 74 per cent (%) of the sample size, while female respondents constituted the remaining 26% of the respondents. The results came as expected, mainly because male farmers are more interested in livestock as it has proven to be beneficial for them as heads of the families, as well as in their experience and training from a young age.

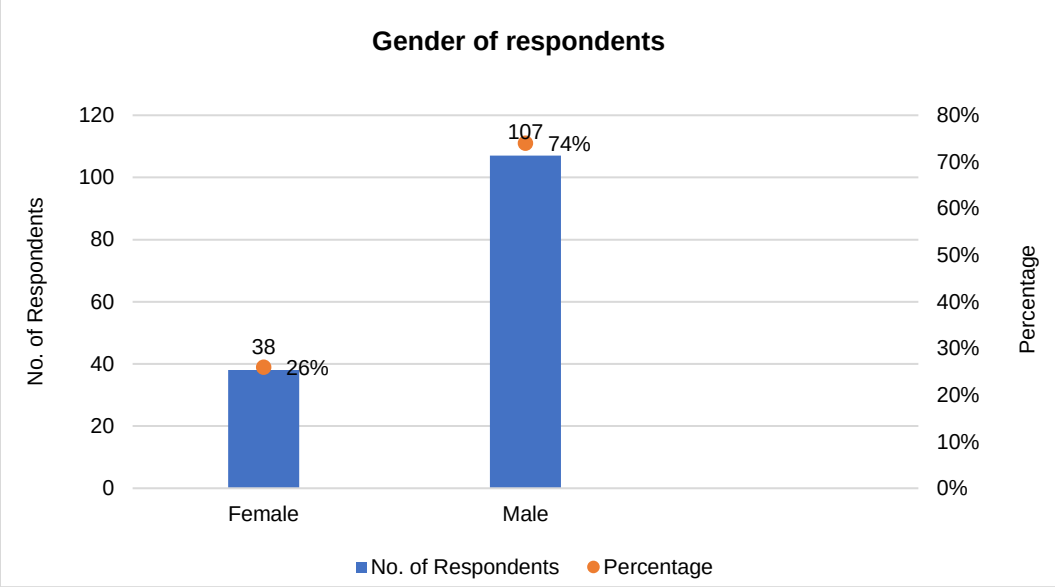

Figure 6: Gender of respondents.

The results correlate with findings of World Bank (2019). The study found that men often make the major decisions about farming and crop marketing, especially when cash crops are involved.

4.2.3 Age distribution among respondents

Figure 7 presents result on age distribution among respondents.

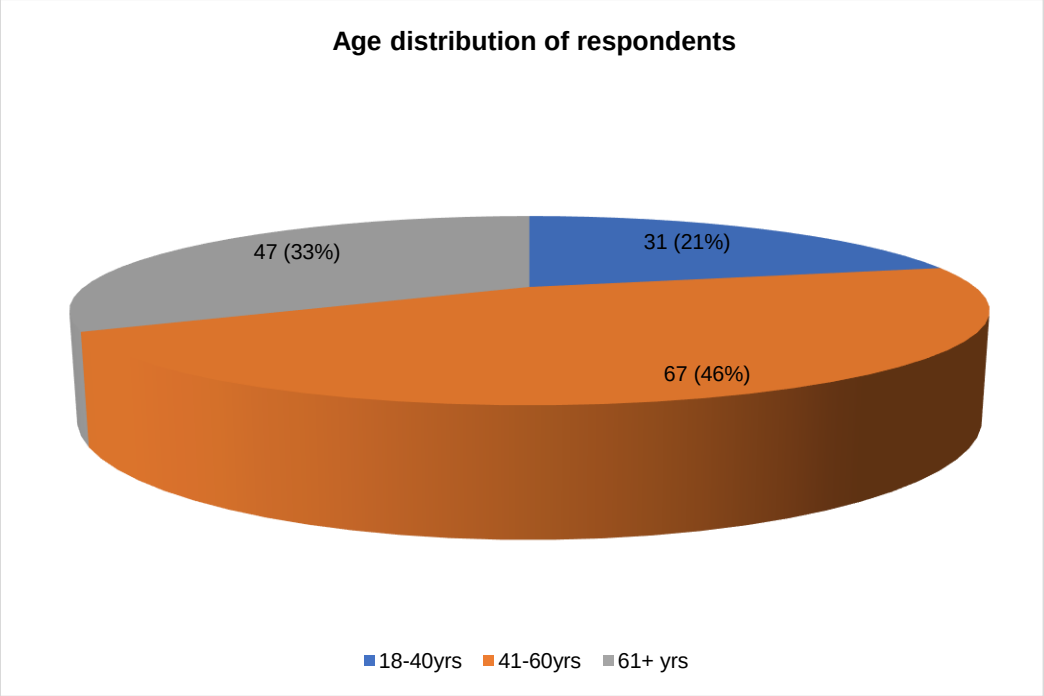

Figure 7: Age distribution of respondents.

Figure 7 above presents results on the age groups of respondents in the study area. Most of the respondents (46%) fall within the age range of 41-60 years old, 33% of respondents fall within the age range of 61+ years old and the remaining 21% fall within the age range of 18-40 years old. The results are in concurrent with Christiansen et al. (2020) who found that as countries develop, agriculture's role as an employer decline, and the average farmer becomes older and more wage oriented and Fan et al. (2020) who found that high production constraints make agriculture unattractive to young people. Consequently, high production constraints make agriculture unattractive to young people (Fan et al., 2020).

4.2.4 Age distribution of households of respondents

Figure 8 presents the age distribution in the household and the results indicates that in most households there are family members aged 31-60yrs olds (66.9%) followed by the

19-30yrs (66.9%), while 0-18yrs are contributing 64.8% and the elderly people aged 61+ are contributing 22.8%.

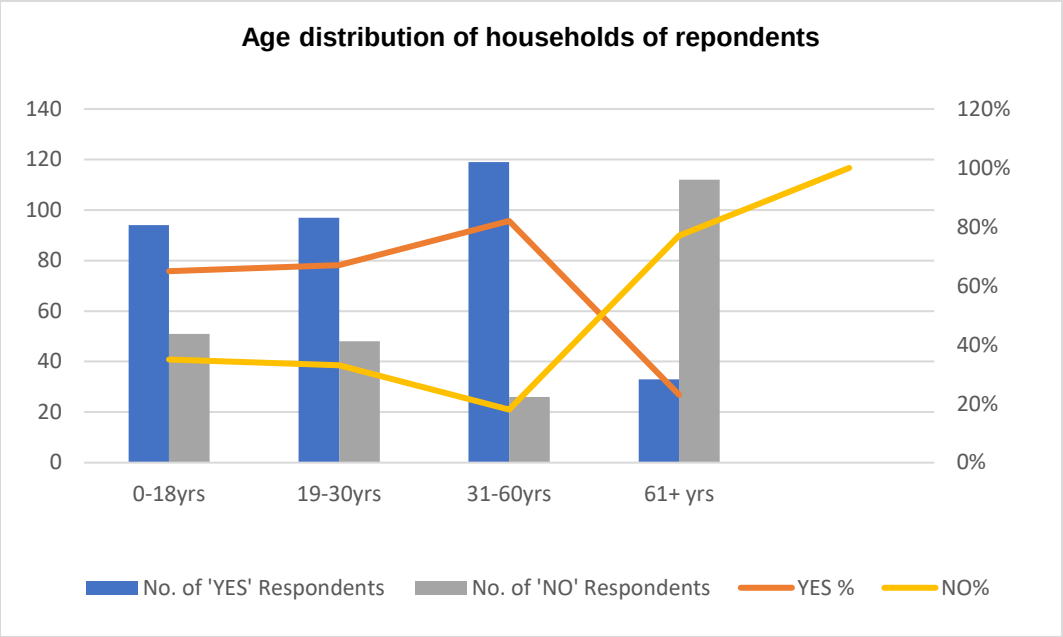

Figure 8: Distribution of households of respondents.

4.2.5 Size of households of the farmers

According to results presented on Table 7, about 52.4% of respondents had between 1-4 people in their households, 44.1% had between 5-8 people, 2.8% had between 9-12 people in their households, and 0.7% had between 13-15 people in their households. A high number of members in a household increases the likelihood for them to contribute to the farm business. Smallholder farming is predominantly a household business, labour in the farms is mainly provided by family members (World Bank, 2019; Lowder, 2021).

Table 7: Size of household of the farmer

Variable	Frequency	Percentage
1-4	76	52.4%
5-8	64	44.1%
9-12	04	2.8%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.2.6 Educational level of respondents

Figure 9 below presents results on educational level of respondents. For a better understanding of Figure 9, the variables have been classified into: No schooling (None), Primary, Secondary and Tertiary. Some respondents chose not to disclose their level of education; however, they were also included on the statistics.

The results show that most of the respondents (41%) have received secondary school education followed by 21% of the respondents who have received primary school education, then 21% of them have received tertiary institution education, while 5% has never received any education and only 1% did not want to disclose their level of education.

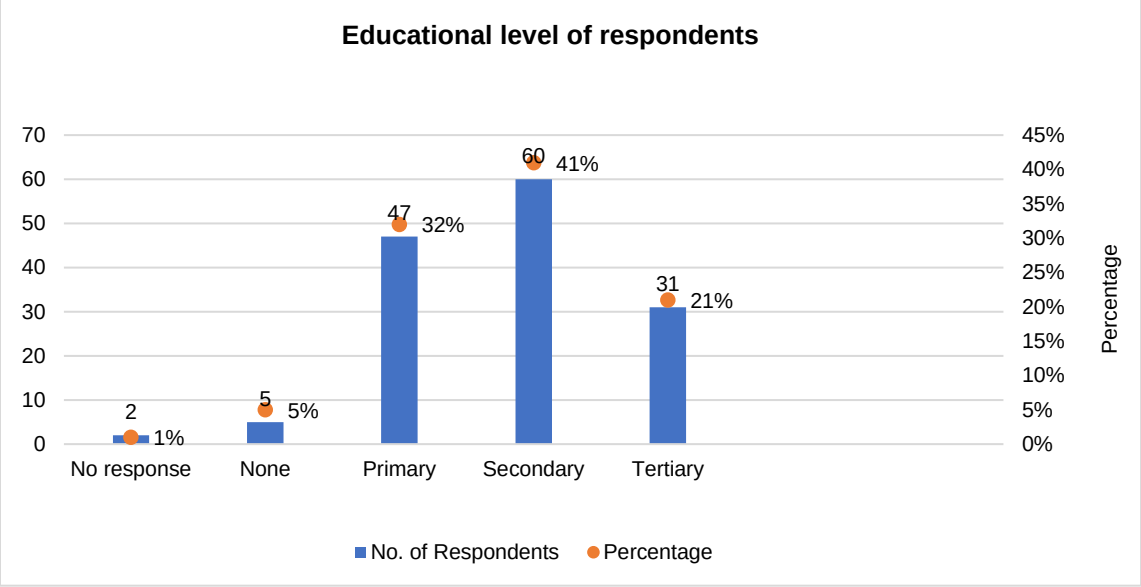

Figure 9: Educational level of respondents.

The results show that there is an effort to acquire education. The level of education when it comes to agricultural production plays a significant role in the agricultural industry especially in the formal market (Reinhardt, 2018).

4.2.7 Main language spoken in the households of respondents.

The spectrum of languages spoken by the respondents in the study area is presented in Figure 10 below.

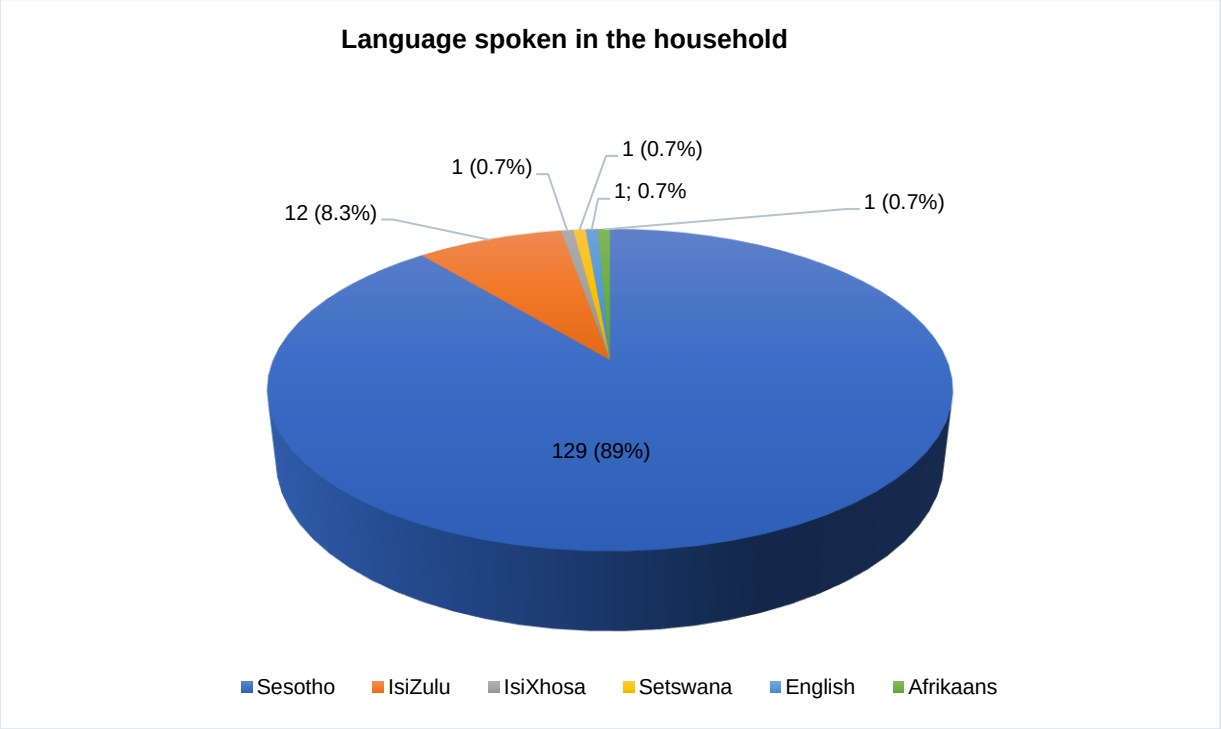

Figure 10: Main language spoken in the household of respondents.

The results of the analyses show that about 89% of the respondents in the study area speak Sesotho, followed by Isizulu speaking respondents accounting for 8.3%. The two languages are followed by IsiXhosa (0.7%), Setswana (0.7%), English (0.7%) and Afrikaans (0.7%).

The results correspond with findings by the Department of Agriculture, which found that respondents often don't understand processes as it is all communicated in English therefore there may be a need to translate restitution documents into other languages, which would provide clarity (DPME, 2024).

4.2.8 Does a farmer engage in off-farm income generating activities?

Figure 11 presents information about smallholder and emerging farmers of sheep and goat livestock who engage in off-farm income generating activities. The Figure indicates that 51% of the respondents don't engage in off-farm income generating activities, followed by 47% of respondents who engage in off-farm income generating activities, 2% of the respondents did not indicate whether they engage in off-farm income generating activities or not.

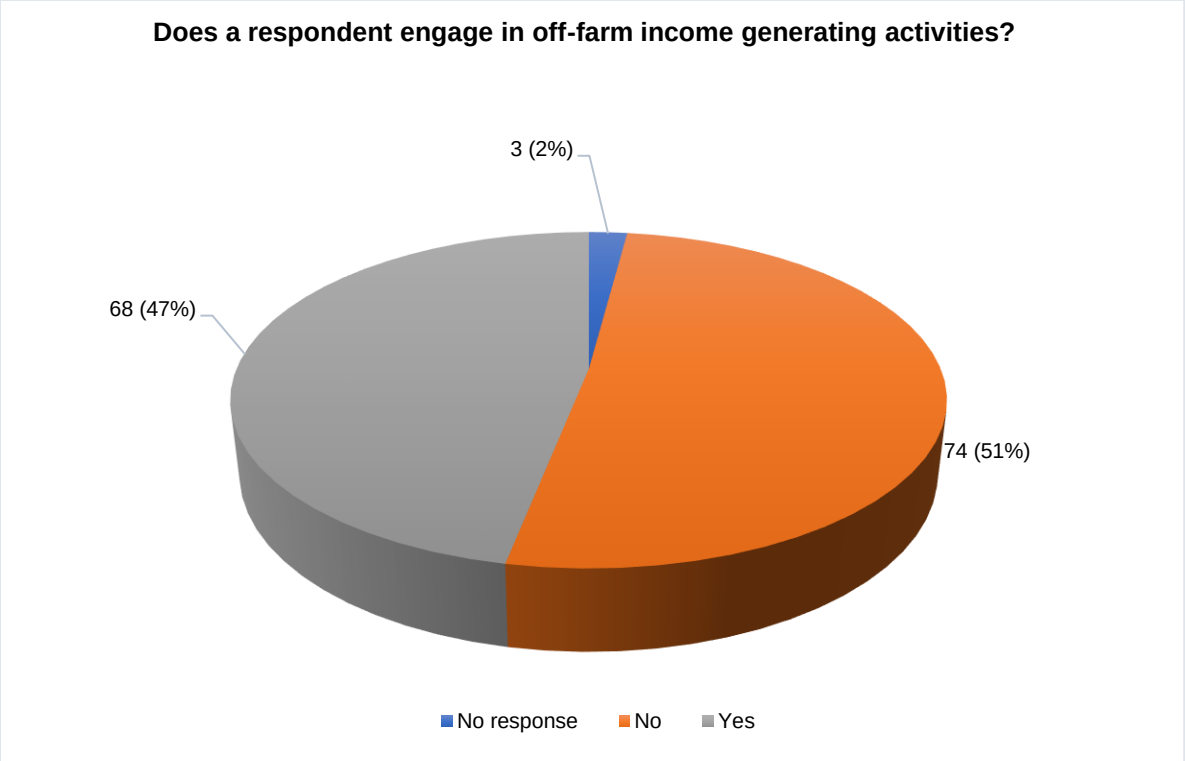

Figure 11: Does a farmer engage in off-farm income generating activities?

In developing countries, most smallholder farmers experience deteriorating farm income, hence they enhance their income through participation in off-farm income generating activities. However, this turns to affect farm income and productivity as less time is spent on the farm (Anang et al., 2023).

4.2.9 Indicate the off-farm income generating activities engaged in by a respondent.

Figure 12 below presents results on off-farm activities that farmers engage in. The results show that while 77% of the respondents do not engage in off-farm activities, 13% of the

respondents have small or micro businesses while 1% of respondents are entrepreneurs. Figure 12 further shows that 6% of the respondents are full-time employees, while 3% of the respondents are casual labourers.

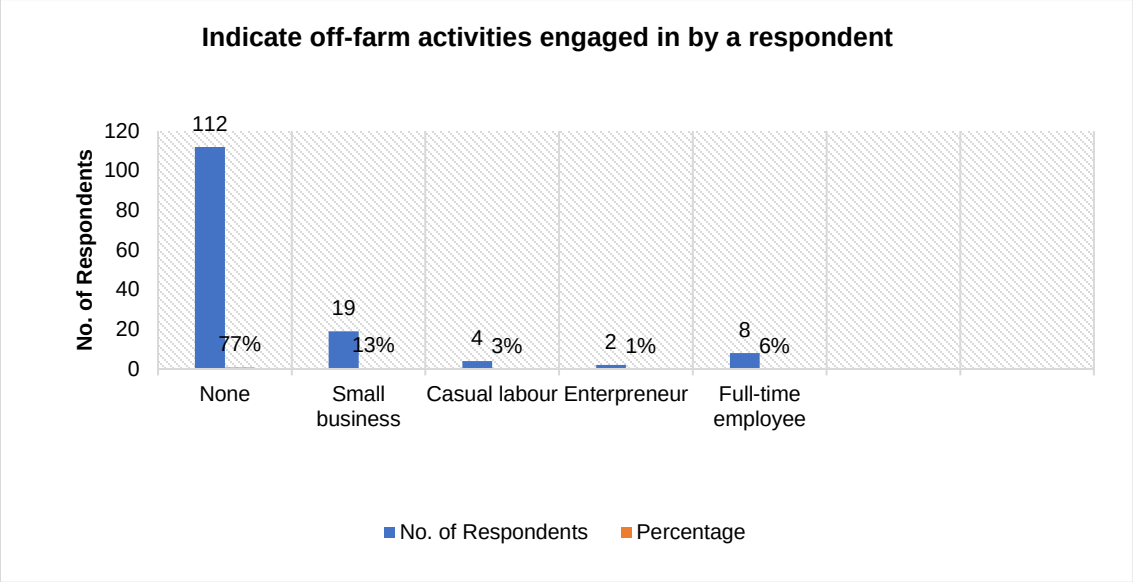

Figure 12: Indicate off-farm income generating activities engaged in.

4.2.10 Marital status of respondents

Figure 13 reveals the results on marital status of the respondents.

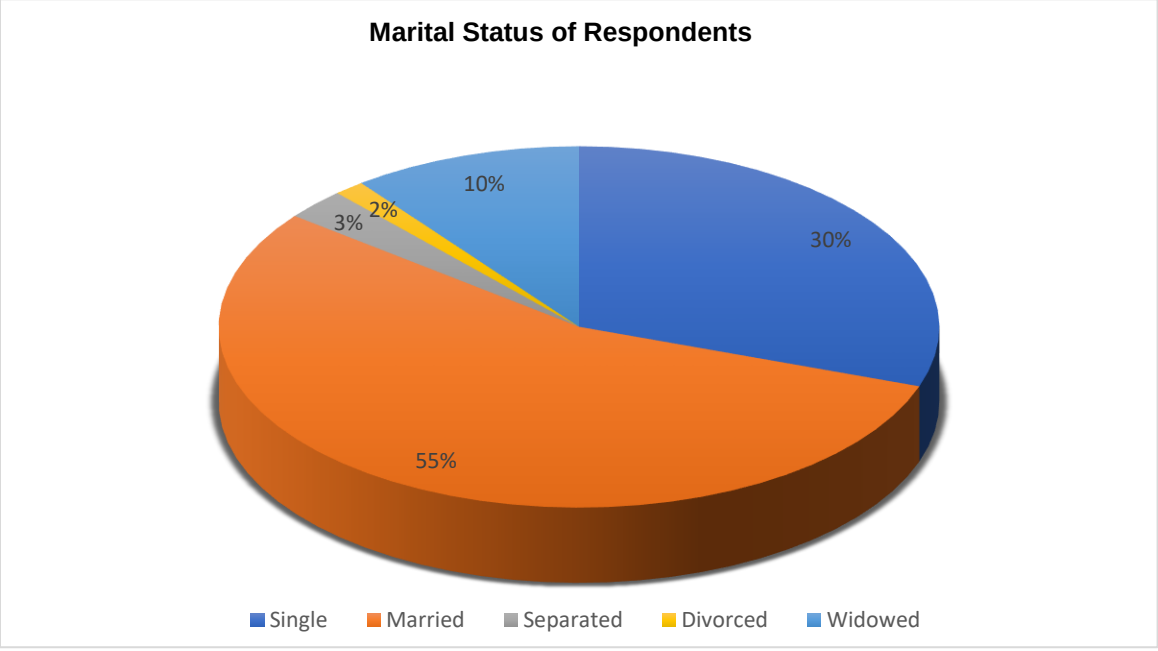

Figure 13: Marital status of respondents.

The results in Figure 13 show that majority of respondents (55%) are married as compared to 30% of respondents who are single. The results in Figure 12 further show that the respondents indicated that the widowed contribute 10%, separated constitute 3% and the divorced forms 2%.

4.2.11 Main source of income of respondents.

Figure 14 below presents the results of farmers' main source of income. The variable main source of income of farmers was considered for the analysis in the study and it is expected to play a significant role in the study that intends to analyse determinants of challenges of smallholder and emerging sheep and goat farmers in the study area. The variable was captured as a categorical and had five (5) possible outcomes.

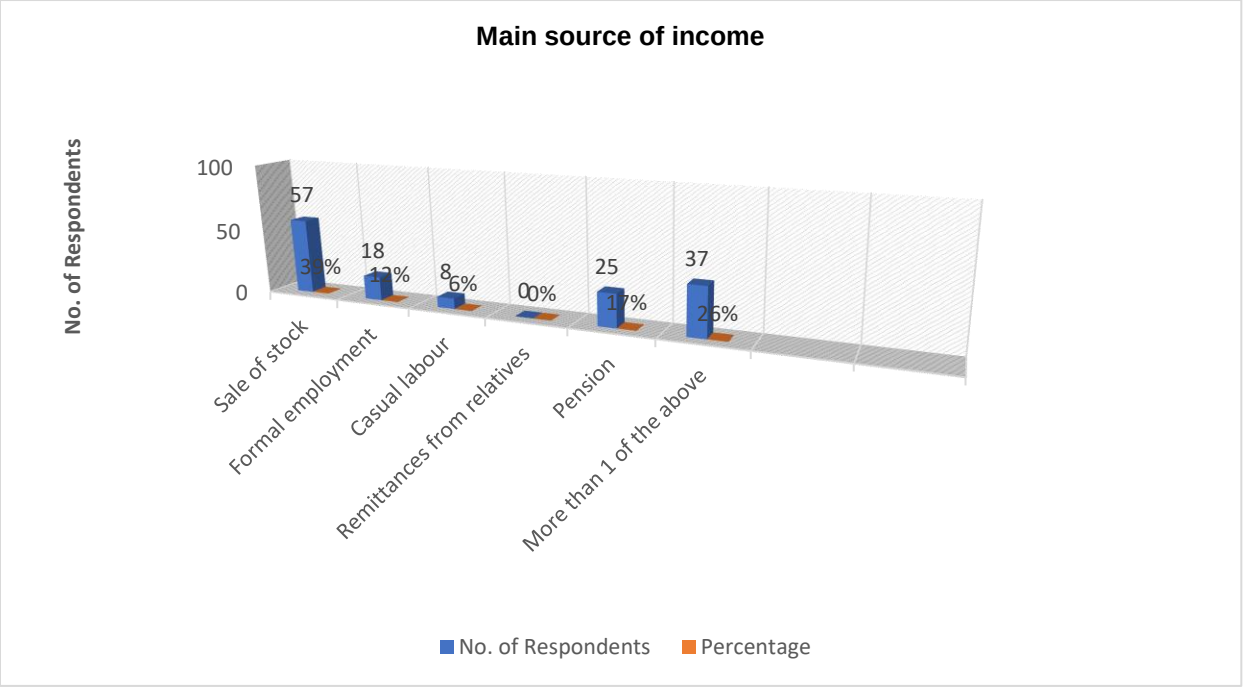

Figure 14: Main source of income.

The results show that 39% of respondents made income out of sale of livestock and they dominated the sample size followed by those in the last of the sample distribution rank accounting for 25%, the respondents who rely on government grants/ pension accounted for 17% while the respondents who are in formal employment and casual labour accounted for 12% and 6% respectively. Additionally, there are no families that rely on

remittances from relatives as their main source of income. From the results, it can be deduced that most of the respondents in the study area depend on income made from sale of livestock.

4.2.12 What is the main reason for your involvement in sheep and goat livestock farming?

There are different reasons why farmers keep animals. The livestock animals are raised to meet multiple objectives of subsistence farmers (Onyango et al., 2015). Figure 15 presents the reason/s for respondents' involvement in the livestock farming. The results indicate that 54% of the respondents are involved in farming to sell livestock, wool, and mohair, 10% of the respondents keep livestock for purposes of food security while 32% of respondents have multiple reasons for involvement in farming. About 3% of respondents indicated that for them farming is just a hobby while 1% of the respondents had only started keeping livestock of less than 5 animals, therefore they could not indicate their reason for farming in livestock as they are still learning about sheep and goat livestock and value-adding markets.

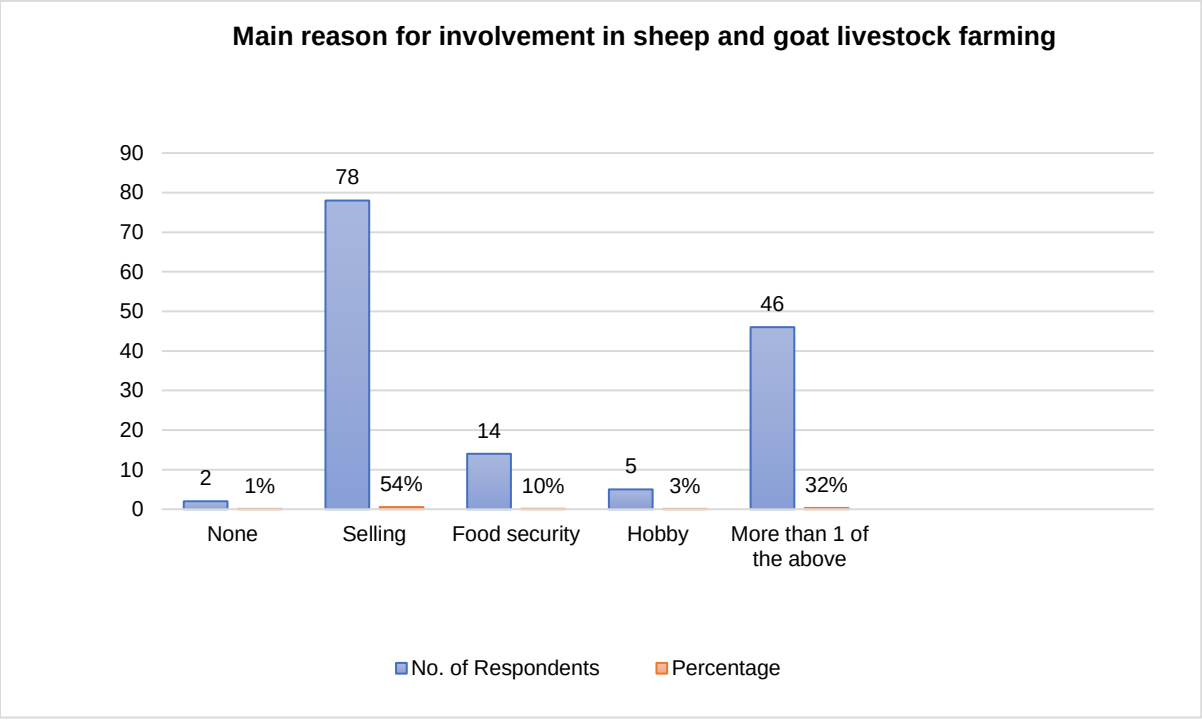

Figure 15: Main reason for involvement in sheep and goat livestock farming.

The results came out as expected mainly because more people worldwide depend on agriculture for their livelihood than any other industry, and since the majority of the world's impoverished live in rural regions and depend heavily on it, agriculture helps to alleviate poverty in these areas, Molotsi et al. (2019). The results are also in concurrence with findings from Jayne et al. (2003); Otte and Chilonda (2002) who reported that agriculture remains the single largest source of income and livelihoods for rural households in the developing world, normally providing more than 50 percent of household income.

4.2.13 Are you achieving this goal?

Table 8 presents results on whether farmers are achieving their goal or not, this is in line with Figure 15 where respondents outlined their main reason/s for involvement in sheep and goat livestock farming.

Table 8: Are you achieving your livestock farming goal?

Variable	Frequency	Percentage
Yes	11	7.3%
No	134	92.7%
Total	**145**	**100%**

Source: Data from the study

From the results, only 2.7% of the farmers are achieving their goals for involving themselves in the livestock farming. The results indicate that most of the respondents (92.7%) are not achieving their goals for different reasons that: they are still increasing their livestock therefore they have never sold livestock before and have never been exposed to markets and negotiations for sale of livestock; they have limited resources hence they are not achieving their goals while the others have lost their livestock through diseases and stock theft; and others experienced challenges with access to market hence, they are not achieving their goals.

4.3 Managerial challenges of smallholder and emerging sheep and goat farmers in the study.

Sheep and goat livestock is important for poverty reduction and food security in rural households. The animals are managed not only for monetary benefits, but also for socio-economic benefits, which includes hide, manure, source of medium-term savings insurance in a case where there is crop failure. It is also means of diversifying investment, as well as to perform social and cultural functions e.g., religious traditional ceremonies (Weyori et al., 2018). It is therefore important to understand how smallholder and emerging farmers of sheep and goat manage them and unpack challenges faced these farmers in managing sheep and goat livestock.

4.3.1 Involvement in day-to-day operations of the farm

Figure 16 presents the results on farmer's involvement in day-to-day operations of the farm. The results indicate that 49% of the respondents are *very much involved* in day-to-day operations, with 25.5% of respondents are just *involved* in day-to-day operations of the farm and 13.8% of repondents are slightly involved. Farmers who are *reasonably involved* account for 8.3% while those who are *not involved* account for 3.4% of the farmers involved in the study.

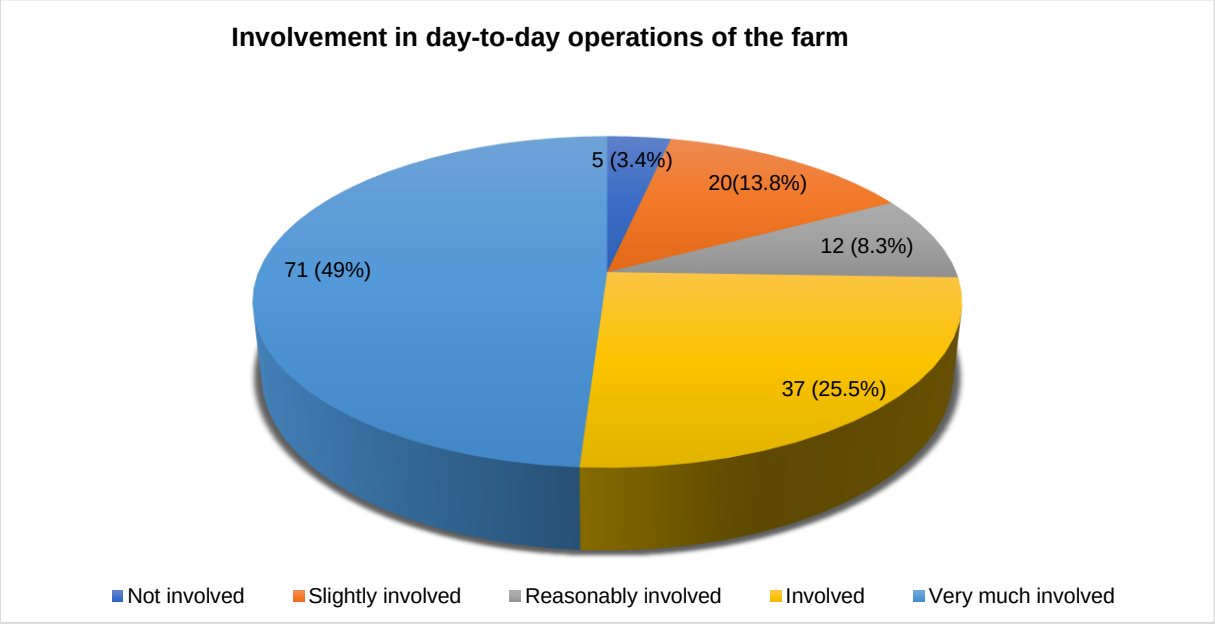

Figure 16: Involvement in day-to-day operations of the farm.

The results came out as expected because the success of farming business depents on the level of commitment by a farmer and farmer involvement in farming activities. This means that the more a farmer is involved in day-to-day operations, the easier it is to plan in advance and to be able to identify risks and put mitigation plans in place. The results are in concurrent with Lencucha et al. (2020) Input, output and technical support have an impact on production, income and other outcomes.

4.3.2 Do you have a business plan for the farm?

Figure 17 presents the results on whether a farmer has a business plan for their farms or not**.** The results show that majority (81%) of respondents do not have business plans while the minority (19%) of respondents maintained that they have business plans. The results revealed that absence of business plans has potential to impact negatively on the farm and livestock management, production, marketing and finances.

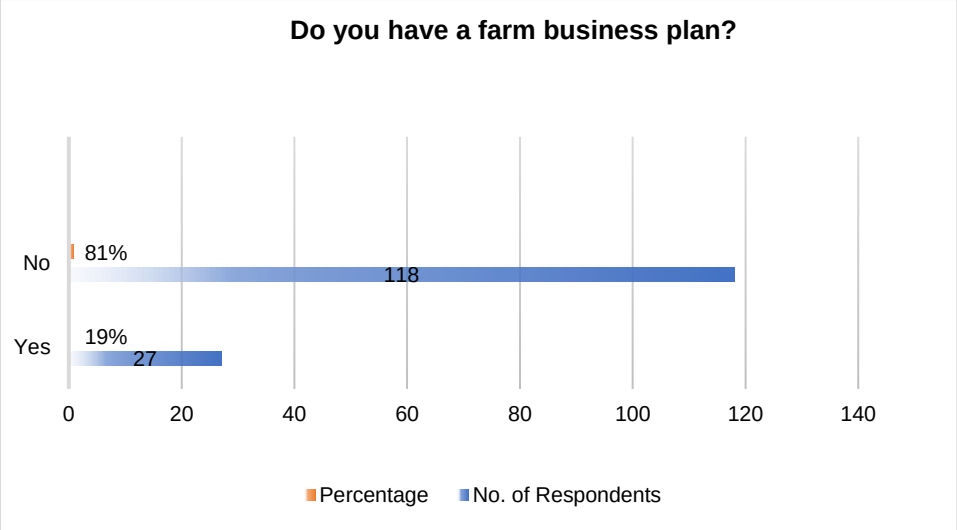

Figure 17: Do you have a farm business plan?

4.3.3 Do you follow your business plan?

Figure 18 below presents information on whether those farmers who have indicated that they have business plans are following their business plans. The results show that respondents who indicated that majority (65%) of respondents with business plans are not following their business plans while 35 % of respondents follow their business plans. The results came out as expected because smallholder and emerging farmers of

livestock generally run their farm operations the traditional way and do not treat their farm operations as business.

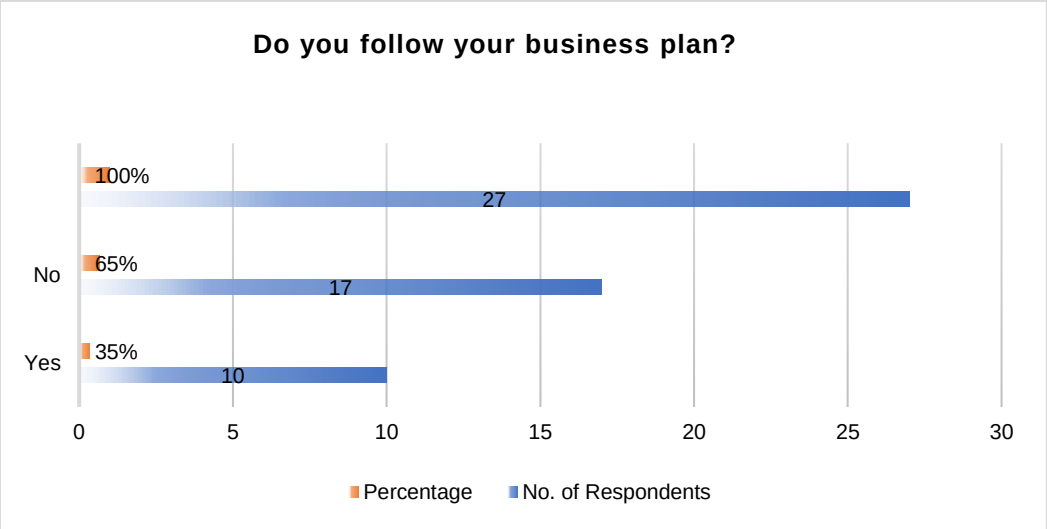

Figure 18: Do you follow your business plan?

4.3.4 How are farm operations organised?

Figure 19 presents the results on how farm operations are organised. The results show that majority of respondents in the study area were found to be sole owners of their farming businesses (72%) followed by co-operatives (12%), close corporation (8%), Trust (5%) and company (3%).

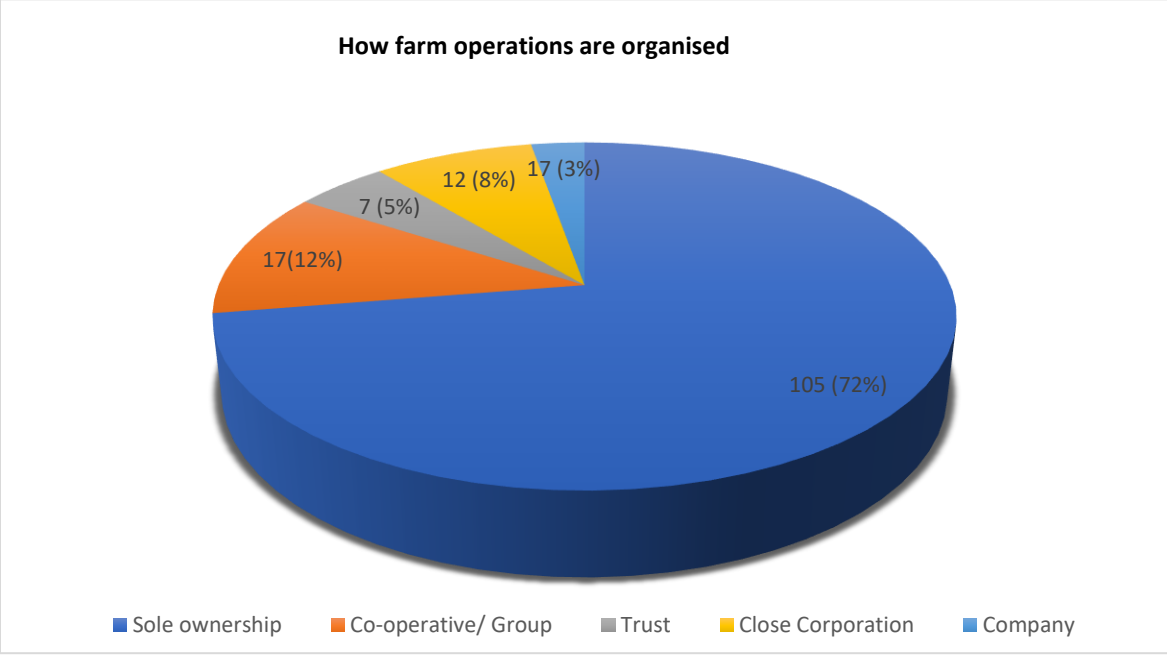

Figure 19: How are farm operations organised?

4.3.5 Labour practices on your farm

Figure 20 presents the results on labour practices on farms of respondents.

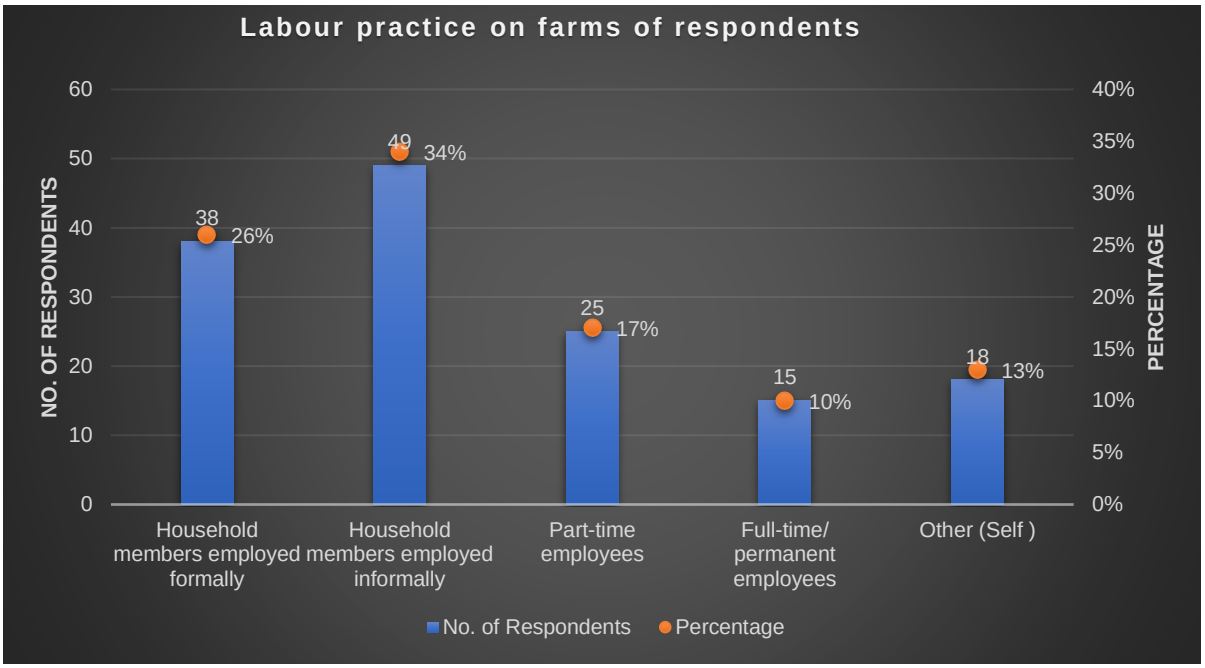

Figure 20: Labour practice on farms of respondents.

In this study, respondents were asked to provide information on labour practices in their farms. 34% of respondents indicated that household members are employed informally in the farm compared to 26% of respondents who have employed household members formally. 13% of respondents handle everything on their own compared to 17% of respondents who have part-time employees like shepherds and 10% of respondents who have permanent employees.

4.3.6 Access to agricultural information in the past year

Figure 21 presents the results on farmers' access to agricultural information in the past year.

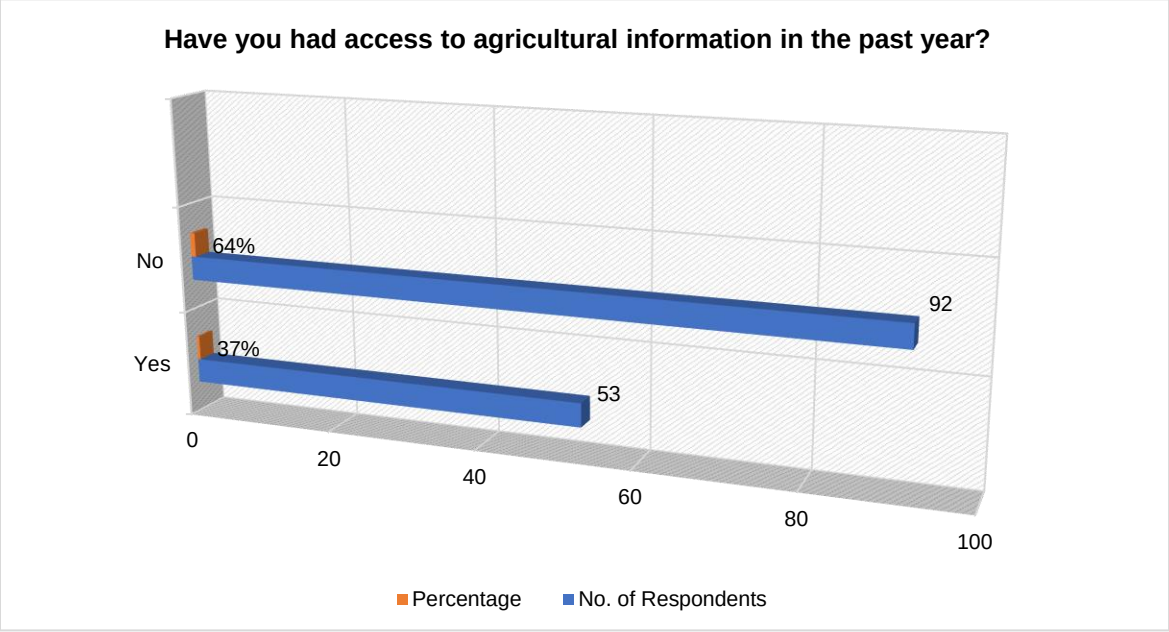

Figure 21: Access to agricultural information in the past year.

The results of the analysis revealed that most of the respondents (64%) did not have access to agricultural information in the past year compared to the 37% of respondents who had access to agricultural information for the same period.

4.3.7 Who provided you with agricultural information?

Table 9 presents the results on who provided farmers with agricultural information in the past year.

Table 9: Who provided agricultural information to smallholder and emerging sheep and goat farmers in the study area?

Variable	Frequency	Percent
None	41	28.3%
Government Extension Officers	43	29.7%
Research	3	2.1%
NGOs	1	0.7%
Farmers Association	4	2.8%
Media	9	6.2%
Other (more than 1 of the above)	44	30.3%
TOTAL	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

The results show that most of the respondents (30.3%) received information from more than one of the options provided including auctions, wool and mohair market places, 29.7% of respondents received agricultural information only from government extension officers, 28.3% of respondents did not receive agricultural information, 6.2% of respondents received agricultural information from media, 2.8% of respondents received agricultural information from farmers associations and 0.7% of respondents received agricultural information from Non-Government Organisations (NGOs).

4.3.8 Interventions/ support from government to the farmers

Figure 22 below presents results on whether there were interventions/support made by government or not. The results in Figure 21 show that majority (57%) of respondents did not receive interventions/support from government, while 43% of respondents received interventions from government. The results came as expected because during the interviews, majority of respondents indicated that they are dissatisfied with minimal or non-existent support from government.

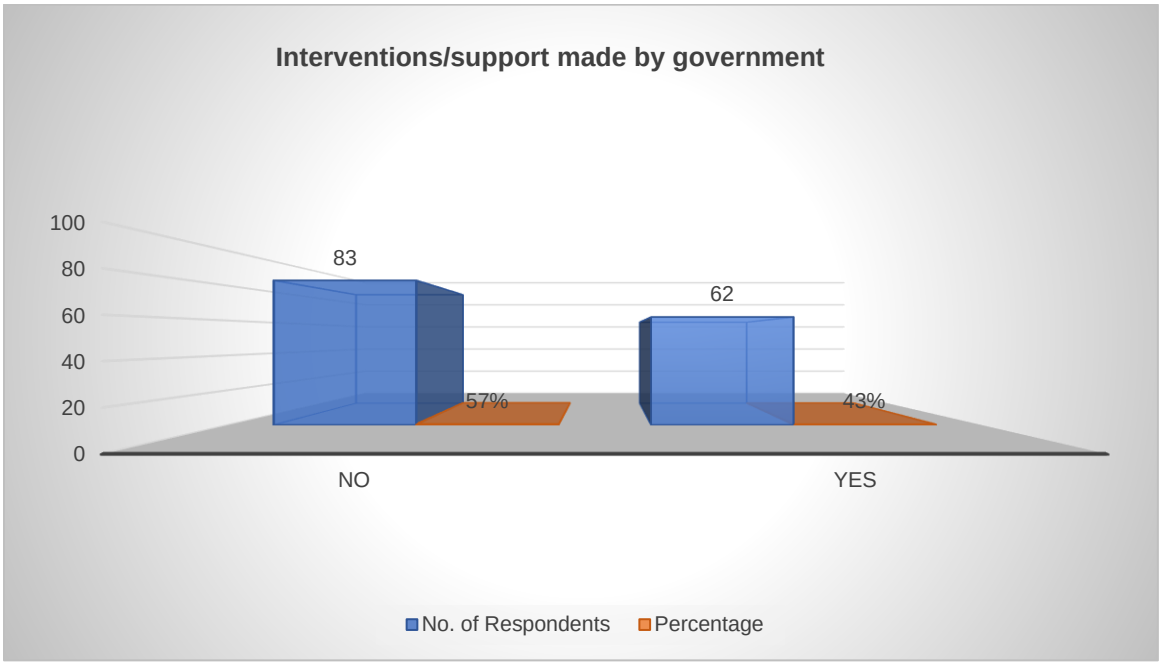

Figure 22: Interventions/ support from government to the farmers.

The results are in concurrent with the findings from Ngqangweni (2010) who found that government is not achieving its goals on implementation of intervention/ support

programs such as CASP, PLAS, RECAP etc., that were introduced to enable land reform beneficiaries to access infrastructure, inputs and technical support in order to use their acquired land productively. The findings indicate that the programs have had a limited success, due to lack of involvement of established commercial farmers to provide technical support, increasing agricultural inputs, limited investment on infrastructure and lack of market access for land reform beneficiaries amongst others. Additionally, most of these programs are in different government departments and accessing them is time consuming and difficult for emerging farmers.

4.3.9 List of interventions/support made by government.

Figure 23 provides results on a list of interventions/support that were made by government. The results indicate that most (59%) respondents did not receive interventions/support from government, 11% of respondents indicated that they were assisted with feed and seedlings, 8% of respondents were assisted with equipment, 7% received multiple interventions/support from government, 5% of them received support during drought and 2% of respondents received support in a form of services e.g., development of business plans from government. The remainder 1% of the farmers received support in the form of land, finance, feed, and medication. The results came out as expected since majority (57%) of respondents on Figure 21 indicated that there were no interventions made by government.

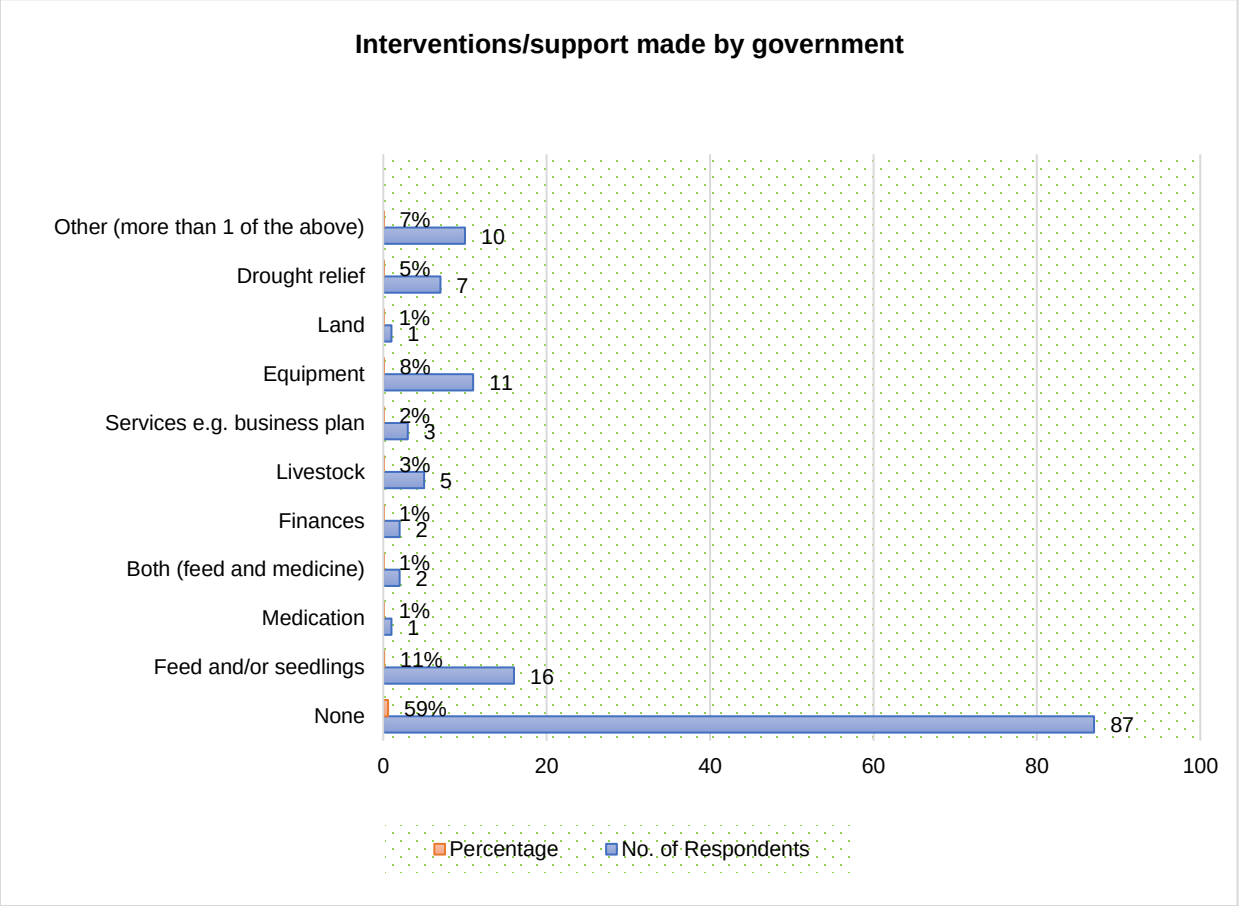

Figure 23: List of interventions/ support made by government to the farmers.

The results are aligned to findings from previous studies. Findings from Plaas (2012) are in concurrent with the results as they indicate that the land program has only managed to redistribute 5% of land by 2009 which has since increased to 7% by 2012. Additionally, Masango (2006) found that emerging farmers who have land, still lack equipment, such as tractors, to plough their land.

Furthermore, Land Bank (2001) found that emerging farmers lack access to marketing channels and the type and quantity of produce demanded by these markets. Access to market is also hampered by the transport costs of delivering products to the markets. The relatively smallholder quantities often produced by emerging farmers also increase the transaction costs related to marketing.

4.3.10 Where do you see your sheep and goat livestock business in the next 5 years to come?

Table 10 provides information about where the farmers see their farming business five (5) years to come. The results indicates that most farmers want to expand their farming business in the next 5 years**.**

Table 10: Where do you see your sheep and goat livestock farming business in five years?

Variable	Frequency	Percent
None	15	10.3%
Stop farming and/or handover to my children.	3	2%
Increase livestock	22	15.2%
Expand business by accessing formal markets (open an abattoir etc.)	81	55.9%
Commercial farming	20	13.8%
Participating in breeding schemes	2	1.4%
More than 1 of the above	2	1.4%

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

The findings show that while 10.3% of respondents have no future plans for their farming businesses, most respondents (55.9%) want to expand their farming businesses by accessing formal markets and open abattoirs in the next 5 years, 13.8% of respondents are planning to be commercial farmers in the next 5 years, 15.2% of respondents want to increase their livestock, 2% of respondents are considering stopping farming or hand over to their children as they are ageing, 1.4% of respondents plans to participate in breeding schemes while another 1.4% have multiple future plans for their sheep and goats livestock farming business.

During the interviews some respondents indicated that they are ageing, and their children don't have interest in farming hence they were not certain about the future of their farms and livestock, while some respondents indicated that livestock maintenance is expensive hence, they wish to sell all their livestock and stop farming. The results came out as expected as majority of the smallholder and emerging sheep and goat farmers in the

study area rely on sale of livestock (Figure 14) for household income and hence, they may wish to expand in order to access profitable and value-added markets.

4.3.11 Human resource challenges faced by the respondents.

Figure 24 presents human resource challenges faced by the smallholder and emerging sheep and goat farmers in the study area.

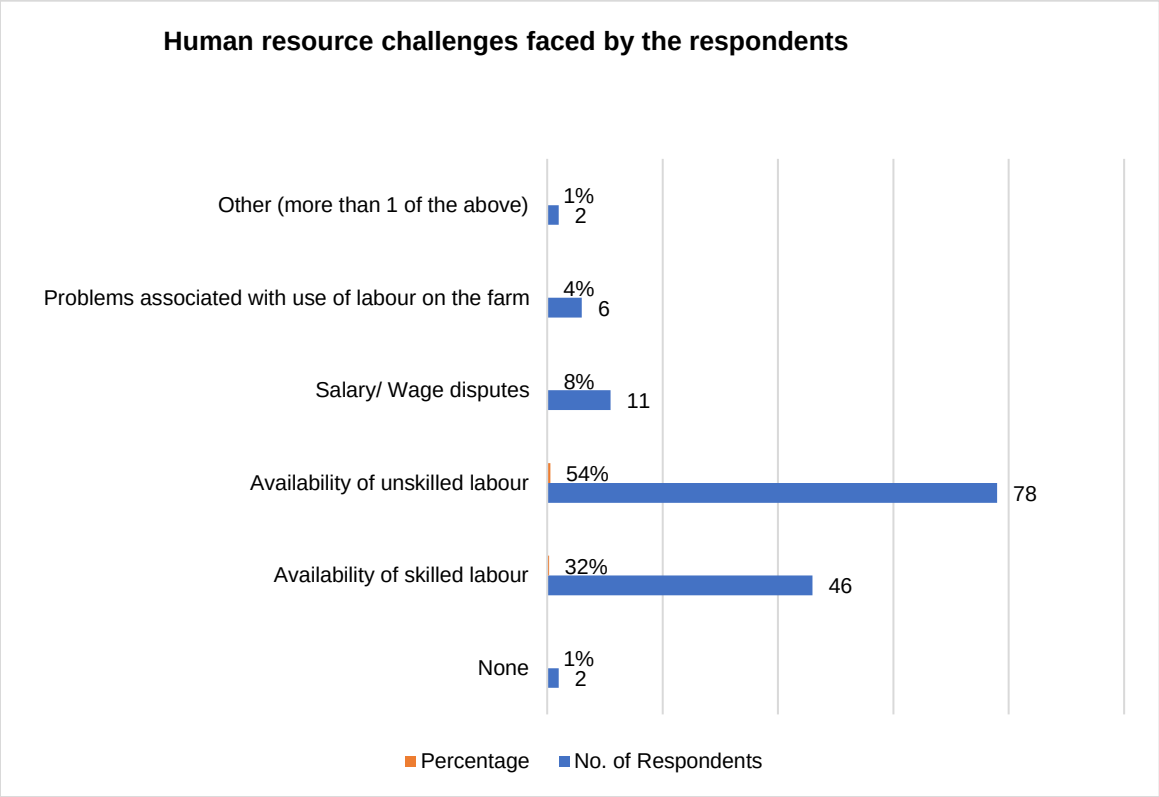

Figure 24: Human resource challenges faced by the respondents.

Figure 24 show that 54% of respondents had challenges with availability of unskilled labour, 32% of respondents had challenges with availability of skilled labour, 8% of respondents had challenges with salary/wage disputes and 4% of respondents had problems associated with use of labour on farm, 1% of the respondents had multiple human resources challenges while the other 1% of respondents indicated that they do not have any human resources challenges. This means that most of the farmers have informally employed household members, this may be due to cost-cutting measures in a farm.

The results came out as expected since most of the respondent indicated that they do not engage in off-farm activities (Figure 10), therefore, they may not always have enough funds to compensate farm workers, hence they employ family members informally as opposed to recruiting farm workers through human resources processes and formally appointing them.

4.3.12 Do you keep farm management records?

Figure 25 presents the results on whether farmers keep farm records or not.

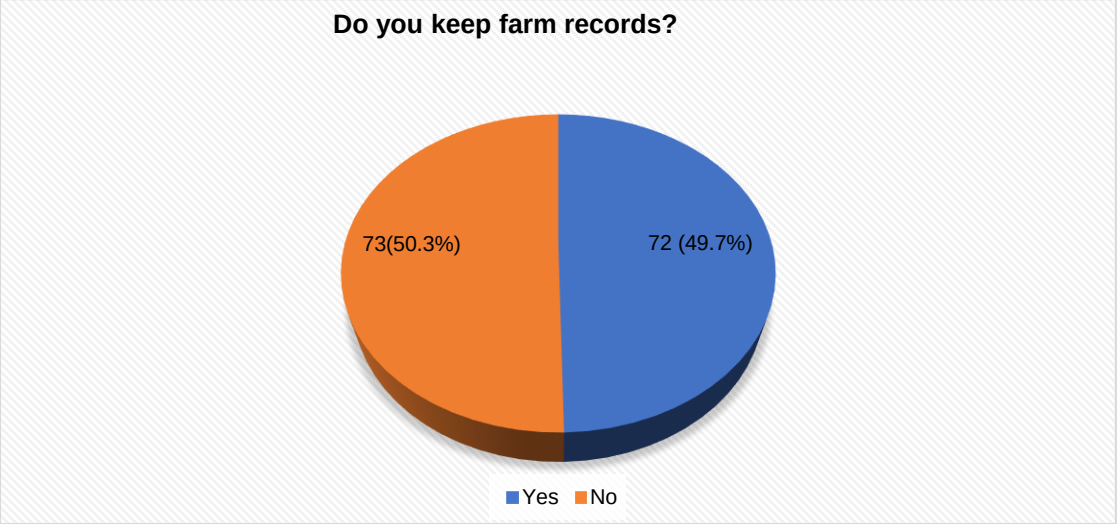

Figure 25: Do you keep farm management records?

The results indicate that majority (50.3%) of respondents do not keep farm records while 49.7% of respondents keep farm records. It was not expected that there will be a slight difference between farmers who keep farm records and those who do not keep farm records since most of the farmers in the study area practise traditional farming and implement what was practised by their elders in the farm.

4.3.13 Farm management records kept by the farmers.

Figure 26 show the results on the type of farm management records kept by smallholder and emerging sheep and goat farmers in a study area.

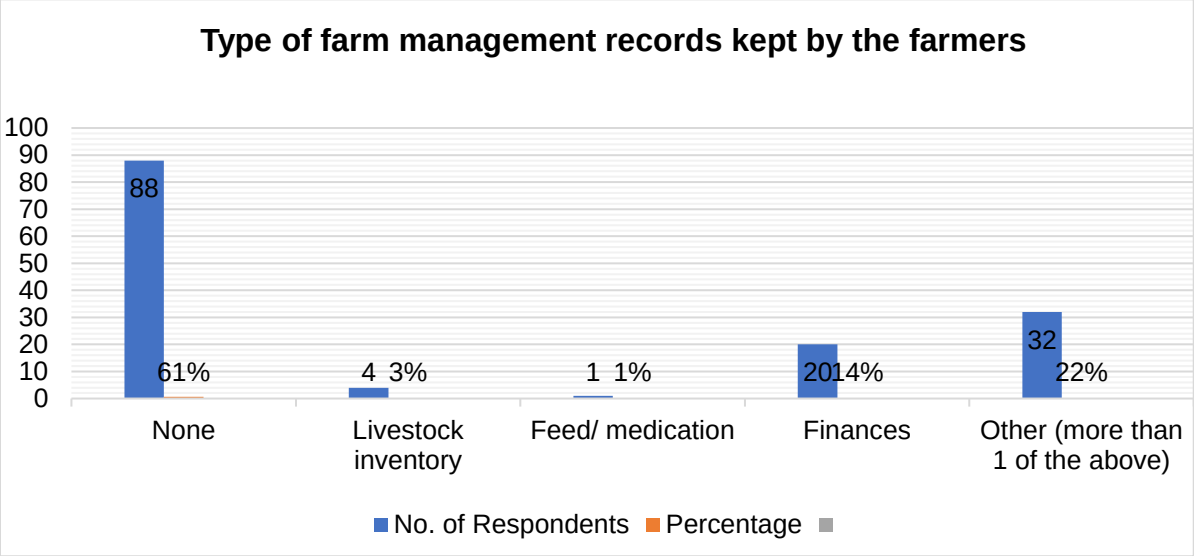

Figure 26: Farm management records kept by farmers.

Figure 26 presents the results on the type of farm records that are kept by the smallholder and emerging sheep and goat farmers in the study area. The results show that 61% of the respondents do not keep farm management records on their farms, while 14% of the respondents keep financial records, 3% of respondents keep inventory records, 1% of respondents keep feed and medication records and 22% of respondents keep multiple records.

4.4 Level of satisfaction resulting from managerial challenges experienced by the respondents.

Satisfaction is defined as fulfilment of one's wishes, expectations, or needs, or the pleasure derived from this Oxford languages (2023). This section presents the results on the respondents' level of satisfaction in respect of variables of managerial challenges. Therefore, the Likert scale of 1 to 5 was employed for farmers to indicate the level of their levels of satisfaction of the respective managerial variables (5. Very dissatisfied; 4. dissatisfied; 3 Neutral; 2. Satisfied; and 1. Very satisfied).

4.4.1 Business management skills challenge

The results of the analysis presented in Figure 27 show the level of satisfaction of farmers regarding business management skills challenges variable.

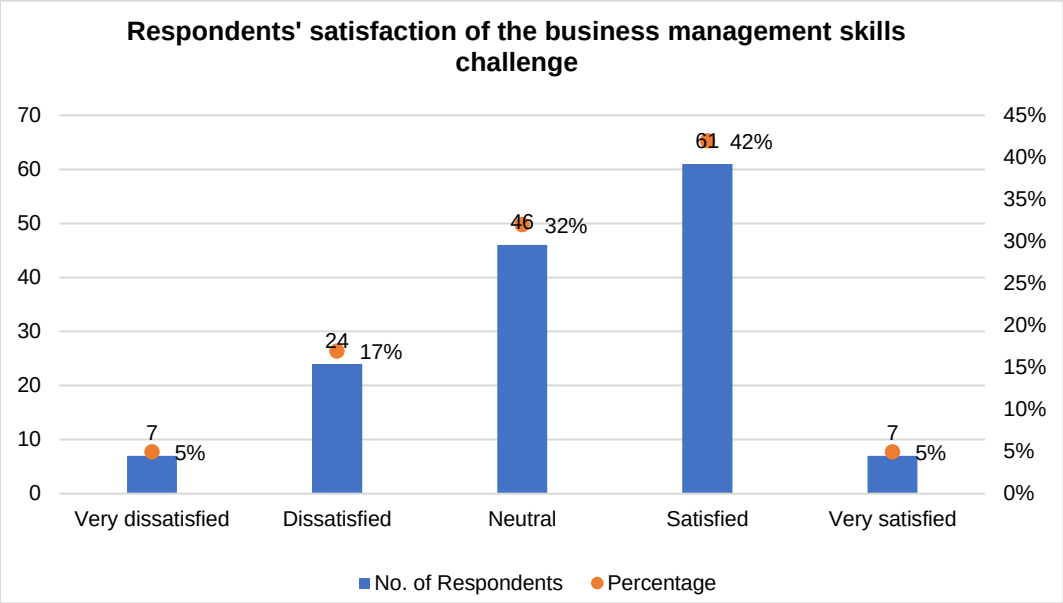

Figure 27: Respondents' satisfaction of the business management skills challenges variable.

Figure 27 indicate that majority (42%) of respondents are satisfied with their business management skills, 32% of respondents are neutral, 17% of respondents are dissatisfied, 5% of respondents are very dissatisfied while the other 5% of respondents are very satisfied. The results about smallholder and emerging sheep and goat farmers' level of satisfaction indicate that majority of respondents are satisfied with their business management skills.

4.4.2 Housing for animals

The results presented in Figure 28 show the level of satisfaction of farmers regarding housing of their livestock. The results show that 40% of respondents are dissatisfied with housing of animals, 23% of respondents are satisfied, 18% of respondents are very dissatisfied, 17% of respondents are neutral and 2% of respondents are very dissatisfied with housing for animals. The results about smallholder and emerging farmers' level of satisfaction indicate that majority of respondents are dissatisfied with housing of their animals.

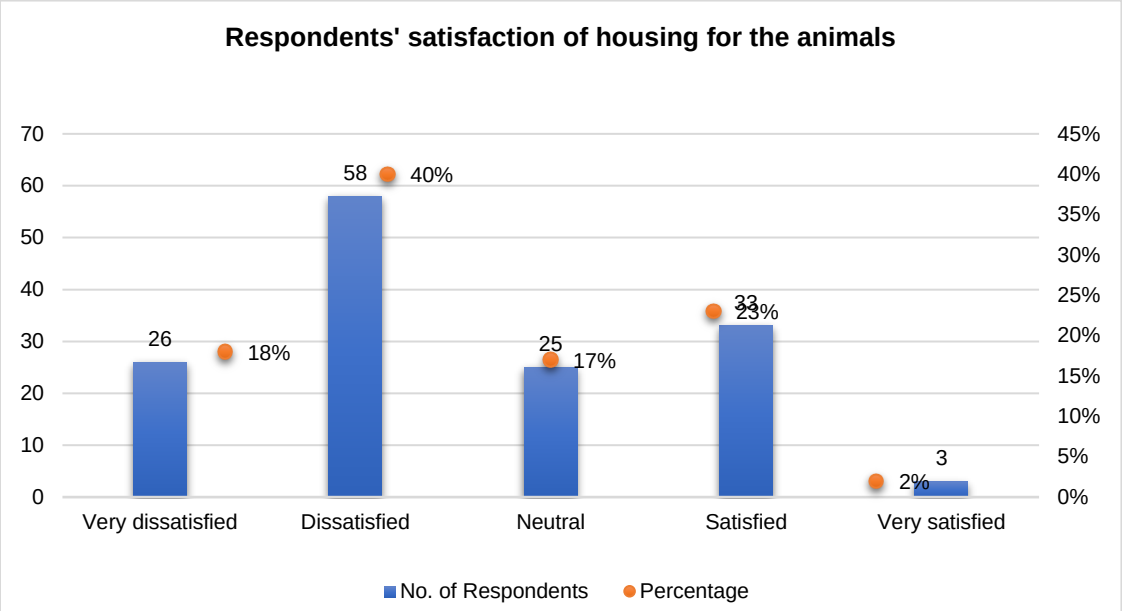

Figure 28: Respondents' satisfaction of housing for the animals.

4.4.3 Extension Services

The results presented in Figure 29 show the level of satisfaction of farmers regarding extension services.

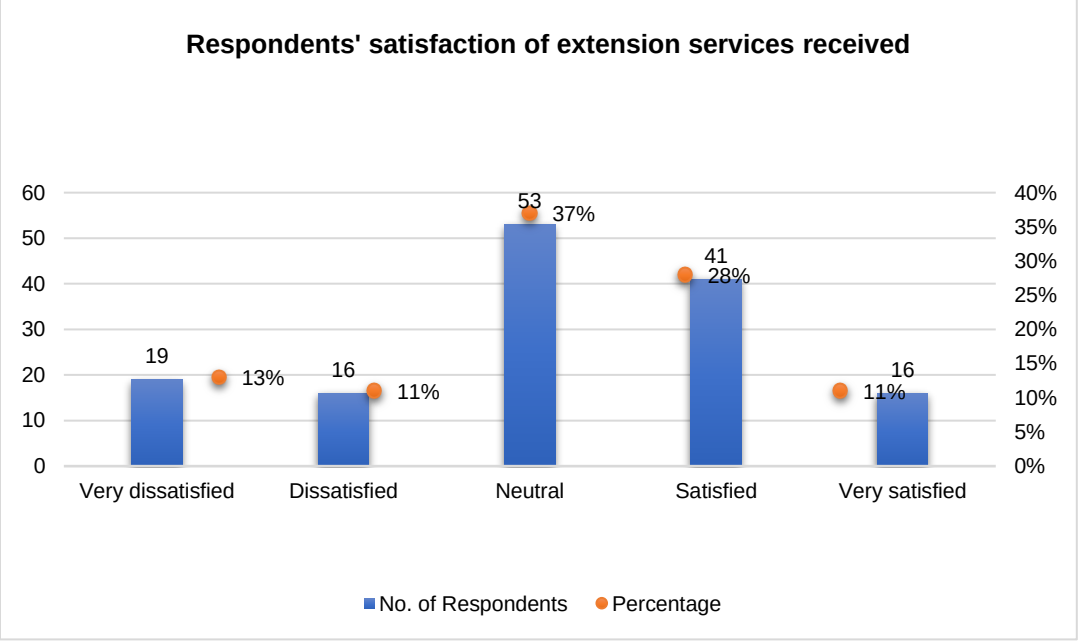

Figure 29: Respondents' satisfaction of extension services received.

Figure 29 indicates that majority of respondents (37%) are neutral, 28% of respondents are satisfied, 13% of respondents are very dissatisfied, 11% of respondents are dissatisfied while the other 11% of respondents are very satisfied with extension services support that they receive.

4.4.4 Level of education and literacy

The results presented in Figure 30 show the level of satisfaction of farmers regarding their level of education and literacy.

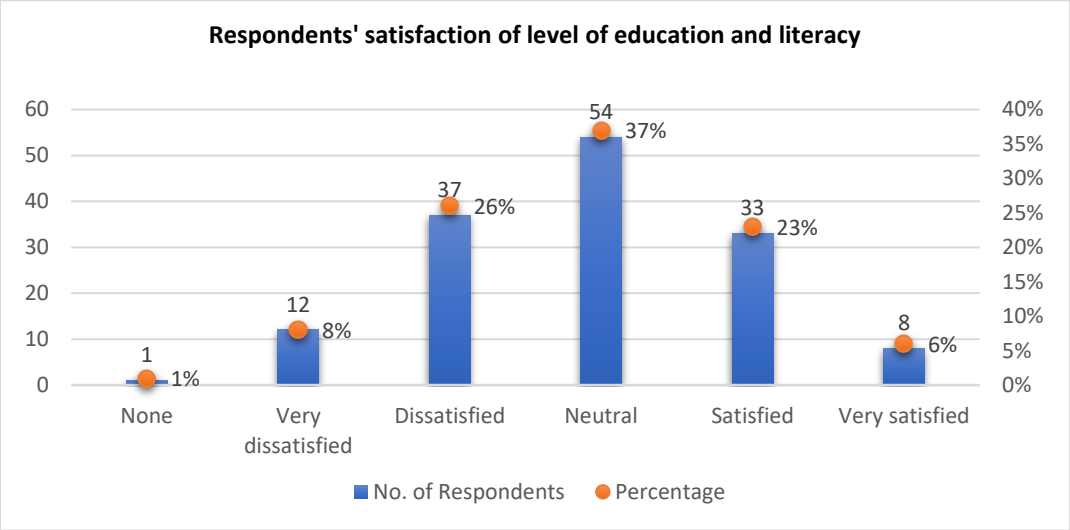

Figure 30: Respondents' satisfaction of level of education and literacy.

Figure 30 indicates that most of the respondents (37%) are neutral, 26% of respondents are dissatisfied, 23% of respondents are satisfied, 6% of respondents are very satisfied, 8% of respondents are very dissatisfied while 1% of respondents did not reveal their level of satisfaction regarding their level of education and literacy. This means that most of the farmers are neutral with their level of education and literacy.

4.4.5 Support systems such as socially organised co-ops and extension officers

The results presented in Figure 31 indicate the level of satisfaction of farmers regarding the support systems. The results reveal that most (35%) respondents are neutral, 23% of respondents are satisfied, 22% of respondents are dissatisfied, 17% of respondents

are very dissatisfied, 6% of respondents are very satisfied with the available support system. This means that the respondents are dissatisfied with the support systems that are in place. The results came out as expected as most of the respondents indicated in the questions above that, they do not have access to agricultural information and that government did not make any interventions in their farming business.

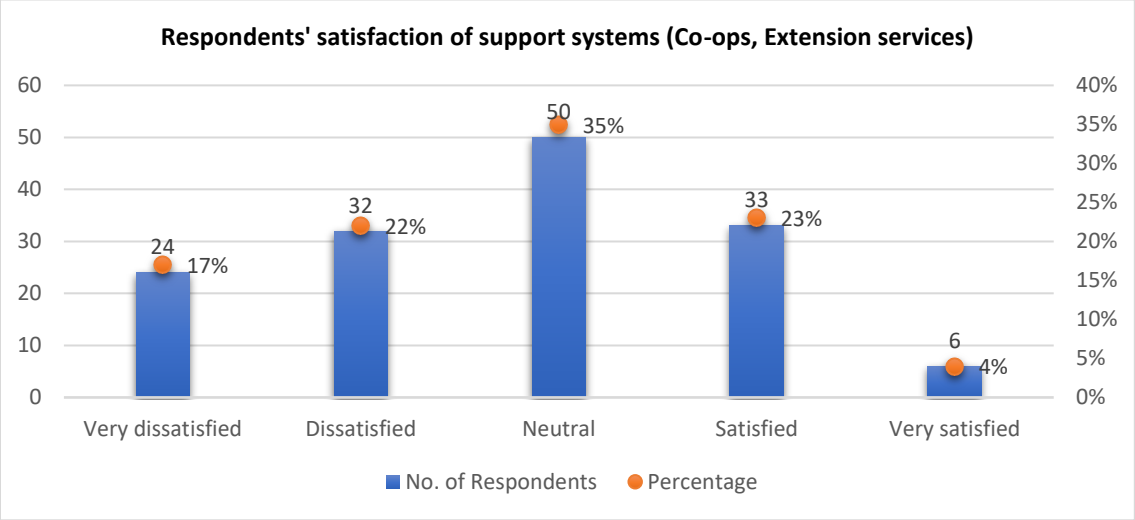

Figure 31: Respondents' satisfaction of support systems.

4.4.6 Record keeping and documentation.

The results presented in Figure 32 indicate the level of satisfaction of farmers regarding their record keeping and documentation.

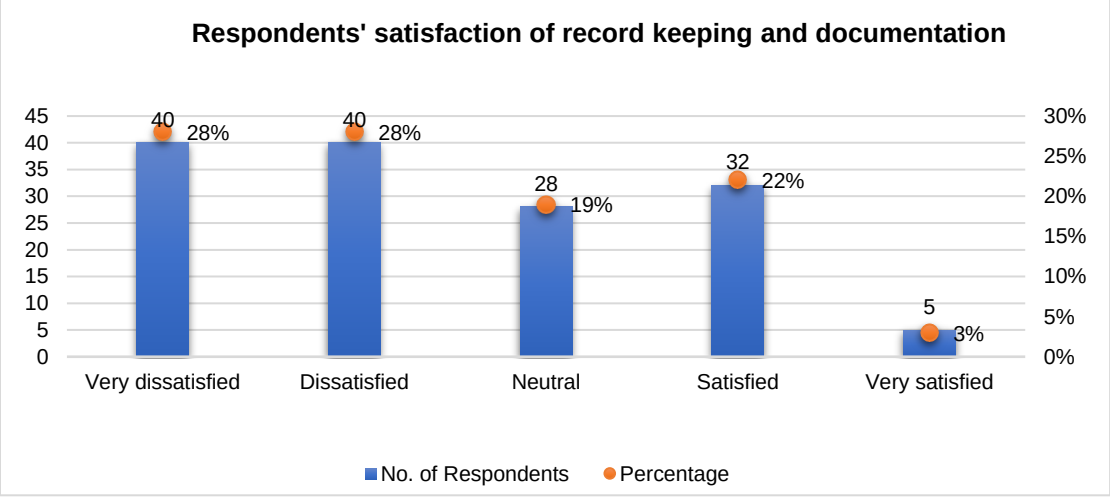

Figure 32: Respondents' satisfaction of record keeping and documentation.

Figure 32 indicates that majority of respondents (28%) are very dissatisfied, another 28% of respondents are dissatisfied, 22% of respondents are satisfied, 19% of respondents are neutral and 3% of respondents is very satisfied with their record keeping and documentation.

The results show that majority of respondents are dissatisfied with their record keeping and documentation. The results were expected as majority of respondents indicated in Figure 17 that they do not have business plans and majority of respondents in Figure 25 indicated that they don't keep farm records.

4.4.7 Management of livestock

The results presented in Figure 33 show the level of satisfaction of farmers regarding management of their livestock.

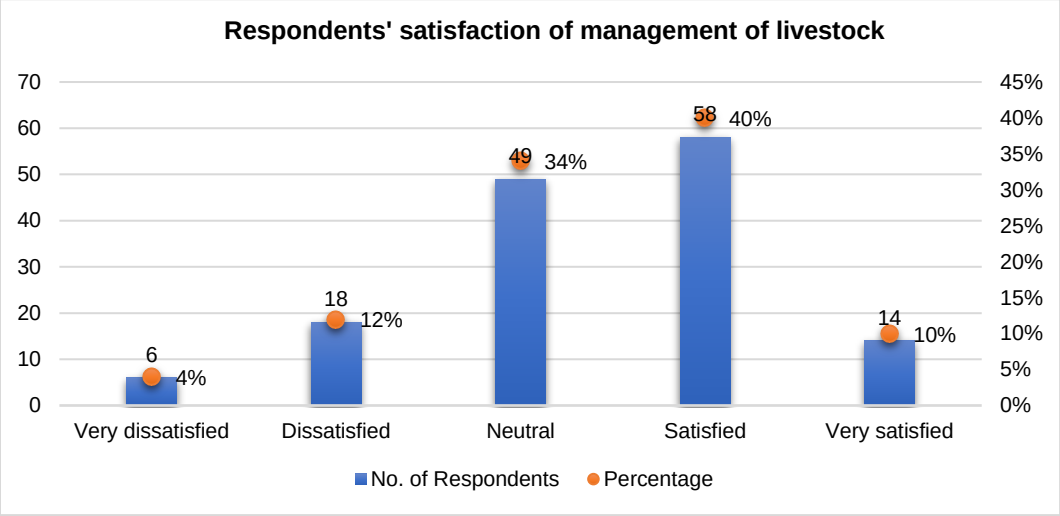

Figure 33: Respondents' satisfaction of management of livestock.

Figure 33 indicates that majority (40%) of respondents are satisfied, 34% of respondents are neutral, while 12% of respondents are dissatisfied, 10% of respondents are very satisfied and 4% of respondents are very dissatisfied with management of their livestock. The results show that majority of respondents are satisfied with management of their livestock, and this was not expected as most of the responses have shown lack of critical

management aspects like human resources management, record keeping, implementation of business plans etc.

4.4.8 Other managerial challenges- Training

The results presented in Figure 34 show the level of satisfaction of farmers regarding any other management challenge that they may have. The respondents mentioned training as additional important aspect of managerial challenges.

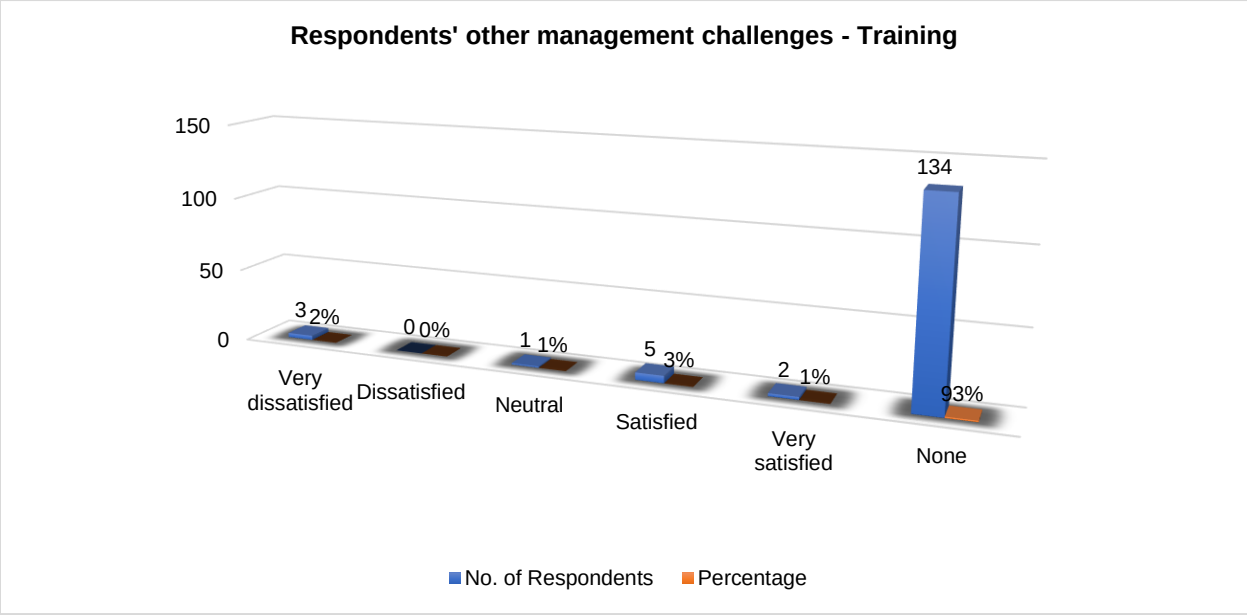

Figure 34: Respondents' other managerial challenges - Training.

Figure 34 indicates that while majority of respondents (93%) did not have any additional managerial challenges, the remaining 7% of respondents identified training as a serious managerial challenge in their farms. About 3% of the respondents indicated that they are satisfied, 2% of respondents are very dissatisfied, 1% of respondents are neutral while the other 1% of respondents are very satisfied with training in their farms. The results in this means that the respondents are satisfied with training and don't find it to be a managerial challenge.

According to DOA (1996), agricultural education training established to transform the sector by supporting farmers who were previously marginalised; however,

implementation was not properly done as critical activities such as farmer training and basic skill education were not provided.

4.4.9 Mean for satisfaction of managerial challenge variable among the respondents.

Table 11 presents the results on the level of satisfaction on managerial challenges faced by smallholder and emerging farmers of sheep and goat livestock. The satisfaction level was measured based on the Likert scale. The highest level of satisfaction score obtained by some of the farmers was 34 and the least score for level of satisfaction from the Likert scale was 7. The mean was reported to be approximately 21 and the standard deviation is approximately 5, with variance of 29. Farmers with scores equal or greater than 21 were classified as 0 (Satisfied with the challenge variable), while farmers with scores less than 21 were classified as 1 (Not satisfied with the challenge variable),

Table 11: Mean for level of satisfaction of managerial challenge variable of respondents

Managerial challenges satisfaction level stats.	
Mean	20.5172
Std. deviation	5.37497
Variance	28.890
Minimum	7.00
Maximum	34.00

Source: Data from the study (Author)

4.4.10 The results of the Probit analysis of factors associated with managerial challenges of the sheep and goat livestock farmers in the study area.

The findings of a probit analysis of the factors impacting the managerial problems faced by sheep and goat livestock farmers are shown in Table 12. The findings indicate that, when all other variables are held constant, there is a negative and significant correlation between being a male farmer and managerial issues. This indicates that, in contrast to female farmers, men farmers follow managerial standards and procedures. This indicates that female farmers are likely to experience managerial challenges than their male counterparts. When all other variables are held constant, the results similarly show a positive and significant correlation between the respondent's age and management

challenges. This indicates the older a farmer gets, increases the likelihood of managerial challenges. This could be the case since generally people lose energy as they age, which makes it challenging for farmers to effectively oversee the operations of the farm and the livestock activities.

The results further indicate that engaging in off-farm activities have positive and significant association with managerial challenges with holding all other information constant. This may be because when a farmer engages in non-farming activities diverts their attention, concentration and commitments from their farm and livestock activities. The findings mean that engaging in off-farm activities increases the likelihood of managerial challenges. The results further reveal that the role of respondents has a negative and significant association with managerial challenges, with all other facts held constant. This means that farm owners will less likely experience managerial challenges as compared to farm managers. This maybe because farm owners have the skills, experience and understand what they seek to achieve in livestock farming.

The results also reveal that involvement in the day-to-day operations of the farm have negative and significant association with managerial challenges, with other facts held constant. This means that farmers who are involved in day-to-day operations of the farm don't experience managerial challenges. This may be because they are able to identify a problem, and it solve it and identify risk and develop risk mitigation plans. The results further indicate that farmers who have farm business plans have negative and significant association with managerial challenges, with keeping all other data constant. This means that farmers who have business plans will be less likely experience managerial challenges. This may be because business plans serve as a guide in managing the farm.

The results also show that farmers who have access to agricultural information have a negative and significant association with managerial challenges, with all other factors held constant. This means that farmers who have access to agricultural information will less likely experience managerial challenges. This may be because farmers who have access to agricultural information use this information effectively and correctly in their farms. Further, the results show that access to market information has a positive and significant association with managerial challenges, keeping all other factors constant.

This implies that farmers with access to market data are more likely to face managerial difficulties than their peers. This may be due to a farmer having limitation of resources on the farm to access market, for example, the market may be far from the farm which will then require more funds.

The results also show that total number of sheep sold in 2019 has positive and significant association with managerial challenges with keeping all other factors constant. This means that farmers who sell more sheep than goats, will likely experience managerial challenges. This may be because a farmer can make money not only from selling livestock or meat but also from selling wool and milk, and if sheep are sold in high numbers, it may affect farmer' income and profit made from wool and milk. The results further show that total number of goats sold in 2019 has a negative and significant association with managerial challenges with other factors held constant. This means that, farmers who sell more goats will less likely experience managerial challenges. This may be because goat is cheaper to maintain and unlike sheep, goats can reproduce more i.e., they can breed twice in 18 months.

Fan and Rue (2020) indicate that the solution to hunger lies with smallholder farmers, however they are increasingly facing barriers to profitability, yet these farmers are increasingly encountering financial obstacles. Given their diversity, they shouldn't all receive the same level of assistance. This view is aligned to the view presented by Pienaar (2013); Tshoni (2015); Fanadzo and Dube (2018) when they were defining smallholder farmers.

Poor education and high levels of illiteracy disadvantages smallholder and emerging farmers from meeting market requirements. Von Loeper et al. (2016) effectively sum up the challenges facing smallholder farmers in line with findings from a study by Ortman et al. (2007). The findings from their studies found that smallholder farmers have (i) low levels of education and literacy; (ii) no access to inputs and services; (iii) no access to markets; (iv) high transaction costs; (v) no access to credit and insurance; (vi) no access to technology; (vii) missing support systems and (viii) insecure land tenure, such as socially organised co-ops and extension services.

Table 12: Results of Probit analysis of factors influencing managerial challenges of the sheep and goat livestock farmers (n=145)

Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Gender of respondent	-.116	.046	-2.524	0.012**	-0.206	-.026
Age of respondent	.013	.001	10.443	0,001***	0.011	.015
Size of household	.004	.010	.389	0.698	-0.016	.024
Level of education	.020	.024	.822	0.411	-0.027	.067
Engage in off-farm income activity.	.230	.043	5.299	0,001***	0.145	.315
Role of the respondent on the farm?	-.482	.062	-7.769	0,001***	-0.604	-.361
Involvement in the day-to-day operations	-.059	.022	-2.691	0.007**	-0.102	-.016
Do you have a farm business plan?	-.175	.067	-2.596	0.009**	-0.306	-.043
Access to agricultural information	-.262	.054	-4.819	0,001***	-0.369	-.156
Do you keep farm management records?	-.095	.056	-1.690	0.091*	-0.206	.015
Do you receive any veterinary services?	-.066	.038	-1.737	0.082*	-0.140	.008
What is the size of your land?	.000	.000	1.782	0.075*	0.000	.000
Do you sell your sheep and goat?	-.091	.067	-1.372	0.170	-0.222	.039
Distance from the market to your farm	.000	.000	.706	0.480	-0.001	.001
Cost per single trip to the market	.000	.000	1.788	0.074*	0.000	.000
Access to market information	.223	.046	4.816	0,001***	0.132	.314
Total number of sheep you sold in 2019.	.005	.001	5.649	0,001***	0.003	.006
Total number of goats you sold in 2019.	-.017	.003	-6.094	0,001***	-0.022	-.011
Intercept	-.359	.283	-1.267	0.205	-0.642	-.076

PROBIT model, 1%:***, 5%:**, 10%:*

Source: Used data from the study (Author)

Table 13 presents the Pearson Goodness-of-Fit results which indicate that there is a relationship between the observed frequency and theoretical distribution, meaning that the model is fit for the analysis.

Table 13: Pearson Goodness-of-Fit Test (n=145)

Chi-Square Tests			
	Chi-Square	df[a]	Sig.
Pearson Goodness-of-Fit Test	1145.201	126	<,001

Source: Data from the study (Author)

4.5 Production challenges of smallholder and emerging farmers of sheep and goat livestock

Ibrahim (1998) states that sheep and goats are significant in smallholder production systems because they require cheap initial capital and maintenance expenses, can be grown on marginal ground, produce meat and in practical quantities, and are easily cared for by most members of the household, including women and children. This is also supported by Sinn et al. (1999).

4.5.1 What kind of livestock do you raise?

Figure 35 presents the results on the type of livestock that a farmer keeps in their farm and the results show that majority (57%) of respondents mainly keep sheep, followed by 38% of respondents who keep both goat and sheep and 5% of respondents who keep goat only.

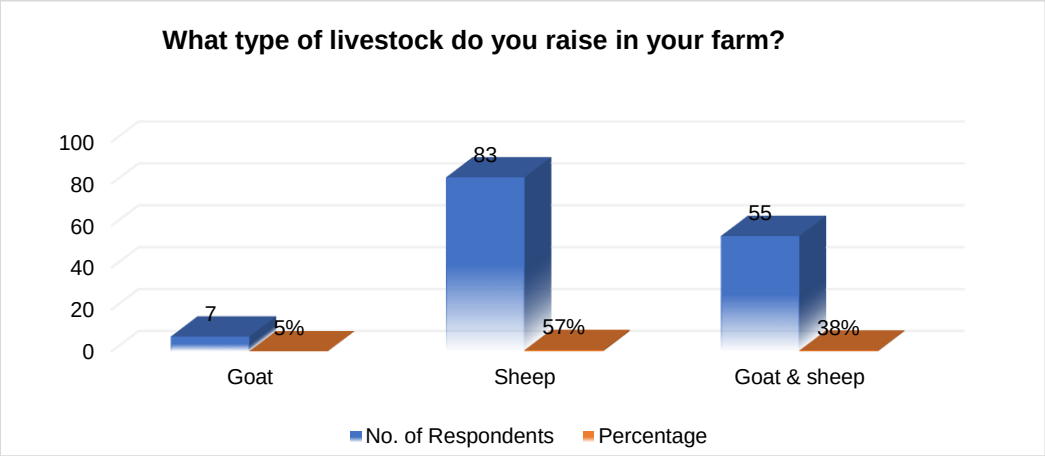

Figure 35: Type of livestock raised in a farm.

The results are in concurrence with Van Averbeke and Khosa (2007) who reported that along with producing food for the markets, smallholder farmers often grow food for their own consumption.

4.5.2 Reasons for keeping the type of livestock kept in a farm.

Table 14 presents the results on reasons why farmers keep the type of livestock they keep in their farms.

Table 14: Reason for keeping the type of livestock kept in a farm

Variable	Frequency	Percentage
For sale only	83	57%
For household consumption	7	5%
Both for sale and household consumption	43	30%
Other (Increase livestock)	12	8%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

In the main, the results reveal that most respondents (57%) keep livestock for sale only, 30% of respondents keep livestock for sale and household consumption, 8% of respondents want to increase their livestock and 5% of respondents keep livestock for household consumption.

4.5.3 Do you aspire to increase your scale of production?

Table 15 presents the results on farmers' aspiration to increase scale of production. The results indicate that majority of farmers have aspiration to increase the scale of production. The results indicate that majority of respondents (89%) aspire to increase their scale of production, while 11% of respondents are not keen on increasing their scale of production. During the interviews, some farmers indicated that they would like to stop farming due to age or handover farming business to their children while others indicated that their children don't have interest in farming, therefore it becomes difficult for them to increase production and have long term plans.

Table 15: Do you aspire to increase production?

Variable	Frequency	Percentage
Yes	129	89%
No	16	11%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

The results are aligned to the findings by Aliber (2009) who reported that it is anticipated that higher agricultural productivity will enhance household and national food security.

4.5.4 Reason for aspiring to increase scale of production.

Figure 36 below indicates that majority of respondents (65%) could not provide reasons for aspiring to increase their scale of production, while 16% of respondents want to make profit, 10% of respondents want to be commercial farmers, 4% of respondents want to consume livestock, 2% of respondents wants to supply formal markets, the remaining 3% of respondents is distributed between theft and mortality rate challenges (1%), the improvement of quality and quantities of livestock (1%) as some respondents have indicated that they still want to increase their livestock, while the other 1% of respondents had multiple reasons for aspiring to increase their scale of production.

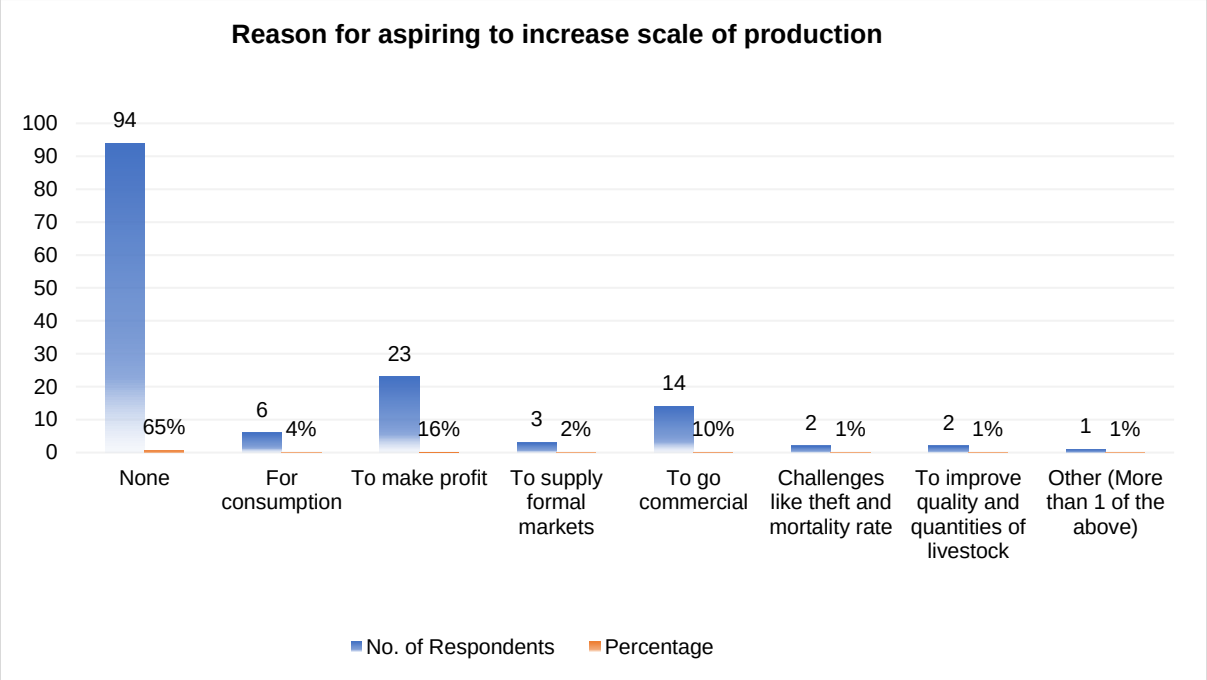

Figure 36: Reason for aspiring to increase scale of production.

4.5.5 Challenges with achieving a goal of increasing scale of production

Figure 37 presents the results on challenges with achieving a goal of increasing scale of production. Figure 37 indicates that 21% of the respondents stated that distance to the

market is a challenge while 17% of respondents stated that they are unable to access the market.

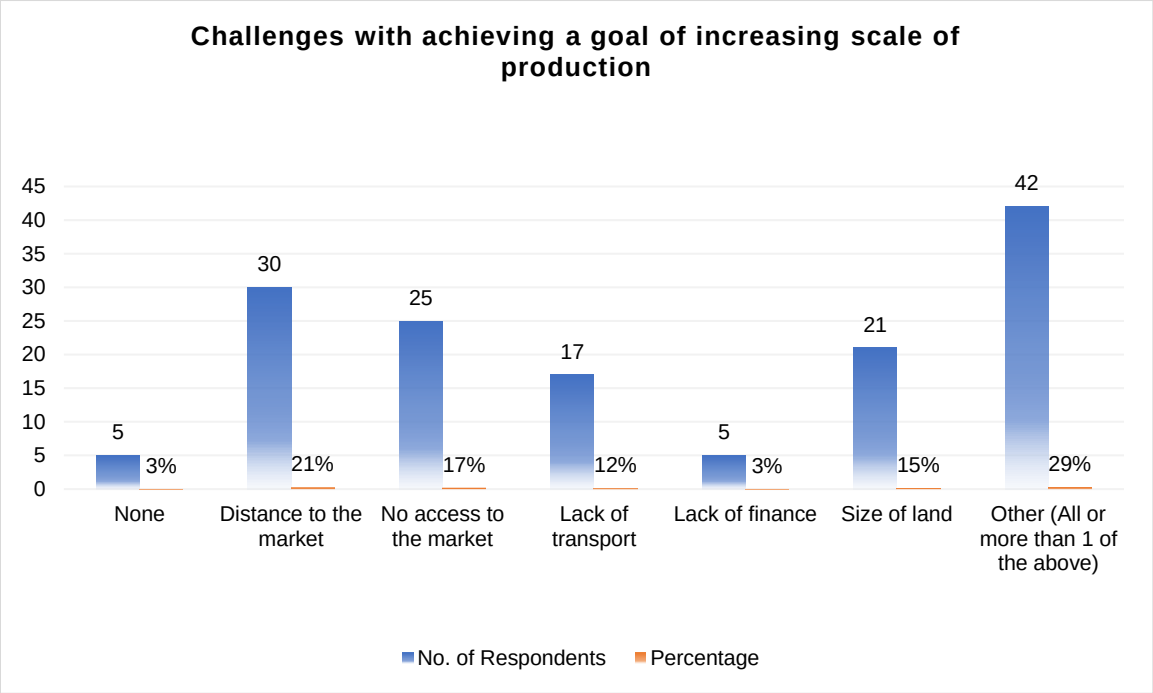

Figure 37: Challenges with achieving a goal of increasing scale of production.

The data also reveal that,15% of the respondents cited land size as a challenge, a further 12% mentioned transportation as a challenge, 3% mentioned finance as a challenge, and the remaining 3% did not report facing any challenges. Also worth mentioning is that 29% of respondents said they face a variety of obstacles when trying to expand their production size.

4.5.6 Do you receive any veterinary services?

Figure 38 presents the results on whether farmers receive veterinary services or not. The results reveal that majority of respondents (57%) receive veterinary services while 43% is not receiving veterinary services.

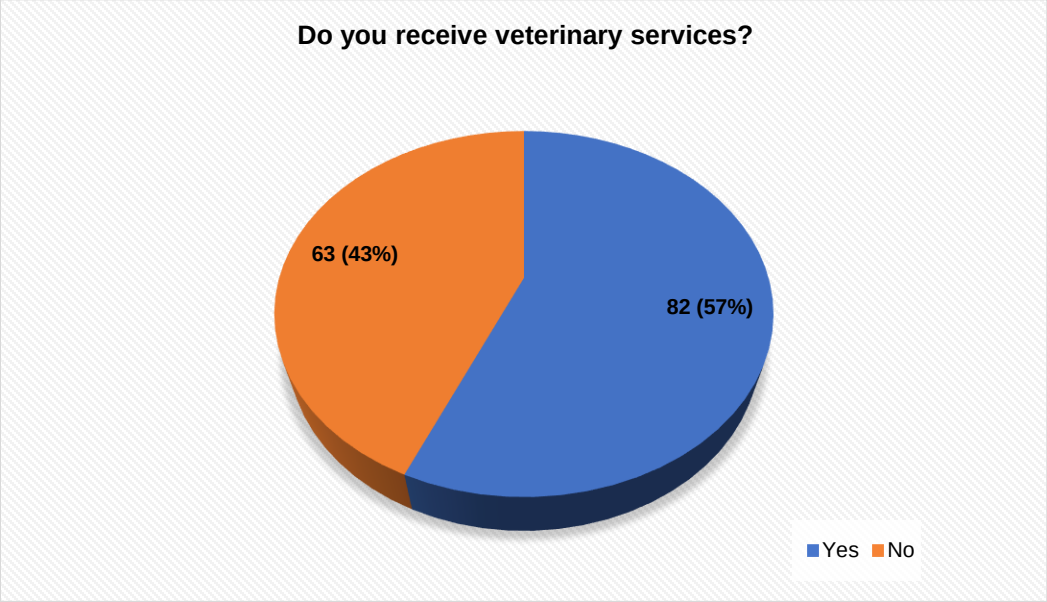

Figure 38: Access to veterinary services.

4.5.7 Who provides veterinary services?

Figure 39 below indicates that private veterinary services are provided to majority of respondents (41%) while the state veterinary services are provided to 18% of respondents and about 3% or respondents receive veterinary services from both private and state veterinary services.

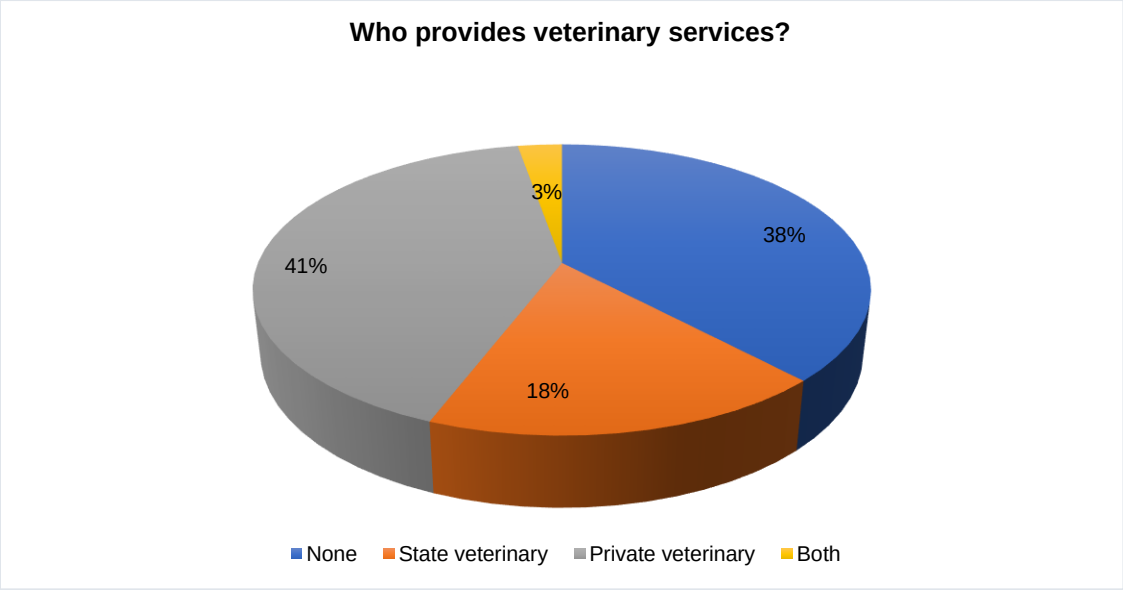

Figure 39: Who provides veterinary services?

4.5.8 Access to feeds in time of drought

Table 16 presents the results on whether farmers had access to feeds in times of drought. The results indicate that most respondents (63.4%) did not receive feeds in times of drought while 37.6% of respondents had access to feeds in times of drought.

Table 16: Access to feeds in times of drought.

Variable	No. of respondents	Percent
No	93	63.4%
Yes	52	37.6%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

According to South African Government, GCIS (2015), South Africa is a water-scarce country, ranking among the 30 driest in the world, with an average rainfall 40% lower than the yearly global average. It has an average annual rainfall of less than 500mm, while the global average is around 850mm. The year 2015 was the driest year on record for South Africa since 1992 and on 04 September 2015, Free State was the second province to declare drought as a disaster, after North West province. Bahta (2021) states that the economic damage caused by this drought accounted for 2 billion USD and agricultural production declined by 8.4% that was attributed to drought conditions. The sheep livestock industry was one of the industries that were severely affected by drought with a reduction of 15% in the national herd.

4.5.10 Amount of land in use for the livestock farming activities

Figure 40 provides the results on the size of land owned by the respondents. The Figure shows that majority of respondents (31%) own 0.5 hectares (ha), 15% of respondents own 161ha, 4% of respondents own 125ha, another 4% of respondents own 50ha, while 3% of respondents own 1ha-2ha. About 2% of respondents own 4ha, another 2% of respondents own 126ha for agricultural activities and 12% of respondents could not provide the size of their land. The biggest land size is 1128ha and it is a privately leased land. It must be noted that farmers who fall within land size of 125,126 and 161 are in a communal land.

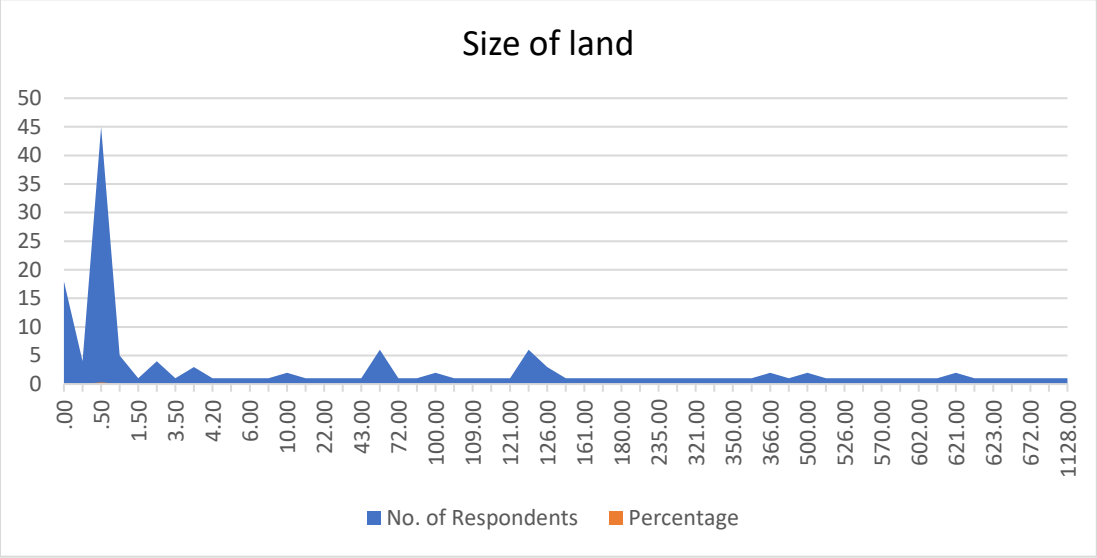

Figure 40: Size of land.

4.5.11 How did you acquire the land for the livestock farm?

Figure 41 below indicates that majority of respondents (44%) live on communal land, followed by 39% of respondents who privately owned the land, 10% of respondents have leased the land from government, 3% of respondents were resettled, 2% of respondents bought the land and have title deeds, 1% of respondents inherited land and another 1% of respondents live in a privately leased land.

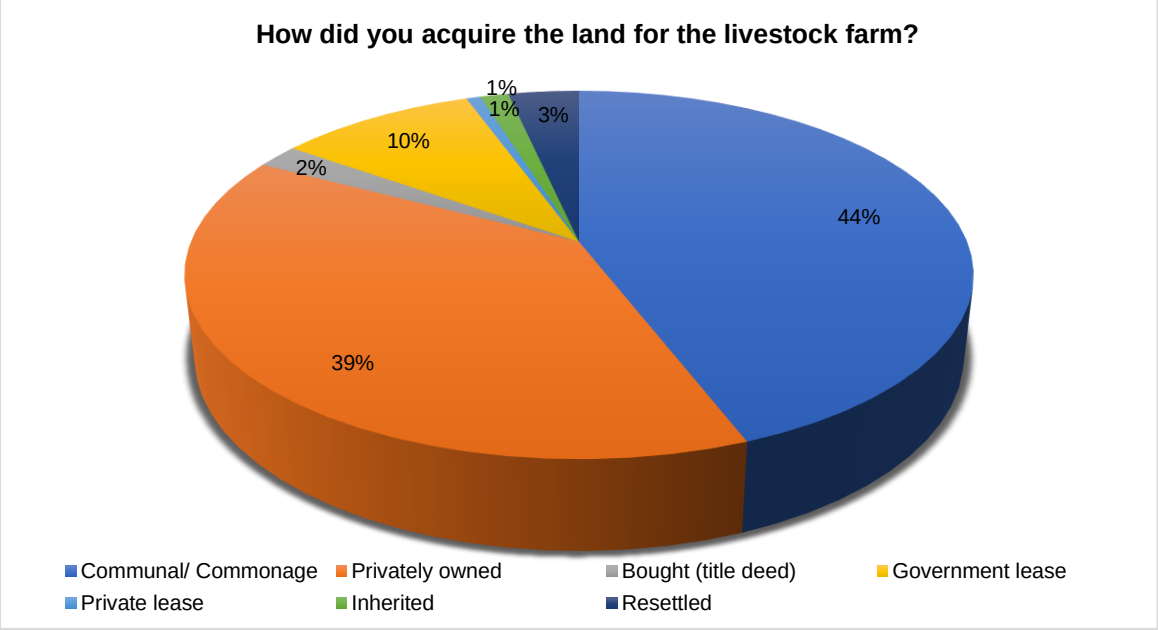

Figure 41: How did you acquire land for the livestock farm?

4.6 Level of satisfaction resulting from production challenges experienced by the respondents.

This section provides the results on the production challenges satisfaction level of smallholder and emerging farmers of sheep and goat livestock. The Likert scale (1: very dissatisfied – 5: very satisfied) is used to record level of satisfaction of smallholder and emerging sheep and goat farmers.

4.6.1 Size of farmland

Table 17 reveals the results on farmers level of satisfaction in relation to size of farmland. The results show that majority of respondents (32%) are very dissatisfied with the size of their farmland, followed by 28.3% of respondents who are dissatisfied. The results also show that 23.4% of respondents are satisfied, 4.8% of respondents are very satisfied and the remaining 11.7% of respondents are neutral. This means that majority of respondents are dissatisfied with the size of their farmland.

Table 17: Respondents' satisfaction of size of farmland

Variable	Frequency	Percentage
Very dissatisfied	46	32%
Dissatisfied	41	28.3%
Neutral	17	11.7%
Satisfied	34	23.4%
Very satisfied	7	4.8%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.2 Satisfaction of practical designed breeding programme

Table 18 show the results on farmers level of satisfaction with regards to practical designed breeding programme (e.g., male-female ratio of 1(male):20 (females) - mating young males with experienced older ewes or older rams with younger ewes, 3 lambing in 2 years (3 in 2) etc. The results show that majority of respondents (40%) are very dissatisfied with practical breeding programmes (3 lambings in 2 years, Artificial insemination (AI) and embryo transfer (ET) while 26.2% of respondents are neutral, 20%

of respondents are satisfied, 1% of respondents are very satisfied and the remaining 12.4% of respondents are dissatisfied. These results mean that majority of respondents are dissatisfied with practical designed breeding programme.

Table 18: Respondents' satisfaction of practical designed breeding programme

Variable	Frequency	Percentage
Very dissatisfied	58	40%
Dissatisfied	18	12.4%
Neutral	38	26.2%
Satisfied	29	20.0%
Very satisfied	2	1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.3 Grazing environment

Table 19 presents the results on farmers' level of satisfaction regarding grazing environment. The results show that majority of respondents (33.1%) are very dissatisfied with grazing environment, 24.1% of respondents are dissatisfied as some of the farmers are in townships, 20% of respondents are neutral, 17.9% of respondents are satisfied while 4.1% of respondents are very satisfied. This means that majority of respondents are dissatisfied with their grazing environment.

Table 19: Respondents' satisfaction of grazing environment

Variable	Frequency	Percentage
Very dissatisfied	48	33.1%
Dissatisfied	35	24.1%
Neutral	30	20.7%
Satisfied	26	17.9%
Very satisfied	6	4.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.4 Prevention of livestock contagious diseases

Table 20 below indicates that 33.1% of respondents are dissatisfied with prevention of livestock contagious diseases, 23.4% of respondents are very dissatisfied, 20.7% of respondents are very satisfied and another 20.7% of respondents are very satisfied. Only 13.8% of respondents are neutral. This means that majority of respondents are dissatisfied with their prevention of livestock contagious diseases.

Table 20: Respondents' satisfaction of prevention of livestock contagious diseases

Variable	Frequency	Percentage
Very dissatisfied	34	23.4%
Dissatisfied	48	33.1%
Neutral	20	13.8%
Satisfied	30	20.7%
Very satisfied	13	20.7%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.5 Profitability of farm production

Table 21 below indicates that 35.2% of respondents are dissatisfied with profitability of farm production, 12.4% of respondents are very dissatisfied, 26.2% of respondents are neutral while 21.4% of respondents are satisfied and 4.8% of respondents are very satisfied. This means that majority of respondents are dissatisfied with profitability of farm production.

Table 21: Respondents' satisfaction of profitability of farm production

Variable	Frequency	Percentage
Very dissatisfied	18	12.4%
Dissatisfied	51	35.2%
Neutral	38	26.2%
Satisfied	31	21.4%
Very satisfied	7	4.8%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.6 Value adding opportunities.

Table 22 below indicates that majority of respondents (26.9%) are dissatisfied with the size of their farmlands, 24.1% of respondents are very dissatisfied, 1% of respondents are satisfied, 5.5% of respondents are very satisfied and 21.4% of respondents are neutral. This means that, the respondents are dissatisfied with value adding opportunities.

Table 22: Respondents' satisfaction of value adding opportunities

Variable	Frequency	Percentage
Very dissatisfied	35	24.1%
Dissatisfied	39	26.9%
Neutral	31	21.4%
Satisfied	32	22.1%
Very satisfied	8	5.5%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.7 Herd size of animals

Table 22 below indicates that majority of respondents (32.1%) are neutral about herd size of animals, 26.9% of respondents are dissatisfied, 13.1% of respondents are very dissatisfied, 4.8% of respondents are satisfied and 4.1% of respondents are very satisfied. This means that majority of respondents are dissatisfied.

Table 23: Respondents' satisfaction of herd size of animals

Variable	Frequency	Percentage
Very dissatisfied	19	13.1%
Dissatisfied	39	26.9%
Neutral	54	32.1%
Satisfied	27	4.8%
Very satisfied	6	4.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.8 Production resources (such as pasture, infrastructure, and water)

Table 24 below indicates that majority of respondents (31.7%) are neutral about production resources, 26.9% of respondents are dissatisfied, 22.1% of respondents are very dissatisfied, 17.2% of respondents are satisfied and 2.1% of respondents very satisfied. This means that majority of respondents are dissatisfied.

Table 24: Respondents' satisfaction of production resources

Variable	Frequency	Percentage
Very dissatisfied	32	22.1%
Dissatisfied	39	26.9%
Neutral	46	31.7%
Satisfied	25	17.2%
Very satisfied	3	2.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.9 Access to comprehensive agricultural support for the smallholder and emerging sheep and goat farmers

Table 25 below indicates that majority of respondents (36.6%) are neutral about access to comprehensive agricultural support for the smallholder and emerging sheep and goat farmers. About 20.7% of respondents are dissatisfied, 18.6% of respondents are very dissatisfied while 17.9% of respondents are satisfied and 6.2% of respondents are very satisfied.

Table 25: Respondents' satisfaction of access to comprehensive agricultural support for the smallholder and emerging sheep and goat farmers

Variable	Frequency	Percentage
Very dissatisfied	27	18.6%
Dissatisfied	30	20.7%
Neutral	53	36.6%
Satisfied	26	17.9%
Very satisfied	9	6.2%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

The results presented on Table 26 mean that majority of respondents are dissatisfied with access to comprehensive agricultural support for smallholder and emerging sheep and goat farmers in the study area.

4.6.10 Climate change and water scarcity

Table 26 below indicates that majority of respondents (38.6%) are very dissatisfied with climate change and water scarcity, while 31.7% of respondents are neutral, 15.9% of respondents are dissatisfied, 11.7% of respondents are satisfied and 2.1% of respondents are very satisfied. This means that majority of respondents are dissatisfied with climate change and water scarcity.

Table 26: Respondents' satisfaction of climate change and water scarcity

Variable	Frequency	Percentage
Very dissatisfied	56	38.6%
Dissatisfied	23	15.9%
Neutral	46	31.7%
Satisfied	17	11.7%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.11 Prolonged drought

Table 27 below indicates that majority of respondents (37.2%) are very dissatisfied with prolonged drought while another 37.2% of respondents are neutral, 15.2% of respondents are dissatisfied, 8.3% of respondents are satisfied and 2.1% of respondents are very satisfied. This means that majority of respondents are dissatisfied with prolonged drought.

Table 27: Respondents' satisfaction of prolonged drought

Variable	Frequency	Percentage
Very dissatisfied	54	37.2%
Dissatisfied	22	15.2%
Neutral	54	37.2%
Satisfied	12	8.3%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.12 Supplementary feed for livestock

Table 28 above indicates that majority of respondents (51.1%) are neutral about supplementary feed for livestock, 25.5% of respondents are dissatisfied, 22.8% of respondents are very dissatisfied, 18.6% of respondents are satisfied and 1.4% of respondents are very satisfied. This means that majority of respondents are neutral about supplementary feed for livestock.

Table 28: Respondents' satisfaction of supplementary feed for livestock

Variable	Frequency	Percentage
Very dissatisfied	33	22.8%
Dissatisfied	37	25.5%
Neutral	46	51.1%
Satisfied	27	18.6%
Very satisfied	2	1.4%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.13 Access and adaptation of modern technologies

Table 29 reveals the results on farmers' level of satisfaction on access and adaptation of modern technologies. The results on Table 4.23 indicates that majority of respondents (49.7%) are very dissatisfied with access and adaptation of modern technologies while another 23.5% of respondents are neutral, 18.6% of respondents are dissatisfied, 8.3% of respondents are satisfied and 0% of respondents are very satisfied. This means that majority of respondents are dissatisfied with access and adaptation of modern technologies.

Table 29: Respondents' satisfaction of access and adaptation of modern technologies

Variable	Frequency	Percentage
Very dissatisfied	72	49.7%
Dissatisfied	27	18.6%
Neutral	34	23.5%
Satisfied	12	8.3%
Very satisfied	0	0%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.14 Stock theft

Table 30 above shows that majority of respondents (68.3%) are very dissatisfied with stock theft, 13.8% is neutral and 9.7% is dissatisfied. 6.2% respondents are satisfied with stock theft while 2.1% is very satisfied as they do not experience stock or have very low rate of stock theft in their villages. This means majority of respondents are dissatisfied.

Table 30: Respondents' satisfaction of stock theft

Variable	Frequency	Percentage
Very dissatisfied	99	68.3%
Dissatisfied	14	9.7%
Neutral	20	13.8%
Satisfied	9	6.2%
Very satisfied	3	2.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.15 Human resources/ Labour availability

Table 31 below indicates that majority of respondents (42.0%) are very dissatisfied with human resources/ labour availability in their farms, followed by 29.0% respondents who are neutral, 12.4% of respondents are dissatisfied, 14.5% of respondents are satisfied and 2.1% of respondents are very satisfied.

Table 31: Respondents' satisfaction of human resources/ labour availability

Variable	Frequency	Percentage
Very dissatisfied	61	42.0%
Dissatisfied	18	12.4%
Neutral	42	29.0%
Satisfied	21	14.5%
Very satisfied	3	2.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.16 Consistency in production

Table 32 below indicates that majority of respondents (42.0%) are neutral with consistency in production, 20.7% of respondents are satisfied, 17.9% of respondents are dissatisfied, 14.5% of respondents are very dissatisfied while 4.8 % of respondents are very satisfied. This means that majority are neutral about consistency in production.

Table 32: Respondents satisfaction of consistency in production

Variable	Frequency	Percentage
Very dissatisfied	21	14.5%
Dissatisfied	26	17.9%
Neutral	61	42.0%
Satisfied	30	20.7%
Very satisfied	7	4.8%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.17 Quantities of animal production and quality of animals

Table 33 indicates that majority of respondents (41.4%) are neutral about quantities of animal production and quality of animals, while 26.2% are satisfied, 20.7% are dissatisfied, 9.7% are very dissatisfied and 2.1% are very satisfied. This means that majority of respondents are neutral about quantities of animal production and quality of animals.

Table 33: Respondents satisfaction of quantities of animals' production and quality of animals

Variable	Frequency	Percentage
Very dissatisfied	14	9.7%
Dissatisfied	30	20.7%
Neutral	60	41.4%
Satisfied	38	26.2%
Very satisfied	3	2.1%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.18 Livestock expertise of farmer

Table 34 indicates that majority of respondents (42.7%) are neutral about their livestock expertise, 35.2% of respondents are satisfied, 11% of respondents are dissatisfied, 5.5% of respondents are very dissatisfied while another 5.5% of respondents are very satisfied. These results mean that majority of respondents level of satisfaction is neutral with livestock expertise of farmer.

Table 34: Respondents' satisfaction of livestock expertise

Variable	Frequency	Percentage
Very dissatisfied	8	5.5%
Dissatisfied	16	11.0%
Neutral	62	42.7%
Satisfied	51	35.2%
Very satisfied	8	5.5%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.19 Land tenure

Table 35 indicates that majority of respondents (39.3%) are very dissatisfied with land tenure, followed by 23.4% of respondents that is dissatisfied, 20% of respondents that is neutral, 13.8% of respondents that is satisfied and 3.4% of respondents that is very satisfied. This means majority of respondents are dissatisfied with land tenure.

Table 35: Respondents' satisfaction of land tenure

Variable	Frequency	Percentage
Very dissatisfied	57	39.3%
Dissatisfied	34	23.4%
Neutral	29	20.0%
Satisfied	20	13.8%
Very satisfied	5	3.4%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.20 Mean of production challenges satisfaction level of respondents.

Table 36 presents the results on the mean for satisfaction production challenges variable among the respondents. The satisfaction level was measured based on the Likert scale. The highest level of satisfaction score obtained by some of the farmers was 76 and the least score for level of satisfaction from the Likert scale was 19. The mean was reported to approximately be reported to be approximately 45 and standard deviation is approximately 14 with variance of 187. Farmers with scores equal or greater than 45 were classified as 0 (Satisfied with the challenge variable), while farmers with scores less than 45 were classified as 1 (Not satisfied with the variable).

Table 36: Mean of production challenges satisfaction level of respondents

Production challenges satisfaction level	
Mean	45.3103
Std. deviation	13.67455
Variance	186.993
Minimum	19.00
Maximum	76.00

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

4.6.21 The results of the Probit analysis of factors associated with production challenges of the sheep and goat livestock farmers in the study area.

Table 37 presents the results on probit analysis of factors influencing production challenges of the sheep and goat livestock farmers. The results show that the more farmers sell sheep and goat, the more they will less likely experience production challenges. This may be because farmers make profit from sale of sheep and goat livestock sales, and this allows them to intensify production in a farm, use farm space efficiently and feed optimally. The results also show that cost per single trip to the market has a positive and significant association with production challenges. This means that the more a farmer spends money per single trip, the more they will likely experience productions. This may be because an increase in costs per single trip to the market affects profit that has been secured for production activities in the farm.

The results also indicate that age of respondent has positive and significant association with production challenges, with all other factors held constant. This means that the more a respondent age, the more they will likely experience production challenges. This may be because generally the more a person gets older, the more the energy level drops which makes it difficult for a farmer to increase production in the farm. The results further indicate that the size of household has a positive and significant association with production challenges with all other factors held constant. This means that the more a household has a high number of members, the more likely a farmer will experience production challenge. This may be because finances that are meant for production in the farm ends up being spent on household commitments, and time spent on farm and livestock production may be limited as a farmer has to spend time with the family, more especially when there are young children (under the age of 18yrs).

The results reveal that level of education has a positive and significant association with production challenges. This means that the more a farmer is educated, the more they will likely experience challenges. This effect was not expected since majority of the respondents have acquired secondary school education. This may be because education acquired by a farmers/ respondents may not be related to agriculture. The findings further reveal that the role of respondents has a negative and significant association with production challenges, with all other facts held constant. This means that farm owners will less likely face challenges as compared to farm managers. This maybe because farm owners have the skills, experience, and understand what they seek to achieve in livestock farming.

The results also reveal that involvement in the day-to-day operations of the farm have a negative and significant association with production challenges, with other facts held constant. This means that a farmer who are involved in day-to-day operations of the farm will less likely experience production challenges. This may be because a farmer who is involved in daily operations of the farm is able to identify a problem and solve it, as well as to identify risk and develop risk mitigation plans. Furthermore, the findings reveal that farmers who have access to agricultural information have a negative and significant association with production challenges, with all other factors remaining the same. This means that farmers who have access to agricultural information will less likely experience

production challenges. This may be because farmers who have access to agricultural information use this information effectively and correctly in their farms.

Furthermore, the results show that keeping farm management records has a positive and significant association with production challenges, with all other factors held constant. This means that farmers who keep farm management records will more likely experience production challenges. The effect was not expected, but this may be because farm management records that are kept are not utilised, or information contained in the farm management records may not be relevant. The results also reveal that farmers who sell sheep and goat have negative and significant association with production challenges, with other facts held constant. This mean that, farmers who sell sheep and goat livestock will less likely experience production challenges. This may be because selling livestock can help maintain a manageable herd size, reducing pressure on resources like feed and water and it also provides a steady income stream, enabling farmer to invest in the farm and pay bills.

The results also show that total number of sheep sold in 2019 has positive and significant association with production challenges with other factors held constant. This means that the more a farmer sell sheep, the more likely they will experience production challenges. This may be because a farmer may compromise the breeding herd, moreover there may be loss of genetic diversity and over-reliance on a single species. The results further show that total number of goats sold in 2019 has a negative and significant association with managerial challenges with other factors held constant. This means that farmers who sell more goats are less likely to experience production challenges. This may be because, selling goat can provide a diversified income stream reducing dependence on crops, additionally goat is cheap to maintain and unlike sheep, goats can reproduce more i.e., they can breed twice in 18 months. This is concurrent with Mataveia et al. (2021) that small ruminants are often referred to as the “village bank”.

Table 37: Results of Probit analysis influencing production challenges of smallholder and emerging sheep and goat farmers (n=145)

Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Gender of respondent	.007	.040	.181	0.856	-.071	.086
Age of respondent	.018	.001	16.320	0,001***	.016	.020
Size of household	.019	.009	2.140	0.032**	.002	.037
Level of education	.093	.022	4.312	0,001***	.051	.135
Engage in off-farm income activity.	.060	.041	1.481	0.139	-.019	.139
Role of the respondent on the farm?	.258	.067	3.859	0,001***	.127	.388
Involved in the day-to-day operations of farm.	-.041	.020	-2.090	0.037**	-.079	-.003
Do you have a farm business plan?	-.111	.062	-1.801	0.072*	-.232	.010
Access to agricultural information	-.102	.049	-2.087	0.037**	-.198	-.006
Do you keep farm management records?	.151	.051	2.946	0.003***	.051	.252
Do you receive any veterinary services?	.036	.034	1.053	0.292	-.031	.103
What is the size of your land?	.000	.000	.140	0.888	.000	.000
Do you sell your sheep and goat?	-.245	.059	-4.171	0,001***	-.359	-.130
Distance from the market to your farm?	.000	.000	.653	0.513	-.001	.001
Cost per single trip to the market	.000	.000	-12.65	0,001***	-.001	.000
Access to market information	-.069	.041	-1.698	0.090*	-.149	.011
Total number of sheep you sold in 2019.	.008	.001	10.508	0,001***	.006	.009
Total number of goats you sold in 2019.	-.027	.002	-10.97	0,001***	-.032	-.022
Intercept	-1.919	.258	-7.445	0,001***	-2.177	-1.661

PROBIT model, 1%:***, 5%:**, 10%:*

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023).

Table 38 presents the Pearson Goodness-of-Fit results, The results indicate that there is a relationship between the observed frequency and theoretical distribution, meaning that the variables have significant association with production challenges. This assumes that the null hypothesis is correct.

Table 38: Pearson Goodness-of-Fit Teast on production challenges (n=145)

Chi-Square Tests			
	Chi-Square	df[a]	Sig.
Pearson Goodness-of-Fit Test	2253.512	126	.000

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

4.7 Marketing challenges of smallholder and emerging sheep and goat farmers

Small-scale farmers battle to access valuable markets because of factors such as poor infrastructure, insufficient expertise, inability to conclude contractual agreements and lack of information (Cheteni, 2017; Cheteni, Mushunje &Taruvinga, 2014). These problems result in farmers being excluded from the mainstream markets (Makhura, 2001). Therefore, they are constantly trapped in market constraints since it is difficult to change these challenges on their own (Fenwick & Lyne, 1999).

4.7.1 Do you sell sheep and goat?

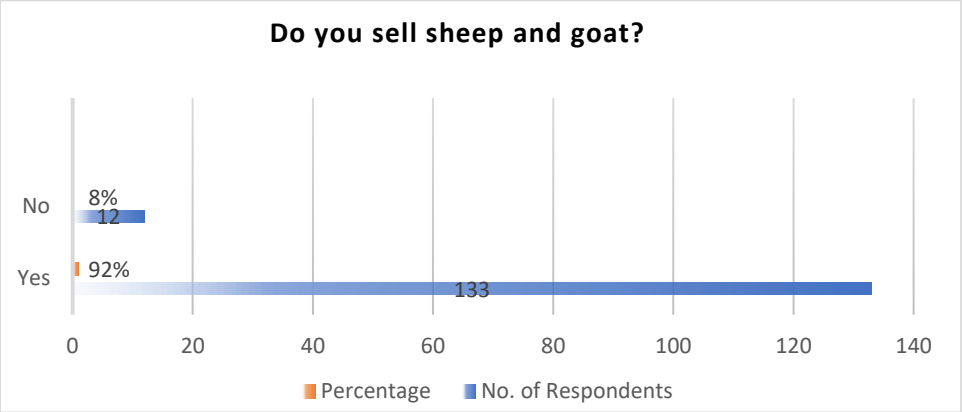

Figure 42: Do you sell sheep and goat?

Figure 42 above indicates that majority of smallholder and emerging farmer in the study area (92%) sell sheep and goats livestock while 8% is not selling their livestock as they either want to increase herd size of their livestock while some farmers indicated that they keep livestock to only sell wool and mohair and for household consumption.

4.7.2 Reason for not selling sheep and goat.

Figure 43 below presents the results on reasons provided by the respondents on why they are not selling their sheep and goat livestock.

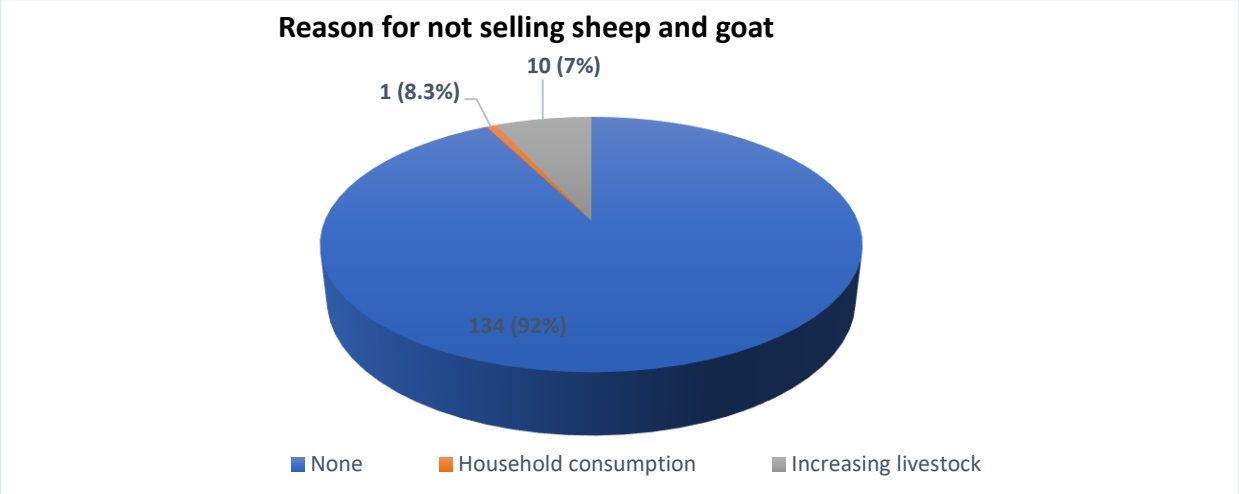

Figure 43: Reason for not selling sheep and goat.

Figure 43 indicates that majority of respondents (92%) are selling livestock hence 'None' is used in the graph to represent these farmers and for the remaining 8%, 1% farmers indicated that they keep livestock for household while 7% is still increasing herd size of their livestock.

4.7.3 Where do you sell sheep and goat?

Figure 44 presents the results on where farmers sell their sheep and goat.

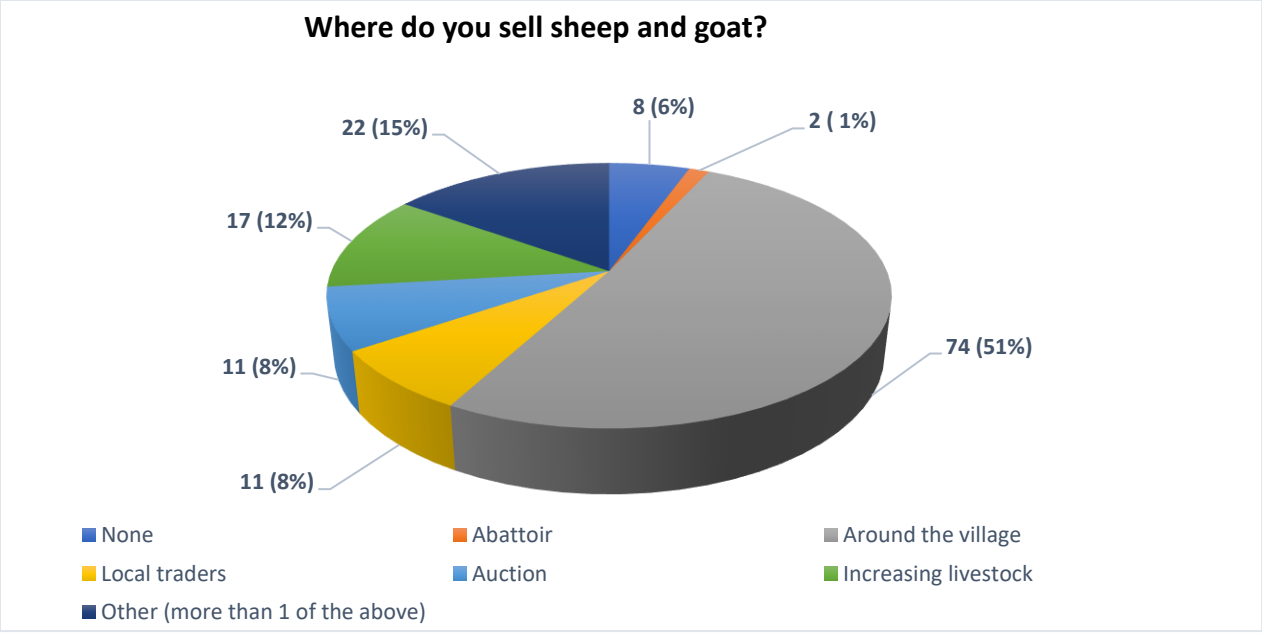

Figure 44: Where do you sell sheep and goat?

Figure 44 above indicates that majority of respondents (51%) sell their livestock around the village, 12% of respondents only started livestock farming recently therefore are currently not selling livestock, 8% of respondents sell livestock at local traders and another 8% of respondents sell livestock at auctions, 1% of respondents sell livestock at abattoirs and the remaining 15% of respondents sell livestock at multiple markets.

4.7.4 Distance from your farm to the market

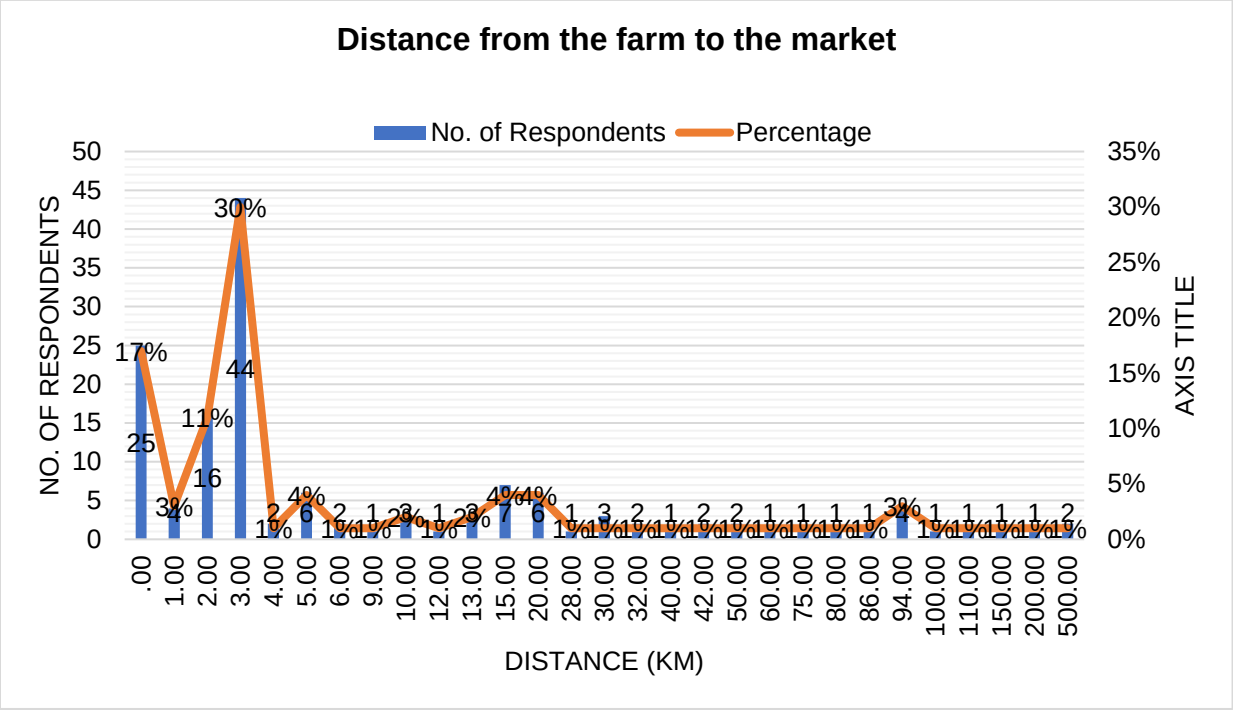

Figure 45: Distance from your farm to the market.

Figure 45 above presents the results on a distance from the farm to the market. The furthest distance noted is 500km (Vanderbiljlpark) contributing 1% of the results. Most of the respondents (30%) travel 3km to their market (around the village or to auctions), while 17% of respondents do not travel as their customers collect the animals at the farm, 11% of respondents travel 2km to their market, 4% of respondents travel for 5km, another 4% of respondents travel for 15km while the other 4% of respondents travel for 20km. About 2% of respondents travel for 10km while the other 2% of respondents travels for 13km to their market. The remaining respondents account for 1% per each kilometre.

4.7.5 Is there any other market closer to the farm than where a respondent is currently selling your livestock?

Figure 46 reveals the results on other markets closer to the farm than where the farmers are currently selling livestock.

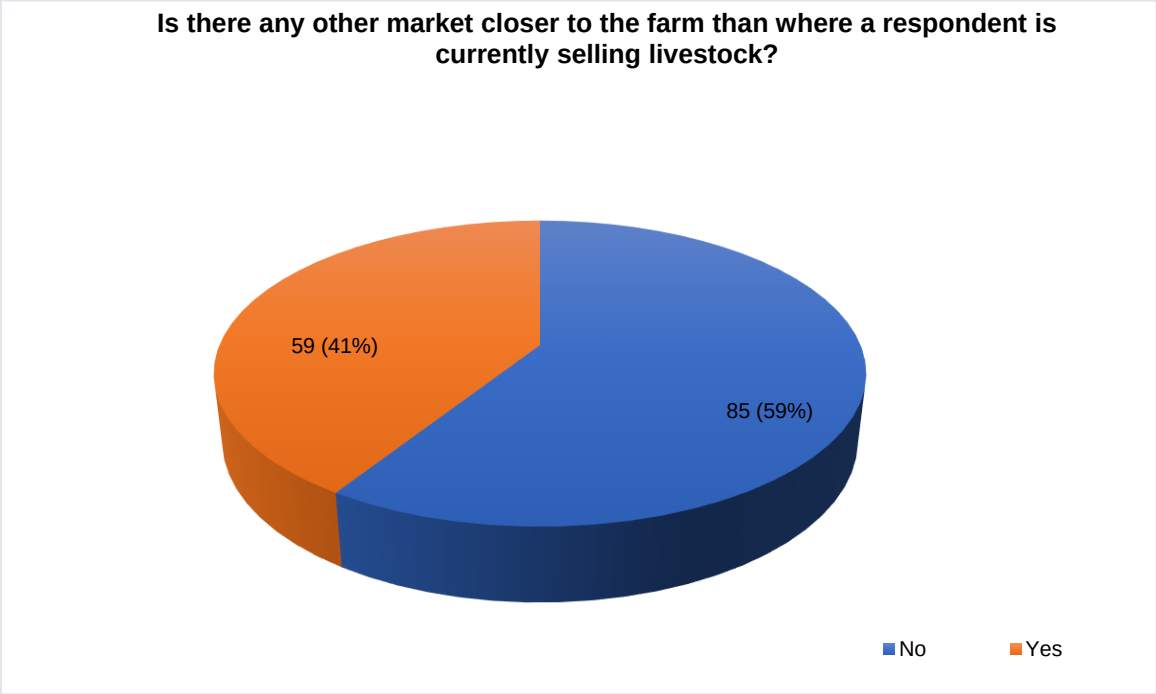

Figure 46: Is there any other market closer to the farm than where a respondent is currently selling livestock?

Figure 46 above indicates that majority of respondents (59%) indicated that there are no other markets closer to their farms than where they are currently selling their livestock, while 41% of respondents indicated that there are other markets closer to their farms than where they are currently selling their livestock.

The results are in concurrent with findings of a study conducted by Von Loeper et. al. (2016) stating that it is difficult for South African smallholder farmers to engage in the contemporary economy because most of them have limited access to marketplaces for selling their produce, finance, and insurance (Von Loeper et al.,2016).

4.7.6 Reason for not supplying other markets closer to the farm.

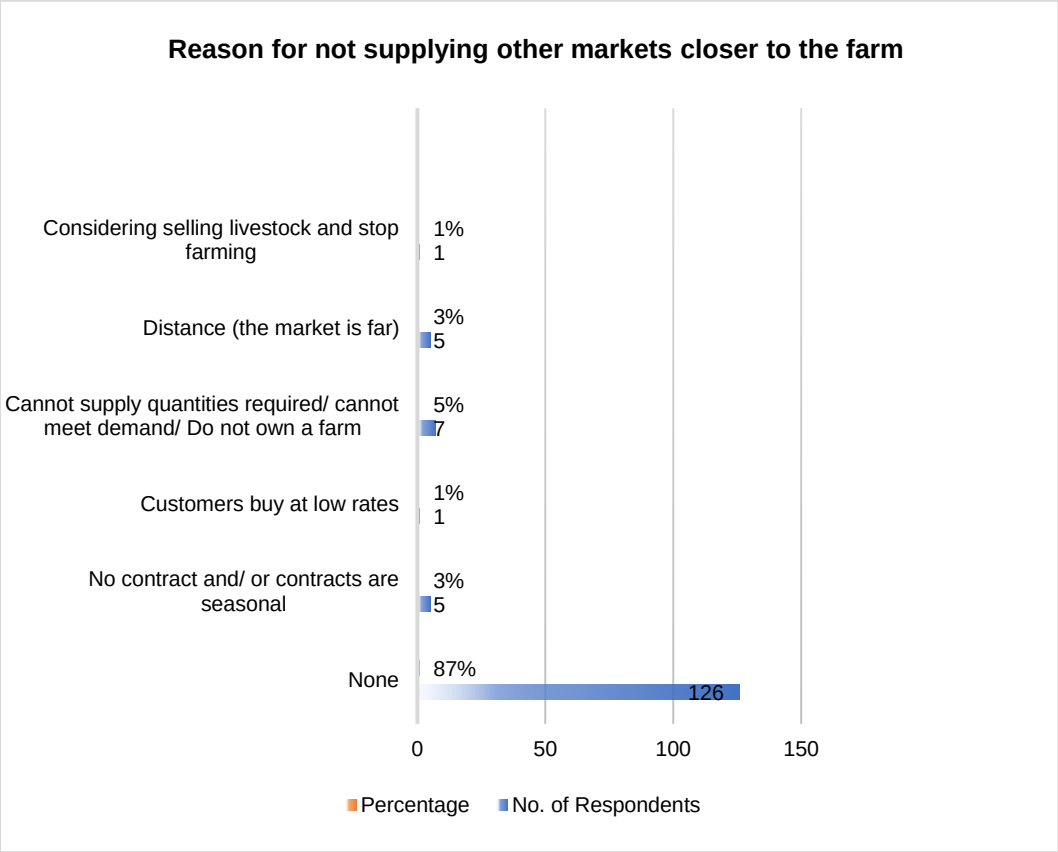

Figure 47: Reason for not supplying other markets closer to the farm.

Figure 47 above presents results in line with the results on Figure 46 where respondents indicated that there are other markets closer to their farms and other than where they are currently selling their livestock. About 5% of the respondents stated that they cannot supply other identified markets that are closer to the farm because their supply cannot meet the demand, 3% of respondents revealed that the identified markets require farmers to have valid contract and unfortunately these contracts are issued on a seasonal basis, another 3% of respondents indicated that distance to the market is a challenge while 1% of respondents indicated that customers want to buy at low rates (buyers negotiate to buy at a lower price) and another 1% of respondents indicated that they want to stop farming hence they are not looking for other market.

4.7.7 Transporting sheep and goat livestock to the market

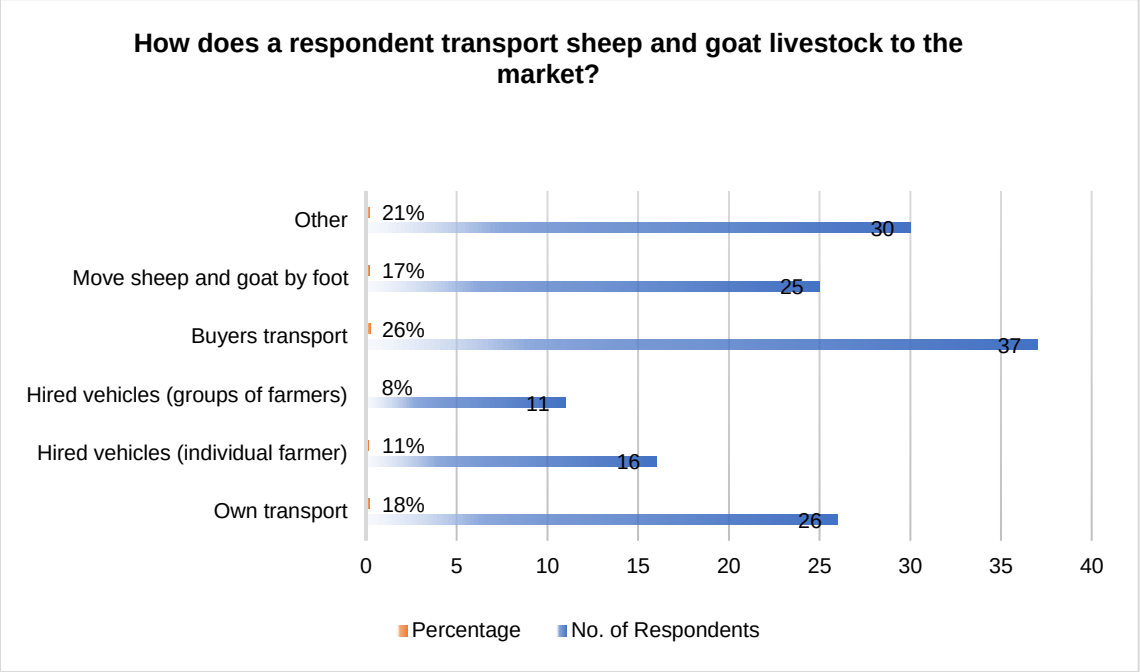

Figure 48: Transporting sheep and goat livestock to the market.

Figure 48 above indicates how farmers transport their sheep and goat to the market. Most of the respondents (26%) make use of buyers' transport as customers collect livestock themselves, 18% of respondents deliver livestock, 17% of respondents move livestock by foot, 11% of respondents hire transport and 21% of respondents use other means to transport their livestock to the market or they have not started trading yet.

The findings on Figure 48 are aligned to the findings from a study conducted by Mmbando et. al. (2015). The study found that some smallholder and emerging farmers use of their own vehicles to deliver their livestock to the market and these farmers are in better positioned to search for more profitable/ valuable markets, and their produce is of a better quality making it possible for them to get a better price for their produce. Moreover, communal roads are inaccessible, and farmers who do not have vehicles will be forced to hire transport and this leads to high transportation costs (Mmbando et al., 2015). Furthermore, Land Bank (2001) found that access to markets is also negatively affected by the transport costs of delivering products to the markets.

4.7.8 Amount paid per trip to the market.

Figure 49 presents the results on amount of money that farmers spend per trip to the market.

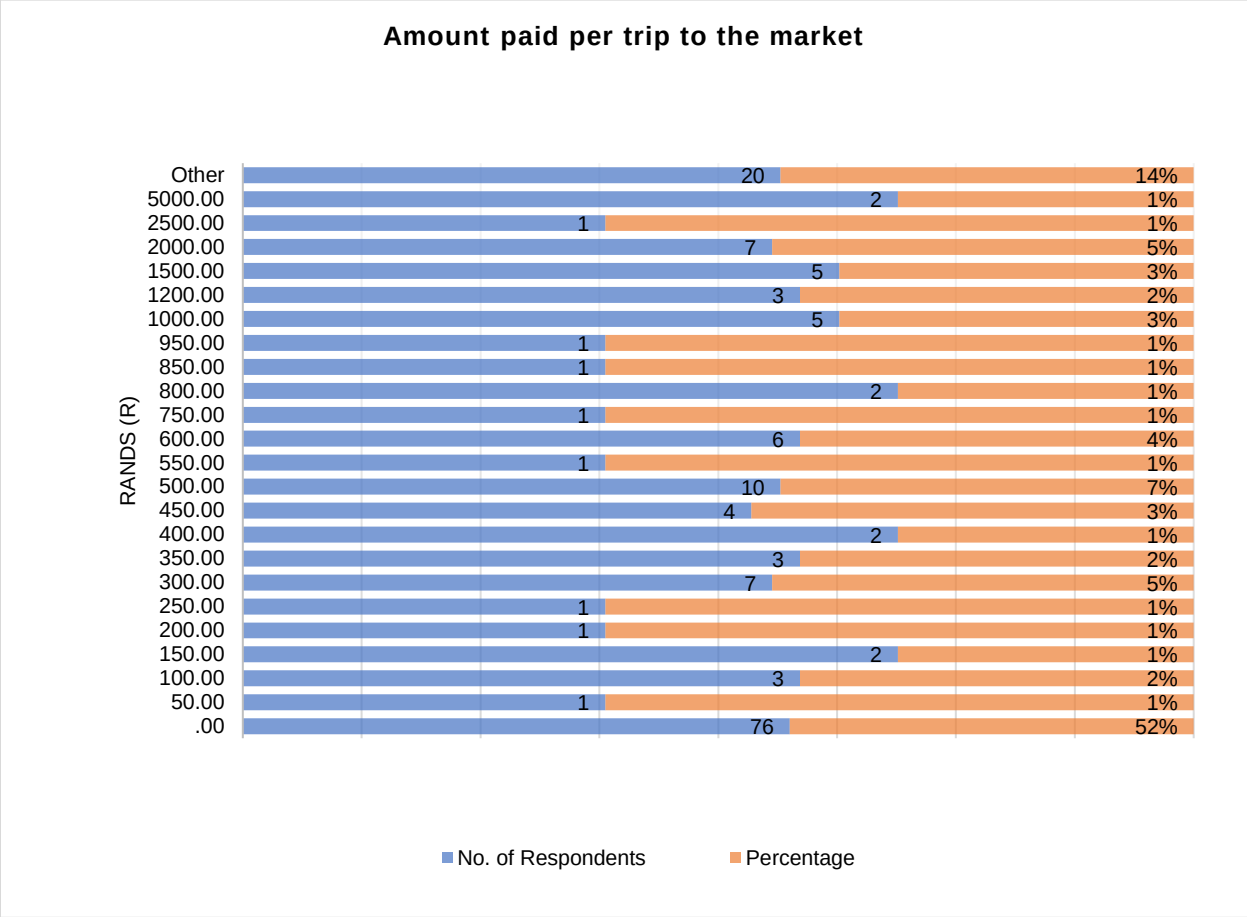

Figure 49: Amount paid per trip to the market.

Figure 49 above indicates that majority of respondents (52%) do not spend any money when selling at their market of choice, while 14% of respondents spend R5000.00, 7% of respondents spend R500.00, 5% of respondents spend R2 000.00 another 5% of respondents spend R300.00 and 4% of respondents spend R600.00. The results came out as expected as most of the respondents in Figure 47 indicated that they don't require any means of transport when selling their livestock as buyers use their own transport while others move livestock by foot.

4.7.9 Additional costs incurred when selling sheep and goat livestock.

Figure 50 presents the results on additional costs incurred by farmers when selling their sheep and goat livestock, this applies to those who indicated that they incur costs when selling livestock.

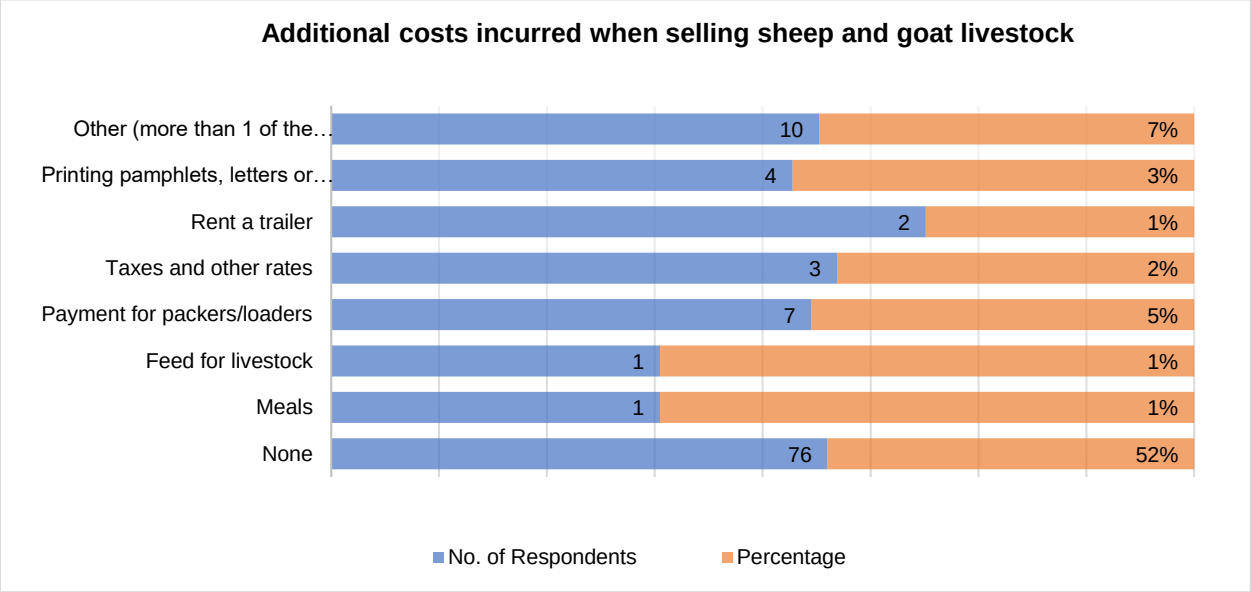

Figure 50: Additional costs incurred when selling sheep and goat livestock.

Figure 50 above presents other marketing costs that incurred when selling their sheep and goat livestock. 5% of respondents incur additional costs on payment for packers and loaders, 3% incur additional costs on printing marketing material, 2% incur additional costs taxes and other rates at auctions, 1% spend on renting trailers, while another 1% spend on feed and 7% of respondents indicated that they incurred additional costs on more than one (1) activity.

4.7.10 Access to market information

Figure 51 presents the results on farmers access to market information.

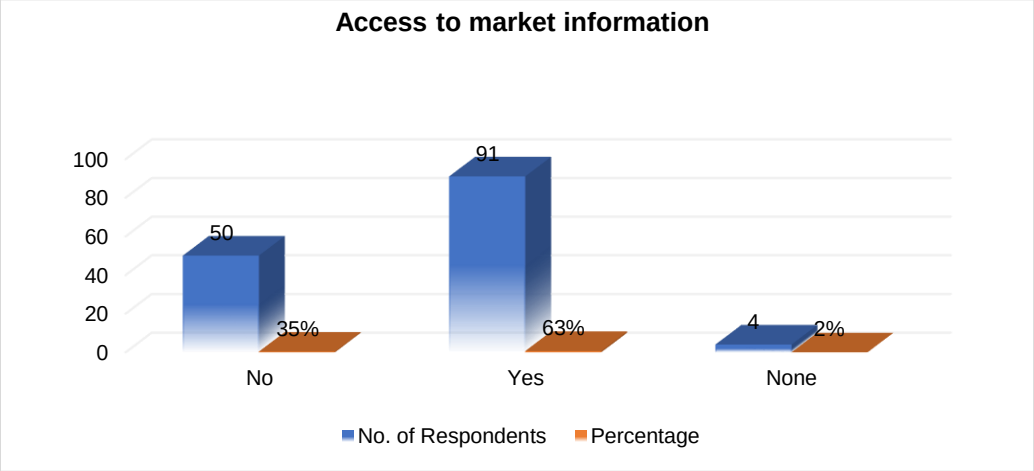

Figure 51: Access to market information.

Figure 51 above indicates that majority of respondents (63%) have access to information while 35% of respondents do not have access to information. The remaining 2% of respondents are farmers who recently started sheep and goat livestock.

4.7.11 If farmers are receiving market information, where do they get it from?

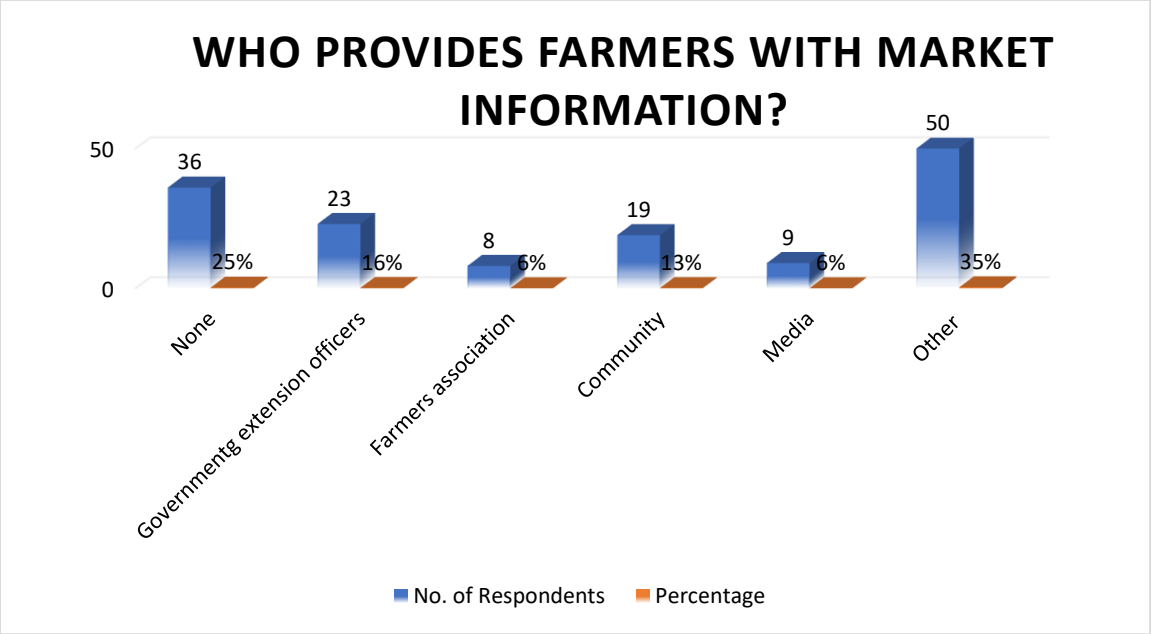

Figure 52: Who provides farmers with market information?

Figure 52 above indicates that majority of respondents (35%) receive information from other platforms than from the options provided, 25% of respondents does not receive

market information, 16% of respondents receive market information from government extension officers, 13% of respondents receive market information from community members, 16% of respondents receive market information from farmers association while the other 6% of respondents receive information from media.

4.7.12 What kind of market information do you receive from the selected sources?

Figure 53 present the results on the kind of market information farmers receive from their providers of market information. The results show that majority of respondents (43%) receive marketing information that incorporates more than 1 of the marketing information provided (has all the relevant information), 15% of respondents receive information on market opportunities, another 15% of respondents receive information on dates of sales, 3% of respondents receive information on prices, 1% of respondents on market demand and another 1% of respondents provides buyers information.

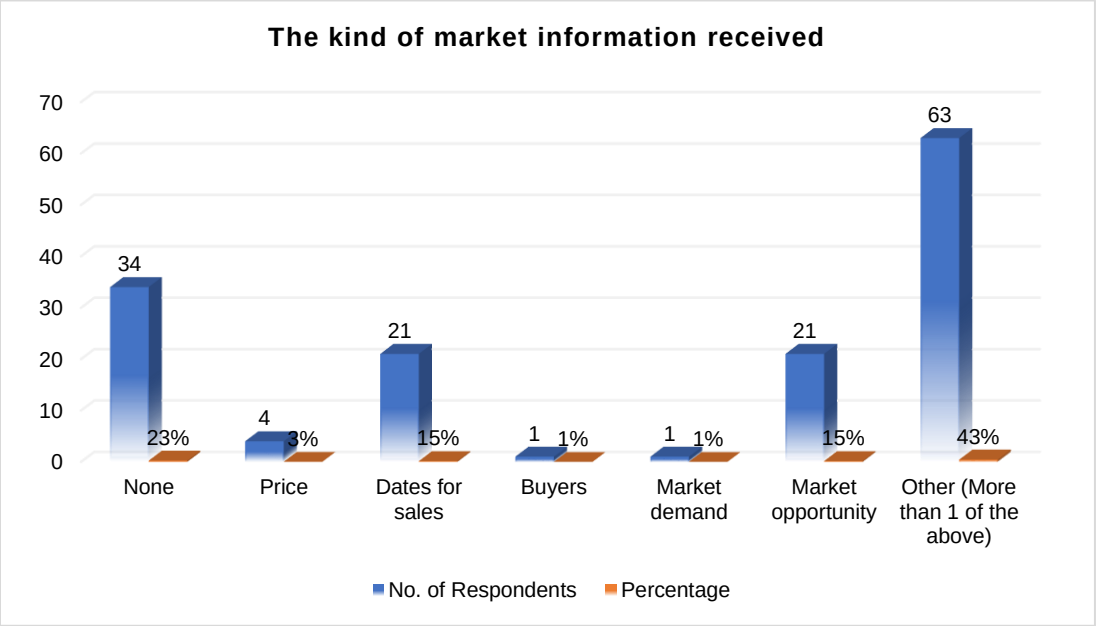

Figure 53: What kind of market information do you receive from the selected sources?

4.7.13 How often do you receive market information?

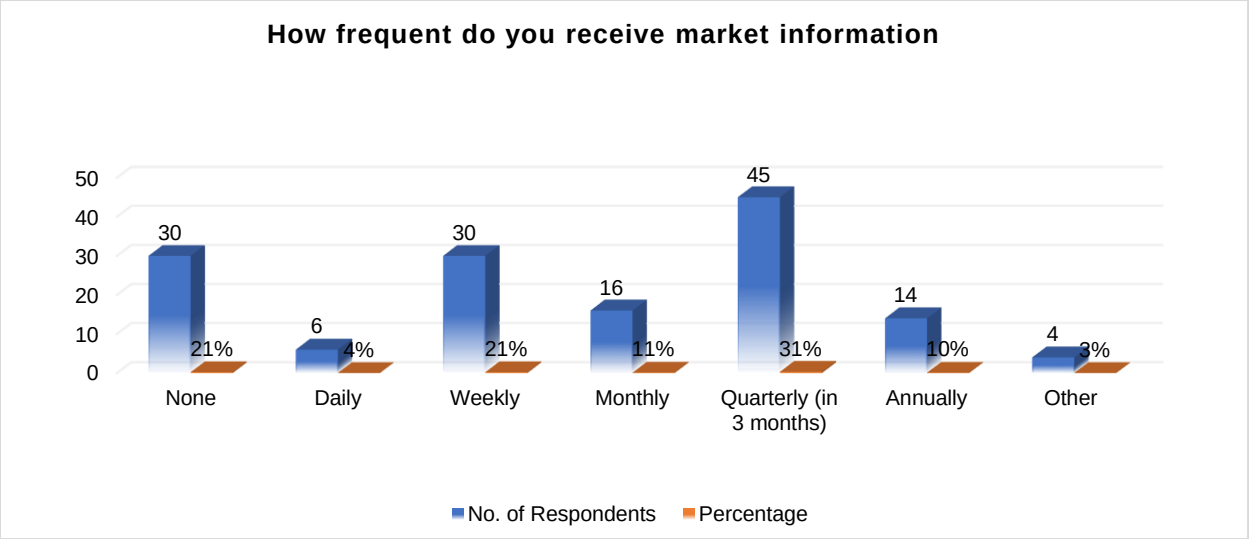

Figure 54: How frequent do you receive market information?

Figure 54 above indicates that majority of respondents (31%) receives marketing information on a quarterly basis, 21% of respondents on a weekly basis, 11% of respondents on a monthly basis,10% of respondents on annual basis, 4% of respondents on a daily basis, 3% of respondents on timeframes that are not provided on the options.

4.7.14 Which language is used to disseminate market information?

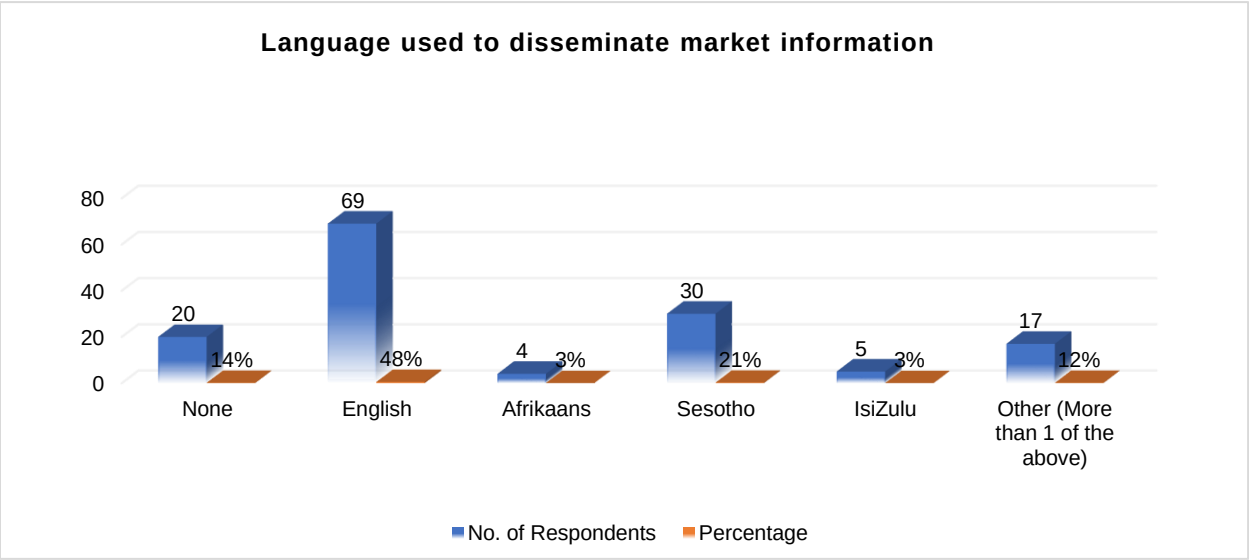

Figure 55: Which language is used to disseminate market information?

Figure 55 above indicates that majority of respondents (48%) receive marketing information in English, 21% of respondents receive marketing information in Sesotho, 3% in Afrikaans and another 3% of respondents in IsiZulu. 12% of respondents receive marketing information in more than 1 language.

4.7.15 How do you receive market information?

Figure 56 show the results on the type of communication medium farmers use to receive market information.

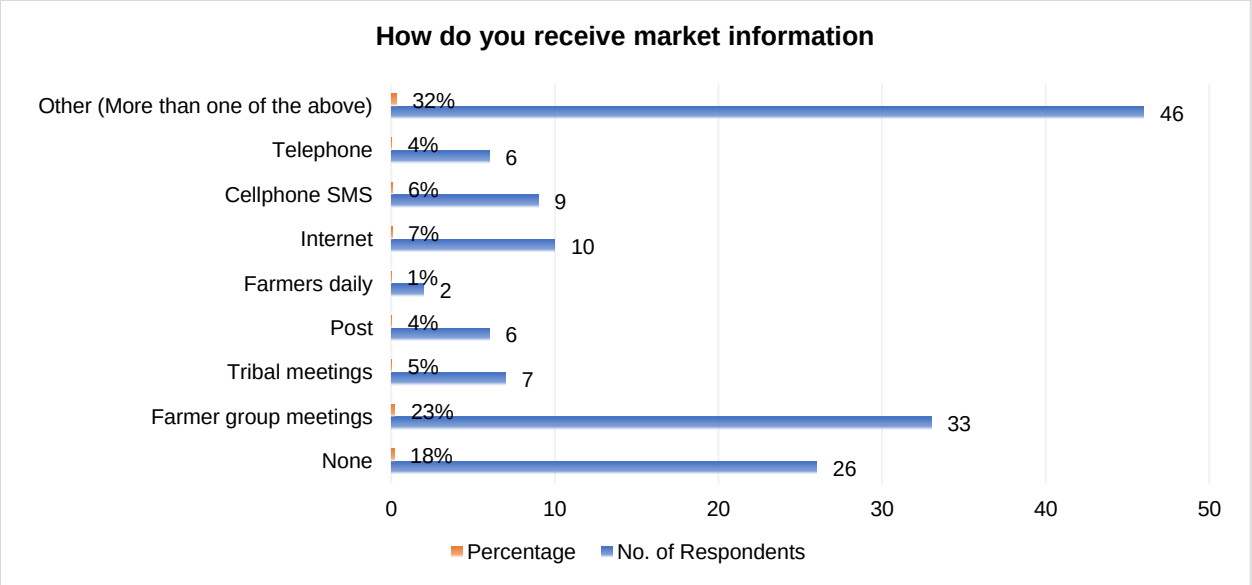

Figure 56: How do you receive market information

Figure 56 above presents the results on how farmers receive market information. Most of the respondents (32%) receive marketing information through more than 1 platform, 23% of respondents receive market information from farmer group meetings, 7% of respondents receive marketing information from internet, 6% of respondents receive marketing information through cellphones, 4% of respondents receive marketing information through telephone calls, another 4% of respondents receive marketing information through post, 1% of respondents receive marketing information from farmers daily.

4.7.16 Total number of sheep sold in 2019.

Table 39 below provides the results on a total number of sheep that were sold by smallholder and emerging farmers in 2019.

Table 39: Total number of sheep sold in 2019

Number sold	No. of respondents	Percentage
None	52	35.9%
1-100	89	61.3%
101-200.	3	2.1%
>200	1	0.7%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

Table 39 results show that 1 respondent accounting 0.7% sold a maximum of 600 sheep in 2019, 2.1% sold up to 200 sheep, 61.3% sold up to 100 sheep and 35.9% did not make any sales.

4.7.17 Total number of goats sold in 2019.

Table 40 below provides the results on a total number of goats that were sold by smallholder and emerging farmers in 2019.

Table 40: Total number of goats sold in 2019

No. sold.	No. of respondents	Percentage
None	83	57.2%
1-20	58	40%
21- 40	2	1.4%
>180.00	2	1.4%
Total	**145**	**100%**

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

Table 40 results indicates that 2 respondents accounting 1.4% sold a maximum of 180 goats in 2019, another 1.4% sold 40 goats each, 40% sold a maximum of 20 goats and 57.2% did not make sales.

4.7.18 Which of the following are marketing functions performed at your farm?

MBA Skool defines marketing function as a role which helps a company to identify and source potentially successful products for the marketplace they operate on and then promote them by differentiating them from similar products. Table 41 below, presents the results on farmers' marketing functions performed at a farm.

Table 41: Which marketing functions performed at a respondent's farm?

Variable		Frequency	Percentage
Buying	No	110	76%
	Yes	36	25%
Selling	No	23	16%
	Yes	122	84%
Transporting	No	136	93.8%
	Yes	9	6.2%
Processing	No	142	98%
	Yes	3	2%
Grading	No	145	100%
	Yes	0	0%
Risk taking	No	144	99%

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

Table 41 above presents the results on marketing functions that smallholder and emerging farmers of sheep and goat in the study area are performing at their farms. The table reveals that majority of respondents (84%) are selling livestock, 25% of respondents buy livestock,6.2% of respondents transport livestock, 2% of respondents are processing livestock and 1% of respondents are involved in risk taking. None of the respondents are involved in grading livestock.

4.7.19 Which of the value-adding functions are you performing in your farm?

Figure 57 reveals the results on the type of value-adding functions that farmers perform in their farms. The results show that majority of respondents (75%) are not taking part in value-adding functions, 8% of respondents slaughter livestock, 3% of respondents process livestock, 1% of respondents are involved in packaging and 13% of respondents are involved in more than 1 value-adding activities.

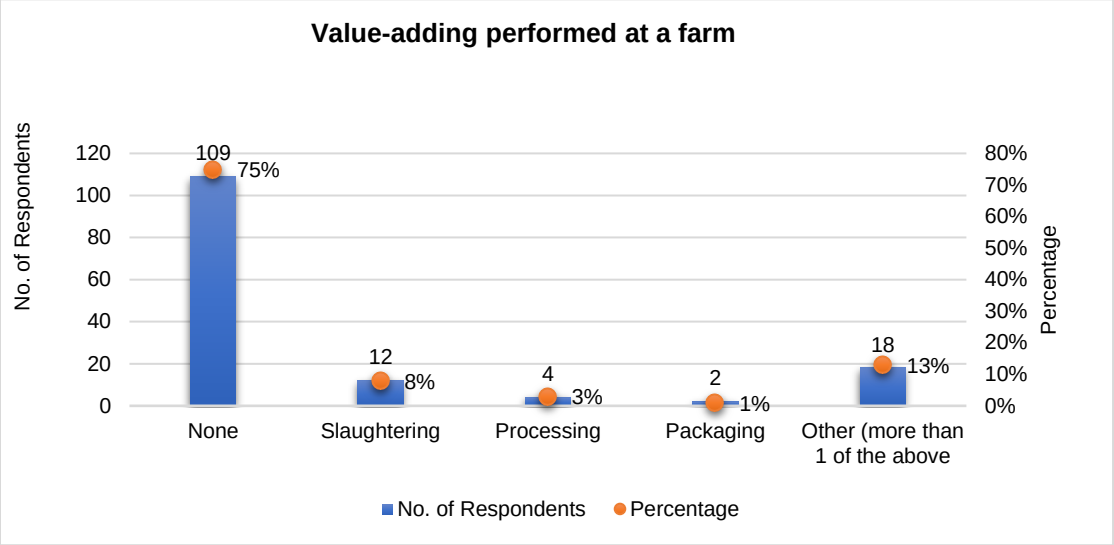

Figure 57: Value-adding functions performed at a farm.

4.7.20 Type of marketing systems adopted by the farmers.

Figure 58 provides the results on the type of marketing systems adopted for the farm of the respondents.

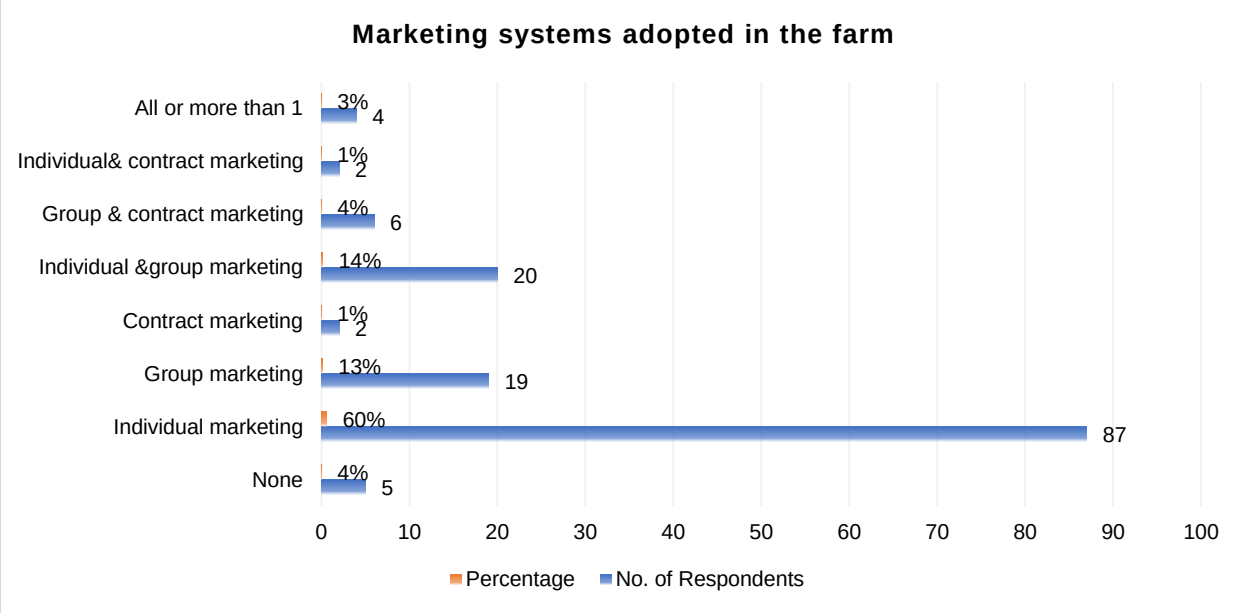

Figure 58: Marketing systems adopted in the farm.

Figure 58 above presents marketing systems adopted in the farm. The results indicate that most of respondents (60%) adopted individual marketing, 13% of respondents

adopted group marketing, 4% of respondents adopted group and contract marketing, and 3% of respondents have adopted more than 1 of the marketing systems provided. Bienabe et al. (2004), IFAD (2003), Minot and Hill (2007); and the World Bank (2007) found that farmers' challenges that are important and include: high costs of transaction that increase marketing cost, production risk e.g. bringing new initiatives like new products, poor infrastructure and/or high price variability; and weak primary markets that create an opportunity for buyers to negotiate for lower prices and/ orbargaining power of producers and sellers.

4.8 Level of satisfaction resulting from marketing challenges experienced by respondents.

This section provides the results on the marketing challenges satisfaction level of smallholder and emerging farmers of sheep and goat livestock.

4.8.1 Do you have access to formal marketing channels?

Figure 59 provides the results on farmers' access to formal marketing channels.

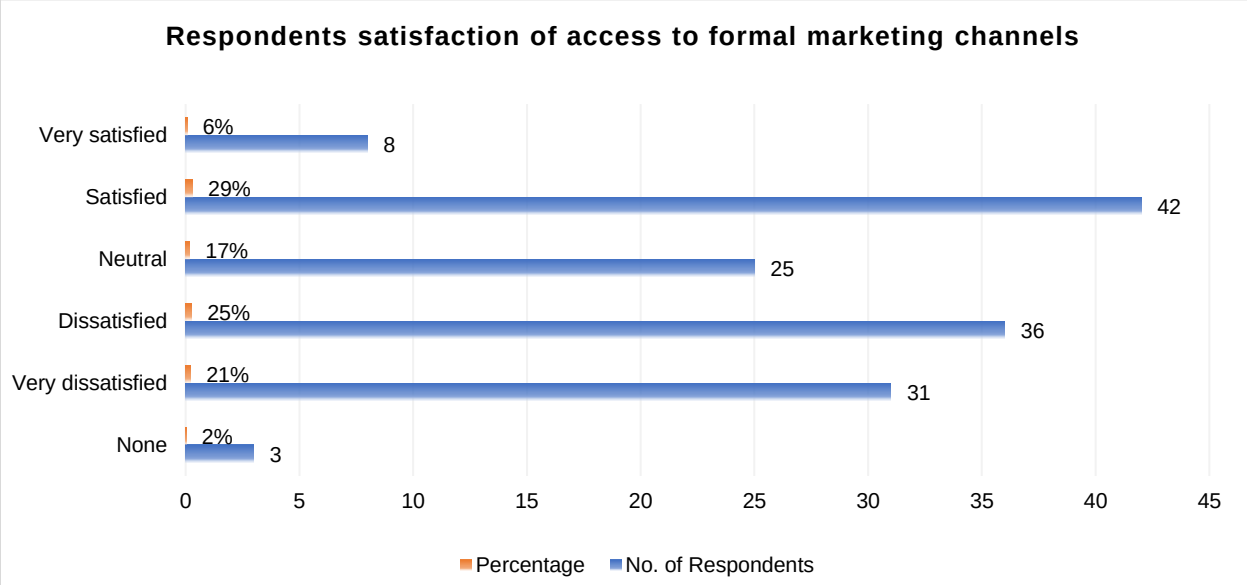

Figure 59: Respondents satisfaction of access to formal marketing channels.

Figure 59 indicates that majority of respondents (29%) are satisfied with access to formal marketing channels, 25% of respondents are dissatisfied, 21% of respondents are very

dissatisfied, 17% of respondents are neutral, 6% of respondents are very satisfied and 2% of respondents did not provide their level of satisfaction with regards to access to formal marketing channels. The results mean that majority of respondents are dissatisfied with access to formal marketing channels.

4.8.2 Transaction costs associated with marketing.

Figure 60 presents the results on the respondent's satisfaction of high transaction costs associated with marketing.

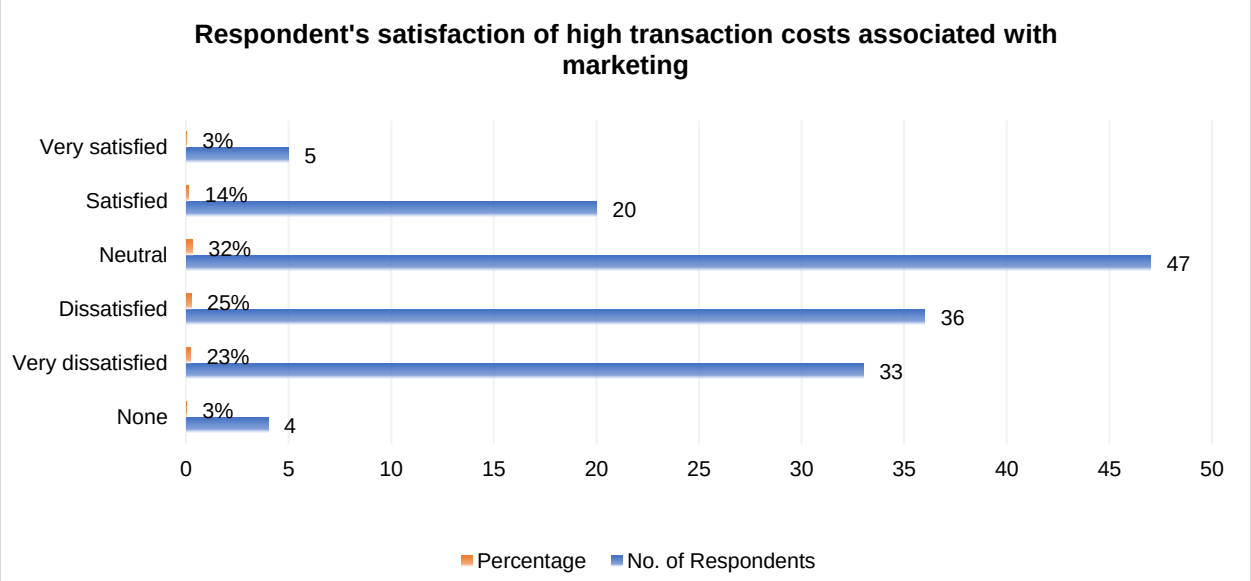

Figure 60: Respondents satisfaction of high transaction costs associated with marketing.

Figure 60 above indicates that majority of respondents (32%) have a neutral view regarding high transaction costs associated with marketing, 25% of respondents are dissatisfied, 23% of respondents are very dissatisfied, 14% of respondents are satisfied while 3% of respondents are very satisfied. The results mean that majority of respondents are dissatisfied with high transaction costs associated with marketing. Hall and Aliber, (2010) reported that smallholder farmers must be able to benefit from efficient markets and local level value adding and be more exposed to competition. However, markets are often constrained by inadequate property rights and high transaction cost.

4.8.3 Prices of livestock

Figure 61 reveals the results on the level of satisfaction of smallholder and emerging sheep and goat farmers in relation to prices of livestock.

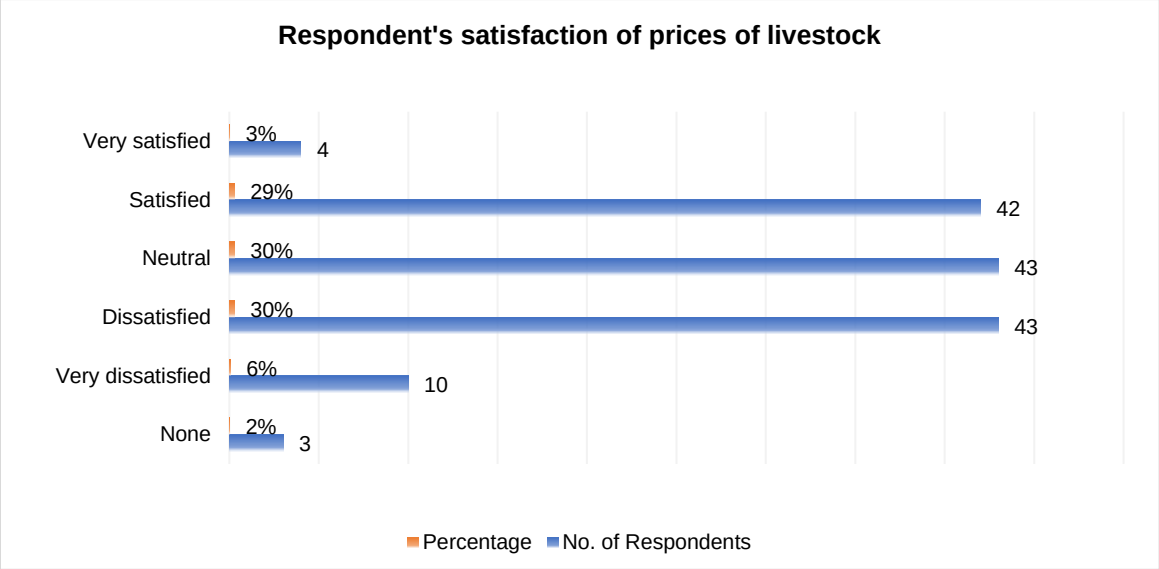

Figure 61: Respondent's satisfaction of prices of livestock.

Figure 61 above indicates that majority of respondents (30%) are dissatisfied while another 30% has neutral view regarding prices of livestock, 29% of respondents are satisfied with prices of livestock, 6% of respondents are very dissatisfied and 3% is very dissatisfied. The results mean that majority of respondents are dissatisfied.

4.8.4 Transportation of livestock to the market

Figure 62 below indicates that majority of respondents (33%) are neutral about transportation of livestock to the market, 28% of respondents are dissatisfied, 14% of the respondents are satisfied while the other 14% of respondents are very dissatisfied, 9% of respondents is very satisfied. The results mean that majority of respondents are dissatisfied with transportation of livestock to the market.

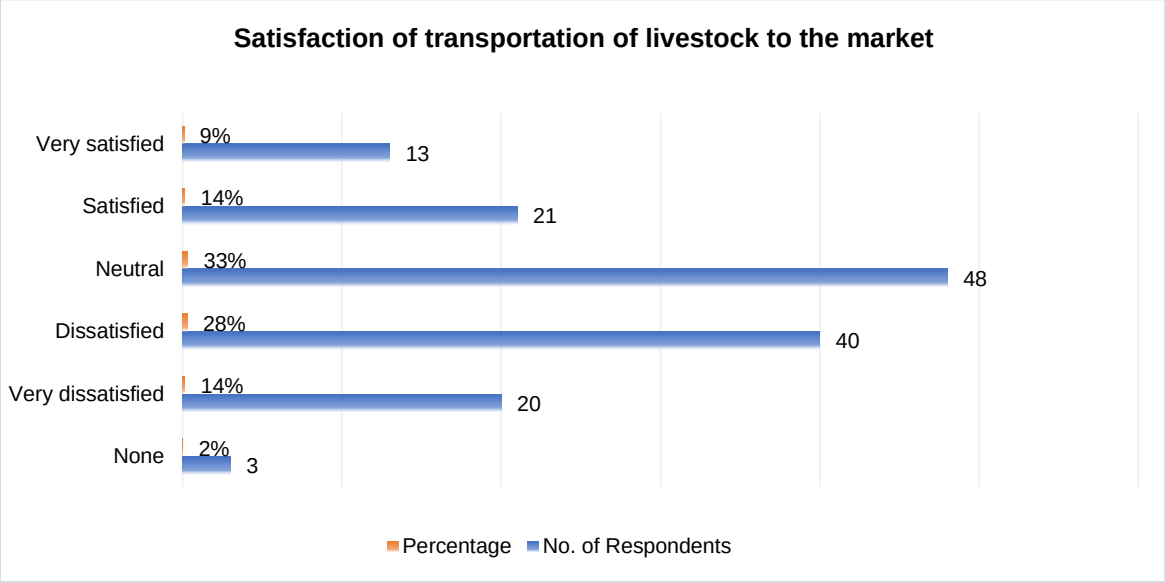

Figure 62: Respondent's satisfaction of transportation of livestock to the market.

The results in Figure 62 are aligned to findings from Cheteni (2017); Cheteni, Mushunje &Taruvinga (2014) that small-scale farmers struggle to access markets due to a range of factors such as poor infrastructure, lack of information, insufficient expertise, and inability to conclude contractual agreements. Makhura (2001) supported this view demonstrating that these problems result in their exclusion from the mainstream markets. Therefore, they are constantly trapped in market constraints since it is difficult to change these challenges on their own (Fenwick & Lyne, 1999).

4.8.5 Regulatory and technological policies

Figure 63 below indicates that majority of respondents (36%) are neutral while 27% of the respondents are very dissatisfied, 21% of the respondents are dissatisfied, 11% of the respondents are satisfied and 1% of the respondents are very satisfied. The results mean that majority of respondents are dissatisfied with regulatory and technological policies.

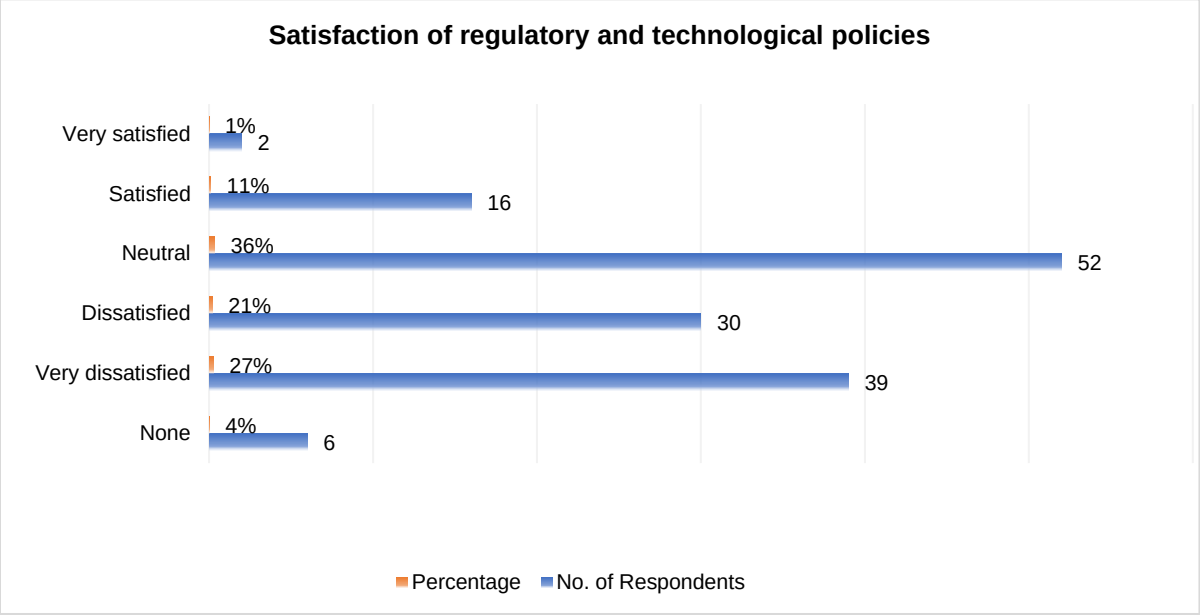

Figure 63: Respondent's satisfaction of regulatory and technological policies.

4.8.6 Market information

Figure 64 reveals market information the results on the level of satisfaction of smallholder and emerging sheep and goat farmers in the study area.

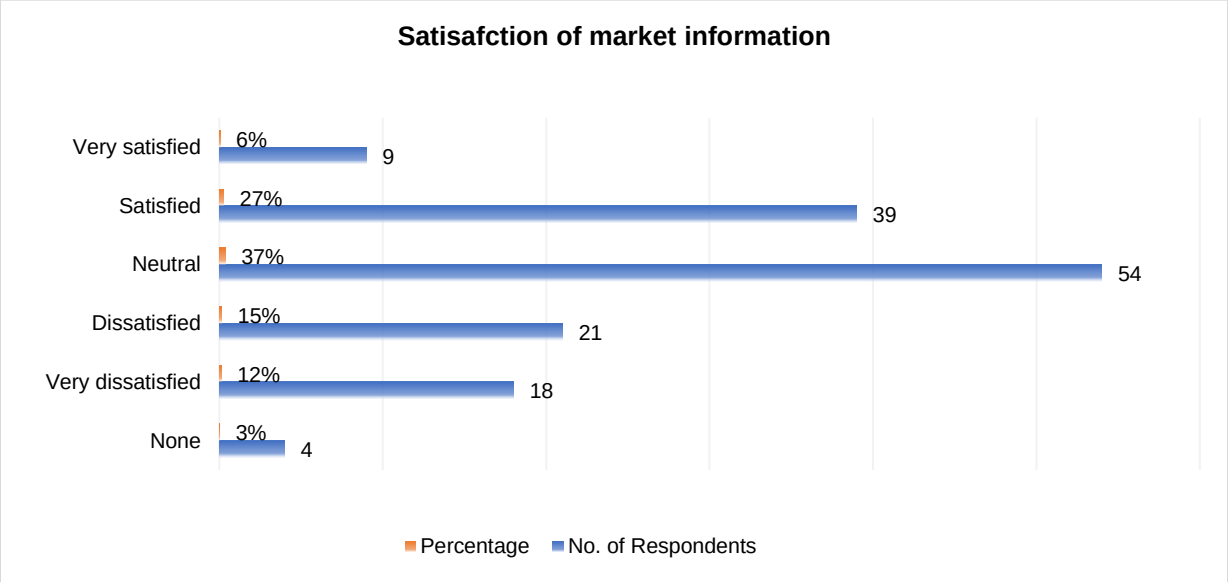

Figure 64: Respondent's satisfaction of market information.

Figure 64 above present result on marketing information challenges that farmer may have. Most of respondents (37%) are neutral, 27% of respondents are satisfied, 15% of

respondents are very dissatisfied, 12% of respondents are very dissatisfied, 6% of respondents are very satisfied. The results mean that majority of respondents are neutral about market information.

4.8.7 Bargaining power of producers

Figure 65 presents the results on respondents' satisfaction level regarding bargaining power producers. The results show that majority of respondents (50%) are neutral about bargaining power of producers, 15% of respondents are satisfied, 12% of respondents are very dissatisfied and another 12% of respondents are dissatisfied and 7% of respondents are very satisfied. The results mean that majority of respondents are neutral with bargaining power of producers.

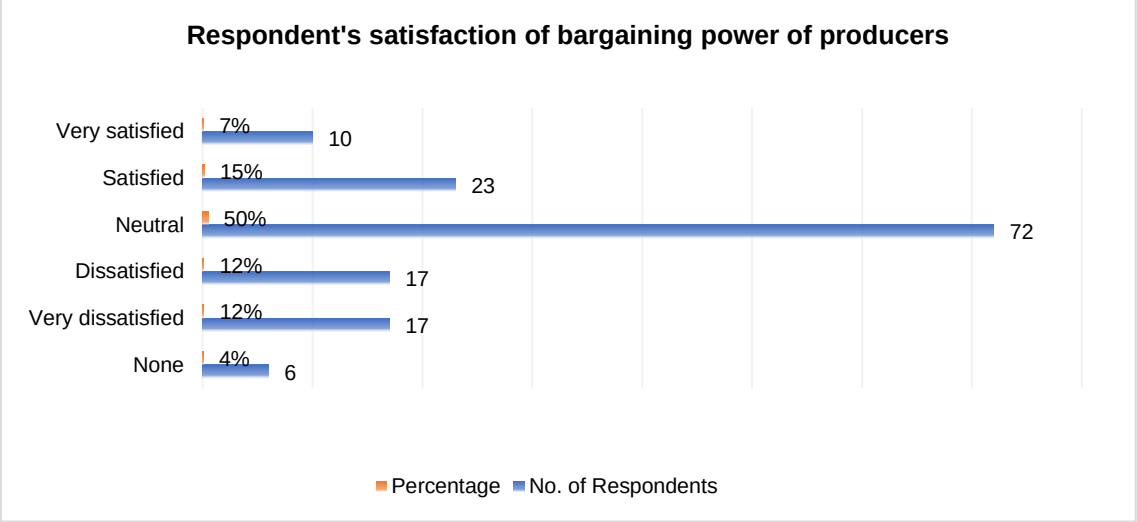

Figure 65: Respondent's satisfaction of bargaining power of producers.

4.8.8 Road conditions and travel distance to the market

Figure 66 below indicates that majority of respondents (53%) are very dissatisfied with road conditions and travel distance to the market. 18% of respondents are dissatisfied, 16% of respondents are neutral, 8% of respondents are satisfied and 3% of respondents are very satisfied. The results mean that majority of respondents are dissatisfied with road conditions and travel distance to the market.

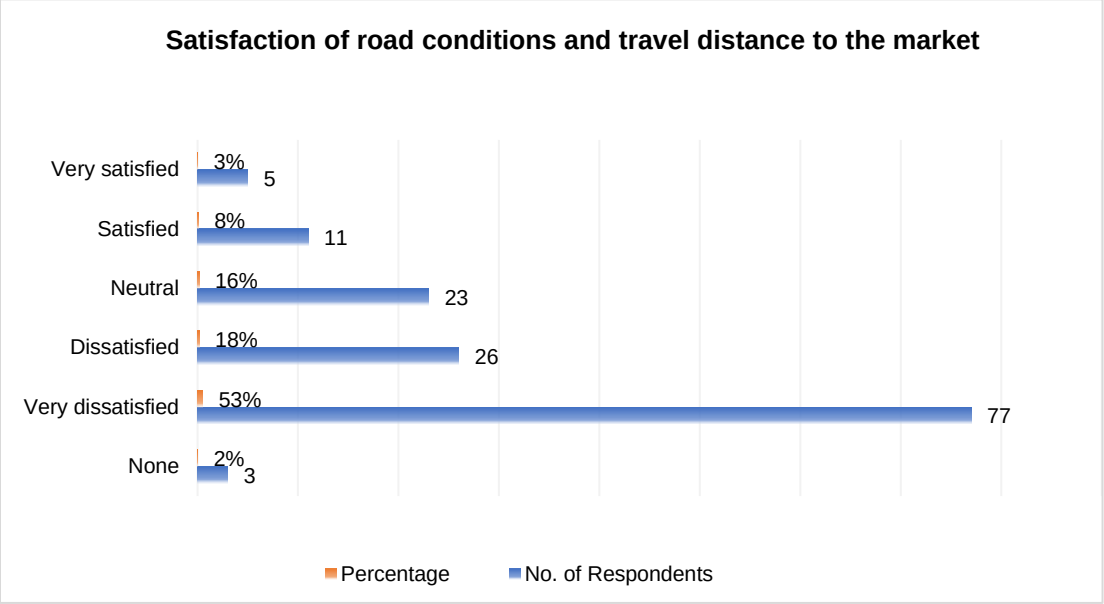

Figure 66: Respondent's satisfaction of road conditions and travel distance to the market.

4.8.9 Mean of marketing challenges satisfaction level of respondent.

Table 42: Mean of marketing challenges satisfaction level of respondent.

Marketing challenges satisfaction level	
Mean	20.3862
Std. deviation	6.17925
Variance	38.183
Minimum	.00
Maximum	36.00

Source: Information from the study, Survey data (Mid-August 2022- end of June 2023)

Table 42 presents the results on the mean for satisfaction of marketing challenges variable among the respondents. The satisfaction level was measured based on the Likert scale. The highest level of satisfaction score obtained by some of the farmers was 36 and the least score for level of satisfaction from the Likert scale was 0. The mean was reported to approximately be 20 and standard deviation is approximately 6 with variance of 38. Farmers with scores equal or greater than 20 were classified as 0 (Satisfied with the challenge variable), while farmers with scores less than 20 were classified as 1 (Not satisfied with the variable).

Table 43 below presents results of Probit analysis of factors influencing marketing challenges of livestock farmers.

Table 43: Results of Probit analysis of factors influencing marketing challenges of the livestock farmers (n=145)

Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Gender of respondent	.072	.038	1.917	0.055*	-.002	.147
Age of respondent	.018	.001	16.929	0,001***	.016	.020
Size of household	.017	.008	2.070	0.038**	.001	.033
Level of education	.059	.020	2.882	0.004***	.019	.099
Engage in off-farm income activity.	.058	.036	1.606	0.108	-.013	.128
Role of the respondent on the farm	.333	.062	5.355	0,001***	.211	.454
Involved in the day-to-day operations of farm.	-.040	.019	-2.148	0.032**	-.076	-.003
Do you have a farm business plan?	-.127	.058	-2.181	0.029**	-.241	-.013
Do you keep farm management records?	-.159	.047	-3.398	0,001***	-.251	-.067
Access to agricultural information	-.218	.046	4.785	0,001***	.129	.308
Do you receive any veterinary services?	.025	.031	.811	0.417	-.036	.086
What is the size of your land?	.000	.000	-2.499	0.012**	.000	.000
Do you sell your sheep and goat?	-.094	.056	-1.675	0.094*	-.204	.016
Distance from the market to your farm?	.000	.000	-.563	0.573	-.001	.001
Cost per single trip to the market	.000	.000	13.107	0,001***	.000	.000
Access to market information	-.292	.037	-7.870	0,001***	-.365	-.219
Total number of sheep you sold in 2019.	.008	.001	11.519	0,001***	.007	.009
Total number of goats you sold in 2019.	-.025	.002	-10.93	0,001***	-.030	-.021
Intercept	-2.061	.245	-8.409	<,001***	-2.306	-1.816

PROBIT model, 1%:***, 5%:**, 10%:*

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

Table 44 below presents data information on marketing challenges experienced by respondents. Data presented is in line with Probit results presented on Table 43.

Table 44: Data analysed information summary on marketing challenges experienced by respondents.

Data Information		
		No. of Cases
Valid		145
Rejected	Missing	0
	Number of Responses > Number of Subjects	0
Control Group		284

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

The results on Table 43 show that age has a positive and significant association with marketing challenges. This means that the more a farmer age, the more likely they will experience marketing challenge. This may be due to deterioration of energy and ability to strategically analyse farm needs and identify value-adding markets. The results also indicate that the size of household has a positive and significant association with marketing challenges with keeping all other factors constant. This means that a household with a high number of members, increases the likelihood of a farmer to experience marketing challenge. This may be because finances that are meant for farm and marketing ends up being spent on the household, and time spent on farm and livestock marketing may be limited as a farmer has to spend time with the family, more especially when there are young children.

The results show that level of education has a positive and significant association with marketing challenges. This means that the more a farmer is educated, the more likely they will experience marketing challenges. This effect was not expected since majority of the respondents have acquired secondary school education. This may be because education acquired by farmers/ respondents is not related to agriculture. The results further indicate that farmer involvement in day-to-day operations has a negative and significant association with marketing challenges. This means the more a farmer is involved in day-to-day operations, the less likely they will experience marketing challenges with other factors remaining the same. This may be due to farmer involvement on daily operations has positive contribution to the business as a farmer will have knowledge of when to take livestock to the market.

The results further show that farmers who have farm business plans have negative and significant association with marketing challenges, with all other factors held constant. This means that farmers who have business plans will less likely experience marketing challenges. This may be because business plans serve as a guide in managing the farm. Further, the results show that keeping farm management records has a positive and significant association with marketing challenges, with all other factors held constant. This means that farmers who keep farm management records will more likely experience marketing challenges. The effect was not expected. This may be because farm management records that are kept may not be utilised, or information contained in the records may not be relevant.

The results also show that farmers who have access to agricultural information have a negative and significant association with marketing challenges, with all other factors held constant. This means that farmers who have access to agricultural information will less likely experience marketing challenges. This may be because farmers who have access to agricultural information use this information effectively and correctly in their farms. The results also show that size of land has a positive and significant association with marketing challenge. This means that an increase in land, increases the likelihood for a farmer to face marketing challenges with other factors held constant. This may be because the more the size of land is big, the more it requires financial input in order to set up other farm activities which make it difficult to access different markets for different activities.

Furthermore, the results on cost per trip has a positive and significant association with marketing challenges. The results also show that cost per single trip to the market has a positive and significant association with marketing challenges. This means that spending more money per single trip increase the likelihood of a farmer to experience marketing challenges. This may be because an increase in costs per single trip to the market affects profit available for marketing activities in the farm. The results also show that access to market information has a negative and significant association with marketing challenges, with all other factors held constant. This means that access to market information, reduces the likelihood of a farmer to experience marketing challenges. This may be due to a farmer making a better use of the relevant market information to his/her advantage.

Additionally, the results indicate that sale of sheep has positive and significant association with marketing challenge, with all other factors held constant. This means that an increase in sale of sheep increases the likelihood of a farmer experiencing marketing challenge, this may be because sheep helps improve socio-economic and food security. The results on sale of goat revealed that sale of goat has a negative and significant association with marketing challenges. This means that an increase in sale of goat decreases the likelihood of a farmer to face marketing challenge. This may be because goat might have a better market than sheep.

Table 45 presents Pearson Goodness-of-Fit results on marketing challenges. The Figure indicate that there is a relationship between the observed frequency and theoretical distribution, meaning that the variables have significant association with marketing challenges. This assumes that the null hypothesis is correct.

Table 45: Pearson Goodness-of-Fit test on marketing challenges (n=145)

Chi-Square Tests			
	Chi-Square	df	Sig.
Pearson Goodness-of-Fit Test	3040.276	126	.000

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

4.9 Financial challenges of smallholder and emerging farmers of sheep and goat livestock farmers

This section reveals the results on financial challenges of smallholder and emerging farmers of sheep and goat livestock farmers. Farmers often need funds for adoption of new technologies and to buy inputs (Ullah et al., 2022). To meet these needs, they must either utilize their savings or borrow money (Omobitan & Khanal, 2022). In a case where farmers do not have cash in hand or savings, they must access credit. The financial constraints faced by small-scale farmers, low income and high cash expenses, require utilization of agriculture credit as an indispensable source for arranging the required investment (Kumari & Garg, 2023; Nyebar et al., 2023).

4.9.1 Is your livestock business profitable during the year?

Figure 67 presents the results on whether, livestock business is profitable per annum.

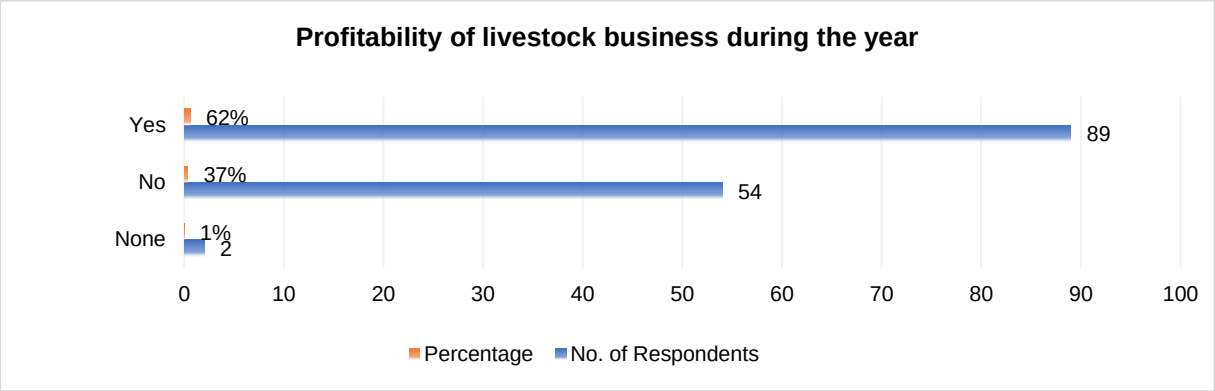

Figure 67: Is your livestock business profitable during the year?

Figure 67 results show that most of the respondents (62%) revealed that livestock business is profitable while 37% indicates that they are not seeing any profit as they always commit funds to other need in the farm whenever they make sale from their livestock. The results correlate with the findings of Opportunity International (2012) that majority of African population is engaged in farming, however, cannot feed themselves due to lack of access to agricultural inputs and other agricultural technologies, largely because of lack of finance.

4.9.2 Number of years in sheep and goat livestock farming

Figure 68 presents the results on a period that respondents have been involved in sheep and goat livestock farming.

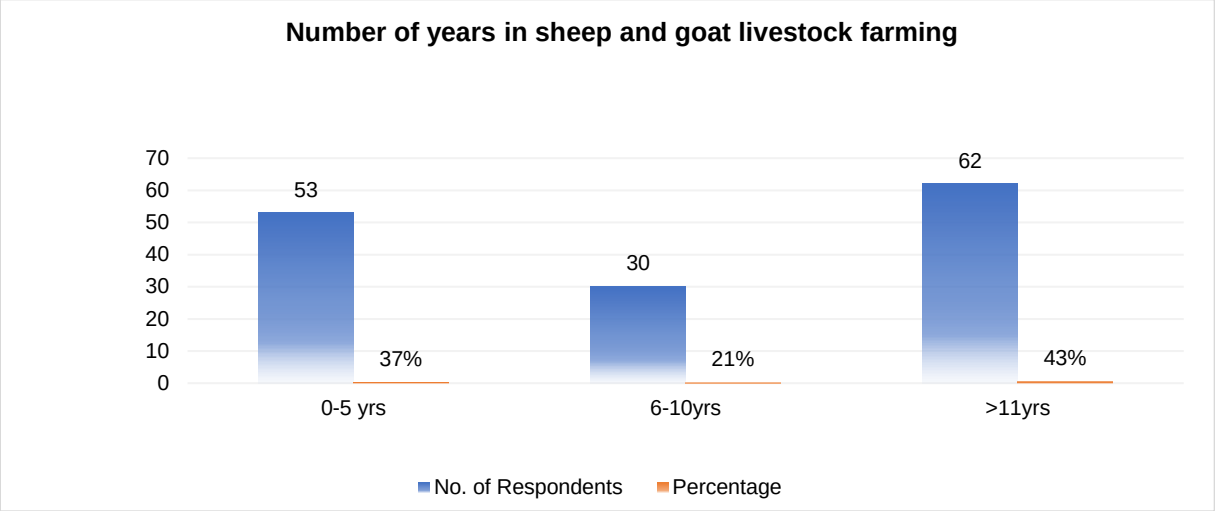

Figure 68: Number of years in sheep and goat livestock farming.

The Figure shows that majority of respondents (43%) have been sheep and goat livestock farmers for more than 11 years while 21% have been livestock farmers for 6-10 years and 37% have been livestock farmers for 5 years or less.

4.9.3 Farmers' annual income from sheep and goat livestock sales in 2019

Figure 69 above reveals the results on the annual income from sheep and goat livestock sales in 2019.

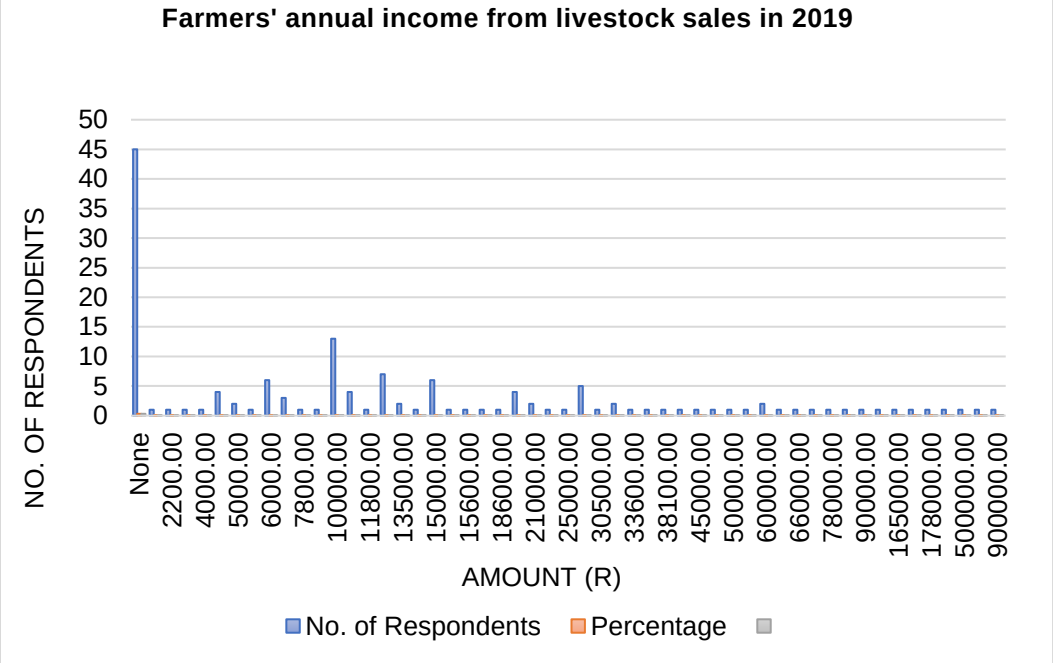

Figure 69: Farmers' annual income from sheep and goat livestock sales in 2019.

The maximum amount that was made from livestock sale in 2019 is R900 000.00 and this was declared by 1 of the respondents accounting for 0.7%. Most of the respondents (31%) did not make any sales in 2019, while 9% made R10 000.00, 5% made R12 000.00, 4% made R6000.00, 3% made R30 000.00, 3% made R20 000.00 and another 3% made R4500.00 while 2% made R7 500.00. The remaining contributed 1% each.

It must be noted that in 2019, some farmers had not started buying livestock/ started farming business therefore they are included in the majority of farmer who did not make sales in 2019. Also, important to note is that majority of farmers indicates that a sheep was sold at an average of R1 500.00 and a goat at R1 200.00.

4.9.4 Financial assistance received from the Department of Agriculture and Rural Development (DARD)

Figure 70 presents the results on financial assistance received from the Department of Agriculture and Rural Development (DARD). The results show that 72% of respondents have never been assisted financially by DARD while 28% has received assistance from DARD.

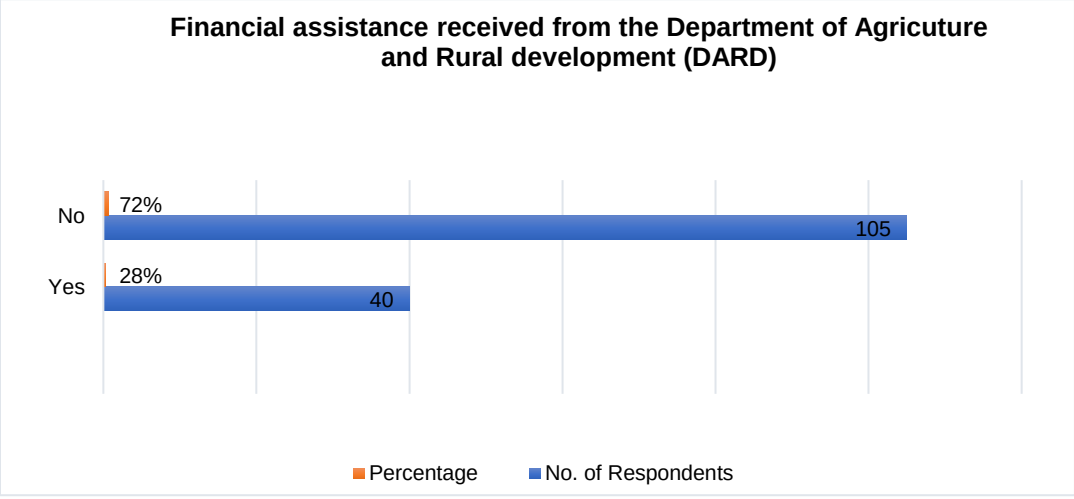

Figure 70: Financial assistance received from the Department of Agriculture and Rural Development (DARD)

4.9.5 Government funding programme that offered financial assistance to a farmer?

Figure 71 presents the results on whether farmers have been assisted financially by government and if so, farmers must indicate the programme offered financial assistance.

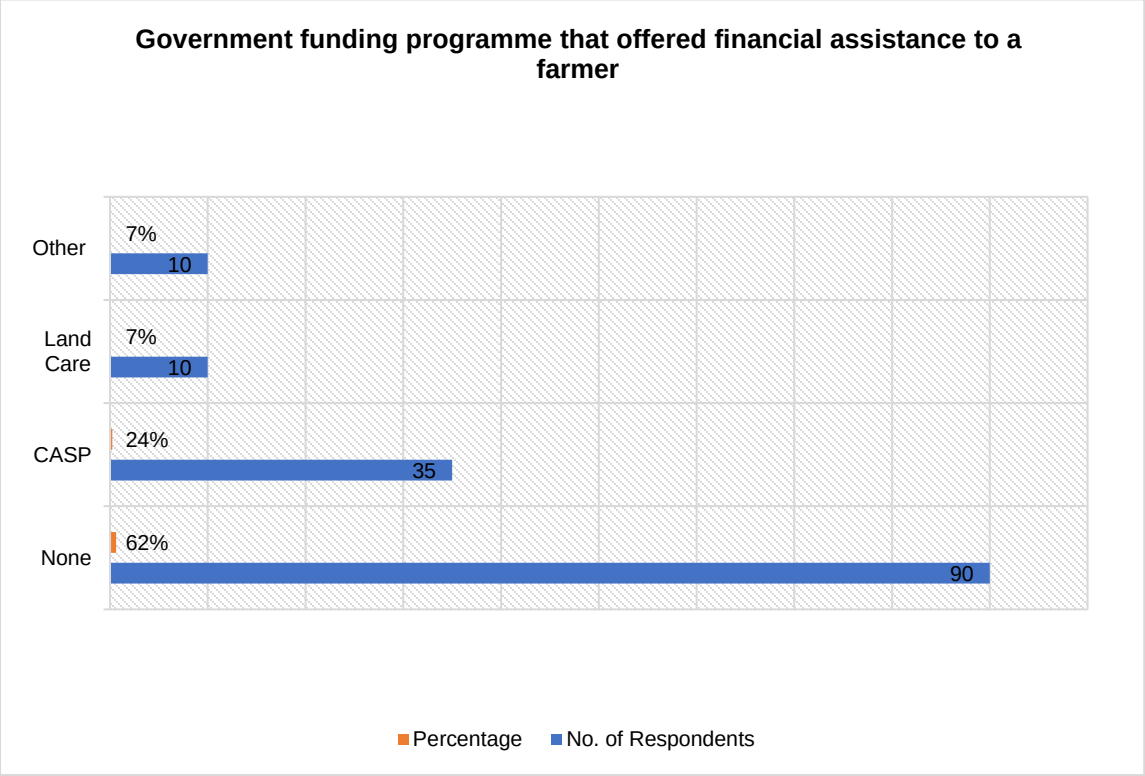

Figure 71: Government funding programme that offered financial assistance to a farmer?

Figure 71 above presents the results on the type of government funding programme that offered financial assistance to farmers in a case a farmer has received government funding. The results show that 24% received CASP funding, 7% for land and another 7% for other resources like infrastructure.

4.9.6 What was the grant meant for?

Figure 72 above presents results of what the grant was meant for, in a case where farmers have received grants from government.

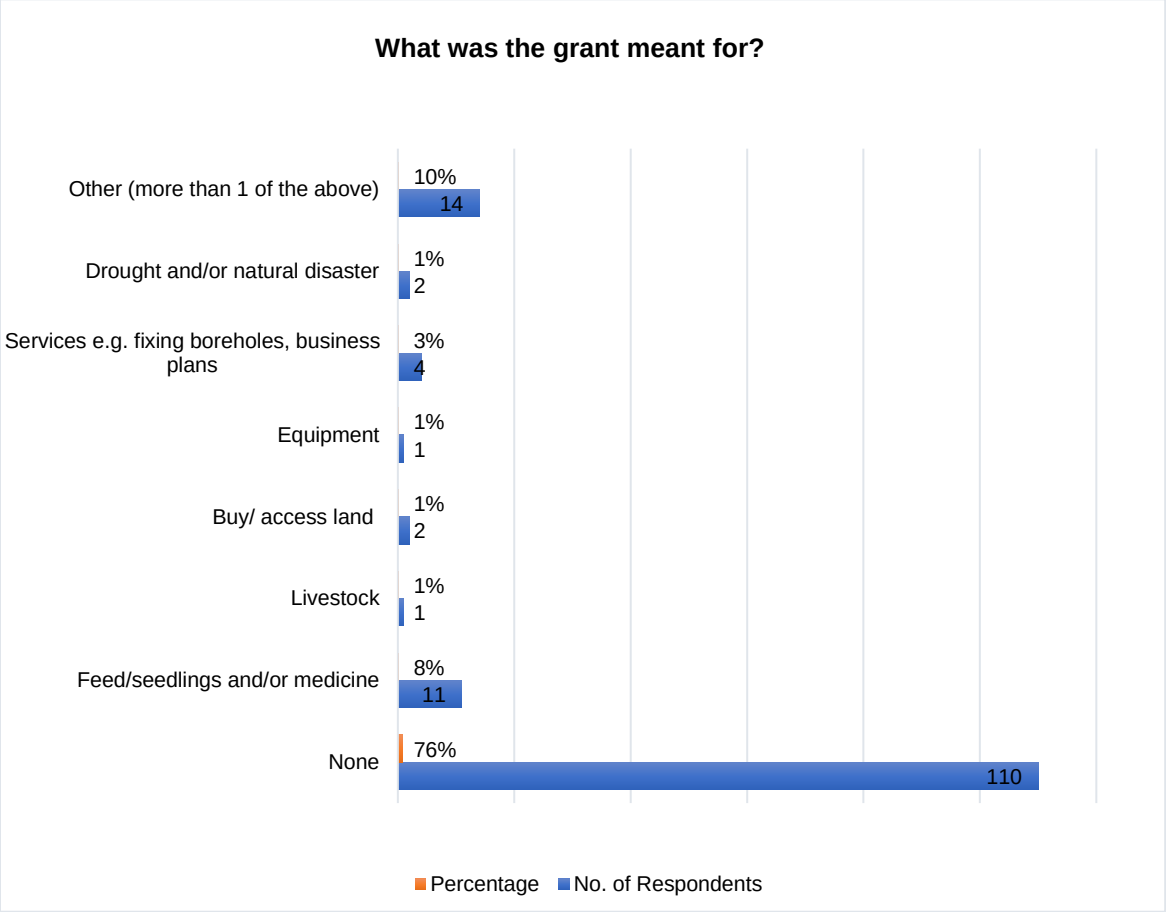

Figure 72: What was the grant meant for?

The Figure shows that 8% received grants for feed/ seedlings and medication, 3% received grant for servicing their farms e.g., fixing boreholes, accessing business plans etc. 1% of respondents received grants for drought relief/ natural disaster, 1% received grant for equipment,1% to buy or access land, 1% to buy livestock. The other 10% received grants for more than 1 of the reasons provided.

4.9.7 Have you ever applied for a loan?

Figure 73 above provides the results on whether smallholder and emerging farmers have applied for a loan or not.

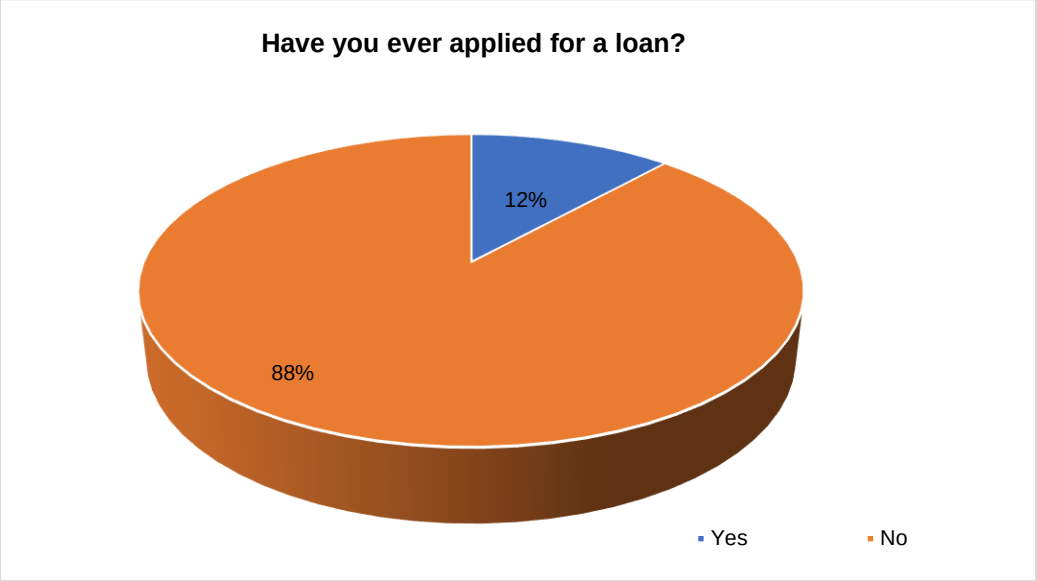

Figure 73: Have you ever applied for a loan?

The results reveal that 88% of the respondents in the study have never applied for a loan and during engagements, they indicated that they are either unemployed or do not have formal employment and payslips and mainly rely on sale of livestock, therefore that is why they have never bothered applying for loans. However, 12% of the respondents in the study area have applied for loans. The results are in concurrence with Okuru et al. (2004) that credit is one of the most significant bases of capital accumulation and may be viewed as a device for providing the basis for increased production efficiently and income. Unfortunately, small-scale farmers in communal areas have limited access to affordable credit.

4.9.8 Reason for loan application

Figure 74 presents the results on the reason for respondents to apply for loans.

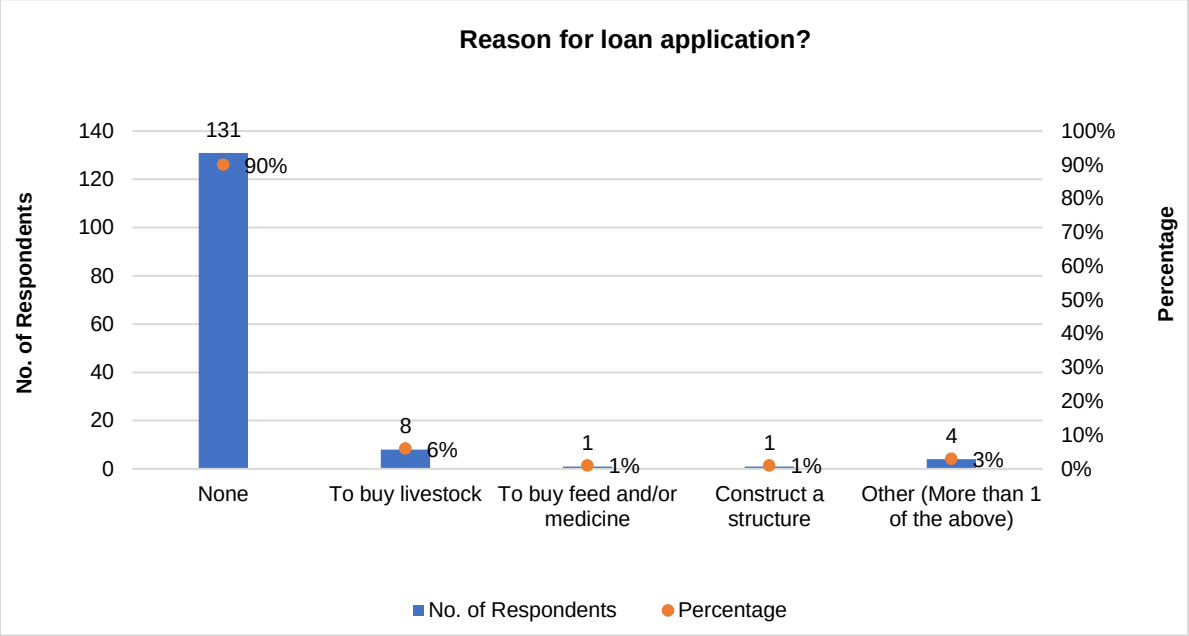

Figure 74: Reason for loan application.

Figure 74 above indicates that majority of respondents (6%) who applied for loans, they did it because they wanted to buy livestock, while 1% wanted to buy feed or medication for animals and the other 1% wanted to construct or renovate their infrastructure. 3% had more than 1 of the provided reasons.

4.9.9 How much interest rate do you pay towards the loan per month?

Figure 75 below presents the results on the interest rate charged by the lenders of loans.

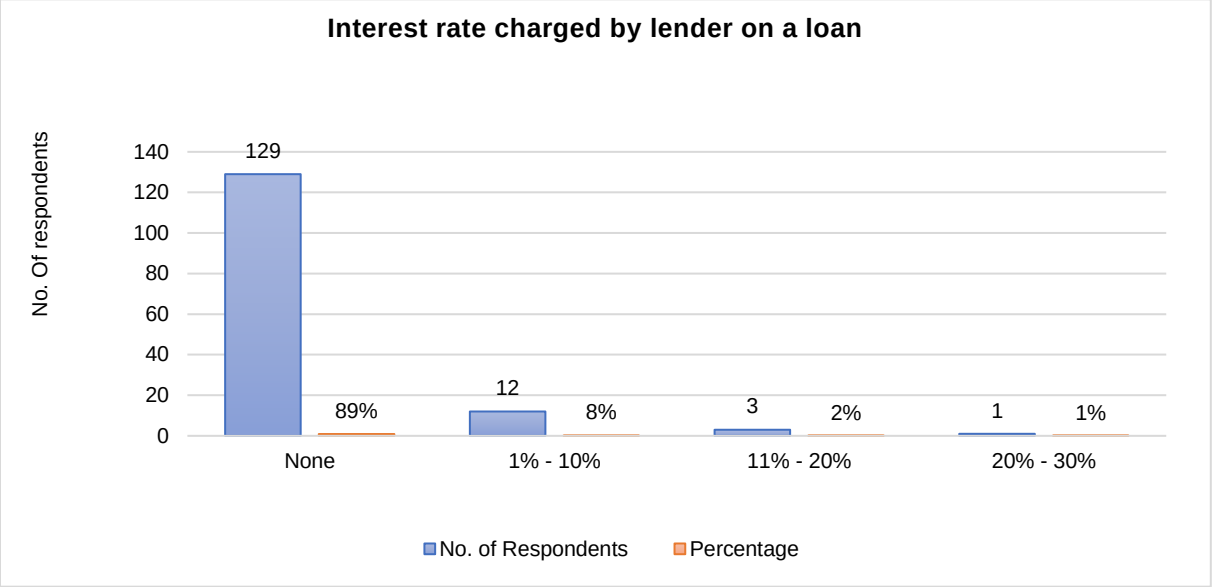

Figure 75: Interest rate charged by lender on a loan.

Figure 75 above indicates that from the respondents who have applied for loans and received loans, 8% of the respondents paid up to 10% of interest towards their loan, 2% paid interest rates of between 11% - 20% while 1% paid an interest rate of between 20%-30%. Okuru et al. (2004) further states that the poor access to agrarian and support services experienced by these farmers is attributed to socio-economic factors as well as the constraints that they encounter with financial and other institutions due to the high risk and transaction costs.

4.9.10 Default on instalment payments towards loan

Figure 76 below presents the results on whether respondents who have had access to loan had defaulted on instalment payment towards a loan.

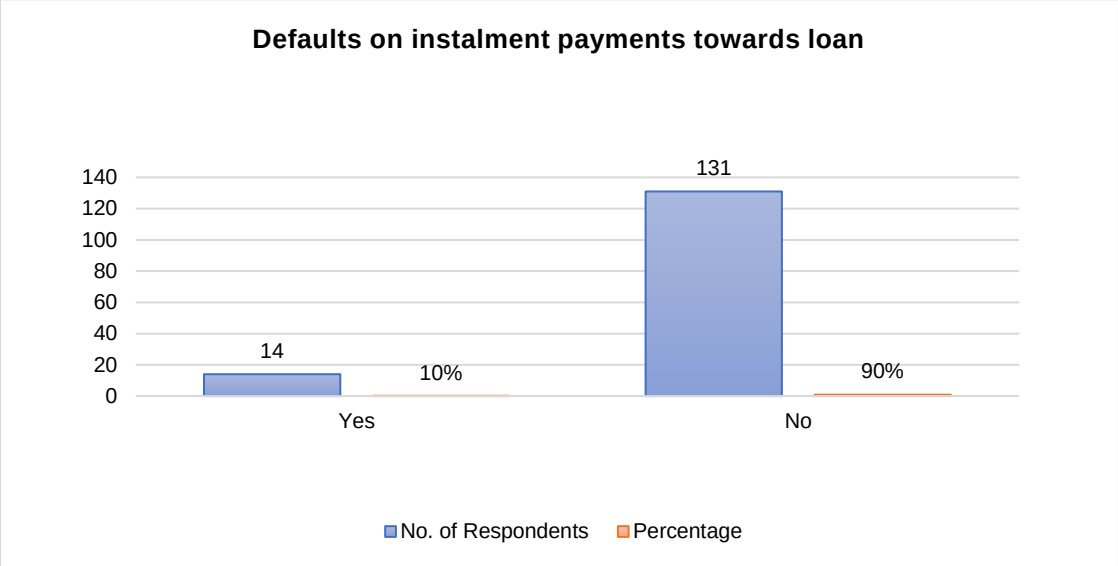

Figure 76: Defaults on instalment payments towards a loan.

Figure 76 above presents the results on whether respondents have skipped or defaulted on their loan repayments. The results indicates that from the respondents who have received a loan, 10% of them have skipped or defaulted on instalment payment towards the loan.

4.9.11 Reason for defaulting on instalment payment towards loan.

Figure 77 below presents the results on the reasons for defaulting on instalment payment towards a loan.

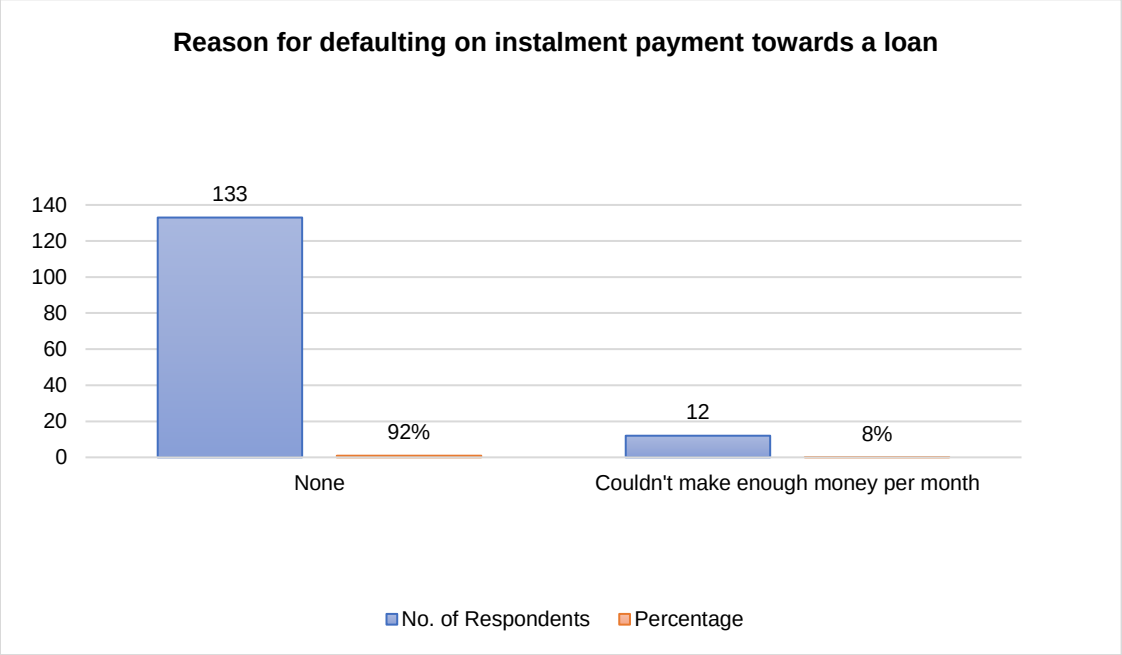

Figure 77: Reason for defaulting on instalment payments towards a loan

Figure 77 above indicates that 8% of the respondents have defaulted on loan instalments payments as they could not make enough money per month to be in a good position to repay the loan. The remaining 92% had no comment as this question was not applicable to them.

4.9.12 Has a farmer' loan application previously been rejected?

Figure 78 presents the results on whether farmer's loan application has been rejected if the farmer has applied for loan.

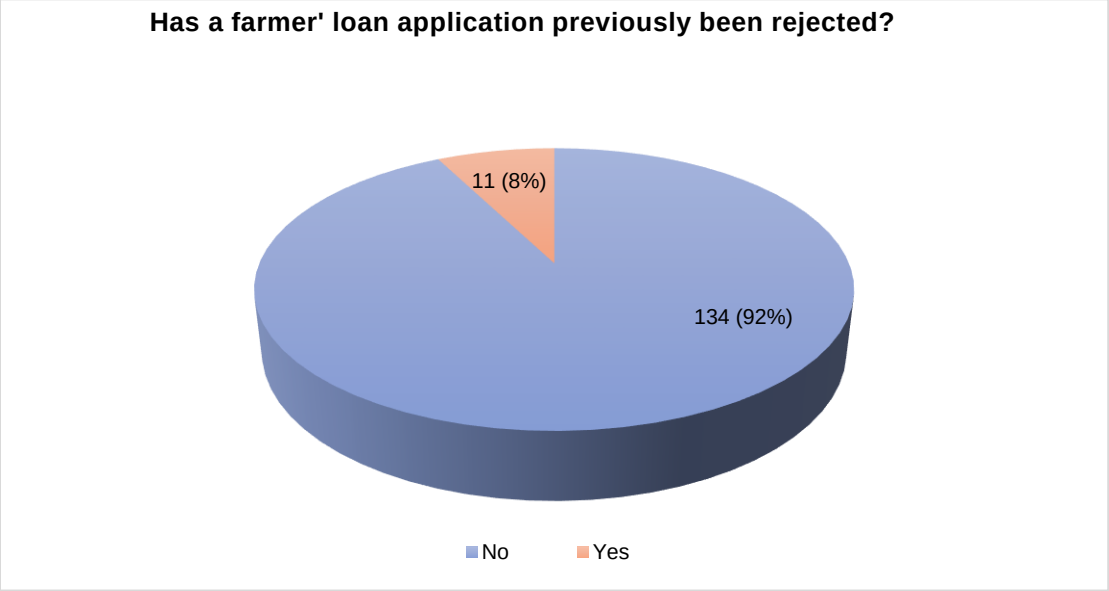

Figure 78: Has a farmer's loan application previously been rejected?

The results on Figure 78 show that only 8% of respondents who have applied for loans received rejections while 92% of respondents have either never experienced loan rejection or their loans were approved.

4.9.13 Indicate reason for rejection of a loan application.

Figure 79 reveals the results on whether loan applications were rejected for farmers who have applied for a loan.

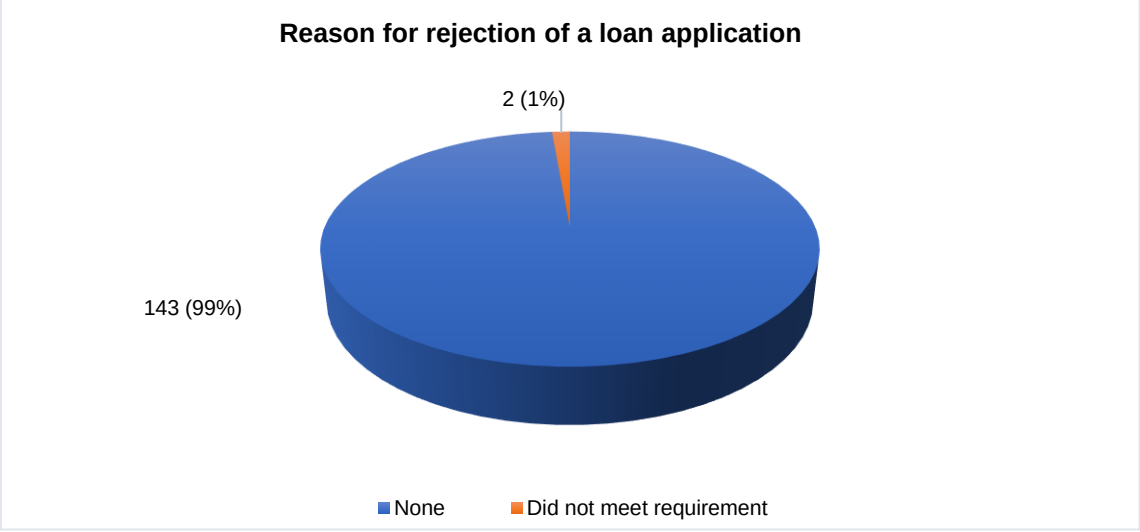

Figure 79: Reason for rejection of loan application

Figure 79 above indicates that majority of respondents (99%) have never had rejection of loan application while 1% of respondents did not meet requirements of loan application.

4.10 Level of satisfaction resulting from financial challenges experienced by respondent.

This section provides the results on the financial challenges satisfaction level of smallholder and emerging farmers of sheep and goat livestock.

4.10.1 Own financial capital

Figure 80 provides the results on farmers' own financial capital.

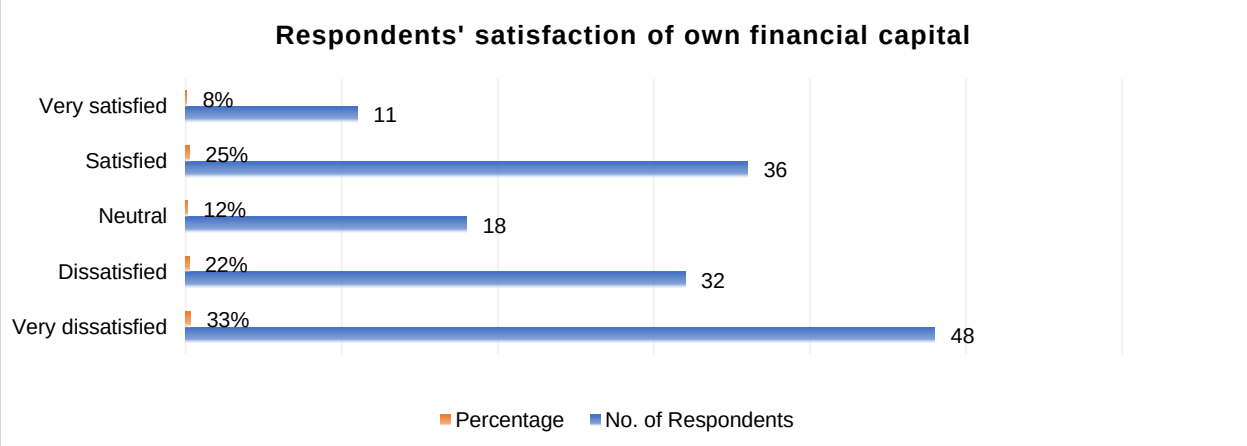

Figure 80: Respondents' satisfaction of own financial capital

Figure 80 above presents the results on satisfaction level of respondents regarding own financial capital. Majority of respondents (33%) are very dissatisfied, 25% of respondents are satisfied, 22% of respondents are dissatisfied, 12% of respondents are neutral and 8% of respondents are very satisfied.

4.10.2 Securing financial capital from financial institutions.

Figure 81 presents the results on respondents' satisfaction of securing financial capital from financial institutions.

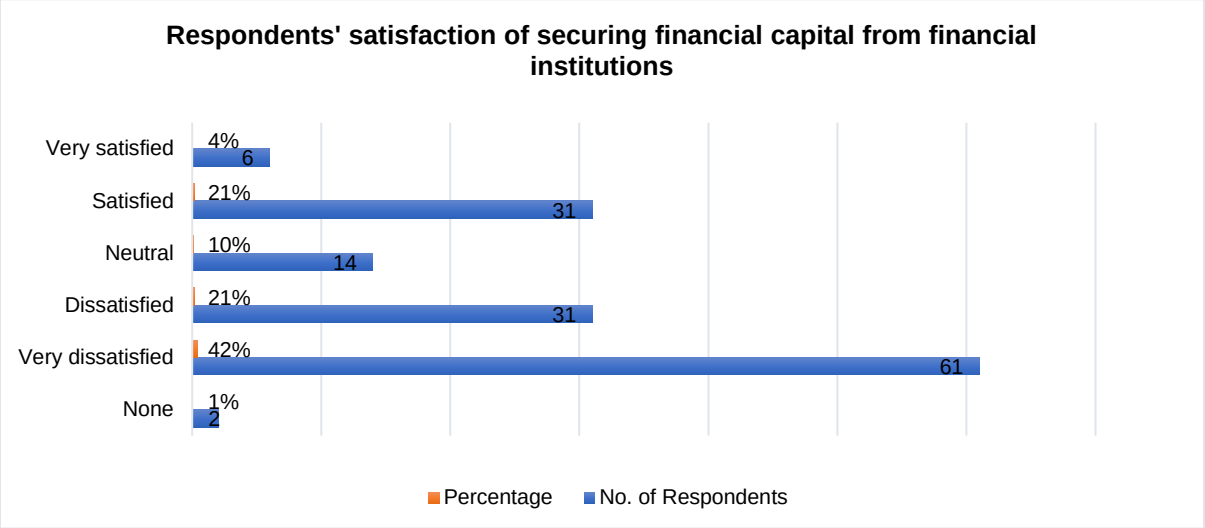

Figure 81: Respondents' satisfaction of securing financial capital from financial institutions

The results on Figure 81 show that majority of respondents (42%) are very dissatisfied with securing financial capital from financial institutions, 21% of respondents are dissatisfied while another 21% of respondents are satisfied, 10% of the respondents are neutral and 4% of respondents are very satisfied.

4.10.3 Borrowing from private money lenders in the communities

Figure 82 presents the results on Respondents' satisfaction of borrowing from private money lenders in the community.

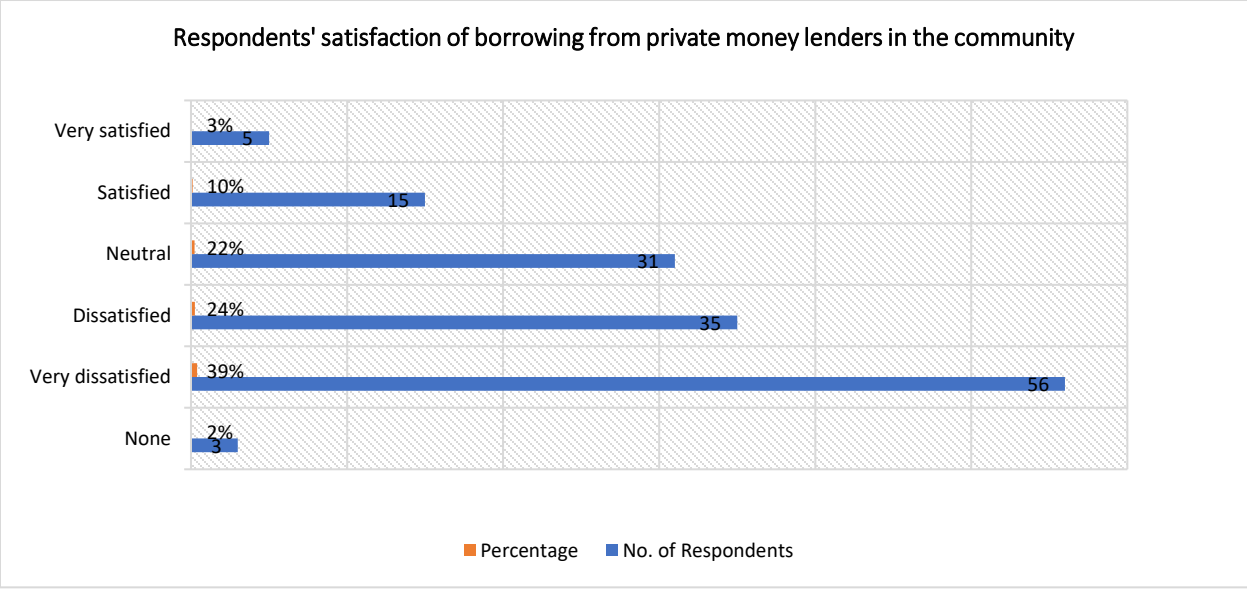

Figure 82: Respondents' satisfaction of borrowing from private lenders in the community

Figure 82 above indicates that majority of respondents (39%) are very dissatisfied with borrowing from private money lender in the communities, 24% of respondents is dissatisfied, 22% of respondents are neutral, 10% of respondents are satisfied and 3% of respondents are very satisfied, and 2% of respondents did not echo their views on borrowing from private lenders in the communities.

4.10.4 Access to start-up finance

Figure 83 presents the results on respondents' satisfaction of access to start-up finance.

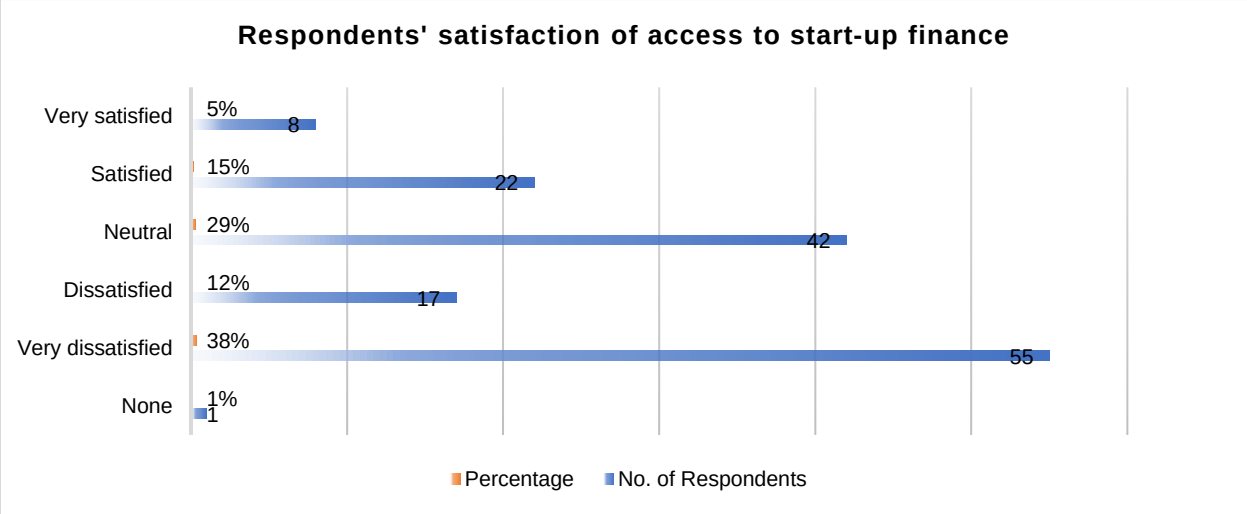

Figure 83: Respondents' satisfaction of access to start-up finance

Figure 83 above indicates that majority of respondents (38%) found it difficult to access start-up finances, 29% of respondents are neutral, 15% of respondents are satisfied, 12% of respondents are dissatisfied and 5% of respondents are dissatisfied about access to start-up finance.

4.10.5 Availability of collateral to secure farm loan from financial institutions

Figure 84 presents the results on respondents' satisfaction of availability of collateral to secure farm loan from financial institutions.

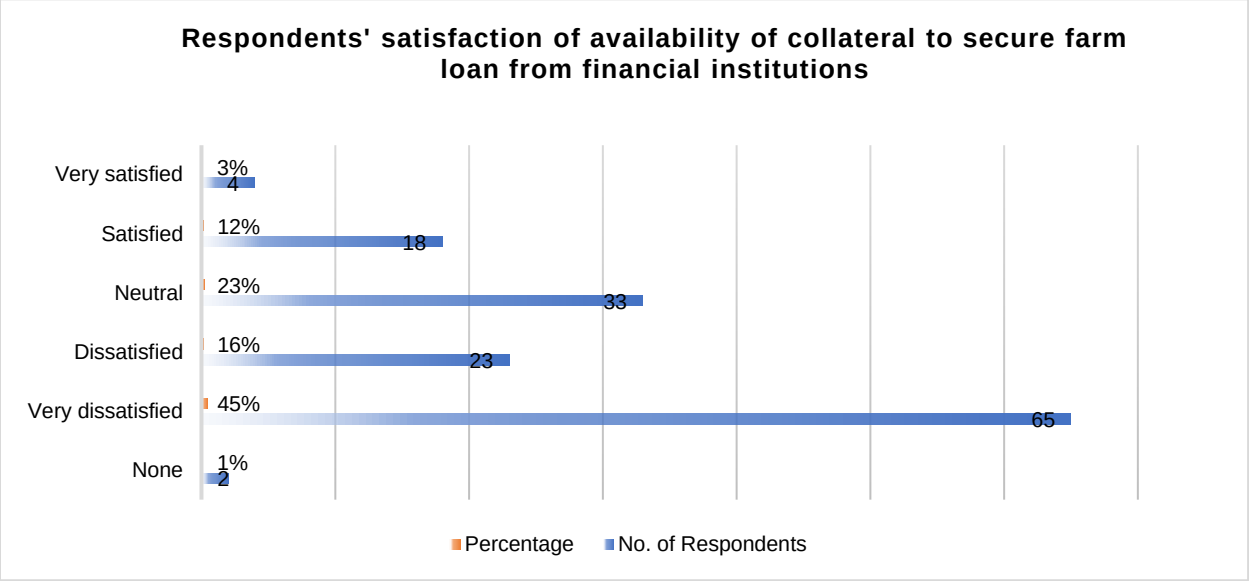

Figure 84: Respondents' satisfaction of availability of collateral to secure farm loan from financial institutional institutions

The results on Figure 84 show that majority of respondents (45%) are very dissatisfied with availability of collateral to secure farm loan from financial institutions, 23% of respondents are neutral, 16% of respondents are dissatisfied, 12% of respondents are satisfied and 3% of respondents are very satisfied.

4.10.6 Access to farm insurance

Figure 85 presents the results on respondents' satisfaction on access to farm insurance.

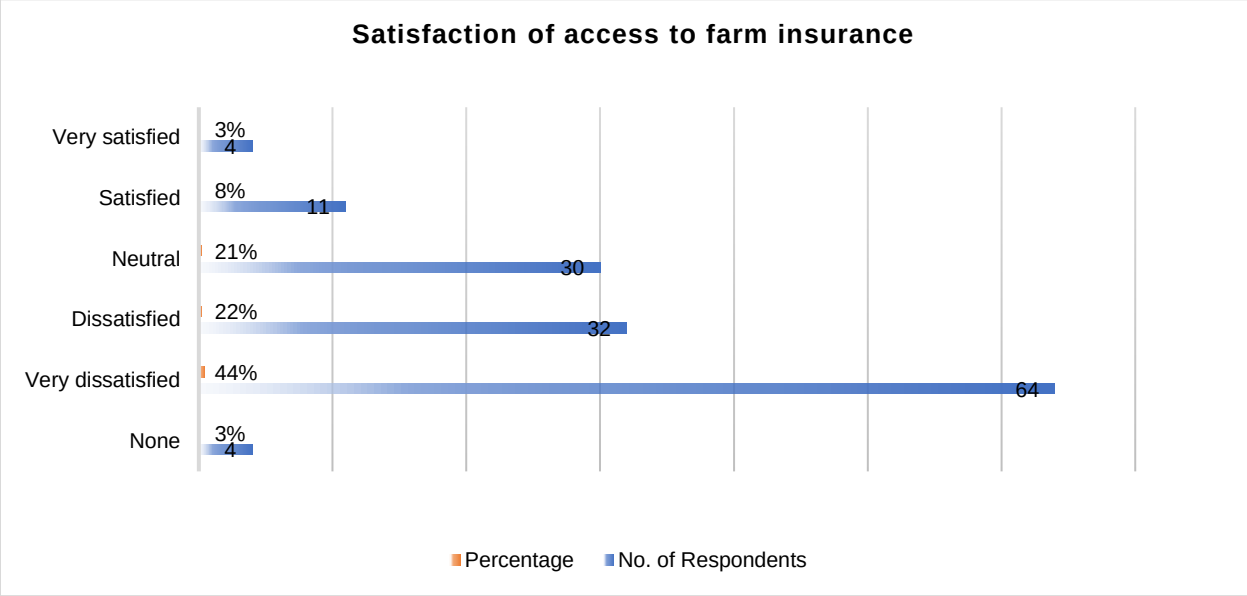

Figure 85: Respondents' satisfaction of access to farm insurance

Figure 85 above presents results that most of the respondents (44%) are very dissatisfied with access to farm insurance, 22% of respondents are dissatisfied, 21% of respondents are neutral, 8% of respondents are satisfied, 3% of respondents are very satisfied while another 3% of respondents did not have a comment as they indicated that finances are a challenge therefore farm insurance will not be possible for them.

4.10.7 Mean for level of satisfaction of financial challenges variables of smallholder and emerging farmers of sheep and goat livestock farmers (n=145)

Table 46 presents the results on the mean for satisfaction of financial challenges variable among the respondents. The satisfaction level was measured based on the Likert scale. The highest level of satisfaction score obtained by some of the farmers was 30 and the least score for level of satisfaction from the Likert scale was 3. The mean was reported to approximately be 13 and standard deviation is approximately 7 with variance of 44. Farmers with scores equal or greater than 13 were classified as 0 (Satisfied with the challenge variable), while farmers with scores less than 13 were classified as 1 (Not satisfied with the variable).

Table 46: Mean of financial challenges satisfaction level of respondents.

Financial challenges satisfaction level	
Mean	13.2207
Std. deviation	6.63374
Variance	44.007
Minimum	3.00
Maximum	30.00

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

Table 47: Results of Probit analyses of factors influencing financial challenges of the livestock farmers (n=145)

Table 47 presents the results on probit analysis of factors influencing financial challenges of the smallholder and emerging sheep and goat farmers.

Table 47: Results of Probit analyses of factors influencing financial challenges of livestock farmers (n=145)

Parameter/ Variable	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Gender of respondent	-.159	.038	4.162	0,001***	.084	.234
Age of respondent	.023	.001	21.164	0,001***	.021	.025
Size of household	.015	.008	1.723	0.085*	-.002	.031
Level of education	.076	.020	3.742	0,001***	.036	.116
Engage in off-farm income activity.	.168	.035	4.791	0,001***	.100	.237
Role of the respondent on the farm?	-.149	.054	-2.778	0.005**	-.254	-.044
Involved in the day-to-day operations of farm.	.011	.019	.602	0.547	-.025	.048
Do you have a farm business plan?	-.198	.054	3.679	0,001***	.093	.303
Do you keep farm management records?	-.193	.047	-4.137	0,001***	-.285	-.102
Access to agricultural information	-.121	.045	2.664	0.008**	.032	.209
Do you receive any veterinary services?	-.057	.031	-1.861	0.063*	-.117	.003
Size of your land	.000	.000	-2.498	0.012**	.000	.000
Do you sell your sheep and goat?	-.152	.056	-2.711	0.007**	-.262	-.042
Distance from the market to your farm?	-.001	.000	-1.596	0.110	-.001	.000
Cost per single trip to the market	.000	.000	11.825	0,001***	.000	.000
Access to market information	-.136	.037	-3.675	0,001***	-.209	-.064
Total number of sheep you sold in 2019.	.008	.001	11.673	0,001***	.007	.009
Total number of goats you sold in 2019.	-.027	.002	-11.76	0,001***	-.031	-.022
Intercept	-2.080	.239	-8.694	0,001***	-2.319	-1.840

Probit: 1%: ***, 5%: **, 10%: *
Source: Data from the study, Survey data (Mid-August 2022- end of June 2023).

Table 48 presents the results on Pearson Goodness-of-Fit. The results indicate that there is a relationship between the observed frequency and theoretical distribution, meaning

that the variables have significant association with financial challenges. This assumes that the null hypothesis is correct.

Table 48: Pearson Goodness-of-Fit test on financial challenges (n=145)

Chi-Square Tests			
	Chi-Square	df	Sig.
Pearson Goodness-of-Fit Test	3200.651	126	.000

Source: Data from the study, Survey data (Mid-August 2022- end of June 2023)

The results on Table 47 show that being a male farmer has a negative and significant association with financial challenges with all other factors held constant. This means that male farmers are less likely to experience financial challenges. This may be because male farmers adhere to financial principles and processes compared to their counterparts. The results show that age has positive and significant association with financial challenges, this means that the more farmers age, the more they will likely experience financial challenges. This may be due to poor investment decisions older people make as they age and are more likely to struggle with managing finances.

The findings indicate that level of education has a positive and significant association with financial challenges. This means that the more a farmer is educated the more likely they will experience challenges. This effect was not expected since majority of the respondents have acquired secondary school education. This may be because education acquired by farmers/ respondents is not related to agriculture. The results also show that off-farm activities have positive and significant association with financial challenges with all other factors held constant. This means that farmers who engage in off-farm activities are more likely to experience financial challenges. This may be because when a farmer engages in non-farming activities, these activities divert their attention, concentration and commitments from their farm and livestock activities.

The results further show that the role of respondents has a negative and significant association with financial challenges, with all other facts held constant. This means that farm owners will less likely face challenges as compared to farm managers. This maybe because farm owners have the skills, experience and understand what they seek to

achieve in livestock farming. The results further show that farmers who have farm business plans have negative and significant association with financial challenges, with all other factors held constant. This means that farmers who have business plans are less likely to experience financial challenges. This may be because business plans serve as a guide in managing the farm. Further, the results show that keeping farm management records has a negative and significant association with financial challenges, with all other factors held constant. This means that farmers who keep farm management records are less likely to experience financial challenges. The effect was expected. This may be because farm management records that are kept may be utilised, or information contained in the records may are relevant for budgeting and profitability analysis.

The results also show that farmers who have access to agricultural information have a negative and significant association with financial challenges, with all other factors held constant. This means that farmers who have access to agricultural information will less likely experience financial challenges. This may be because farmers who have access to agricultural information use this information effectively and correctly in their farms. The results have showed that size of land has positive and significant association with financial challenges. This means that the more the land size is big, the more farmers will more likely experience financial challenges. This may be because, for land to be developed it requires finances e.g., purchase input, set up infrastructure, diversity into other agricultural farming activities etc. as diversity will increase productivity and profit.

The results also reveal that farmers who sell sheep and goat have negative and significant association with financial challenges, with other facts held constant. This means that sale of sheep and goat decreases the likelihood to financial challenges. This may be because farmers will make profit from livestock sales, and this allows them to manage financial challenges as well as to use farm space and feed optimally. Cost per single trip has a positive and significant association with financial challenges. This means that the more farmers go to the market the more likely they will face financial constraints. This may be because farmers may not always have money readily available to go to the market as they may be unemployed and relying on sale of farm produce for income.

The results also show that access to market information has a negative and significant association with financial challenges, with all other factors held constant. This implies that farmers who can obtain market information are less likely to experience financial challenges. This may be due to a farmer having access market information, f may sell livestock in a market with better prices and earn more income, hence less financial challenges. Total number of sheep sold in 2019, has a positive and significant association with financial challenges, this implies that sale of sheep increases the likelihood of farmers to experience financial challenges. This may be because return on investment for sheep livestock begins in first year and from there it takes several years before the flock reach its maximum productivity and produce a high lambing rate. Total number of goats sold in 2019, has a negative and significant association with financial challenges, this means that the more farmers who sell goat will less likely experience financial challenges. This may be due to cheap maintenance and can adjust in different climate conditions and still produce meat, milk, manure, hide and mohair.

4.11 CHAPTER SUMMARY

This chapter presented the results of the descriptive statistics for the study. Characterised by the demographic, socio-economic and variables associated with managerial, production, marketing and financial challenges in the study area. The respondents view on sheep and goat livestock farming and the level of satisfaction on the managerial, production, marketing and financial challenges are also discussed in the chapter. This section is mainly descriptive because information provided is based on frequencies, percentages, minimums, maximums, mean and standard deviation. The highlights from the results show that most respondents were male who are middle age (41-60yrs) and farm owners. The results also show that most of the respondents have received secondary school education. Majority of respondents are involved in sheep and goat livestock for sale of livestock, wool and mohair; and their future plan is to expand their business. Most of the respondents don’t receive support during drought but aspire to increase scale of production. Majority of respondents have indicated that distance and cost per trip to market is a challenge. Regarding level of satisfaction, majority of respondents were dissatisfied with managerial, production, marketing and financial challenges. The Pearson Goodness-of-Fit results indicate that there is a relationship

between the observed frequency and theoretical distribution, meaning that the variables have significant association with financial challenges. This assumes that the null hypothesis is correct.

CHAPTER FIVE

5.0 SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study was conducted to determine challenges of smallholder and emerging farmers of sheep and goat livestock in the Thabo Mofutsanyana district municipality of the Free State province. The findings of the study reflect that farm management, productivity, access to markets; finances and information (agriculture, markets etc.) are significant to the success of smallholder and emerging farmers.

5.2 SUMMARY OF THE STUDY METHODOLOGY

The objective of the study was to identify and analyse the determinants of production, marketing, financial, and managerial challenges of smallholder and emerging sheep and goat producers in Thabo Mofutsanyana district municipality of the Free State province and highlight key factors which if addressed will create an enabling environment for the farmers to improve the production and income. The specific objectives of the study were to: analyse the demographic, socio-economic and the general farming characteristics of the target farmers in the study area; identify and analyse production, marketing, finance and management challenges of smallholder and emerging farmers in the goat and sheep livestock and examine the determinants of the production, marketing, financial and managerial challenges of the farmers. A stratified random sampling technique was used to sample 145 smallholder and emerging sheep and goat farmers from a sampling frame of 251 farmers. A semi-structured questionnaire was used to collect data through face-to-face interviews. The primary data was collected by survey using a semi-structured questionnaire and secondary data was sourced from journal articles and books. To be eligible to participate, the respondents had to be a smallholder or emerging sheep and goat farm owner or farm manager, be eighteen years and above and willing to participate in the study.

Descriptive statistics were used to summarise and present the data in the form of frequency tables, percentages, charts, and graphs for the respective objectives. All the responses for the open-ended/qualitative questions were also coded and summarised using descriptive statistics. The Likert scale of 1 to 5 were presented in the questionnaire for farmers to indicate the level of their satisfaction for the respective challenge variables (1. Very dissatisfied; 2. dissatisfied; 3 Neutral; 4. Satisfied; 5 Very satisfied). The mean of the scores for questions/responses under the respective main challenges were determined (e.g., main production challenge have 21 sub-questions/ variables as shown in the table above). The mean for the sub-questions/ responses were determined by adding the scores and dividing by the number of questions. The scores less than the average were classified as 1; while scores equal to the average, and more than the mean were classified as 0 (thus a farmer not experiencing the challenge). Statistical Package for Social Science (SPSS) version 28.0 was used to analyse the data. The response/ dependent variable *Y* of the study objective on determinants of the respective production, marketing, financial and managerial challenges is *binary* that is it can have only two possible outcomes which is denoted as 1 and 0. This study followed the post positivism philosophy, deductive research approach, quantitative methodological choice, survey research strategy with cross-sectional time horizon data.

5.2 FINDINGS/ CONCLUSIONS OF THE STUDY

A summary of the respondents' demographics and socioeconomic data was provided in the form of charts and tables, utilizing descriptive statistics like percentages, frequencies, and standard deviations. The findings were as follows: males (74%) are more active than females (26%); 21% of youth are involved in sheep and goat livestock in the study area; majority (91%) of respondents were farm owners. Majority (46%) of the respondents are within age range of 41-60 years old, 55% of them are married and 41% have received secondary school education. Additionally, 52.4% of respondents indicated that their households consisted of one to four people. About 51% of the respondents engage in off-farm income generating activities and 39% made income out of sale of livestock. The results indicate that 54% of the respondents are involved in farming to sell livestock, wool and mohair.

The probit analysis results on managerial challenges experienced by smallholder and emerging sheep and goat farmers in the study area show that gender of a farmer, role of respondents, involvement of a respondent in the day-to-day operations of the farm, access to agricultural information by a farmer and a total number of goats sold has a negative and significant association with managerial challenges, with every other factor remaining unchanged. The results also show that an increase in age, access to market information, engagement in off-farm activities and total number of sheep sold have a positive and significant association with managerial challenges, with every other factor remaining unchanged.

The probit results on production challenges experienced by smallholder and emerging sheep and goat farmers in the study area indicate that an increase in age, size of household, level of education, role of respondent, keeping farm management records, cost per single trip to the market and total number of sheep have a positive and significant association with production challenges, keeping all other information constant. Additionally, the results show that farmer involvement in day-to-day operations of the farm, agricultural information, sale of sheep and goats and total number of goats have a negative and significant association with production challenges, keeping all other information constant.

The probit results on marketing challenges experienced by smallholder and emerging sheep and goat livestock farmers demonstrate that age, size of household, level of education, role of respondent on the farm, access to agricultural information, size of land, cost per trip to the market, and total number of sheep sold in 2019 have a positive and significant association with marketing challenges. The results also show that farmers who are involved in day-to-day operations of the farm, have farm business plans, keep farm management records, access to market information, total number of goats sold in 2019 have a negative and significant association with marketing challenges, with all other factors held constant.

The results on financial challenges experienced by smallholder and emerging sheep and goat farmers in the study area show gender, age, level of education, engage in off-farm income generating activity, have farm business plan, , size of land, cost per single trip to

the market, total number of sheep sold in 2019 have a positive and significant association with farming challenges. The results also show that the role of respondent on the farm, keeping farm management records, access to agricultural information, sale of sheep and goat, access to market information and total number of goats sold in 2019 have a negative and significant association with production challenges, keeping all other factors the same.

The Pearson Goodness-of-Fit results, indicate that there is a relationship between the observed frequency and theoretical distribution, meaning that the variables have significant association with managerial, production, marketing and financial challenges. This assumes that the null hypothesis is correct.

5.3 RECOMMENDATIONS OF THE STUDY

Based on the study, the evidence shows that most respondents in the study area face a variety of difficulties that impede their growth and achievement in sheep and goat livestock farming. evident

Considering the study's conclusions, the results of the managerial constraints of smallholder and emerging farmers revealed that age, access to market information, engaging in off-farm activities; and selling sheep and goat livestock have a significant and positive impact on managerial challenges. It is important to encourage youth and women to engage in sheep and goat livestock farming as this will contribute to the improvement of farm management. Furthermore, male farm owners must be encouraged to focus their attention on sheep and goat livestock farming business instead of engaging in off-farm income generating activities, and they must acquire market information and avoid selling more sheep than goats in order to improve managerial challenges.

It is recommended that:

i. The Department of Agriculture and Rural Development must organise training and development programmes must be developed to address managerial challenges of male farmers of sheep and goat livestock.
ii. The Department of Agriculture and Rural Development (DARD) must arrange training and development programmes on sheep and goat livestock to address specific needs of females and youth be provided.

iii. The Department of Agriculture and Rural Development (DARD) must develop and implement farm management policies that support integration of older farmers, youth and female in agricultural development programs is necessary.
iv. The Department of Agriculture, Land Reform and Rural Development (DALRRD) must develop and implement a national agricultural marketing information system sharing relevant information to farmers.
v. DARD must develop and implement policies promoting farm entrepreneurship and innovation.
vi. DARD must develop and implement livestock production and management best practise.

The findings of the study on production challenges revealed that age, size of household, education, keeping farm records, cost per trip, selling more sheep than goat have a significant and positive impact on production constraints. Young people must be encouraged to engage in sheep and goat livestock farming to improve production challenges. Moreover, farm owners must be encouraged to acquire education and keep farm records relevant to livestock production, reduce cost per trip to the market and avoid selling sheep more than goat as the breeding herd might be compromised.

It is recommended that:

i. DARD must develop mentorship programmes that will pair older farmers and young people to promote knowledge sharing and succession planning.
ii. DARD must develop and implement policies that support integration of youth in agriculture, and sheep and goat livestock farming.
iii. DARD must promote relevant, tailored agricultural literacy and entrepreneurship and/or integrate agricultural education into school curricula.
iv. DARD must provide farm and financial management; and farm recording keeping training and workshops to farm owners as this will assist in improving productivity in a farm.
v. Government must provide scholarships and grants to pursue higher education in agriculture be provided.

The findings of the study on marketing challenges revealed that age, size of household, education, keeping farm records, size of land, cost per trip, access to market information and selling more sheep than goat have a significant and positive impact on marketing constraints. Youth must be encouraged to engage in sheep and goat livestock farming as they are exposed to technology and social media, this is a skill that is vital to every business nowadays. Farm owners must be encouraged to learn new ways of keeping relevant farm records and modern ways of gaining access to market information.

i. DARD must provide training and capacity-building programmes to address specific marketing needs and constraints of youth and marketing capacity building programmes must be provided to older sheep and goat livestock farmers.
ii. DARD must develop training on farm record keeping improving access to valuable market and implement initiatives to connect farmers with buyers and other relevant stakeholder e.g. through trade fairs, digital platforms etc.
iii. DALRRD must develop and implement a national agricultural marketing information system sharing relevant information to farmers and policies promoting marketing best practise must be developed and implemented.
iv. There is a need for farm owners to acquire land as it is important for supply to meet demand whenever valuable markets are accessed. However, the land should be productively used by achieving optimal stocking rate of sheep and goat's livestock for profit maximisation. Furthermore, government programmes to support farmers acquire land must be put in place and there must be development of effective monitoring tools to ensure that beneficiaries of land reform programme access land accordingly.
v. Farm owners must be encouraged to reduce cost per trip to the market by rearing and selling more goats than sheep. Farmers in the study area must also pull their livestock together to reduce sales costs per farmer e.g. Marketing through cooperatives.
vi. Government must upgrade rural market infrastructure to reduce transactional costs.

The findings of the study on financial challenges revealed that age, education, engaging in off-farm activities, keeping farm records, size of land, cost per trip, access to market

information and selling more sheep than goat have a significant and positive impact on marketing constraints. It is recommended that:

i. Youth must be encouraged to engage in sheep and goat livestock farming as they may have basic financial literacy, and young people are interested in learning new things.
ii. DARD must develop and implement training and development programmes on financial literacy, farm investments, credit management, asset building to improve financial challenges of the sheep and goat livestock farmers.
iii. DARD must provide access to credit and financial services tailored to sheep and goat livestock farmer's needs. Moreover, offer incentives for farmers to diversify their income streams and invest in the farm.
iv. DARD must promote farming entrepreneurship to farmers in order to withdraw from engaging in off-farm activities.
v. DARD should embark on training and development on financial data management and record keeping for livestock farming must be developed and implemented.
vi. DARD must develop and implement an information system on market information and must accommodate farmers who are economically disadvantaged e.g. SMS service may be used to share information on a regular basis as this information will inform farmer's market and financial decisions.

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7.0 APPENDIX A

QUESTIONNAIRE

My name is Mmakhuduga Neriath Kgomongwe from the College of Agriculture & Environmental Sciences at Unisa. I am researching on the following topic: Determinants of challenges of the smallholder and emerging farmers of sheep and goat livestock in Thabo Mofutsanyana District, Free State Province. The research requires conducting interviews with various farmers including your farm or household. The interview will take approximately one (1) hour. You are humbly requested to participate in this study but please be assured that your participation is voluntary, and you may indicate at any time when you need to rest or discontinue with this questionnaire. All your personal information will be treated confidentially and will only be used for the research purposes. Your name will never be divulged to anybody while your input will be summarised with that of other participants to produce a general report that will be presented to all participating farmers and interested stakeholders. We only request your cell number for ease of contact in case we require further information from you.

Thank you for agreeing to participate.

FARMER IDENTIFICATION

Questionnaire no.	:	……
Name of the village	:	……
Ward number	:	……
District	:	……
Municipality	:	……
Signed	:	……

Respondent: _____ Date: _____

Researcher: _____ Date: _____

Contact number of respondents: _____

Mark appropriate box with [X]

1. **DEMOGRAPHIC AND SOCIO-ECONOMIC INFORMATION**

1.1 [RORES] What is the role of the respondent in the farm (Mark with **X**)

Role	1.Owner	2.Manager
Response (X)		

1.2 [GEN] Indicate the gender of the farmer/household head: (Mark with **X**)

Gender	1.Male	2.Female
Response (X)		

1.3 [AGER] Indicate the age range of the farmer/household head (years): ……

Age (between)	1. 18 – 40 years	2. 41 - 60 years	3. ≥ 61 years
Response (X)			

1.4 [HHS] The size of the household of the farmer ……

1.5 [EDULVL] What is the highest level of education of the farmer?

Educational Level	1.None	2.Primary	3.Secondary	4.Tertiary	5. Other
Response (X)					

1.6 [HHLAN] Main language spoken in the household? (Mark with **X**)

Main Language	1. Sotho	2. Zulu	3. Xhosa	4. Pedi	5. Tswana	6. Pedi	10. Eng	11. Afri
Response (X)								

1.7 [HHAGE]Indicate the age distribution of your household (Mark with **X**)

Category	1.Children 0-18 years	2.Members 19-30 years	3.Members 31-60 years	4.Older than 60 years
Response (X)				

1.8 [OFFINC] Do you engage in off-farm income generating activity?

Off-farm income	1. Yes	2. No	If yes, indicate the activity in the space below
Response (X)			

1.9 [FMARST] Marital status of farmer (Mark with **X**)

Marital Status	1.Single	2.Married	3.Separated	4.Divorced	5.Widowed	6. Other (specify)
Response (X)						

1.10 [MSINC] What are the main sources of household income? (Mark with **X**)

Source of Income (main)	1. Sale of livestock	2. Formal employment	3. Casual labour	4. Remittances from relatives	5. Pension	6. Other (Specify)
Response(X)						

1.11 [INVFAR] What are the main reasons for your involvement in farming? (Mark with **X**)

Reason	1.Selling	2.Food security	3.Hobby	4.Other (Specify)
Response (X)				

1.12 [ACHGO]Are you achieving this goal? (Mark with **X**)

Goal achieved	1.Yes	2.No	If No, indicate reasons in the space below
Response (X)			

2. CHALLENGES OF SMALLHOLDER AND EMERGING FARMERS OF SHEEP AND GOAT LIVESTOCK

2.1 MANAGERIAL CHALLENGES

2.1.1 [FARINV] Are you involved in the day-to-day operations of the farm?

Involvement	1. Not involved	2. Slightly involved	3. Reasonably involved	4. Involved	5. Very much involved

Response (X)					

2.1.2 [BUSPL] Do you have farm Business Plan? (Mark with **X**)

Business plan	1. Yes	2. No
Response (X)		

2.1.3 [FBUSPL] If yes in 2.2, are you following the plan? (Mark with **X**)

Following plan	1. Yes	2. No
Response (X)		

2.1.4 [FAROP] How is your farming operation organized? (Mark with **X**)

Category	1.Sole Ownership or Individual Farmer	2.Co-operative or Group	3.Trust	4.CC/ Close Cooperation	5.Company	6.Other (specify)
Response (X)						

2.1.5 [LABPR] Which one of the following represents the labour practice on your farm? (Mark with **X**)

Type of employees	1.Household members employed formally	2.Household members employed informally	3.Part-time employees	4.Full-time / permanent employees	5.Other (specify)
Response (X)					

2.1.6 [ACCINF] In the past year have you had access to agricultural information?

Access to information	1. Yes	1. No
Response (X)		

2.1.7 [ACCINF] If yes in 2.1.6, indicate who provides you with the agricultural information?

Information	1.Government Extension Officer	2. Research	3. NGOs	4. Farmer Association	5. Relatives	6. Media	7.Other (specify)
Response (X)							

2.1.8 [GOVINT] Were there any interventions made by government?

Interventions made by government	1. Yes	2. No
Response (x)		

2.1.9 [GOVINT] If yes in 2.18, list the interventions made by government.

……..

2.1.10 [BUSVIS] Where do you see this business in five (5) years' time? ……

2.1.11 [HRMCHA] Mark with an 'X' a list of human resource management challenges faced by you

Human resource management challenges	1.Availability of skilled labour	2.Availability of unskilled labour	3.Salary/ wage dispute	4.Problems associated with the use of labour on the farm
Response (x)				

2.1.12 [FMR] Do you keep farm management records?

Keep farm management record	1. Yes	1. No
Response (X)		

2.1.13 [IYFMR] If Yes in 2.1.12 indicate the farm management records kept by your farm

……

2.1.14 Please, indicate the main livestock management challenges you are facing on this farm in the table below

No	Managerial challenges of smallholder sheep and goat farmers	Very Satisfied 5	Satisfied 4	Neutral 3	Dissatisfied 2	Very Dissatisfied 1
1	Business management skills					
2	Housing for the animals					
3	Extension service					
4	Level of education and literacy					
5	Support systems, such as socially organised co-ops and extension services.					
6	Record keeping and documentation					
7	Management of livestock.					
8	Other (specify)					
9	Mean					

2.2 PRODUCTION CHALLENGES

2.2.1 [TYPLIV] What kind of livestock do you raise/keep?

Type of main livestock on farm	Number	Reason (1. only for sale; 2. only for household consumption; 3. Both, 4. Other (specify)

2.2.2 [INCPRO] Do you aspire to increase your scale of production? (Mark with **X**)

Increase scale of production	1. Yes	2. No	Reason/s for the choice of response
Response (x)			

2.2.3 [CHAINC] If yes in 2.2.2, which of the following reasons would be a challenge in achieving that? (Mark with **X**)

Challenge in achieving increase in scale of production	1.Distance to the market	2.No access to the market	3.Lack of transport	4.Lack of finance	5.Size of land

Response (x)					

2.2.6 [RVETS] Do you receive any veterinary services? (Mark with **X**)

Veterinary services received	1. Yes	2. No
Response (x)		

2.2.7 [PVETS] If yes in 2.2.6, indicate from whom you receive this service from? (Mark with **X**)

Veterinary services	1. State Veterinary Services	2. Private Veterinarian
Response (x)		

2.2.8 [RFEDR] Do you receive feeds in times of drought? (Mark with **X**)

Receipt of feeds during drought	1. Yes	2. No
Response (x)		

2.2.10 [FARACT] What type of farming activities are you involved in (Mark with **X**) and also indicate the amount of land in use?

Type of farming activity	1. Sheep and goat only	2. Mixed livestock only (small and large stock)	3. Crops & livestock	4. Crops only	5. Vegs only	6. Vegs and Crops (grains)	7. Fruits only	8. Fruits and vegs	9. Fruits and Grains	10. Other Specify
Resp. (x)										

2.2.11 [ACQLA]How did you acquire the land? (Mark with **X**)

Land Tenure System	1.Communal	2.Privately owned	3.Bought (Title deed)	4.Gov't Lease	5.Private Lease	6. Inherited	7. Resettled	8. Other Specify
Resp. (x)								

2.2.12 [LANSI] What is the size of your land (ha)?

……

2.2.13 [PROCHA] Indicate the main production challenges facing your farm as applied in the Likert table below

No	**Production challenges**	5.Very Satisfied	4.Satisfied	3.Neutral	2.Dissatisfied	1.Very Dissatisfied
1	Size of farmland					
2	Practical designed breeding programme					
3	Grazing environment					
4	Prevention of livestock contagious diseases					
5	Profitability of farm production					
6	Value adding opportunities					
7	Herd size of the animals					
8	Production resources such as pasture, infrastructure and water					
9	Access to comprehensive agricultural support for the smallholder/emerging sheep & goat farmers					
10	Climate change and water scarcity					
11	Prolonged drought					
12	Supplementary feed for livestock					
13	Access and adaptation of modern technologies					
14	Stock theft					
15	Human resources/labour availability					
16	Consistency in production					

17	Quantities of animal production and quality of animals					
18	Livestock farming expertise of owner					
19	Land tenure					
20	Mean					

2.3 MARKETING CHALLENGES

2.3.1 [SELLC] Do you sell your sheep and goat? (Mark with **X**)

Sheep and goat sold	1. Yes	2. No
Response (x)		

2.3.2 If the answer is no, explain why?

……

2.3.3 [WHESL] If yes, where do you sell your sheep and goat?

Market	1. Abattoir	2. Around the village	3. Local traders (butcheries, retail stores)	4.Speculators	5.Auctions	6.Other (specify)
Response (X)						

2.3.4 [MRKDIS] How far (km) is it from the market to your farm?

……

2.3.5 [MRKNE] Is there any other market closer to your farm than where you sell your livestock?

Market closer to the farm	1. Yes	2. No
Response (x)		

2.3.6 [MRKSUP] If yes in 2.3.5, explain why are you not supplying that market

……

2.3.7 [TRNLIV] How do you transport your sheep and goat to the market?

Type of Transport	1.Own transport	2.Hired vehicles (individual farmer)	3.Hired vehicles (group of farmers)	4.Buyers transport	5.Move sheep and goat by foot	6.Other specify
Response (x)						

2.3.8 [COSTRP] How much do you pay for a single trip to the market?

……..……..……

2.3.9 [COSINC] What other marketing costs do you incur when selling your sheep and goat?

……

2.3.10 [MRKINF] Do you have access to market information? (Mark with **X**)

Access to market information	1.Yes	2.No
Response (x)		

2.3.11 [INFACQ] If yes in 2.31, where do you get the information from? (Mark with **X**)

Provider of information	1.Gov't ext. officer	2.Farmer Assoc	3.Community	4.Media	5.NGOs	6. Other Specify
Response (X)						

2.3.12 [MRKINF] What kind of market information do you receive from the above selected source/s?

(Mark with **X**, you can choose more than one)

Information kind	1.prices	2.dates for sales	3.buyers	4.market demand	5.market opportunity	6.other (specify)
Response (x)						

2.3.13 [RECINF] How often do you receive the information selected above?

Frequency	1. daily	2. weekly	3. monthly	4.quarterly (in 3 months)	5.annually	6.other (specify)
Response(x)						

2.3.14 [MRKLAN] Which language is used to disseminate market information to you?

Language used for market information	1.English	2.Afrikaans	3.Sesotho	4.isiZulu	5. Setswana	6.Other (specify)
Response(x)						

2.3.15 [RMRKINF] How do you receive the market information? (you can choose more than 1)

Medium used to receive market information	1.Farmer group meetings	2.Tribal meeting	3. post	4.Farmers day	5. Internet	6.Cellphone SMS	7.Telephone	8.Other (specify)
Response (x)								

2.3.16 [TOTSLDS] Indicate the total number of sheep you sold in 2019.

…….....

2.3.17 [TOTSLDG] Indicate the total number of goats you sold in 2019.

……
…

2.3.18 [MRKFUN] Which of the following marketing functions do you perform?

Marketing functions	1.Buying	2.Selling	3.Transporting	4.Processing	5.Grading	6.Risk taking	7.Other (specify)
Response (x)							

2.3.19 [VALACT] Which of the following value adding do you perform before selling?

Value adding activities	1.Slaughtering	2.Processing	3.Packaging	4.Other (specify)
Response (x)				

2.3.20 [MRKSYS] Choose the type of marketing system you have adopted for your farm business

Marketing system adopted	1.Individual marketing	2.Group marketing	3.Contract marketing	4.Individual & group marketing	5.Group & contract marketing	6.Individual & contract marketing	7.All
Response (x)							

2.3.21 [MRKCHL] Indicate marketing challenges facing your farm as applied in the Likert table below. Tick the applicable option (column)

No.	**Marketing challenges**	5.Very Satisfied	4.Satisfied	3.Neutral	2.Dissatisfied	1.Very Dissatisfied
1	Access to formal marketing channels					
2	High transaction costs associated with marketing					
3	Prices of the livestock					
4	Transportation of livestock to the market					
5	Regulatory and technological policies					
6	Market information					
7	Bargaining power of producers					
8	Road conditions and travel distances to the market					
9	Mean					

2.4 FINANCIAL CHALLENGES

2.4.1 [LIVPRO] Is your livestock business profitable during the whole year?

Livestock profitable	1. Yes	2. No
Response (x)		

2.4.2 [YRSFAR] How long have you been a livestock farmer?

Number of years	1. < 5 years	2. 6 – 10 years	3. >11 years
Response (x)			

2.4.3 [ANNINC] What was your annual income from your livestock sales in 2019?

……

…

2.4.4 [FINASS] Have you ever been assisted financially by Department of Agriculture and Rural Development?

Financially assisted	1. Yes	2. No
Response (x)		

2.4.5 [FUNPRO] If yes, through which funding programme(s)? (Mark with X)

Funding programme	1.CASP	2.Land Care	3.Equitable share	4. Other (specify)
Response (x)				

2.4.6 [USGRNT] What was the grant meant for?

……

2.4.7 [LONAPL] Have you ever applied for a loan? (Mark with **X**)

Loan application	1. Yes	2.No
Response (x)		

2.4.8 [LONPUR] If yes, what was the purpose for the loan?

2.4.9 [AMOREP] How much interest rate do you pay towards the loan per month?

……..

2.4.10 [PAYSKIP] Have you ever skipped/defaulted any instalment payment? (Mark with **X**)

Skipped loan payment	1. Yes	2.No
Response (x)		

2.4.11 [RPAYSKIP]If yes, what are the reason(s) for defaulting?

……..

2.4.12 [APPREJ] Has your application for loan previously been rejected? (Mark with **X**)

Loan application rejected	1. Yes	2.No	If yes indicate the reasons in the space below
Response (x)			

2.4.13 [RAPPREJ] Indicate all financial challenges facing your sheep & goats farming as applied in the Likert table below.

No	Financial challenges of smallholder sheep and goat farmers	5.Very Satisfied	4.Satisfied	3.Neutral	2.Dissatisfied	1.Very Dissatisfied
1	Own financial capital					
2	Securing capital from financial institutions					
3	Lending from private money lenders in the communities					
4	Access to start-up finance					
5	Availability of collateral to secure farm loan from financial institutions					
6	Access to farm insurance					
7	Mean					

3 FACTORS INFLUENCING PRODUCTION, INCOME AND MARKET ACCESS OF THE EMERGING AND SMALLHOLDER SHEEP AND GOAT FARMERS

3.1 GENERAL

3.1.1 [ACCFIN] Do you find it difficult to access finance for your livestock farm e.g., credit etc.?

(Mark with **X**) 1. YES 2. No

3.1.2 [ACCFMRK] Do you have any difficulty accessing formal markets?

(Mark with **X**) 1. YES 2. No

3.1.3 [LCKPOL] Do you think that there is lack of policy support for livestock or unfavourable policies relative to alternative to livestock? (Mark with **X**)

1. YES 2. No

3.1.4 [IMPDLP] Do you think that imports depress local prices and thus discourage production by farmers? (Mark with **X**) 1. YES 2. No

3.1.5 [LSMNEED] What do you think smallholder sheep & goat livestock farmers need to enable them to participate fully in the formal markets?

……
…

3.2 PRICE RELATED INFORMATION

3.2.1 [SELNEG] When selling who negotiate on your behalf? (Mark with **X**). 1. Self; 2. Agent; 3.Other specify.

……..…

3.2.2 [NEGLAN] When negotiating, which language do you use?

Language used when negotiating	1.Own language (name it)	2.English	3. Afrikaans	4.Zulu	5.Sotho	6.Tswana	7.Other (Specify)
Response (x)							

3.2.3 [NEGLAN] If not own language, are you able to negotiate well as you would have if you were to use your own language?

Do you negotiate well if not using own language	1. Yes	2. No
Response (x)		

3.2.4 [CLAPRC] Indicate how important is each of the following livestock classification characteristics when determining the price by the buyers of your sheep and goat? Mark with **X**

	Classification characteristics	4.Very important	3.Important	2.Less important	1.Unimportant
1	Sex				
2	Age				
3	Level of damage to skin or bruises				
4	Fatness				
5	Conformation				

6	Other specify				

3.2.3 [CLAMRK] How does the above chosen livestock classification characteristic/s affect your market price? In terms of sex, age, level of damage to skin, fatness and conformation

……

3.2.4 [INFLPRC] According to your perception, rank the following influence on livestock price formation? Rank them as follows:

Rank 4- as most important influence on livestock prices

Rank 3- as an important influence on livestock prices

Rank 2- as slightly important influence on livestock prices

Rank 1- as the least important influence on livestock prices. (You can choose more than one)

Influence on price formation	Availability and price of maize	Climate (rain, drought or fodder flows)	Economy of the country	Quality of livestock	Supply and demand	Imports of red meat	Other (specify)
Rank							

3.2.5 [FACPRC] How does the above selected factors affect the price of livestock and your income?

……

3.2.6 [CHASEL] What are the challenges you normally experience when selling your sheep and goat through market outlets below?

Item	**Market type**	**Challenge/s**
1	Abattoir	
2	Auction	
3	Informal markets	
4	Other specify	

3.3 LIVESTOCK PROMOTIONAL TOOLS

3.3.1 [PROTLS] Indicate which channel/s you use as the promotional tool/s to communicate livestock information in your farm: (Mark with X, you can choose more than one)

Promotional tool	1.Personal selling	2.Advertise through media	3.Promotions and demonstrations	4.Word of mouth	5.Other (specify)
Response (x)					

3.3.2 [GOVROL] Indicate the role played by the government in facilitating smallholder livestock market access if any

……

3.3.3 What do you recommend to improve smallholder livestock farmers' access to high value markets?

……

Thank you very much for your time and participation.

8.0 APPENDIX B

ETHICS CLEARANCE LETTER

UNISA university of south africa

UNISA-CAES HEALTH RESEARCH ETHICS COMMITTEE

Date: 06/06/2022

NHREC Registration # : REC-170616-051
REC Reference # : 2022/CAES_HREC/106
Name : Ms MN Kgomongwe
Student #: 55744621

Dear Ms Kgomongwe

Decision: Ethics Approval from 02/06/2022 to 31/05/2025

Researcher(s): Ms MN Kgomongwe
55744621@mylife.unisa.ac.za; 082-724-9038

Supervisor (s): Prof MA Antwi
antwima@unisa.ac.za; 011-670-9391

Working title of research:

Determinants of challenges of smallholder and emerging sheep and goat farmers in Thabo Mofutsanyana district municipality, Free State Province

Qualification: MSc Agriculture

Thank you for the application for research ethics clearance by the Unisa-CAES Health Research Ethics Committee for the above mentioned research. Ethics approval is granted for three years, **subject to submission of yearly progress reports. Failure to submit the progress report will lead to withdrawal of the ethics clearance until the report has been submitted.**

The researcher is cautioned to adhere to the Unisa protocols for research during Covid-19.

Due date for progress report: 31 May 2023

The progress report is available on the college ethics webpage: https://w2.unisa.ac.za/www.unisa.ac.za/sites/corporate/default/Colleges/Agriculture-%26-Environmental-Sciences/Research/Research-Ethics.html

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*The **low risk application** was **reviewed** by the UNISA-CAES Health Research Ethics Committee on 02 June 2022 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.*

The proposed research may now commence with the provisions that:

1. The researcher will ensure that the research project adheres to the relevant guidelines set out in the Unisa Covid-19 position statement on research ethics attached.
2. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
3. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the Committee.
4. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
5. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.
6. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
7. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
8. No field work activities may continue after the expiry date. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:
*The reference number **2022/CAES_HREC/106** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,

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