EVALUATING FACTORS INFLUENCING GOAT COMMERCIALIZATION AMONG SMALLHOLDER FARMERS IN GWERU DISTRICT, ZIMBABWE

A dissertation submitted in partial fulfilment of the requirements for the Master of Science Degree in Food Security and Sustainable Agricultural (Pro)

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DECLARATION

I hereby declare that the research project entitled "**Evaluating factors influencing goat commercialization among smallholder farmers in Gweru district, Zimbabwe**" submitted to Bindura University of Science Education, Department of Agricultural Economics, Education and Extension is a record of an original work done by me under the guidance and supervision of **DR R. CHIVHEYA** and this work is submitted in partial fulfilment of the requirements for the award of a Master of Science Degree in Food Security and Sustainable Agriculture. The results embodied in this thesis have not been submitted to any University or Institute for the award of any degree of diploma.

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DEDICATION

This research study on the factors affecting the commercialization of goat farming for smallholder farmers in Chiundura, Gweru rural is dedicated to the resilient and hardworking smallholder goat farmers who are the backbone of the agricultural economy in this region.

Through their tireless efforts and commitment to livestock rearing, these smallholder farmers have sustained their livelihoods and contributed to the food security of their communities. Despite the numerous challenges they face, including limited access to resources, markets, and technological innovations, their resolve to improve their goat farming enterprises is truly admirable.

It is our sincere hope that the insights and recommendations generated from this study will empower these smallholder goat farmers, enabling them to overcome the barriers to commercialization and unlock the full potential of their farming activities. May this work serve as a stepping stone towards a more prosperous and sustainable future for the smallholder goat farming community in Chiundura, Gweru rural.

ACKNOWLEDGEMENTS

All thanks to the Almighty for allowing me to complete this study.

I would like to thank my supervisor for his unwavering support throughout this project despite his tight schedule.

The successful completion of this research study would not have been possible without the invaluable contributions and support of various stakeholders such as RDC, Abattoirs, Butchery owners, small holder farmers, and NGOs in Gweru rural district among others.

First and foremost, I would like to express my sincere gratitude to the smallholder goat farmers in Gweru rural district who generously shared their experiences, challenges, and aspirations during the data collection process. Their insights have been instrumental in shaping the findings and recommendations of this study.

I also extend my appreciation to the other key stakeholders involved in the goat value chain, including butchery owners, abattoir representatives, travelling traders, animal health specialists, and the Vungu Rural District Council (VRDC). Their willingness to participate in interviews and focus group discussions has provided a comprehensive understanding of the complex dynamics influencing the commercialization of smallholder goat farming.

The support and guidance provided by the local extension officers and agricultural development agencies have been invaluable in facilitating access to the study communities and coordinating logistics throughout the research process.

ABSTRACT

The global goat industry has experienced significant growth and commercialization in recent years, driven by increasing demand for goat meat, milk, and other products. However, the full potential of this activity remains underexploited, with a myriad of challenges hindering its successful commercialization. The aim of the study was to assess the factors affecting the commercialization of smallholder goat farming and come up with a model that restitutes the situation. The study was conducted in Chiundura ward 12, in Gweru rural district in the Midlands Province of Zimbabwe. The assessment adopted a cross-sectional study design, and data was gathered using key informant interviews, household questionnaires, value chain mapping, and stakeholder analysis. SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, Human Computer Interaction (HCI) model and logistic regression models were used in the analysis of data. On the current state of goat commercialization, it was found out that the average HCI rate was at 29.7%, meaning that generally the area is implementing a subsistence approach to goat production. Based on the analysis, there is still a huge gap for Chiundura's smallholder goat farmers to commercialize their operations. The analysis revealed that three factors statistically influenced the household level of goat commercialization which include attainment of secondary-level education by the household head, availability of an animal health center within the area, and attendance of training in animal health. The findings from the logistic regression model showed that there was a significant amount of variance (Chi square - 88%; P = .000) between choice of market outlet and the predictor variables. The choice of marketing outlet was found to be significantly influenced by the availability of market information to the household. The study revealed that the goat value chain is dominated by the presence of mobile goat vendors who serve as key intermediaries connecting smallholder producers to the market. Based on the gaps noted in the assessment, a model was developed for improving the commercialization of goat farming for smallholder farmers and the establishment of a robust goat value chain. The study recommended that stakeholders should establish and strengthen market information systems that provide timely and accurate data on prices, demand, and other relevant market dynamics to smallholder goat farmers. The model for enhancing smallholder goat farming's commercialization and building a strong goat value chain was developed by the study. Establishing a goat one-stop business centre was also proposed as a key recommendation. Finally, the model clarifies linkages to foster private sector stakeholder collaborations for farmer training, extension services, research, and monitoring and evaluation.

Keywords: Commercialization, value chain, mapping, smallholder goat farming

LIST OF ACRONYMS AND ABBREVIATIONS

AGRITEX:	Department of Agricultural, Technical and Extension Services
CLAFA:	Crop, Livestock and Fisheries Assessment
DVS:	Department of veterinary Service
FAO:	Food and Agriculture Organisation
FGDs	Focused Group Discussions
GDP:	Gross Domestic Product
HCI:	Household Commercialization Index
HIV/AIDS	Human Immuno Virus/Acquired Immune Deficiency Syndrome
LMAC:	Livestock and Meat Advisory Council
MoLAWRD:	Ministry of Lands, Agriculture, Fisheries, Water and Rural Development
NGO:	Non-Governmental Organisation
PPPs:	Public-private partnership
RDC:	Rural Development Council
SADC:	Southern African Development Community
SWOT:	Strengths, Weaknesses, Opportunities, Threats
SBCC:	Social and Behaviour Change Communication
SME:	Small and Medium Enterprises
VRDC:	Vungu Rural Development Council
ZRP:	Zimbabwe Republic Police

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

TABLE OF CONTENTS

CHAPTER ONE

INTRODUCTION

1.1 Background

The socioeconomic structure of Zimbabwe is heavily dependent on agriculture. Sekaran, Lai, Issiri, Kumar, & Clay (2021) state that it is a crucial and essential component of the agricultural industry as a whole, accounting for 15% to 25% of the total value of agricultural output across all farming businesses. Herrero, Grace, Njuki, & Johnson (2022) state that 70 percent of the population depends on agriculture for food, income, and employment. It supplies 60 percent of the raw materials required by industry and contributes about 40 percent of the total export earnings. On average, agriculture contributes 15 to 18 percent of the GDP (Government of Zimbabwe, 2023). However, Zimbabwe's agricultural production especially that of key food crops such as maize, wheat, and sorghum has declined markedly over the past decade due to the recurring droughts. The decline has caused a negative impact to goat value chain for smallholder goat farmers and the commercialization of goat farming in Zimbabwe since goats feed is manufactured using key crops such as maize, sunflower, and wheat.

Likewise, the decline in the production of major staple crops and cash as well as export crops, such as tobacco, cotton, and soya beans, significantly weakened the country's ability to earn adequate foreign exchange. From a surplus producer of staple commodities from the pre-independence era Zimbabwe has become a net food importer during the 2000s, increasingly reliant on food aid and imports from regional neighbours. The constraints within the food grains sector are firmly rooted at farm level. Productivity in these sectors has been declining and uncompetitive.

Livestock makes a significant contribution of 35% of the Gross Domestic Product (GDP) to the national economy and to the nutritional and material wellbeing of the country's population, generally and to the rural households in particular (Government of Zimbabwe, 2021). More than 80% of rural households own cattle, making support for livestock production a suitable vehicle for income distribution and economic empowerment. Zimbabwe is home to a diverse range of domesticated animals. They haven't, however, made much of an economic impact on the country. According to MoLAWRD (2023), there are an estimated 5.2 million cattle, 397 thousand sheep, 3.2 million goats, 202 thousand pigs, 38 thousand dairy cattle, and several million poultry among the strategic livestock commodities. In Zimbabwe, commercial animal farming involves the

production of beef, dairy, poultry, pigs, and, to a lesser degree, goats and sheep while the informal sector focuses mainly on goats among other animals.

Additionally, goats play a vital role in the livelihood of smallholder farmers in developing countries. They contribute to food security and alleviate seasonal food variability and availability directly through milk and meat production and through cash earned from sales of their products. In semi-arid areas goats have comparative advantages over cattle. Since they are hardy and more tolerant to drought, they utilize a wider diversity of flora, and their higher reproductive rate allows rapid multiplication of their populations Goat meat prices are often comparable to that of beef and many retailers indicate frequent shortages in local markets (Herrero et al. 2022).

Goat numbers in most of southern Africa has remained constant during the last 20 years and per capita ownership is dwindling. Growth in this sector is constrained by the long-term investments required for cattle production, frequent die-off during drought, low rates of recovery after population crashes, and poor buying power of rural households to purchase new stock. On the other hand, goat numbers are steadily increasing in most Southern African Development Community (SADC) countries. The current global goat population according to the Food and Agriculture Organization (FAO) is 1.002 billion (FAOSTAT, 2018). In the same vein, the population has doubled in the last thirty years from 480 million in the 1980s most probably because of their high fecundity, adaptability to various habitats and their relatively low purchasing prices compared to cattle. Goat populations recover quicker, and households can build goat herds faster than cattle herds. There is need for thorough investigations and in-depth analysis of goat value chains and how commercialization can be exploited to maximise farmers' beneficiation.

Commercialization of goat farming in the Global South (China, Brazil, Pakistan, India, and Indonesia) have gained significant attention in recent years due to its potential for poverty reduction, food security, and rural development. Goat farming offers multiple economic benefits, including income generation, employment opportunities, and diversification of rural economies (Aziz, Abdur et al., 2021).

1.2 Statement of the Problem

Goats play a vital role in the livelihoods of small-scale farmers in developing countries. In view of the impeding climate change effects and the semi-arid areas, goats have comparative advantages over cattle since they are more resistant to harsh climatic conditions. In general, small animals are more resistant to droughts, as they utilize a wider diversity of plants, and their higher reproductive

rate allows populations to recover quickly. Since browsers depend on a variety of vegetation as opposed to cattle, farmers are more likely to make more efficient use of the available natural resources. Zantsi & Mushnje (2023), state that despite the various government support programs such as the Presidential Goat Pass-on Scheme for the improvement and transformation of goat farming in Zimbabwe, the level of commercialization has remained very low and much of the production is mostly under subsistence systems, with a few who are commercialized. Research has revealed that although farmers owned goats in large numbers, they still could not earn enough income to meet their basic needs such as food, clothes, health and to send their children to school (Mazhangara et al., 2019). Subsistence farming approach as a livelihood may not be a viable option to ensure household food security and make sure all household welfare needs are met (Mazhangara et al., 2019).

A few studies have been conducted in Midlands province focused on goat production and not the holistic value chain which include Mazhangarara et al. (2019), Lu & Miller (2019), Bvirwa et al. (2023), & Matsa et al. (2011). It is evident that these studies emphasized much on breeding, health and production, with minimal aspects of commercialization and the holistic goat value chain included. The lack of scholarly literature, reports, and studies that are related to commercialization of goat farming in Midlands province, to which Chiundura is not an exception has motivated the researcher to contribute to the body of knowledge with a related study. Determining the primary drivers of goat farming's commercialization, assessing the variables influencing goat farmers' selection of marketing channels, and conducting a comprehensive value chain analysis are the goals of this research.

1.3 Research Objectives

The study seeks to achieve the following objectives.

i. To assess the current state of goat commercialization in Chiundura Ward 12

ii. To identify Key factors influencing the level of goat commercialization

iii. To identify key factors influencing the choice of different market outlets among goat farmers in Chiundura ward 12

iv. To analyze the goat value chain and the key factors influencing market outlets in value chain in Chiundura ward 12

v. To develop a model that can guide goat farmers in improving their commercialization efforts and optimizing the value chain.

1.4 Research Questions

The following questions were answered in the study.

i. What is the current state of goat commercialization in Chiundura Ward 12?

ii. What factors influence goat commercialization in Chiundura Ward 12?

iii. What factors influence the choice of marketing outlet in the smallholder goat farming sector in Chiundura Ward 12?

iv. How effective is the goat value chain and which key factors influence market outlets in the goat value chain in Chiundura Ward 12?

v. Which model can be used to guide Chiundura smallholder goat farmers in improving their commercialization efforts and the optimization of the goat value chain?

1.5 Justification of the Study

Goat production plays a significant role in the agricultural sector of Zimbabwe, contributing to rural livelihoods, food security, and economic development. Goats are well-suited to the country's diverse climatic conditions and are a valuable source of meat, milk, and other by-products. Various stakeholders will benefit from this study. The findings of this study will inform all the goat value chain actors in terms of the problems that impede against the commercialization of goat farming. This study will promote the effective expansion of value chains for goats and the commercialization of goat farming. The results of this study would be a valuable source of data for programs and policies that support goat production that is focused on the market. Therefore, the study will lead to improvement of goat value chain in the country as a positive step towards economic growth and improved livelihoods.

1.6 Delimitations of the Study

This study was geographically delimited to Chiundura in Gweru rural district ward 12 in Midlands Province of Zimbabwe. Mawoleni ward 12 was the focus of the study where goat farming is practiced a lot in Chiundura district. Smallholder farmers, butcheries, input suppliers, financial institutions, famers, local leadership, staff at Vungu Rural District Council, Abbattoir owners, consumers, and NGO staff, constituted the population of the study while AGRITEX officers were

the key informants. The study focused on the factors influencing or contributing to the commercialization and value chain of smallholder goat farmers in Chiundura. The major variables of the study are goat farming, value chain, and commercialization. The sample of the study constituted of 300 participants. The study uses mixed-methods research. Thematic analysis and statistical analysis using STATA and R Studio software was employed in the study. The study took a period of 3 months to be completed. Data collection was done in Chiundura in which questionnaires, focus group discussions (FGDs), and interviews will be used.

1.7 Limitations of the Study

Time could have been a limitation in this study. However, the researcher ensured that she strikes a balance on her time schedules and books for data collection well in time to ensure the effectiveness of the data collection process. Since the targeted group is the farming communities, they also have other activities and duties to do, and may be difficult to access them. However, the researcher informed them about the study in time and explain the importance of the study so that the study participants organize their work schedules in time. On questionnaires, some of the respondents may not respond to all the questions as a result would not have given sufficient information. During the interviews, some of the participants may be unwilling to provide full information or reliable data and adequate cooperation. Based on the participants' personal commitments, some may fail to fully complete the questionnaires, however, the research was motivated the participants on the importance of this study to smallholder farmers and the rest of the community in Chiundura and Zimbabwe at large. The researcher created a rapport with the participants to make them feel comfortable and fully respond to the study questions. Additionally, unintentional bias can be experienced in collecting data in this study. This was addressed by the implementation of a pilot study to figure out any challenges and screen them before the final data collection phase.

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CHAPTER TWO

LITERATURE REVIEW

2. Introduction

This chapter gives a comprehensive outline of theoretical and empirical literature analysis of the goat value chain, current state of goat commercialization and goat marketing. The section, reviews on the socio-economic, institutional factors and environmental affecting goat commercialization and goat marketing outlet choices used in the thesis and lastly, the summary of literature review of the thesis.

2.1 Overview of goat production

Goats *(Capra hircus)* are distributed all over the world because of their great adaptability to varying environmental conditions and the different nutritional regimes under which they were evolved and subsequently maintained. They proved useful to humans throughout the ages due to their productivity, small size, and non-competitiveness with humans for food. It is believed that goats were among the first farm animals to be domesticated. Goats are the most prolific domesticated ruminants; farmers are increasingly relying on goats as means of survival and a way of boosting their income (Peacock, 2005). Goat is a multi-use animal commonly reared for the meat (chevon) however, they are also raised for the milk, wool, and leather in other parts of the world. Academic analysis of goat farming encompasses various aspects related to the industry, including its economic, social, and environmental dimensions. Researchers examine the commercialization and value chain development of goat farming, as well as factors influencing its success and impact on smallholder farmers and local economies.

2.1.1 Goat production in the world

The fact that goats can adapt so well to varied environmental factors and dietary regimens during their evolution and subsequent maintenance has led to their global distribution. Because they were productive, tiny, and incapable of competing with humans for food, they proved valuable to humans throughout history. One of the earliest agricultural animals to be tamed is thought to have been goats. The data from archaeology suggests that they have shared a symbiotic connection with humans for approximately 10,000 years (Moretti et al., 2023). According to Namonje-Kapembwa et al. (2022), goats are the most common domesticated ruminant, and farmers are depending more and more on them for both survival and money. Goats are resilient enough to survive extended periods of heat stress and water scarcity. They can also thrive in unfavorable geophysical and

meteorological circumstances that are inhospitable to cattle and sheep. Furthermore, goats can make good use of subpar forage; their unusual eating patterns facilitate the selection of diets that satisfy their needs. It is also discovered that goats are becoming a more important source of income and a means of survival for farmers and pastoralists (Peacock, 2005). There are one billion goats in the world now (Miller B.A and Lu D.C2019).Goat consumption is rising worldwide, with almost 400 million tons consumed annually in Africa alone (Namonje-Kapembwa et al. 2022) A significant portion of goat populations worldwide are goats raised for chevon. The Boer goat of South Africa is the predominant meat breed in the region. High-quality chevon is a notable product of this breed.

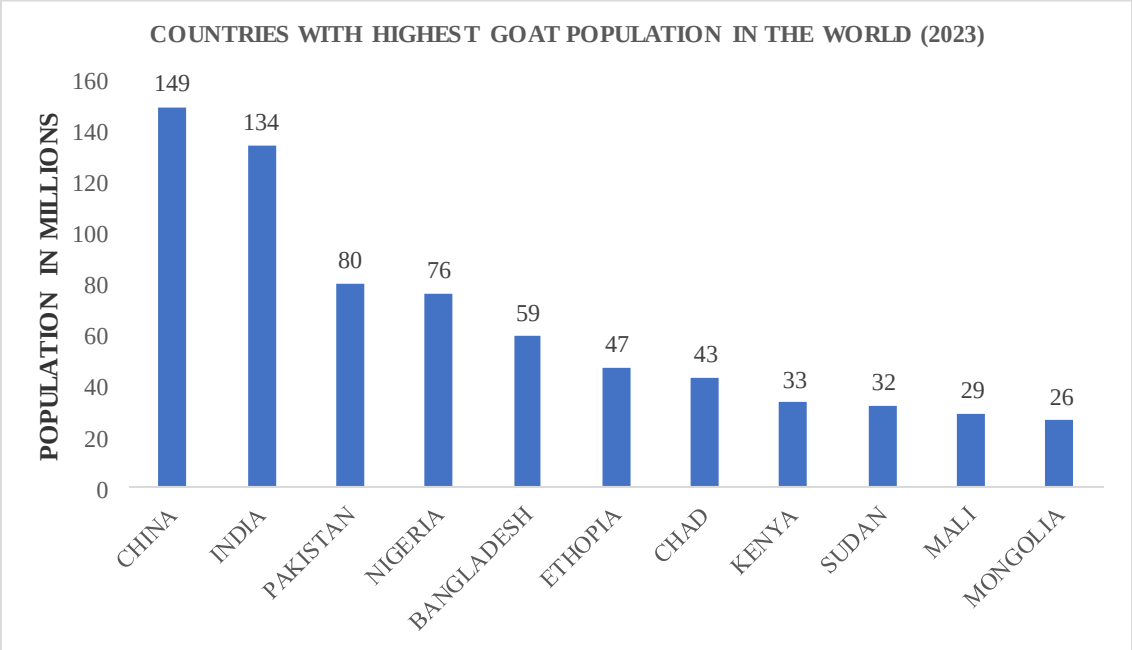


Figure 1: World Goat Population Source: FAOSTAT 2023

2.1.2 Goat production in Africa

The role of livestock is becoming more important in southern Africa. As elsewhere in the world, there is an increasing urban demand for livestock products based on growing urban populations with higher incomes and associated dietary changes (Tesfaye & Tamir, 2015) which gives opportunities for income generation for goat farmers. However, southern Africa is not benefiting enough from these opportunities. The productivity and offtake of small-scale production systems remain low in most of the region, though there is also large variability. Countries such as Namibia and South Africa have well-developed goat markets and export livestock within the Community

(SADC) region, whereas livestock markets in Mozambique or Zimbabwe are largely undeveloped (van Rooyen & Tui, 2009).

The countries in the region now realize the potential inherent in livestock and there are more initiatives to improve livestock production and marketing. The overarching aim is to assist rural households to escape the poverty trap through market-driven livestock production (Skapetas & Bampidis, 2016). Goats are the most common livestock species being promoted as they are now viewed as being a source of empowerment, especially for marginal groups, such as female-headed households and those affected by HIV/AIDS.

2.1.3 Goat production in Zimbabwe

According to Mazhangara, Chivandi, Mupangwa, & Muchenje (2019), the majority of smallholder farmers (communal, old resettlement, and A1) maintain an average of 20 goats in a low-input output system. The degree of market orientation and the focus placed on management concerns such as housing and nutrition are the primary distinctions between smallholder operations and larger enterprises (Government of Zimbabwe, 2005). Low productivity and disease rates are the hallmarks of goat production systems that have not drawn considerable attention or investment (FAO, 2010).

Goats play a vital role in the livelihoods of small-scale farmers in developing countries. They contribute to food security and can alleviate seasonal food variability and availability directly through milk and meat production and indirectly through cash earned from the sale of their products (Mazhangarara et al. 2019). In semi-arid areas, goats have comparative advantages over cattle. Since they are more tolerant to droughts, they utilize a wider diversity of plants, and their higher reproductive rate allows populations to recover quickly. As browsers, they feed on different vegetation than cattle and thus allow farmers to make more efficient use of the available natural resources. In addition, goats play an important socio-cultural role. Promoting the goat value chain contributes to risk mitigation, particularly in drought-prone areas, and empowerment of vulnerable groups (women, HIV/ AIDS, & the poor).

Various initiatives in Zimbabwe have been implemented to boost the efficiency and goat production in Zimbabwe for example projects like Zimbabwe Agricultural Growth Program (ZAGP) that was funded by the EU VALUE project (FAO, 2023). ZAPG focused on increasing agricultural productivity through various activities such as livestock commercialization in which the farmers were supported through training, accessibility to better breeds, as well as improving

animal husbandry practices. Additionally, ZAPG facilitated linkages between goat farmers and local/export markets. Also, the US$40 million presidential goat scheme that was launched in 2022 also distributed goats to communal farmers and it aimed at distributing 632 000 goats to improve genetics across the country (Government of Zimbabwe, 2023).

There are numerous agroecological potentials and regions in Zimbabwe that are more or less suitable for goat farming. While most livestock are found in the drier regions of Natural Regions IV (parts of Manicaland, Mashonaland Central and East, Masvingo and Matabeleland North and South), and V (parts of Manicaland, Masvingo, and Matabeleland), crops thrive in Natural Regions I to III due to the favorable climatic conditions (Adicha et al. 2021). Since practically all goats in these drought-prone areas live in communal areas, the goat industry has the potential to improve food security and reduce poverty for a sizeable section of the rural population.

Zimbabwe's less wealthy populace produces goats; if farmers improved their management techniques, the country's goat population could rise by 40–60% in just two years (FAO, 2023). As per the findings of a research conducted on goat production and marketing on behalf of the Goat Forum, farmers place great importance on the various purposes of goats and prioritize money over other needs like meat, milk, manure, and customs (Homann et al., 2007). Goats in particular have a lot of potential to help rural Zimbabwean households improve their standard of living, as long as livestock output is raised (Ahmed, 2017).

Goats are simpler for farmers to get rid of than cattle because the former are kept for milk and draft power. The livelihoods of the rural poor can consequently be significantly improved by increased goat production and improved market accessibility. Nyathi et al. (2007) looked at the main goat market flows in Zimbabwe and found that Beitbridge, Gwanda, Matobo, Bubi, Binga, Mangwe, and Bulilima districts account for the majority of goat origins and goat products. Their primary places of origin in Masvingo are the districts of Chivi, Chiredzi, and Mwenezi. For instance, more than 30,000 goats from Gwanda were officially registered for sale in 2006, and a sizable portion were sold through unofficial, unrecorded channels. The flows verify that metropolitan regions, including the major cities of Harare and Bulawayo, are the primary markets for goats. In these areas, many impoverished individuals require access to affordable, high-quality protein, while higher-income groups can afford to pay for higher-quality protein. Enhancing these market flows may be possible through increasing the productivity of goat production and marketing activities. Farmers in the rural supply areas would be compelled by this to commercialization.

Efficiency can be increased by developing value chains tailored to the production and sale of goats. AGRITEX, local authorities, butchers, transporters, abattoirs, supermarkets, restaurants, non-governmental organizations (NGOs), research organizations, input suppliers (banks, animal health, agro-processing feed suppliers, and animal health), and other significant players in the goat industry are a few examples of these public-private sector partnerships (Arsenos et al., 2021). These value chains aim to strengthen the competitiveness of small-scale goat producers and enhance the efficiency of goat production and marketing by empowering them and transforming them into informed players in market-oriented goat production.

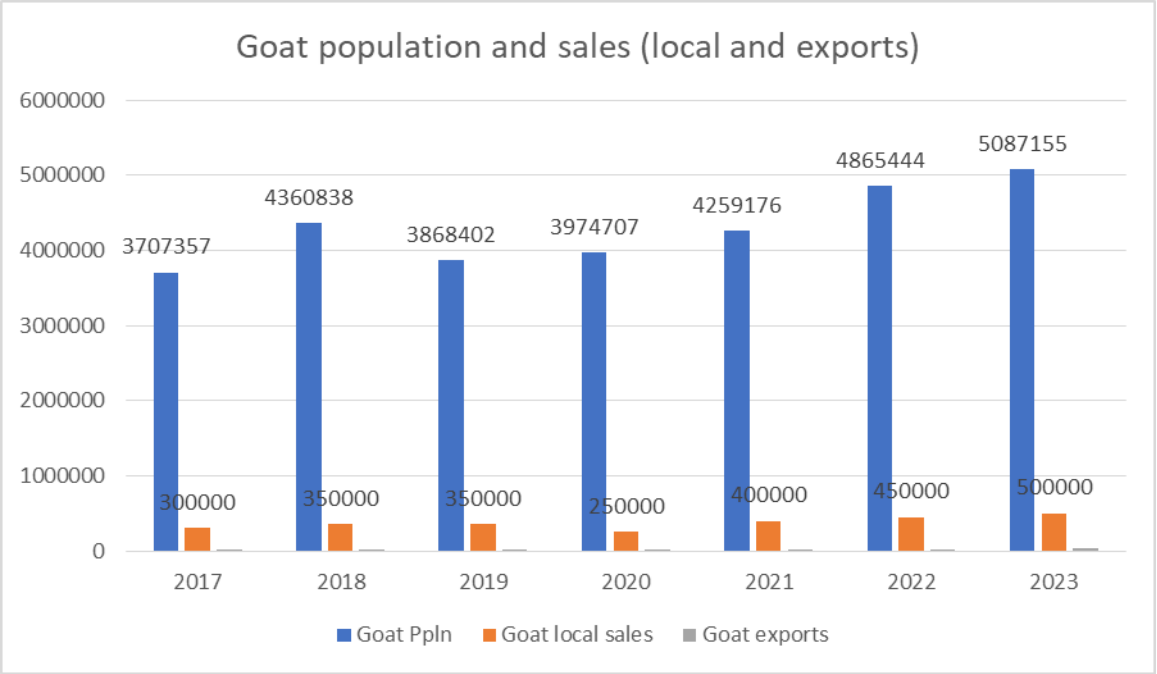


Figure 2: Zimbabwe Goat population and sales (Source: 2nd CLAF 2023)

Objective 1: To assess the current state of goat commercialization in Chiundura Ward 12

2.1.3.1 Goat Commercialization

Commercializing smallholder agriculture is an indispensable pathway towards economic growth and development for most developing countries relying on the agricultural sector (Bekele & Alemu, 2015). In the long-run, subsistence agriculture may not be a viable activity to ensure sustainable household food security and welfare (Carlletto *et al.*, 2016). The process of commercializing goats is intricate and dynamic, with many facets and levels of involvement. The procedure entails a shift in commercialization from low to high along several dimensions. From traditional or subsistence farming to contemporary commercialization or specialty farming, there are different levels of commercialization (Mumba, 2019).

The commercialization of the goat farming sector has been gaining momentum globally. Goats are a versatile livestock species that can provide various products, including meat, milk, fiber, and skins. The commercialization efforts in the goat farming sector are driven by several factors, including increasing global demand for goat products, changing consumer preferences, and the potential economic viability of goat farming (Katiku et al. (2013). Asia has a significant presence in the goat farming sector, with countries such as India, Pakistan, and China being major contributors to the global market. In these countries, commercialization efforts have focused on improving breed quality, enhancing productivity through improved management practices, and establishing efficient value chains. For instance, in India, the Sirohi and Boer breeds are popular choices for commercial meat production, while the Jamunapari breed is known for its high-quality milk.

In Europe, commercial goat farming has witnessed growth, particularly in countries such as France, Spain, and Greece. Commercialization efforts in Europe have emphasized the production of high-quality dairy products, including cheese and yogurt, using goat milk (Lu & Miller, 2019). European farmers have been investing in breed improvement programs, modernizing production systems, and adopting sustainable farming practices to meet the growing demand for goat dairy products. In the Americas, commercial goat farming has seen developments in both North and South America. In the United States, commercialization efforts have focused on meat production, with the Boer breed being widely used for its fast growth and high-quality meat. In South America, countries like Brazil and Argentina have also seen increased commercialization in goat farming, primarily driven by meat production and exports.

Africa has a rich tradition of goat farming, and commercialization efforts are gaining momentum across the continent. In countries like Nigeria, Kenya, and Ethiopia, commercial goat farming is focused on both meat and milk production (Moretti et al. 2023). Farmers are adopting improved breeds, implementing better herd management practices, and investing in processing and value addition to tap into domestic and export markets. Overall, the current state of commercialization in the goat farming sector is characterized by increasing market demands, breed improvement initiatives, adoption of modern management practices, and the development of robust value chains. However, it's important to note that the specific state of commercialization may vary across regions within each continent, influenced by factors such as market dynamics, infrastructure, government policies, and cultural preferences, Lack of technical knowledge and training like Insufficient knowledge and training on modern goat farming practices, including breed improvement, nutrition management, and disease control. Limited access to extension services and technical assistance for

smallholder farmers (FAO, 2022) and financial constraints as limited access to credit facilities and capital for investment in infrastructure, technology, and herd improvement. High input costs, such as feed and healthcare, affecting the profitability and sustainability of goat farming enterprises. Smallholder farmers often face difficulties in accessing credit or loans to invest in their goat farming enterprises. Financial institutions may perceive goat farming as a high-risk venture, resulting in limited access to formal credit facilities (Hegde, 2020). This lack of capital restricts farmers' ability to expand their herds, improve infrastructure, and invest in inputs and technologies. For example, in rural areas of Namibia, smallholder goat farmers may struggle to secure loans from banks to purchase breeding stock, improve grazing infrastructure, or invest in animal healthcare. This limitation hampers their ability to make necessary investments for sustainable goat farming practices.

Sub-Saharan Africa still has a large number of subsistence farmers, notwithstanding the likelihood of commercialization, claim Rubhara & Mudhara (2019). Zimbabwe has used a variety of methods for its citizens' social and economic development for a number of decades. The models' linked results have primarily dealt with infrastructure development, food security, technology acceptance and transfer, commercialization, and an overall improvement in rural development and food security. With the primary goal of enhancing economic aspects such as employment, earnings, empowerment, and entrepreneurial growth, a number of models have been presented (Magombeyi & Odhiambo, 2017). Rural Development 8.0 is one of the models that is being used. The Rural Development 8.0 policy has eight components and one of the components is the Presidential Goat Pass on Scheme. The model aims at eradicating poverty in all its forms, including food and water poverty through an “agricultural development-rural industrialization.

2.1.4 Objective ii: To identify Key factors influencing the level of goat commercialization

2.1.4.1 Key factors influencing the level of goat commercialization

It is believed that a multitude of factors influence the level and kind of commercialization of farmers. These include socioeconomic factors like age, gender, education level, household size, and farming experience, as well as market factors like owned assets, closeness to the market, off-farm income, and market access (Source??). Participation in farmer groups, loan availability, extension services, and contractual obligations are examples of institutional elements. A study on the variables influencing the decision to commercialize an output and the extent of commercialization of horticulture crops in Ethiopia was carried out by Tufa et al. (2014). The

findings indicated that gender and cultivated land were important factors determining the degree of commercialization, even though the primary factors influencing the level of commercialization were household education, household size, availability to irrigation, cultivated land, livestock, and distance to the closest market.

Using the Household Commercialization Index (HCI), Dube & Guveya (2016) examined the degree and factors influencing the commercialization of smallholder agriculture in Manicaland and Masvingo. Their findings indicated that farmers in both provinces primarily practice subsistence farming, with a mean HCI of 0.28. The results demonstrated that female-headed households and male-headed households had comparable levels of commercialization. The study also showed that the number of household members with a secondary education, communal tenure, and the homestead's location in the agro-ecological zone had a negative significance influence on commercialization, while the size of the household, availability of draft power, livestock ownership, access to irrigation, agricultural training, and household income had a positive significance influence on commercialization. According to Dube & Guveya (2016), encouraging smallholder agriculture's commercialization is essential, with a focus on educating farmers to see farming as a business and giving them tools for negotiating and marketing. The gender of the household head, access to draft power, access to extension, access to markets, access to finance, and the quantity of crops produced all had a positive impact on commercialization, according to a study on the topic by Rhubara & Mudhara (2019) among smallholder farmers. The amount of commercialization was, however, inversely correlated with the age of the head of the household, the quantity of cattle, the revenue earned off the farm, and the amount of community land.

Objective iii: To identify key factors influencing the choice of different market outlets among small holder goat farmers

2.1.4.2 Key factors influencing the choice of different market outlets among goat farmers

Growing consumer demand for goat products, such as meat, milk, and cheese. Access to formal markets, supermarkets, and restaurants that provide opportunities for direct sales (Barua et al. (2021). Market development initiatives and value chain integration that enhance market access for farmers. The absence of a stable market with a reasonable price is the biggest obstacle smallholders confront (Eaton and Shepherd, 2001). The distribution of risks and rewards at different stages of the livestock value chain, as well as access to markets, differ based on the gender of the producers (e.g., rights to income from livestock); processors (e.g., access to

information and processing technologies); market agents (e.g., risk of sexual harassment and abuse, safe market spaces and overnight accommodations); and economies of scale (e.g., bringing women together to improve their market position) (IFAD, 2007).

One method that can facilitate market access in addition to other production aspects is contract farming. In market-focused collaborations, the allocation of risks and rewards along the value chain is an essential element, particularly in a business climate that is changing quickly. The amount of expenses and risks that the actor has incurred across the chain is reflected in the size of the value share. Gaining a sustained competitive advantage and adjusting to a shifting business environment depend on one's capacity for risk management. Variations in price that are unpredictable can provide a danger in local markets.

Connecting smallholders to dynamic markets offers the potential to decrease poverty more quickly, but there are structural obstacles to overcome in order to ensure that investment yields both commercially viable products and value to smallholder. Small-scale producers in low- and middle-income nations like Zimbabwe often operate in locations devoid of infrastructure (roads, power, irrigation, and wholesale markets) and lack access to services (finance, training, and inputs) as a result of decades of underinvestment. They also rely a great deal on good weather. Innovative ways to combine supply and production are required due to high procurement costs connected with obtaining, grading, and bulking items from dispersed suppliers as well as problems with farmers "side selling" to merchants. Because of these challenges, buyers are more likely to value the consistency and dependability of big farmers and suppliers.

2.1.5 Objective iv: To analyze the goat value chain and the key factors influencing value chain

2.1.5.1 Goat value chain and the key factors influencing value chain

According to Gomez,et al (2011) one of the possibilities to strategies for food security is the Food Value Chain approach. The use of this analytical approach provides several benefits, that include identification of incentives by mapping movement of value along the chain, diversification strategies for farmer thus may increase their food access and availability. Goats provides provide a source of income thus addressing the issue of food accessibility as it gives people power to purchase diverse nutritious foods. The income also capacitates them to access health care services which is crucial, for one need to be healthy in order to fully utilise nutrients. Goats not only raise household income through the sale of goats, but they also improve food security. Goats that are

killed at home by families serve as a nutritious addition for their household, albeit this only occurs on rare instances.

A value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, (involving a combination of physical transformation and the input of various producer services) delivery to final consumers, and final disposal after use (Kaplinsky and Morris 2002). When applied narrowly, value chain analysis can be used to describe the steps taken by a single company to launch a product. On the other hand, a more comprehensive definition of a value chain is more frequently used, which looks at the intricate web of actions carried out by different parties (primary producers, processors, traders, and service providers) to move a raw material along a chain to the sale of the finished good. This comprehensive perspective moves along the connections with other players and businesses involved in trading, assembling, processing, etc., starting from the raw material manufacturing system. The features of backward and forward links between chain players are also a concern of value chain analysis. Value chain analysis is a comprehensive method of analysis that takes into account external influences, indirect actors, and direct actors. Direct actors are people who take ownership and possession of the product and are commonly understood to be individuals who are directly involved in the activities that bring the product from manufacturing to consumption. Those that impact the value chain but do not directly own or possess the product are known as indirect actors. The value chain is impacted by environmental, sociocultural, and economic external factors.

2.1.5.2 VALUE CHAIN MAPPING FRAMEWORK

Chain actors are people or organizations that directly manufacture, process, trade, or otherwise deal with the items as they add value along the chain. Suppliers of inputs, manufacturers, distributors, traders, and buyers of the product-goat meat, for example are among them.

Chain supports are either public or private businesses that supply services to the different chain participants without ever handling the product directly, but whose contributions are crucial to the product's value addition. Transporters, processors, local governments, farmer associations, banks, and microfinance institutions are a few of these. Market regulations, capacity expansion, value chain funding, and access to production market information are among the services they offer.

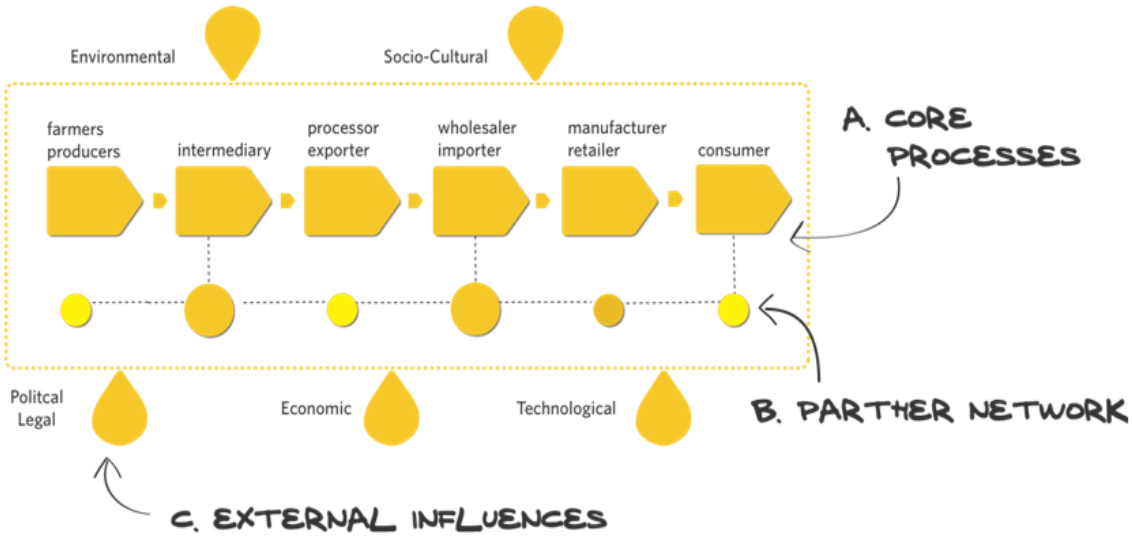


Figure 2: Value Chain Analysis (FAO, 2023)

Value chain analysis: This maps the activities of the different actors involved in production, processing, wholesaling, and retailing of a particular product and assists in identifying the distribution of benefits of actors in the chain through the analysis of margins and profits. Gaining knowledge of the dynamics and domains of the value chain analysis-such as the output market, institutional setup, economics, and functional analysis-will assist in designing the ideal market structure and in generating novel ideas that aid in removing obstacles to market entry. Value chain analysis can be used to identify sustainability challenges and their socio-economic implications. This can be learned through group discussions, questionnaires, and interviews with the various chain participants.

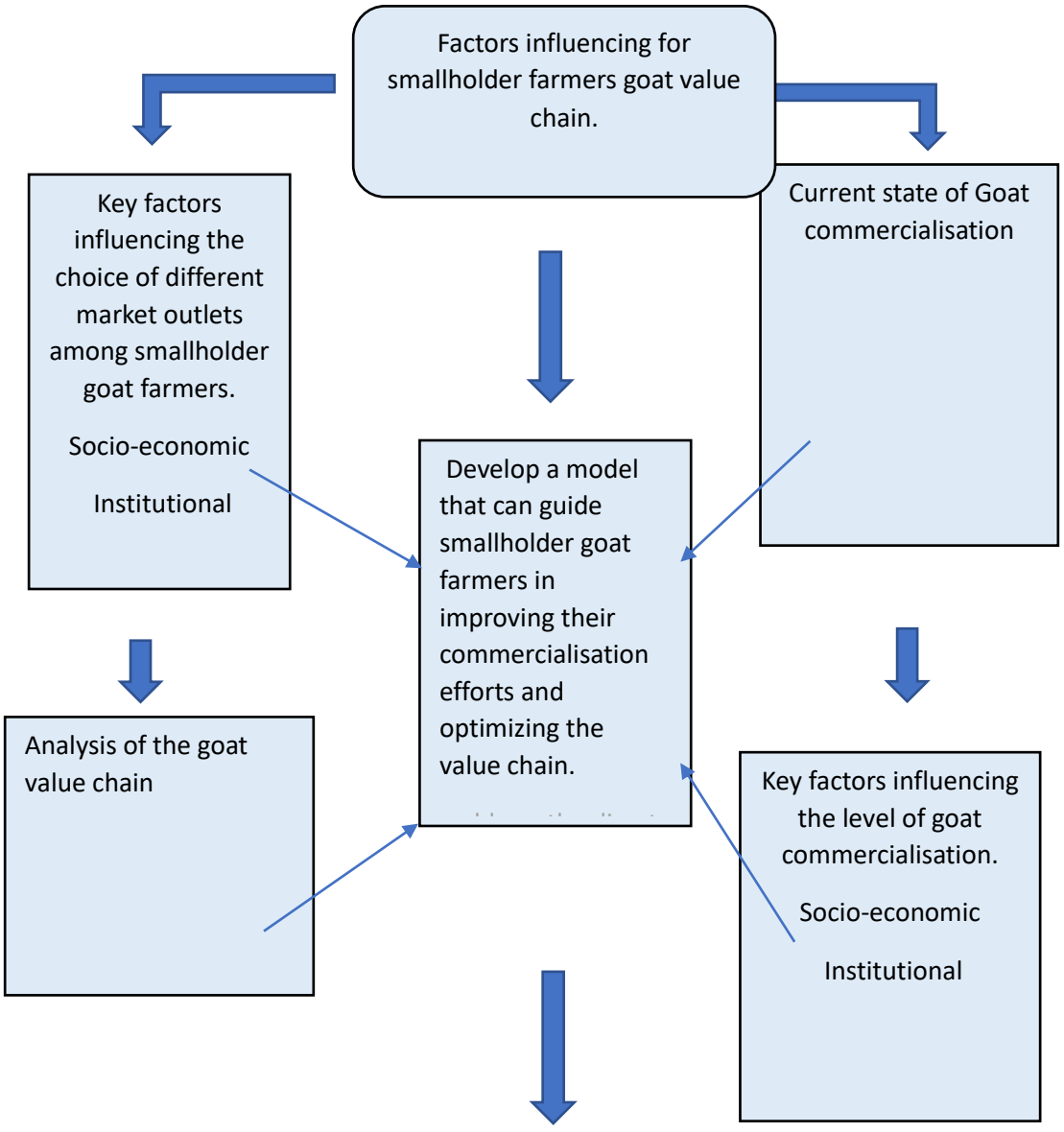
2.2 Value Chain Development

Value chains are created by improving the systems that they are integrated into. Understanding the significance of market, macro, and micro level factors that affect value chains is essential for conceptualizing value chains. To determine the impact of the intervention, it requires doing chain research, analyzing data, and developing strategies. These steps are then followed by monitoring and evaluation.

2.3 Conceptual Framework

Creswell (2014) defines a conceptual framework as a structure that guides and informs research studies. It provides a foundation for understanding the research problem, developing research questions or hypotheses, and organizing the study's key concepts, variables, and relationships. Miles & Huberman (1994) describe a conceptual framework as "a set of interrelated ideas, like a

map of the territory, that guides the researcher in his or her exploration. It is the researcher's lens, a guide for seeing the relationships among variables. The relationship between the pertinent elements that the study looked into in order to improve the small holder goat value chain is explained by the framework in Figure. This is predicated on the notion that the value chain is influenced by institutional, socioeconomic, and agricultural factors. When a farmer chooses to go commercial, they must also choose the marketing channel to use, taking into account institutional, socioeconomic, and farm considerations. Additionally, incentives to commercialize might come from having access to profitable markets. The goal is to create an improved value chain for goats and boost rural industrialization, which will ultimately increase household incomes, improve food security, and reduce poverty by strengthening farmers' resilience to climate change.



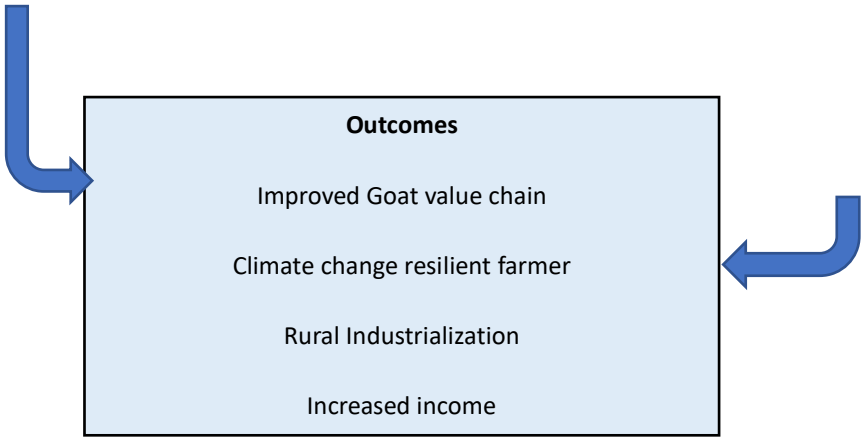


Figure 3: Conceptual framework

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CHAPTER THREE

METHODOLOGY

3. Introduction

This chapter gives an overview of the research methods, which delineates whether the research is quantitative or qualitative. The chapter furthermore explicitly defines the study area, present the research design, as well as the target population and the study unit. It is also made up of sampling methods in terms of the sampling technique, sampling procedures and sample size. Data analysis methods and its framework. The chapter is capped off by presenting the ethical considerations and finally, research methodology summary

3.1 Study Area

The study was conducted Chiwundura Communal Area Ward 12 which is located in Vungu Rural District also known as Gweru Rural District in the Midlands Province of Zimbabwe. It lies Lat/Long (dec):-19.18397,30.01367 about 45 kilometers North East of Gweru, which is the

Provincial capital, and about 40 kilometers South East of Kwekwe. The area is in Agri-ecological region IV climate type Hot semi-arid (steppe) climate with average rainfall between 450 and 500 mm annually, most of which is received during summer seasons. The area is primarily rangeland and has the highest population of goats in Gweru District of this therefore brought the idea of assessing goat value chain in Chiundura The place is dominated by Acacia and combretum tree savannah given the dry climatic conditions in the country. Other livestock kept in the region include cattle, pigs, and chickens. Mixed farming is a common practice in this area where farmers combine their main livestock activity with some crop farming (AGRITEX, 2024).

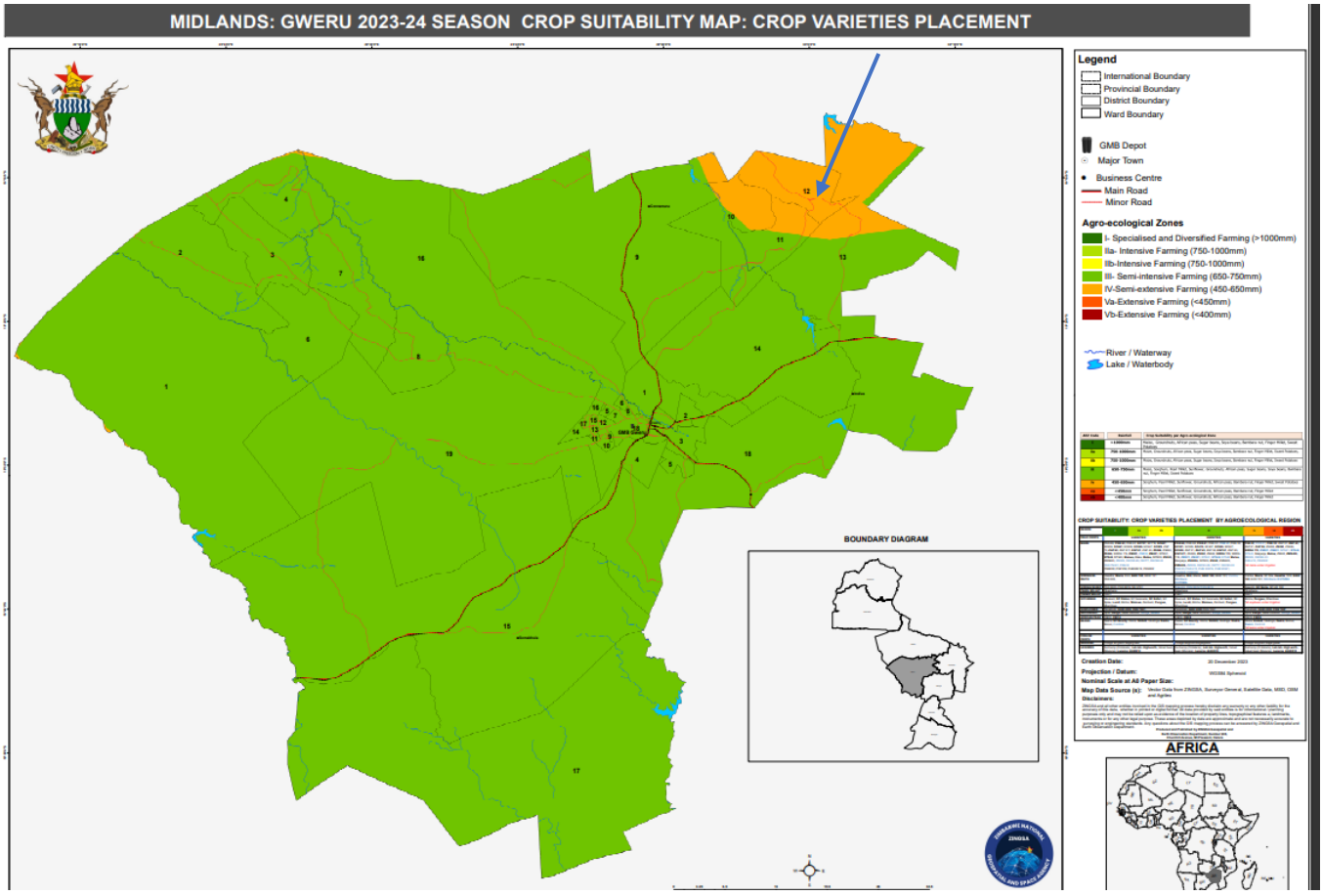

Figure 4: Midlands Gweru 2023-24 Season crop suitability map: Crop varieties placement

Source: (AGRITEX, 2023)

3.2 Research Design

The study employed a mixed research methods design, also known as mixed methods research, refers to a research approach that combines both qualitative and quantitative research methods within a single study or research project. This design allows researchers to gain a more

comprehensive and nuanced understanding of the research topic by integrating the strengths of both qualitative and quantitative research. The mixed research methods design typically involves collecting and analysing both qualitative and quantitative data, using methods such as interviews, surveys, observations, experiments, and statistical analysis (Timans, Wouters, & Helibron, 2019). The specific combination of methods and the sequence of data collection can vary depending on the research question and objectives.

Triangulation involves comparing and contrasting findings from qualitative and quantitative data sources to validate or corroborate the results (Timans et al. 2019). Complementarity involves using one type of data to provide a more in-depth understanding of the other. The mixed research methods design offers several advantages. It allows researchers to capture the richness and complexity of a research topic by combining different data sources and perspectives. It can provide a more comprehensive understanding of phenomena by addressing research questions from multiple angles. It also allows for a stronger validation of findings through data triangulation.

3.3 Target Population

In this research, the target population were smallholder goat farmers, Vungu rural district council, Input suppliers, butchery owners, local consumers, travelling traders, abattoirs, Finance companies and representatives from MoLAWFRD that are actively in the goat value chain in Gweru rural district Ward 12 in Midlands Province.

Ward 12 was purposively selected because there was an initiative conducted by Heifer international, HELP Germany and the Government of giving goats and sheep to smallholder farmers as a pass on program to recapitalize them (AGRITEX ,2017). Ward 12 has 1200 farming households and 42 villages, and all the 42 villages were covered and seven 7 small holder farmers were randomly selected from each village.

3.4 Sampling Procedures and Sample Size

Sample Size Determination

A sample of farmers was obtained using Yamane (1967) formular.

$$n = \frac{N}{1+N(e)^2}$$

WHERE?

n = desired sample size,

N= population size

e = acceptable error (0.05)

$$n = \frac{1200}{1 + 1200(0.05)^2} = 300$$

The sample was based on 5% error. The study makes the assumption that the projected sample size will fall between +/- 5% of the population value.

3.5 Data Collection and Research Design

To determine a relationship between various factors, a cross-sectional survey study design was employed. A semi-structured questionnaire was administered to the selected goat farmers to solicit data on farm, socioeconomic, and institutional features; marketing channels, production methods, earnings, and returns on goat farming; in addition to obstacles. With the help of qualified enumerators, the questionnaire was pretested to ensure its validity before to data collection. The proper statistical tools, including R Studio and STATA, were used to analyze the data gathered in order to meet all of the study area's objectives. The data were analyzed using econometric and descriptive methods. The study promised and made sure that all of the data was handled discreetly and that it was analyzed collectively without mentioning any specific individuals. Therefore, research participants were not subjected to any harm in any way whatsoever.

Objective 1: To assess the current state of goat commercialization

The Household Commercialization Index (HCI) was used to measure commercialization under this objective. It takes into account the percentage of total agricultural output that was sold (Strasberg et al., 1999). To ascertain the variables impacting the degree of commercialization, HCI was employed as the dependent variable. The index represents a percentage of the total value of goats owned by a farmer that are sold in the market. The value of all the goats a farmer kept, including those sold and/or killed within a year, was calculated and expressed as follows:

$$\text{HCI} = \frac{\textit{TOTAL VALUE OF GOATS SOLD}}{\textit{TOTAL VALUE OF GOATS KEPT}} \times 100\%$$

The index takes values between 0% and 100%, according to Muhammad-Lawal et al. (2014) and Dube and Guveya (2016). The higher the commercialization index is, the more the smallholders are commercially oriented. The indices value of 0% and 100% indicate that the smallholder

farmers are subsistence oriented and highly commercial oriented respectively (Govereh, Jayne, and Nyoro 1999). This indicates that highly commercialized farmers are actively involved in the market. Since non-commercialized farmers did not sell any goats in the previous year, they are predicted to have a zero HCI. Conversely, because they are involved in the market, commercialized farmers are anticipated to have an HCI higher than zero. Since most goat farmers always save some stock for breeding and domestic use, the study will not predict an HCI value of 100, suggesting that it may not be feasible for goat farmers to sell their whole harvest.

Objective 2: To identify Key factors influencing the level of goat commercialization

To determine factors influencing the level of goat commercialization a torbit regression analysis was adopted. The model consists of a dependent variable (Household commercialization index) as a continuous variable, the predictor variables Total goats owned, Age of HH head, and HH size are continuous whilst Secondary education, Tertiary education, Farmer group status, HH head Gender, Access to Credit facilities, Access to market information, Training on marketing status, Training on animal health status, availability of animal health centres, availability of butcheries are dichotomous variables. The regression logistic model used for the analysis is as below.

Model Specifications:

$$y = \alpha + \beta_{1HHS} + \beta_{2TGW} + \beta_{3HHA} + \beta_{4SLE} + \beta_{5TLE+} \beta_{6FGS} + \beta_{7HHG} + \beta_{8ACF} + \beta_{9AMI} + \beta_{10TMS} + \beta_{11TAH} + \beta_{12AHC} + \beta_{13AB} + e$$

Where,

Y= the dependent variable, Household commercialization index

α = constant variable

β1…..β5 = coefficients of factors affecting level of goat commercialization

HHS = HH size

TGW = Total goats Owned

HHA = HH head Age

SLE = Secondary Education

TLE = Tertiary Education

FGS = Farmer Group Status

HHG = Household Head Gender

ACF = Access to credit facilities

AMI = Acess to Marketing Information

$_{TMS}$ = Training on Marketing Status

$_{TAH}$ = Training on Animal health Status

$_{AHC}$ = Availability of animal health centres

$_{AB}$ = Availability of Butcheries

e = is an error term which captures all other factors neglected but influencing goat commercialization

Objective 3: To determine factors influencing the choice of different market outlets among smallholder goat farmers

For the 3rd objective a binary logistic regression model was used. The dependent variable was the market outlet for goat, a binary variable predicting the choice of market a household preferred (1- Individual traders and 0 - Organised market). The predictor variables were continuous (HH size, HH head age, total goats owned, distance to organised market) whilst the remaining are dichotomous variables (HH head gender, access to market information, Secondary level education, access to credit facilities, access to training facilities). The regression model used for the analysis was as below.

Model Specifications:

$$Logit(p) = \alpha + \beta_{1Age} + \beta_{2HHS} + \beta_{3TGO} + \beta_{4DOM} + \beta_{5HHG} + \beta_{6AMI} + \beta_{7SLE} + \beta_{8ACF} + \beta_{9ATF} + e$$

Where;

Y= choice of market outlet

α = constant variable

β1…..β11 = coefficients of factors affecting choice of market outlet

$_{Age}$ = HH age

$_{HHS}$ = HH size

$_{TGO}$ = Total goats owned

$_{DOM}$ = Distance to Organised markets

$_{HHG}$ = HH Gender

$_{AMI}$ = Access to market information

$_{SLE}$=Secondary Level Education

$_{ACF}$ = Access to credit facilities

$_{ATF}$ = Access to training facilities

e = is an error term which captures all other factors neglected but influencing choice of market outlet

Objective 4: To analyze the current state of goat value chain in Chiundura ward 12

Value chain analysis comprised of 3 interconnected steps:

1. data collection and research,
2. value chain mapping,
3. Stakeholder analysis of opportunities and constraints
4. SWOT analysis

First data and information for mapping of the value were collected through secondary and primary sources.

Focus group discussions were carried out to identify value chain actors and who they interact with as well as how the actors are linked to each other. Linkages identified during the mapping was indicated by different coloured arrow heads which were drawn according to the direction of the linkages. The colour of the arrow will indicate how the actors are linked in term of flow of products, information, and resources. The process showed a level of influence that each of the actors had in the value chain and to identify linkages of support and disturbance. Through this net mapping a clear value-chain map was developed which was used to identify opportunities and challenges in the value chain.

Objective 5: To develop a model that can guide goat farmers in improving their commercialization efforts and optimizing the value chain.

To develop a proposed model Qualitative thematic and SWOT analysis of the Goat value chain was used as an analysis tool.

3.6 Ethical considerations

The study observed the following ethical and research standards;

3.6.1 Voluntary Participation

Smallholder goat farmers in Chiundura were the primary stakeholders and the focus of the study. Participation into the study was voluntary and the respondents were given the opportunity to stop participating whenever they felt not to continue.

3.6.2 Informed Consent

Participants were provided with comprehensive information about the study, its objectives, and their role. They were given the opportunity to freely choose whether to participate or withdraw at any stage without any coercion or undue influence. This was done through an informed consent form which the participants signed (See Appendix E).

3.6.3 Confidentiality and data protection

The study implemented respect, autonomy, dignity, and privacy of respondents throughout the research process. This promoted them to freely participate in the study. Any sensitive or personal information collected from the participants is still kept confidential and securely stored. The researchers ensured that the participants' privacy is protected, and their identities are not revealed without their explicit consent. The information was kept in an encrypted electronic file that will be discarded after 4 months of completing this study.

3.6.4 No Harm

No harm was inflicted to the respondents by the study as only questionnaires were used to collect data.

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CHAPTER 4

CURRENT STATE OF GOAT COMMERCIALIZATION

ABSTRACT

The global goat industry has experienced significant growth and commercialization in recent years, driven by increasing demand for goat meat, milk, and other products. According to a 2022 report by the Food and Agriculture Organization (FAO), the worldwide goat population has increased by over 30% in the past decade, with the majority of this growth occurring in developing regions of Asia and Africa. The objective of the study was to assess the current state of goat commercialization in Gweru rural district. This study was conducted in Gweru rural district, ward 12, in the Midlands Province of Zimbabwe. A cross-sectional design was used, and data was collected through a household survey questionnaire and key informant interviews with agricultural extension officers. The Household Commercialization Index (HCI) was used to quantify commercialization. The findings reveal that all households surveyed owned goats, with the majority (98.1%) owning indigenous breeds. Goats play a multifaceted role in the livelihoods of these households, with the majority (74.8%) having sold at least one goat in the past 12 months. Most households (83%) made joint decisions on the use of proceeds from goat sales. The majority of households (91.4%) had received goat marketing information, and 95.6% had received some form of training in goat production, primarily from agricultural extension workers. However, access to animal health centers was limited, with the average distance to the nearest center being 7 kilometers. These findings highlight the importance of the goat industry in the livelihoods of smallholder farmers in the study area and the need for continued support and investment in the sector to further enhance its productivity and commercialization. The study recommended that policymakers should develop policies to encourage collective marketing by smallholder farmers, which could improve their bargaining power and access to lucrative market opportunities as well as strengthening extension services to continue providing training and information on improved goat production and marketing practices.

Key words: Commercialization, extension services, productivity, households, goat marketing

4.1 Introduction

The global goat industry has seen significant growth and commercialization in recent years, driven by rising demand for goat meat, milk, and other products. According to a 2022 report by the Food and Agriculture Organization (FAO), the worldwide goat population has increased by over 30% in the past decade, with the majority of this growth occurring in developing regions of Asia and Africa (FAO, 2022). In their 2021 book "The Global Goat Industry", researchers Smith and Nguyen highlight the key factors behind this trend. They note that increasing urbanization and rising middle-class incomes in many countries have fueled greater consumption of goat-based foods, which are valued for their cultural significance, nutritional profile, and perceived health benefits (Smith & Nguyen, 2021). This has incentivized smallholder farmers and commercial producers to scale up goat production to meet the growing market demand. The commercialization of the goat sector has also been facilitated by technological advancements and improvements in herd management practices. As Dey et al. describe in a 2023 journal article, the adoption of modern breeding techniques, feed supplementation, and disease control measures has helped to boost goat productivity and profitability for many farmers (Dey et al., 2023). Additionally, the rise of specialized goat milk and meat processing facilities has created new market linkages and value-addition opportunities along the supply chain.

However, the process of goat commercialization has also presented some challenges that require careful navigation. Alemu et al., in their 2022 policy brief, note that the shift towards more intensive production systems has in some cases led to the marginalization of traditional pastoralist communities who lack the capital to invest in larger-scale operations (Alemu et al., 2022). There are also growing concerns about the environmental sustainability of industrial goat farming, particularly in relation to feed sourcing and waste management. Various researches have been conducted though some literature gaps are still existing resulting in the carrying out of this study. The objective of this study was to assess the current state of goat commercialization in Gweru rural district.

4.2 Materials and Methods

A household survey questionnaire was used to collect information from the respondents and key informant interviews conducted with agricultural extension officers at district level.

4.2.1 Description of study area

Information on the study site was given in Chapter 3. The survey was carried out in Gweru rural district ward 12 in Midlands Province of Zimbabwe.

4.2.2 Research Design

In relation to the methodology section, the study implemented a cross sectional design based on previous studies that have been conducted (Petry *et al*., 2020). Details of the research design are provided in Chapter 3.

4.2.3 Sampling procedure

A multistage cluster sampling procedure was used to come up with the sample which was interviewed during the study and simple random sampling was utilized to eliminate respondent bias in line with previous studies as described in Chapter 3.

4.2.4 Data collection procedure

A mixed method approach was used during data collection. Household questionnaire being used at household level and a key informant interview guide used to ask information concerning the study from professionals within the district. A detailed account on data collection procedure is in Chapter 3.

4.2.5 Data analysis procedure

A Household Commercialization Index was used for data analysis including descriptive statistics and frequency tables, as in chapter 3 of the report.

4.2.5.1 Current state of goat commercialization in Chiundura

Household Commercialization Index (HCI) is the proportion of total agricultural production that is marketed (Strasberg et al., 1999). The index reflects a proportion of the total value of goats sold in the market out of the total value of goats kept by a farmer. The total value of goats kept by a farmer takes into consideration the value of goats a farmer has in addition to any sales and/or deaths they experienced in a period of one year and expressed as:

$$\text{HCI} = \frac{\textit{TOTAL VALUE OF GOATS SOLD}}{\textit{TOTAL VALUE OF GOATS KEPT}} \times 100\%$$

4.2.6 Challenges encountered during data collection

Data collection for the study coincided with the CLAFA assessments thus aiding to survey fatigue. Physical key informant interviews were also disturbed due to the same assessment which saw the researcher using online platforms (email and WhatsApp) to relay the key informant guide and responses however, responses were minimal.

4.3 Results and discussion

4.3.1 Household Demographics

There are a few household heads who had reached tertiary education 8(2.6%) and only 10(3.2%) had no not been in formal school. The highest level of education reached by other household members apart from the household head was predominated secondary school, with 269 (85.9%) having completed secondary level education. The most livelihood activity in the surveyed households was farming with the majority of household heads 256 (81.8%) being full time farmers whilst 14(4,5%) were builders, 12(3.8%) teachers and the remaining predominantly welders and village heads 4(1.3%) each. The majority of interviewed households 309(98.7%) were of Christian faith whilst 4(1.3%) were traditionalists. The predominance of male-headed households (85%) aligns with broader trends observed in the livestock sector, where men often retain primary control over livestock assets and decision-making. Current low education levels or the households negatively affect their level of decision making and understanding of ensuring effective goat farming practices such as planning and marketing. However, as Megersa et al. (2014) and Gizaw et al. (2018) have noted, women play a crucial yet often underrecognized role in smallholder goat production, particularly in terms of daily management and income generation.

The median age in years of the household head in the study was 52, with minimum age 27 years whilst the oldest surveyed was 83 years. The median age of 52 years for the household head is within the economically active populace in the country thus contributing to national economic growth. The most common household size in the study was 6, whilst the minimum and maximum were 3 and 13 respectively. Most households had more females than males, with the mode of household members disaggregated by sex, being 3 for females and 2 for males. As Kosgey et al. (2008) and Gebreyesus et al. (2022) have noted, middle-aged household heads

often have the necessary experience, labor, and resources to effectively manage and invest in livestock production. Also, the gender imbalance observed, with more females than males per household, may also indicate the critical role of women in the day-to-day management of goats, as corroborated by studies such as Megersa et al. (2014) and Gizaw et al. (2018).

The data showed that the majority of household heads (85%) are male, which is consistent with broader patterns observed in rural African communities (Gizaw et al., 2018; Kosgey and Okeyo, 2007). However, the presence of female-headed households (15%) is noteworthy, as studies have highlighted the important role of women in livestock management (Megersa et al., 2014; Gizaw et al., 2018). Additionally, as Gebreyesus et al. (2022) and Kosgey et al. (2008) have noted, higher levels of education among household members can enhance their ability to access information, make informed decisions, and engage more effectively in market-oriented livestock production. Overall, the demographic characteristics of the Chiundura households, particularly the educational attainment, occupational profiles, and household size and composition, suggest a reasonable foundation for the potential commercialization of the goat sector.

Table 1: Household head demographics

Variable	Category	N	Percent
Household Head's Gender	Female	47	15
	Male	266	85
Household Head Highest level of education	No formal or informal education	10	3.2
	Primary	148	47.3
	Secondary	147	47
	Tertiary education	8	2.6
Highest level of education of any other household member	Primary	15	4.8
	Secondary	269	85.9
	Tertiary education	29	9.3
Household Head Occupation	Builder	14	4.5
	Carpenter	9	2.9
	Driver	2	0.6

	Farmer	256	81.8
	Gold panner	3	1
	Pastor	2	0.6
	Police officer	1	0.3
	Retired	4	1.3
	Soldier	2	0.6
	Teacher	12	3.8
	Village head	4	1.3
	Welder	4	1.3
Religion	Christianity	309	98.7
	Traditional	4	1.3
Household Head Age	Median	52	
	Mode	52	
	Mean	52	
	Minimum	27	
	Maximum	83	
	Standard deviation	2	
Household size	Median	6	
	Mode	6	
	Minimum	3	
	Maximum	13	
	Mean	6	
	Standard Deviation	1.31	
Number females in the household	Median	3	
	Mode	3	
	Mean	3	
	Standard Deviation	0.56	
	Minimum	1	

	Maximum	8
Number males in the household	Median	2
	Mode	2
	Mean	2
	Standard deviation	1.15
	Minimum	0
	Maximum	7

Source: (Own data, 2024)

4.3.2 Goat ownership

All the households surveyed in the study owned goats. The majority of households 307(98.1%) owned indigenous goats, whilst 119(38%) owned cross breeds and 12(3.8%) had exotic breeds. The study in Chiundura showed that, in most households there is dual ownership of goats 207(66.1%), whilst males owned 72(23%) and females 34(10.9%). The table 2 below shows numerical distribution of goats within the various households. Most households owned at least 16 goats in total, 12 does and 5 bucks belonging to the indigenous breed. It is paramount that most households owned more does than bucks which promotes a numerical increase of the head. The findings in terms of goat ownerships concurs with other studies, where a household was said to own on average 20 goats (Mazhangara, Chivandi, Mupangwa, & Muchenje, 2019). The presence of crossbred (38%) and exotic (3.8%) goats suggests some level of uptake of improved genetic material, which could potentially enhance productivity and market competitiveness (Kosgey & Okeyo, 2007; Gebreyesus et al., 2022). However, there is need for more targeted efforts to promote the integration of improved breeds in the study area.

Table 2: Household distribution of goats

	Total goats	Bucks	Does	Exotic goats	Cross bred goat	Indigenous Goats
Median	18	5	13	0	0	16
Mode	16	5	12	0	0	17
Mean	18	5	13	0	0	16
Minimum	5	0	4	0	0	0
Maximum	40	15	30	7	24	32

Source: (Own data, 2024)

The median herd size of 18 goats, with a modal value of 16 goats, is consistent with the general range of herd sizes reported in similar smallholder systems across the region (Kosgey et al., 2008; Megersa et al., 2014; Gizaw et al., 2018). The higher proportion of does (median of 13) compared to bucks (median of 5) aligns with the common practice of maintaining a larger breeding female population to promote herd growth and productivity (Kosgey & Okeyo, 2007; Megersa et al., 2014). Notably, the presence of crossbred (up to 24 per household) and exotic (up to 7 per household) goats suggests some level of integration of improved genetic material, which can potentially enhance productivity and market competitiveness (Kosgey & Okeyo, 2007; Gebreyesus et al., 2022).

Figure 6 below, shows the proportion of households by reason of goat ownership. The results show that the majority of households 96% (301) and 65% (203) own goats for the purposes of selling as live animal and breeding stock respectively. A lower proportion 17% (52) own goats to sell as meat whilst 12% (38) for manure.

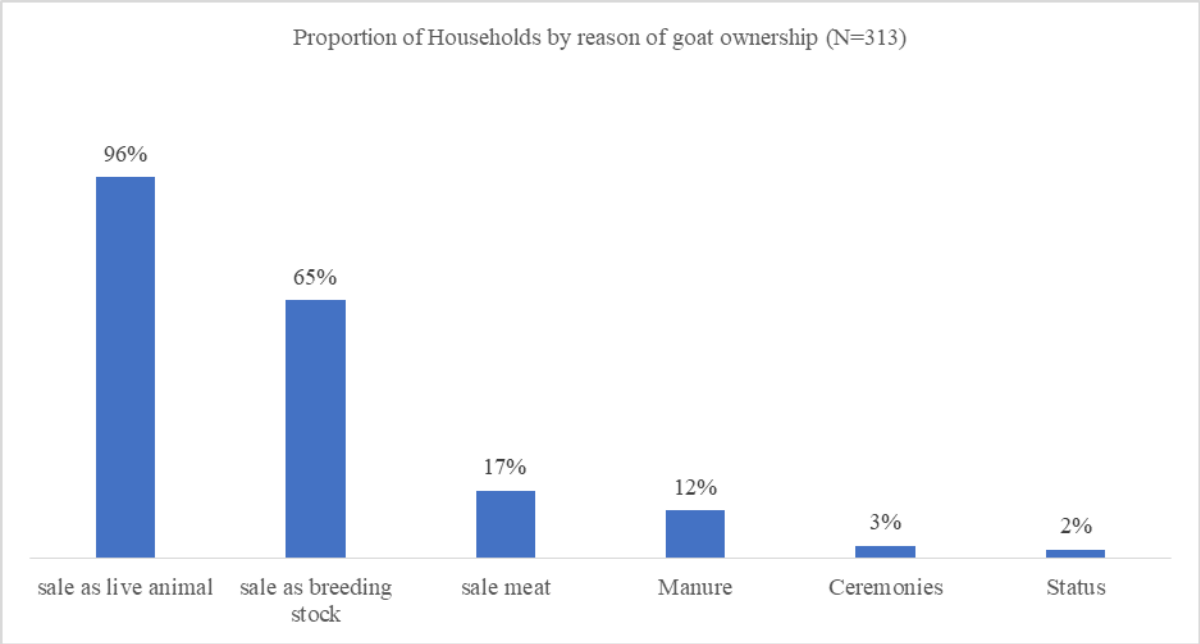

Figure 5: Proportion of Households by reasons of goat ownership
Source: (Own data, 2024)

The findings presented in the chart on the "Proportion of Households by Reason of Goat Ownership" provide an informative snapshot of the multifaceted roles that goats play in the livelihoods of the surveyed households. The dominance of live animal sales as the primary reason for goat ownership (96%) aligns with the common observation that smallholder farmers in the region often keep goats as a form of asset accumulation and a source of cash income, particularly for meeting unexpected household needs or emergencies (Kosgey et al., 2008; Megersa et al., 2014; Gizaw et al., 2018). The relatively high proportion of households (65%) that keep goats for breeding purposes suggests the importance of goats as a genetic resource and a means of herd expansion and intensification (Kosgey & Okeyo, 2007; Gizaw et al., 2018). This finding underscores the potential for targeted breeding programs and the integration of improved genetic material to enhance productivity and market competitiveness. The 17% of households that keep goats for meat production indicates the role of goats in providing a source of protein and income, particularly during festive or ceremonial occasions (Megersa et al., 2014; Gizaw et al., 2018). This diversified use of goats, encompassing both live animal sales and meat production, highlights the multifunctional nature of smallholder goat production systems. On the contrary, while live animal sales are dominant, further research could examine the potential for

more market-oriented production, such as specialized meat or milk goat enterprises, and the constraints that might hinder their development.

4.3.3 Goat commercialization

The majority of households 234(74.8%) sold at least a goat in the past 12 months from the day of data collection. The table below shows the proportion of households that sold goats by the person who influenced the sale. In 146(62%) of households the results show that there was dual decision making in the sale of goats within the stipulated period, whilst in 24.8% and 12.8% of households the decision was unanimously male and female respectively. This corroborates the study findings that goat ownership in most households was dual, thus influencing the decision-making processes. In most households 192(82%) it is the duty of males to go with the goats to the market as the household head. The study showed that most households were male headed which supports the assertion that the household head (males) were responsible for going to the market.

The fact that 74.8% of households sold at least one goat in the past 12 months suggests that goat sales are a significant livelihood activity for the majority of households in the study area. This aligns with the common observation that smallholder farmers in the region often keep goats as a form of liquid assets that can be readily converted into cash to meet various household needs (Kosgey et al., 2008; Megersa et al., 2014; Gizaw et al., 2018). Goats are often kept as a form of liquid asset that can be readily converted into cash to meet various household needs, such as school fees, medical expenses, or investment in other assets (Mapiye et al., 2009; Nyamushamba et al., 2017). The observation that in the majority (82%) of households, it is the duty of male household heads to take the goats to the market is consistent with the general pattern of gendered division of labor and decision-making power in Zimbabwe's smallholder livestock systems (Mapiye et al., 2009; Nyamushamba et al., 2017). This finding suggests that interventions aimed at improving market access and participation should consider the existing social and cultural norms that influence the roles of men and women in livestock marketing.

Table 3: Proportion of Households selling goats in the past 12 months by sale decision maker

		Sale any goats in past 12 months
Who determines when to sell the goats	Joint (Male/Female)	62.40%
	Male	24.80%
	Female	12.80%

Source: (Own data, 2024)

In most households 195(83%) that sold goats the decision to use the proceeds from the sale was unanimously dual, whilst in 33(14%) females made the decision on how to spend. A limited number of households 18(8%) that participated in the sale of goats had a household member belonging to a goat farmer group and of these only 2(11%) sold their goats within a group as they had a contract agreement to supply goats. The study showed that there was limited access to credit facilities as only 19(6%) of the surveyed households had access to any form of credit scheme. The average interest rate for the credit facilities was noted to be 18%. The observation that in the majority (83%) of households, the decision on how to use the proceeds from goat sales was made jointly by both males and females is significant. This is consistent with the literature on the importance of considering both men's and women's roles and preferences in the use of livestock-derived income to ensure more equitable and efficient household resource allocation (Njuki & Sanginga, 2013; Galiè et al., 2015). Further, limited access to credit can limit the ability of smallholders to invest in productivity-enhancing technologies, purchases of breeding stock, or other investments that could improve their goat production and marketing (Nyamushamba et al., 2017; Mapiye et al., 2009).

4.3.3.2.1 Household state of commercialization

Among the sampled households, the range of household commercialization Index (HCI) in the study area was between 0 to 100. Table 4 below, illustrates that approximately 82% of households are at a low level of commercialization with index between 0 and 30, selling an average of 17% of their total herd. In contrast, 11.5% and 6.7% of households had a medium (index between 31 and 50) and high level (index between 51 and 100) of commercialization index. These households sold an average of 39% and 82% of their head, respectively. Looking at the HCI holistically, the research area's average household commercialization rate was at 29.7%, meaning that generally the area is focusing on goat production in a subsistence manner. The

results concur with Dube and Guveya (2016), findings in Manicaland and Masvingo on the smallholder agriculture *commercialization level.*

Table 4: Household Level Commercialization Index

Level of Commercialization			**HCI**		
HCI Indice	**Frequency**	**Percent**	**Mean**	**Max**	**Min**
low (0 -30)	256	81.8	16.7	30.7	0
Medium (31 - 50)	36	11.5	38.8	46.2	31.25
High (51 - 100)	21	6.7	82	100	53.3
Total	**313**	**100**	**29.7**	**100**	**0**

4.4 Recommendations

The following recommendations were proffered to various stakeholders;

i. Extension workers should focus on expanding access to and quality of extension services, particularly in areas without nearby animal health centers and provide information and training on improved goat breeds.
ii. Butchery owners and abattoir owners should engage with extension services and farmer groups to establish reliable supply chains for quality indigenous, crossbred and exotic goats to meet customer demand.
iii. Butchery owners and abattoir owners should provide market information and pricing transparency to farmers to enable them to make informed decisions when selling their goats.
iv. Policymakers should explore ways to incentivize and support the adoption of improved goat breeds to increase productivity, while also preserving indigenous genetic resources.
v. Policymakers should develop policies to encourage collective marketing by smallholder farmers, which could improve their bargaining power and access to lucrative market opportunities as well as strengthening extension services to continue providing training and information on improved goat production and marketing practices.

4.5 Conclusion

The findings from this study provide valuable insights into the household demographics, livelihood activities, and goat ownership and management practices in the Chiundura region. The data reveals that the majority of households are engaged in farming as their primary livelihood, with most household heads being full-time farmers. This aligns with the widespread ownership of goats across the surveyed households, with nearly all households owning indigenous goat breeds. The study highlights the multifaceted roles that goats play in the livelihoods of these smallholder households. Goats are not only kept for subsistence purposes, but also serve as a source of income through the sale of animals. The decision-making process around goat sales and the use of proceeds is predominantly a dual effort between male and female household members, indicating the important economic contribution of goats to the household.

Furthermore, the findings demonstrate the significant role of agricultural extension services in providing training and information to farmers on goat production and marketing. The majority of households reported receiving some form of training or marketing information in the past year, primarily through extension workers. However, the study also reveals potential areas for improvement, such as the limited access to animal health centers within the region. The average distance to the nearest center is 7 kilometers, which may pose challenges for smallholder farmers in accessing veterinary services and maintaining the health of their goat herds.

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CHAPTER 5

FACTORS INFLUENCING THE LEVEL OF GOAT COMMERCIALIZATON

ABSTRACT

The level of goat commercialization among smallholder farmers is influenced by various factors. Recent studies have identified access to markets and market information, household asset endowments, and gender dynamics as key determinants. Proximity to markets, larger goat herd sizes, higher levels of education, and access to extension services and credit have been positively associated with increased goat commercialization. This study explored the factors influencing the level of goat commercialization in the Gweru rural district of Zimbabwe. A household survey and key informant interviews were conducted to collect data. Torbit regression analysis was employed in determining the level of goat commercialization. The household commercial index (HCI) was also used as a model for the determination process. The analysis revealed that three factors significantly influenced the household level of goat commercialization: attainment of secondary-level education by the household head, availability of an animal health center within the area, and attendance of training in animal health. The findings of the study were that the independent variables were statistically significant ($P<0.05$) and influenced the household level of goat commercialization. The three variables were notably attainment of secondary level education by household head, availability of animal health center within the area and attendance of training in animal health. It was recommended that there is need to encourage the future generation to continue with their education as it has a bearing in their market reasoning and decision-making processes.

Key words: factors: smallholder goat farmers; market outlets; commercialisation

5.1 Introduction

The level of goat commercialization in smallholder farming systems is influenced by a variety of factors. Recent studies have identified several key determinants of goat commercialization in developing regions. One of the primary factors is access to markets and market information. Gizaw et al. (2018) found that proximity to markets and access to market information were positively associated with the level of goat commercialization among smallholder farmers in Ethiopia. Similarly, Megersa et al. (2014) noted that households with better access to markets and market information were more likely to sell a higher proportion of their goat production.

Household asset endowments also play a crucial role. Petry et al. (2020) reported that households with larger goat herd sizes, higher levels of education, and greater access to extension services were more likely to participate in the commercial sale of goats in Mozambique. Kosgey et al. (2008) observed that wealthier households in Kenya were more inclined to keep goats for commercial purposes rather than solely for subsistence. The gender dynamics within the household can also influence goat commercialization. Megersa et al. (2014) found that in male-headed households, the decision to sell goats was more likely to be made jointly by both spouses, whereas in female-headed households, the decision was more often made by the female head alone. Access to credit and financial services has also been identified as a significant factor. Gizaw et al. (2018) noted that households with access to credit were more likely to engage in the commercial sale of goats, as they could invest in herd expansion and improve their production and marketing strategies. Understanding and addressing these factors is crucial for promoting the commercialization of the goat industry and enhancing the livelihoods of smallholder farmers in developing regions. The objective of this study was to explore the factors influencing the level of goat commercialization.

5.2 Materials and Methods

A household survey questionnaire was used to solicit information from the respondents and key informant interviews conducted with AGRITEX officers at district level.

5.2.1 Description of study area

The survey was conducted in Gweru rural district ward 12 in Midlands Province of Zimbabwe. Details of the study site are provided in Chapter 3.

5.2.2 Research Design

In relation to the methodology section, the study implemented a cross sectional design based on previous studies that have been conducted (Petry *et al*., 2020). Details of the research design are provided in Chapter 3.

5.2.3 Sampling procedure

A multistage cluster sampling procedure was used to come up with the sample which was interviewed during the study and simple random sampling was utilized to eliminate respondent bias in line with previous studies as described in Chapter 3.

5.2.4 Data collection procedure

A mixed method approach was used during data collection. Household questionnaire being used at household level used to ask information concerning the study from professionals within the district. A detailed account on data collection procedure is in Chapter 3.

5.2.5 Data analysis procedure

Descriptive statistics, torbit regression analysis and frequency tables were used in analysing survey data. Parametric statistics were used during data analysis with logistics models used for analysis of influencing factors by objective.

5.2.6 Factors influencing the level of goat commercialization

To determine factors influencing the level of goat commercialization a torbit regression analysis was adopted. The model consists of a dependent variable (Household commercialization index) as a continuous variable, the predictor variables Total goats owned, Age of HH head, and HH size are continuous whilst Secondary education, Tertiary education, Farmer group status, HH head Gender, Access to Credit facilities, Access to market information, Training on marketing status, Training on animal health status, availability of animal health centres, availability of butcheries are dichotomous variables. The regression logistic model used for the analysis is as below.

Model Specifications:

$$y = \alpha + \beta_{1HHS} + \beta_{2TGW} + \beta_{3HHA} + \beta_{4SLE} + \beta_{5TLE+} \beta_{6FGS} + \beta_{7HHG} + \beta_{8ACF} + \beta_{9AMI} + \beta_{10TMS} + \beta_{11TAH} + \beta_{12AHC} + \beta_{13AB} + e$$

Where,

Y= the dependent variable, Household commercialization index

α = constant variable

β1…...β5 = coefficients of factors affecting level of goat commercialization

HHS = HH size

TGW = Total goats Owned

HHA = HH head Age

SLE = Secondary Education

TLE = Tertiary Education

FGS = Farmer Group Status

HHG = Household Head Gender

ACF = Access to credit facilities

AMI = Access to Marketing Information

TMS = Training on Marketing Status

TAH = Training on Animal health Status

AHC = Availability of animal health centres

AB = Availability of Butcheries

e = is an error term which captures all other factors neglected but influencing goat commercialization

5.2.7 Challenges encountered during data collection

In conducting the study on the factors influencing the level of goat commercialization in the Gweru rural district using a questionnaire, the researcher encountered some challenges during the data collection process. It was somewhat difficult to gain access to some smallholder farmers who rear goats who were in hard-to-reach areas. The farmers were also finding it difficult to recall details about their goat production, sales, and marketing activities, particularly those do not keep detailed records. Some of the responses that were given by the households were inconsistent in line with their situations.

5.3 Results and discussion

5.3.1.1 Access to information and trainings

The majority of households surveyed 286(91.4%) had received goat marketing information in the past 12 months whilst 27(8.6%) had not received any marketing information. This aligns with the growing recognition in the literature of the importance of access to timely and relevant market information for smallholder livestock producers to make informed decisions and improve their participation in livestock value chains (Mapiye et al., 2019; Musemwa et al., 2008). The majority of households 263(84%) that received goat marketing information got it from the agricultural extension workers, 15(4.8%) from various media platforms whilst 8(2.6%) from other farmers. This is consistent with previous studies that have emphasized the importance of effective extension systems in providing livestock producers with access to market intelligence, technical advice, and linkages to various value chain actors (Manyani et al., 2020; Mapiye et al., 2009). This implies that farmers will be able to commercialize their farming activities if access to markets is enhanced and demand will be high.

The table 5 below is a summary of the proportion of households receiving information by source.

Table 5: Proportion of Households receiving market information in the past 12 months by Source

			Receive goat market information in the past 12 months		Total
			No	Yes	
Source of market information		Count	27	0	27
		% of Total	8.6%	0.0%	8.6%
	Extension staff	Count	0	263	263
		% of Total	0.0%	84.0%	84.0%
	Media	Count	0	15	15
		% of Total	0.0%	4.8%	4.8%
	Other Farmers	Count	0	8	8

	% of Total	0.0%	2.6%	2.6%
Total	Count	27	286	313
	% of Total	8.6%	91.4%	100.0%

Source: (Own Data, 2024)

Table 6 below shows the proportion of households trained in goat production by type of trainer. The majority of households 302(95.6%) had received at some form of training 12 months prior the survey. Agricultural extension workers led the farmer capacity building fraternity with 290(92.7%) having being trained by extension workers, 10(3.2%) online whilst 2(0.6%) where trained by non-governmental organisations (NGOs). The observation that the majority (95.6%) of households had received some form of training in goat production within the 12 months prior to the survey indicates a relatively high level of investment in building the technical and management capacities of smallholder goat farmers. This aligns with the growing recognition in the literature of the importance of farmer training and capacity building for improving the productivity and sustainability of smallholder livestock production systems (Mubukwanu et al., 2019; Nyoni & Mabhena, 2019). The finding that the majority (92.7%) of households had been trained by agricultural extension workers highlights the critical role of extension services in delivering technical support and information to smallholder goat producers. This is consistent with previous studies that have emphasized the importance of effective and accessible extension systems in providing farmers with the necessary knowledge, skills, and technologies to improve their livestock management practices and market participation (Mapiye et al., 2019; Musemwa et al., 2008).

Table 6: Proportion of Households trained in goat production by type of trainer

			Did you receive any training on goat production in the past 12months?		Total
			No	Yes	
who trained you on goat production?		Count	11	0	11
		% of Total	3.5%	0.0%	3.5%
	Government	Count	0	290	290

	Extension	% of Total	0.0%	92.7%	92.7%
	NGO	Count	0	2	2
		% of Total	0.0%	0.6%	0.6%
	Online	Count	0	10	10
		% of Total	0.0%	3.2%	3.2%
Total		Count	11	302	313
		% of Total	3.5%	96.5%	100.0%

Source (Survey data,2024)

The table 7 below show summary statistics of the proportion of households trained in goat marketing by source of training. The majority of households 281(89.8%) were trained by extension workers whilst 12(3.8%) trained online. There is need to channel more resources to the agricultural extension workers so that they reach all the goat farmers with trainings. The observation that the majority (89.8%) of households were trained by agricultural extension workers on goat marketing aligns with the experiences in many parts of the world. Studies from Europe, Asia, and Africa have consistently highlighted the critical role of extension services in providing technical and market-oriented training to smallholder livestock producers (Khatiwada et al., 2018; Megersa et al., 2014; Nnadi et al., 2020).

Table 7: Proportion of Households trained in goat marketing by type of trainer

			Did you receive any training on goat marketing in the past 12months?		Total
			No	Yes	
who trained you on goat marketing		Count	20	0	20
		% of Total	6.4%	0.0%	6.4%
	Government	Count	0	281	281

	Extension	% of Total	0.0%	89.8%	89.8%
	Online	Count	0	12	12
		% of Total	0.0%	3.8%	3.8%
Total		Count	20	293	313
		% of Total	6.4%	93.6%	100.0%

Source (Survey data, 2024)

At least 309(98.7%) of households had received a training in animal health, with 98.1% trained by extension workers as shown in table 8 below. A limited number of households received animal health training online. This could be attributed by the erratic internet connectivity in the rural areas of Chiundura. The efforts of extension workers in trainings goes a long way in the management of diseases and help to curb outbreaks. Studies from South Africa and Zambia have highlighted the critical role of agricultural extension services in delivering livestock health-related training and information to smallholder farmers (Mabaya et al., 2017; Mofya-Mukuka & Haggblade, 2013). Similarly, research from South Africa and Zambia has shown that the limited access to reliable internet connectivity and digital literacy among smallholder farmers can hinder the widespread adoption of online extension and advisory services as well as off-line applications (Asenso-Okyere & Mekonnen, 2012; Masuka et al., 2016).

Table 8: Proportion of Households trained in Animal Health by type of trainer

			Did you receive any training on Animal health in the past 12 months?		Total
			No	Yes	
who trained you on animal health		Count	4	0	4
		% of Total	1.3%	0.0%	1.3%
	Government Extension	Count	0	307	307
		% of Total	0.0%	98.1%	98.1%

	Online	Count	0	2	2
		% of Total	0.0%	0.6%	0.6%
Total		Count	4	309	313
		% of Total	1.3%	98.7%	100.0%

Source: (Own data, 2024)

The majority of households 307(98.1%) had not received any goats in the past 12 months to the day of data collection. At least 6(1.9%) households received goats, 2(0.6%) from the presidential goat scheme whilst 4(1.3%) from relatives as shown in table 9 below.

Table 9: Proportion of Households that received goats by source

			Did you receive any goats the past 12 months,		Total
			No	Yes	
Where did you receive the goats from?		Count	307	0	307
		% of Total	98.1%	0.0%	98.1%
	Presidential goat scheme	Count	0	2	2
		% of Total	0.0%	0.6%	0.6%
	Relative	Count	0	4	4
		% of Total	0.0%	1.3%	1.3%
Total		Count	307	6	313
		% of Total	98.1%	1.9%	100.0%

Source: (Survey Data; 2024)

Studies conducted in the country have highlighted the various constraints that limit the ability of small-scale producers to acquire and maintain goat herds, such as the high cost of purchase, feed,

and veterinary care, as well as the impacts of drought, diseases, and theft (Nyoni & Mubayiwa, 2017; Ncube et al., 2021). The fact that a small proportion (0.6%) of households in the study area received goats through the Presidential Goat Scheme reflects the limited reach and impact of such government-led livestock distribution programs in Zimbabwe. Research has shown that while these initiatives aim to improve the asset base and resilience of smallholder farmers, they often face challenges in terms of poor targeting, inadequate support, and sustainability (Mubaiwa et al., 2019; Chikwati & Mutambara, 2021).

5.3.1.2 Availability of animal health centers

Most households 176(56.2%) did not have an animal health center within their area as opposed to 137(43.6%). The average distance to the nearest animal health center was 7 kilometers, minimum being 2 kilometers and maximum 16 kilometers. The long distance to the nearest health center negatively affects farmers health seeking behavior and refutes all the efforts that would have been invested in farmer education when diseases out-breaks present. Studies conducted in Mozambique, Zambia, and Zambia have highlighted the uneven distribution and poor accessibility of animal health facilities, particularly in remote rural areas, which contribute to the limited veterinary support available to smallholder livestock producers (Temba et al., 2016; Nyirenda et al., 2018; Siamudaala et al., 2021). The average distance of 7 kilometers (with a range of 2 to 16 kilometers) to the nearest animal health center reported in the findings is consistent with the literature from the region. Research in Mozambique and Zambia has shown that the long distances and poor road infrastructure that smallholder farmers often have to traverse to reach veterinary services can be a significant barrier to accessing timely and adequate animal health care (Temba et al., 2016; Siamudaala et al., 2021). Studies in Mozambique and Zambia have documented how the lack of proximity to veterinary services, coupled with financial constraints and poor transportation, often leads to delayed or suboptimal care-seeking by smallholder livestock producers, ultimately compromising animal health and production (Temba et al., 2016; Nyirenda et al., 2018).

5.4 Discussion

The analysis shown in table 10 below, exhibited that 3 independent variables were statistically significant ($P<0.05$) and influenced the household level of goat commercialization. The three variables were notably attainment of Secondary level education by household head, total number

of goats owned, age of the goats, availability of animal health center within the area and attendance of training in animal health. A unit change in household head attainment of secondary education influenced the household level of goat commercialization by 6.9 times in the positive direction (P = 0.01). A unit change in availability of an animal health center within the area influenced an increase in household level of goat commercialization by a factor 11.7 (P = 0.00), whilst a unit change in attendance of a training in animal health had a negative influence by a factor of 40.2 in household level of goat commercialization. All other variables included in the model were not statistically significant to influence the level of goat commercialization.

The findings corroborate other studies that showed that household level of education positively influenced the extent of commercialization. This means that the more the household head had attained a secondary level education the more the chances the commercialization index increased. This is most likely due to the fact that education could raise household knowledge of market dynamics and enable them to make prompt decisions regarding the volume of output sold (Makhura et al, 2001; John & Dawit, 2007). The positive influence of the household head's secondary-level education on the level of goat commercialization is consistent with findings from recent studies. Petry et al. (2020) observed that higher levels of education among household heads were associated with increased participation in the commercial sale of goats in Mozambique. This relationship can be explained by the fact that higher levels of education may enable better decision-making, access to information, and adoption of improved goat management and marketing practices.

The availability of an animal health center influenced an increase in commercialization which is in line with other studies. Availability improved access of smallholder communities to technical services and management of diseases and parasites thus improving the quality of animal health ahead of sale and marketing (Roger, 2019; Ndumiso et al., 2022). The key informant findings highlighted that there were perennial issues with animal health within the area. The findings corroborate the regression analysis in the sense that availability of animal health centres in the area lessened the likelihood ill health animals on the market. There is more confidence of farmers selling their livestock within the vicinity of animal health centres.

Gizaw et al. (2018) found that proximity to veterinary services was a significant factor in enhancing the commercialization of goat production in Ethiopia. The availability of an animal

health center can improve the health and productivity of goats, thereby increasing the marketable surplus and enhancing the household's level of commercialization. The study findings showed that there was less likelihood for an increase in commercialization in a household that had attended a training in animal health, as this variable influenced negatively the household commercialization index. This opposes findings from other studies that explained that capacity building was key to influence commercialization (Ndumiso et al., 2022). In some assessed variables, the findings were inconsistent with other studies that mentioned that total produce, access to markets, distance to market, availability of trainings influenced household commercialization levels (Abdu Mohammed et al, 2016). Furthermore, sex, age of household head, and access to markets had no influence on the household commercialization index.

Table 10: Regression output of factors influencing goat commercialization

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	60.952	18.997		3.208	.002
	Secondary Education	6.934	2.52	-0.111	-1.648	.010
	Tertiary Education	-8.004	8.131	-.063	-.984	.326
	Total goats owned	-.463	.245	-.160	-1.887	.061
	What is the household Head's Gender?	-5.118	3.329	-.103	-1.537	.126
	What is the age of household Head?	-.259	.134	-.146	-1.931	.055
	What is the size of your household?	.639	.811	.067	.787	.432
	Are you or any member of your family in a goat farmer group?	-3.973	4.306	-.058	-.923	.357
	Do you have access to any credit facilities?	-6.034	6.690	-.063	-.902	.368

Did you receive goat market information in the past 12 months, e.g., on prices?	7.140	6.590	.098	1.083	.280
Did you receive any training on goat production in the past 12months?	3.724	9.583	.032	.389	.698
Did you receive any training on goat marketing in the past 12months?	9.235	7.582	.086	1.218	.225
Did you receive any training on Animal health in the past 12months?	-40.221	16.063	-.202	-2.504	.013
Do you have Animal health center in your area?	11.729	2.806	.313	4.180	.000
Do you have butcheries/ supermarket where you can sale goats in your area?	2.231	2.875	.054	.776	.439

a. Dependent Variable: Household Commercialization Index

Source: (Own Data, 2024)

5.5 Recommendations

The study gave the following recommendations;

i. In view of the survey findings there is need to avail more animal health centers within the rural areas, to help provide technical expertise in the management of diseases and parasites.
ii. There is need to provide farmers within the area with improved bucks that can help improve the outcome type of breed. This can go a long way in the development of a sustainable goat value chain as improved breeds got a higher selling price.

iii. There is need to encourage the future generation to continue with their formal education as well as participating in capacity building initiatives in goat production as it has a bearing in their market reasoning and decision-making processes.

iv. There is need for segmented and tailored communication techniques to influence an increase the commercialization index.

v. To increase the average commercialization index, at policy level there is need to mainstream the goat value chain, develop enabling infrastructure and implement goat marketing frameworks within the sub national level, and strengthen public-private sector partnerships.

5.6 Conclusion

The study revealed that most surveyed households were male headed and farming was the major livelihood activity in the surveyed area. The main factor that influenced the household commercialization index was availability of animal health centers at the disposal of the household, age of the goats, and goat herd size, followed by education level of the household head. There was a negative likelihood for a household that attended animal health training to be engaged intensively in the marketing of goats. The agricultural extension workers led the farmer training programs in the area. The major problem faced by farmers in the commercialization of goats was lack of availability markets, poor indigenous breeds in the area as opposed to cross breeds that were on demand, and recurrent diseases and parasites.

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CHAPTER 6

ASSESSMENT OF FACTORS INFLUENCING THE CHOICE OF DIFFERENT MARKET OUTLETS AMONG SMALL HOLDER GOAT FARMERS IN CHIUNDURA, GWERU RURAL DISTRICT

ABSTRACT

This study examined the key challenges faced by smallholder goat farmers in commercializing their production and the factors influencing their choice of market outlets in the Gweru rural district in Zimbabwe. The objective of the study was to assess the factors influencing the choice of different market outlets among small holder goat farmers in Chiundura in Gweru rural. The findings from a logistic regression model highlighted several socio-economic and farm-level factors that shape the marketing decisions of these smallholder farmers. The study was conducted in Midlands Province, Gweru rural district and Ward 12. A cross-sectional quantitative study design. Multi-stage cluster sampling was employed. Data analysis was done using binary logistic regression model (chi-square) was used. The findings from the logistic regression model showed that there was a statistically significant strong positive association (Chi square - 88%; P = .000) between choice of market outlet and the predictor variables. A total of 5 variables included in the model were statistically significant (P < .05) in predicting the variables in the equation. The choice of marketing outlet was found to be significantly influenced by the availability of market information to the household. The study recommended that the private sector should leverage on the market gap in the district as an opportunity for economic growth and expansion.

Key words: factors, smallholder goat farmers, market outlets, commercialization, market decisions

6.1 Introduction

Goat farming is an important livelihood activity for many smallholder farmers in sub-Saharan Africa, providing a source of food, income, and asset accumulation (Kosgey et al., 2008). In Zimbabwe, the goat population is estimated at over 4 million, with the majority reared by resource-poor smallholder farmers (Chakoma et al., 2021). However, the commercialization of goat production remains low, with farmers often relying on informal and less remunerative market outlets (Nkonki et al., 2020).

The choice of market outlet is a critical decision for smallholder goat farmers, as it can significantly impact their income and overall livelihood (Godfray et al., 2010). Factors such as access to market information, bargaining power, transport, and social networks can influence the market channels used by these farmers (Mmbando et al., 2015; Roets and Kirsten, 2005). Understanding the determinants of market outlet choice is essential for designing policies and interventions to improve the commercialization of the goat value chain. Access to timely and accurate information on goat prices, demand, and market trends is a crucial factor in determining the choice of market outlet (Mmbando et al., 2015; Jaleta et al., 2013). Factors such as education, social capital, and membership in farmer organizations can enhance the bargaining power of smallholder farmers (Mmbando et al., 2015; Paudel et al., 2019). Household-level factors such as the age, gender, and education level of the household head, as well as the size and composition of the household, can also influence the choice of market outlet (Mmbando et al., 2015; Paudel et al., 2019). For example, younger and more educated household heads may be more likely to participate in formal market channels. The choice of market outlet among smallholder goat farmers in Chiundura, Gweru Rural District, is influenced by a complex interplay of factors which this study explored.

6.2 Materials and Methods

A household survey questionnaire was used to solicit information from the respondents and key informant interviews conducted with AGRITEX officers at district level.

6.2.1 Description of study area

The survey was conducted in Midlands Province, Gweru rural district and Ward 12, a detailed account was provided in chapter 3.

6.2.2 Research Design

A cross-sectional quantitative study design with reference to previous value chain studies was adopted, details are given in chapter 3.

6.2.3 Sampling procedure

As described in chapter 3, a multistage cluster sampling procedure was used to come up with the target sample. Simple random sampling was utilized to eliminate respondent bias in line with previous studies.

6.2.4 Data collection procedure

A detailed account concerning primary data collection for the study is detailed in chapter 3.

As described in chapter 3, binary regression analysis was used in analysis of factors influencing the choice of different market outlets among small holder goat farmers at household level.

6.2.4.1 Factors influencing the choice of different market outlets among small holder goat farmers

To determine factors influencing the choice of different market outlets among small holder goat farmers a binary logistic regression model was used. The dependent variable was the market outlet for goat, a binary variable predicting the choice of market a household preferred (1- Individual traders and 0 - Organised market). The predictor variables were continuous (HH size, HH head age, total goats owned, distance to organised market) whilst the remaining are dichotomous variables (HH head gender, access to market information, Secondary level education, access to credit facilities, access to training facilities). The regression model used for the analysis was as below.

Model Specifications:

$$Logit(p) = \alpha + \beta_{1Age} + \beta_{2MS} + \beta_{3Sex} + \beta_{4HHS} + \beta_{5FM} + \beta_{6DA} + \beta_{7HIN} + \beta_{8ABFIw} + \beta_{9HAL} + \beta_{10KBF} + \beta_{11CAE} + e$$

Where;

Y= choice of market outlet

α = constant variable

β1…...β11 = coefficients of factors affecting choice of market outlet

Age = HH age

HHS = HH size

TGO = Total goats owned

DOM = Distance to Organised markets

HHG = HH Gender

AMI = Access to market information

SLE=Secondary Level Education

ACF = Access to credit facilities

ATF = Access to training facilities

e = is an error term which captures all other factors neglected but influencing choice of market outlet

6.2.5 Challenges encountered during data collection

Data collection for the study coincided with the CLAFA assessments thus aiding to survey fatigue. Physical key informant interviews were also disturbed due to the same assessment which saw the researcher using online platforms (Email and WhatsApp) to relay the key informant guide and responses however, responses were minimal.

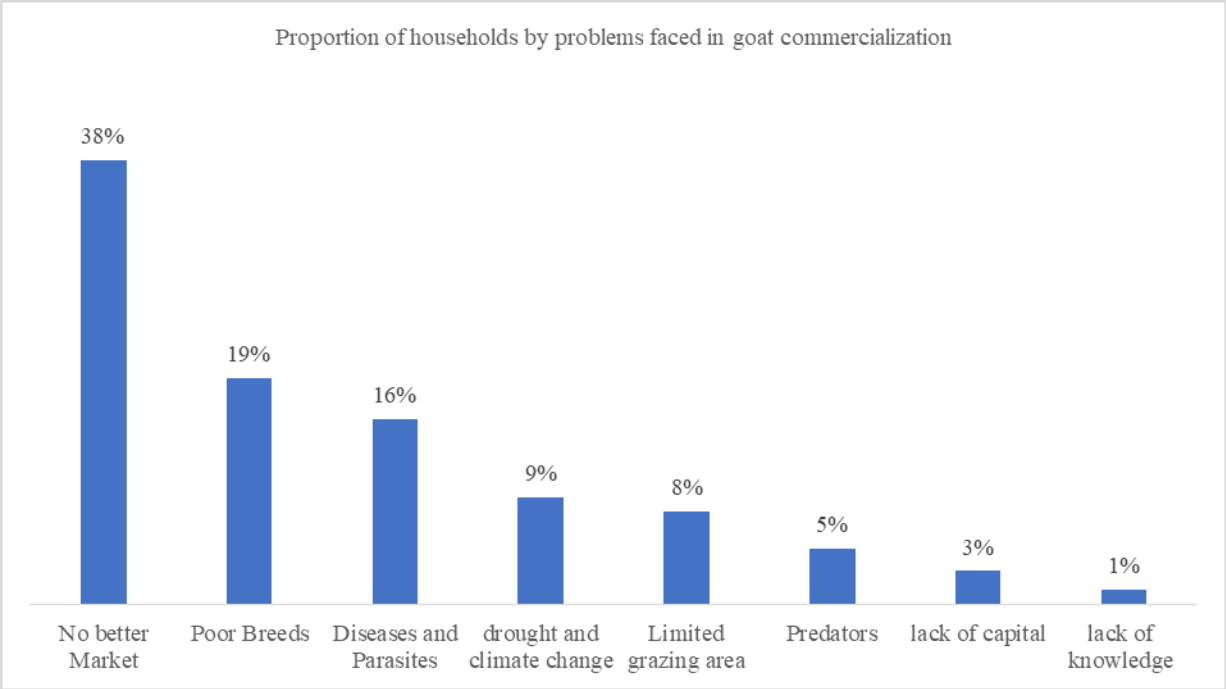
6.3 Results and discussion

Figure 11 below shows the problems faced by households in goat commercialization. The most prominent problem reported by households was at 38% lack of access to better markets, 19% poor breeds that do not sell good on the market, 16% frequent diseases and parasites whilst drought and climate change, and limited grazing area were 9% and 8% respectively. A limited proportion of households 3% cited lack of capital to invest more into goat commercialization and

1% that lacked knowledge about goat commercialization. The findings from the logistic regression model presented in your summary highlight the key factors that influence the choice of market outlets among smallholder goat farmers. These findings are consistent with the recent literature on the subject in the Southern African region.

The predominant challenge reported by 38% of the households is the lack of access to better markets. This issue is widely documented in the literature on smallholder livestock farming in Southern Africa. Nkonki et al. (2020) found that smallholder goat farmers in Zimbabwe often rely on informal and less remunerative market outlets, such as selling to local traders, due to limited access to formal markets. Additionally, the prevalence of diseases and parasites, as reported by 16% of the households, is a common challenge faced by smallholder livestock farmers in Southern Africa. Chakoma et al. (2021) highlighted the significant impact of diseases, such as internal and external parasites, on goat production in Zimbabwe, and the need for improved animal health management practices. On the contrary, the impact of drought and climate change, as reported by 9% of the households, is also well-documented in the literature on smallholder livestock farming in the region. Nkonki et al. (2020) noted that the frequency and severity of droughts in Zimbabwe have adversely affected the productivity and commercialization of goat production among smallholder farmers.

Table 11: Proportion of Households by problems faced in goat commercialization (N=313)



Source: (Survey data, 2024)

6.3.1 Factors influencing the choice of different market outlets among small holder goat farmers

The findings from the logistic regression model table 12 below showed that there was a statistically significant strong positive association (Chi square - 88%; P = .000) between choice of market outlet and the predictor variables. This shows that the model is good fit in predicting the variations between the dependent and independent variables. A total of 5 variables included in the model were statistically significant (P < .05) in predicting the variables in the equation. A unit change in household size influenced the choice of marketing outlet by a factor of 0.56 is the positive direction, sex of household head influenced the choice of market by a factor of 1.6 in the negative direction, access to training information on marketing influenced the choice of market by a factor of 2.6 in the positive direction, total goats owned influenced the choice of market by a factor of 0.1 in the positive direction. Education level of household head influenced the choice of marketing outlet by a factor of 0.7 in the positive direction.

The choice of marketing outlet was found to be significantly influenced by the availability of market information to the household. This entails that capacity building of farmers and relaying information on markets can help improve the commercialization level and choice of market outlet. There is need to leverage on social networks and Social and Behavioral Change Communication (SBCC) strategies to boost information dissemination to smallholder farmers on livestock marketing and economies of small scale (Oparinde et al., 2016). Having access to information about the market could assist farmers in deciding how much to produce based on market signals and enable them to produce primarily for the market, these results correspond with findings by other researchers (Abdu Mohammed et al, 2016).

The positive association between household size and the choice of market outlet, as indicated by the model (factor of 0.56), aligns with the findings of Nkonki et al. (2020) in Zimbabwe. They found that larger households were more likely to sell through formal market channels, as they had a greater labor pool to participate in various marketing activities. The negative influence of the sex of the household head (factor of 1.6) on the choice of market outlet is corroborated by studies in the region. Chaminuka et al. (2014) in South Africa and Marwa et al. (2017) in Tanzania observed that female-headed households were more likely to sell through informal market channels, potentially due to socio-economic and cultural barriers to accessing formal markets.

The positive association between the total number of goats owned and the choice of market outlet (factor of 0.1) aligns with the literature. Nkonki et al. (2020) and Chaminuka et al. (2014) found that farmers with larger herd sizes were more likely to participate in formal market channels, as they had a greater marketable surplus and could better meet the volume and quality requirements of these markets.

The positive influence of the education level of the household head (factor of 0.7) on the choice of market outlet is consistent with the findings of Marwa et al. (2017) in Tanzania. Educated farmers are often better equipped to navigate the complexities of formal market channels and have a greater understanding of market dynamics and requirements. These findings from the logistic regression model provide valuable insights into the key socio-economic and farm-level factors that shape the marketing decisions of smallholder goat farmers in the Southern African region.

The total number of goats owned by a household influenced the choice of market thus implying the need to increase the households' ability to generate excess in production which could be essential to raising their level of commercialization and choice of market (Oteh and Nwachukwu, 2014). The limited influence in choice of market induced by household size could be explained by the less likelihood of a high household size in selling their produce so as to meet the family consumption needs (Abdu Mohammed et al, 2016). However, household head level of education help in making sound decisions based on market value of the product at hand. The variables access to credit facilities and age of household head had no influence on the choice of marketing outlet by the household and were both statistically insignificant.

Table 12: Regression output of factors influencing choice of market outlet

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age of household Head	-.004	.019	.046	1	.830	.996
	Size of household	.565	.134	17.652	1	.000	1.759
	Household Head Gender	-1.620	.566	8.194	1	.004	.198
	Access to training on marketing	2.643	.761	12.078	1	.001	14.056
	Total Goats Owned	.105	.034	9.501	1	.002	1.111
	Access to any credit facilities	-1.210	.734	2.715	1	.099	.298
	Secondary education status HH head	.778	.361	4.650	1	.031	2.177
	Constant	-4.685	1.223	14.661	1	.000	.009
Nagelkerke R Square: .361							

Chi-square: 87.7; P = .000 Overall Classification: 79,6	

Source; (Survey data; 2024)

6.4 Recommendations

Based on the study findings, the researcher proposed the following recommendations;

i. The private sector should leverage on the market gap in the district as an opportunity for economic growth and expansion.
ii. There is need to intensify small holder trainings on marketing as a way to induce emancipation of farmers from the subsistence way of agricultural practice.
iii. Public-private partnerships through small to medium enterprises need to be established for the introduction and management of improved breeds.
iv. Veterinary services need to intensify diseases surveillance within the district. At policy level there is need for inclusion of management of small ruminants in educational curriculum and business sector to promote the goat value chain.
v. The Government of Zimbabwe need to prioritize setting up clear goat value chain protocols at national and sub national level.

6.5 Conclusion

This study provides valuable insights into the challenges faced by smallholder goat farmers in commercializing their operations, as well as the key factors influencing their choice of market outlets. The findings are largely consistent with the recent literature on smallholder livestock farming in the Southern African region. The most prominent challenge reported by households was the lack of access to better markets. This issue of limited market access for smallholder livestock farmers is well-documented, with studies highlighting their reliance on informal and less remunerative market channels. The prevalence of diseases and parasites is another common challenge faced by smallholder livestock farmers in the region, underscoring the need for improved animal health management practices. The logistic regression analysis identified several key socio-economic and farm-level factors that influence the choice of market outlets among smallholder goat farmers. Access to market information emerged as a particularly important

factor, with a positive and statistically significant association with the choice of market outlet. This emphasizes the importance of capacity building and information dissemination to empower farmers and enable them to make more informed marketing decisions. These findings highlight the multifaceted nature of the challenges facing smallholder goat farmers in the commercialization of their operations. Addressing the key constraints, such as improving market access, strengthening animal health management, and enhancing the dissemination of market information, will be crucial in supporting the livelihoods and commercialization efforts of these smallholder producers.

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CHAPTER 7

TO ANALYZE THE CURRENT STATE OF GOAT VALUE CHAIN IN CHIUNDURA WARD 12

ABSTRACT

The goat value chain in the rural community of Chiundura, Gweru district, Zimbabwe, plays a vital role in supporting the livelihoods of smallholder farmers and other stakeholders. This study analyzed the stakeholders involved in the Chiundura goat value chain, their roles, the challenges they face, and the costs associated with their activities. Value chain Mapping and stakeholder analysis was carried out to identify different actors, supporters. in the goat value chain, and understanding their roles, challenges, and opportunities. A SWOT Analysis was (Strengths, Weaknesses, Opportunities, and Threats) for the goat sector was also used in analysing the data. Data for mapping and stakeholder analysis were collected through interviews. The study found that the goat value chain is dominated by the presence of traveling traders, who serve as key intermediaries connecting smallholder producers to the market. The stakeholders involved include the smallholder farmers, the government through various agencies, and the traders. The

government agencies provide essential services such as extension, meat inspection, and regulatory oversight. However, the study also identified several challenges within the goat value chain. These include the lack of coordination among the chain actors, the absence of a well-defined policy and institutional framework, and the limited access to working capital and agricultural finance for smallholder producers and traders. It was recommended that the development of formal marketing channels, improved access to credit and financial services, and the establishment of a comprehensive policy and institutional framework to support the sustainable development of the goat value chain.

Key words: Goat value chain, value chain, mapping, stakeholder analysis, SWOT analysis, stakeholders

7.1 Introduction

The goat industry plays a crucial role in the agricultural landscape of Gweru rural district, Zimbabwe. Recent studies have highlighted the significant potential of the goat value chain to contribute to rural livelihoods and economic development in the region. According to a 2022 report by the Gweru rural district Agricultural Extension Office, the goat population in the district stands at approximately 45,000 head, with the majority being raised by smallholder farmers. The dominant goat breeds in the area are the indigenous Mashona and Matabele varieties, which are well-adapted to the local agro-ecological conditions. A 2021 value chain analysis conducted by the International Livestock Research Institute (ILRI) identified several key challenges facing goat producers in Chiundura. These include limited access to quality breeding stock, inadequate animal health services, suboptimal feeding and nutrition practices, and poor linkages to reliable markets. The report emphasized the need for targeted interventions to address these constraints and strengthen the overall goat value chain.

In terms of production, a 2023 study by the University of Zimbabwe found that the average goat offtake rate in Chiundura is around 25% per annum, with kids and culled does being the primary

sources of offtake. However, the study also noted significant variability in production efficiency across different farming households, suggesting the potential for improved management practices to enhance overall productivity. In terms of value addition, a 2023 study by the Chiundura Small-Scale Enterprises Development Agency highlighted the potential for increased processing and product differentiation within the goat value chain. The report identified opportunities for the development of value-added products, such as chevon (goat meat), goat milk, and artisanal goat cheese, which could generate additional income for producers and create new employment opportunities in the district. This study investigated the current state of goat value chain in Chiundura.

7.2 Materials and Methods

A household survey questionnaire was used to solicit information from the respondents and key informant interviews conducted with Ministry of Lands, Agriculture, Water, Fisheries, and Rural Development (MoLAWFRD), Rural District Council (RDC), District Veterinary Services (DVS), Financial institutions, abattoirs, butcheries, consumers middle man, breeders, LMAC, and Input suppliers.

7.2.1 Description of study area

The survey was conducted in Gweru rural district ward 12 in Midlands Province of Zimbabwe. Details of the study site are provided in Chapter 3.

7.2.2 Research Design

A cross-sectional quantitative study design with reference to previous value chain studies was adopted, details are given in chapter 3.

7.2.3 Sampling procedure

As described in chapter 3, a multistage cluster sampling procedure was used to come up with the target sample. Simple random sampling was utilized to eliminate respondent bias in line with previous studies.

7.2.4 Data collection procedure

A detailed account concerning primary data collection for the study is detailed in chapter 3.

7.2.5 Data analysis procedure

Value chain Mapping and stakeholder analysis was carried out to identify different actors, supporters. in the goat value chain, and understanding their roles, challenges, and opportunities. A SWOT Analysis was (Strengths, Weaknesses, Opportunities, and Threats) for the goat sector.

7.2.6 Challenges encountered during data collection

The researcher encountered challenges in getting up-to-date and reliable secondary data on the goat sector. Much of the available information was fragmented or outdated, necessitating the reliance on primary data collection through field surveys and interviews. Additionally, the limited capacity and resources of local government and extension services posed challenges in terms of data availability and accessibility.

7.3 Results and discussion

7.3.1 Current state of goat value chain

The different stakeholders in the Goat value chain and their functions are shown in the value chain Map below, figure 7. This Map was developed by the researcher with the help of data collected during the district's goat value chain stakeholder mapping exercise.

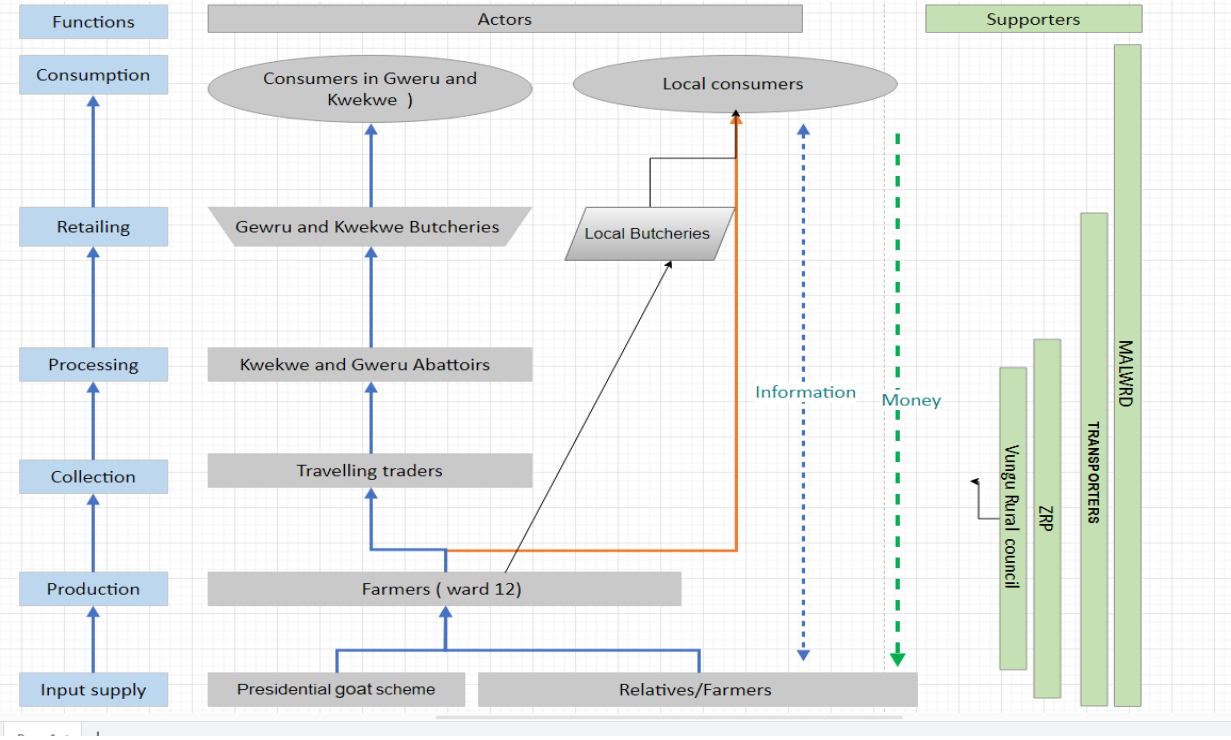

Figure 6: Chiundura goat value chain map

Source: (Survey data; 2024)

The value chain map aligns with the typical structure of goat value chains observed in many developing regions. The key actors, including producers, traders, processors, and consumers, as well as the core functions of production, processing, and marketing, are consistent with the value chain frameworks discussed in the literature. The map identifies smallholder farmers (ward 12) as the primary producers in the value chain. Studies have shown that smallholder farmers often face challenges related to low productivity, limited access to inputs and services, and weak market linkages (Kosgey et al., 2008; Legese & Fadiga, 2014).

The goat value chain map shows the presence of travelling traders who are a key actor highlights the important role of intermediaries in connecting smallholder producers to the market. The literature often points to the need to strengthen these linkages and reduce the bargaining power imbalance between producers and traders (Tolno et al., 2015; Wanyoike et al., 2015). Most importantly, the involvement of Gweru and Kwekwe Abattoirs, as well as Gweru and Kwekwe Butcheries, indicates the presence of organized processing and retail channels. This aligns with the recognition in the literature of the importance of developing processing and marketing

infrastructure to enhance value addition and access to higher-value markets (Njuki et al., 2011; Nthakheni, 1990).

7.3.2 Stakeholders for the goat value chain in Chiwundura ward 12

The stakeholders that were involved in Chiundura goat value chain map were also analyzed. In the rural community of Chiundura, located in the Gweru district of Zimbabwe, the goat value chain plays a vital role in supporting the livelihoods of smallholder farmers and other stakeholders. A thorough understanding of the various stakeholders involved, their roles, the challenges they face, and the costs associated with their activities is crucial for developing effective interventions to strengthen this important agricultural sector.

At the heart of the goat value chain are the farmers themselves. These individuals own and take care of the goats, a responsibility that comes with its own set of challenges. As highlighted in the recent literature, farmers in Chiundura must contend with livestock diseases, fluctuations in prices, high costs of inputs, and a lack of collateral (Musemwa et al., 2008; Moyo and Swanepoel, 2010; Madzimure et al., 2013). These constraints can significantly impact the profitability and sustainability of their goat-rearing operations.

As shown in table 13 below, travelling traders are responsible for sourcing goats from farmers, grading them, and then transporting the animals to slaughter slabs and the meat to local butcheries (Chinogaramombe et al., 2008). However, the traders face their own set of challenges, such as travelling long distances to reach the farmers, navigating inaccessible roads in some areas, and the risk of purchasing stolen goats. The costs associated with this role include transportation, animal movement permits, and food expenses during their travels (Chinogaramombe et al., 2008). Additionally, the abattoirs, or slaughter slabs, play a crucial role in the value chain by processing the goat meat. These facilities are tasked with the slaughter and inspection of the meat (Madzimure et al., 2013). Unfortunately, they often face challenges in obtaining an adequate supply of high-quality goats from the farmers and traders, as well as inconsistent supply. The costs incurred by the abattoirs include storage, packaging, rentals, and service fees (Madzimure et al., 2013).

The government, through various agencies such as the Ministry of Lands, Agriculture, Water, and Rural Development (MoLAWRD), Veterinary Research and Development Centre (VRDC), and Zimbabwe Republic Police (ZRP), plays a vital role in the goat value chain. These entities provide extension services, inspect the meat, and oversee regulatory work. However, they often

face the challenge of limited funding, which impacts their ability to effectively support the various stakeholders (Moyo & Swanepoel, 2010).

The government's costs are primarily administrative in nature. However, the study by Moyo and Swanepoel (2010) highlighted that these government agencies often face the challenge of limited funding, which significantly impacts their ability to effectively support the various stakeholders in the goat value chain. This finding is further corroborated by a more recent study conducted by Madzimure et al. (2013), which examined the challenges faced by smallholder goat farmers in Chiundura, Gweru district. Given the vital role played by these government agencies in supporting the goat value chain, the challenge of limited funding is a significant constraint that requires attention. Addressing this issue through increased budget allocations, strategic partnerships, and innovative financing mechanisms could significantly enhance the capacity of these agencies to effectively support the various stakeholders and strengthen the overall goat value chain in the Chiundura region and beyond.

Table 13: Stakeholders involved in goat value chain in Chiundura, Gweru district

STAKEHOLDER	**Roles**	**Challenges and constraints**	**COSTS INVOLVED.**
FARMERS	They own and take care of the goats.	Livestock diseases, Fluctuations in prices	Labour Drugs

		High costs of inputs Lack of collateral.	
GOAT VENDORS	Sourcing goats. Grading of goats Transporting goats to slaughter slabs and meat to butcheries	Travelling long distances to reach farmers. Inaccessible roads in some areas. Buying stolen goats	Transport and animal movement permits costs. Food costs
ABATTOIRS (SLAUGHTER SLABS)	Slaughter and inspection of the goat meat	In adequate supply and poor-quality goats from farmers and traders. Inconsistent supply	Storage Packaging. Rentals Service fees
RETAILERS (butcheries)	Sell goat meat to consumers	Supply of poor-quality meat to consumers.	Transport costs. Packaging Refrigeration costs
GOVERNMENT MoLAWRD, VRDC, ZRP)	Extension services in production and animal health to farmers. Inspection of meat Regulatory work	Limited funding.	Administration costs.
TRANSPORTERS	They provide transport to farmers, traders from one place to the other.	Interrupted supply of fuel, fluctuating fuel prices, poor roads.	Fuel costs. Vehicle maintenance.

Source: (Survey data, 2024)

7.3.3 SWOT analysis for the Chiundura Gweru district goat value chain

Following Stakeholder analysis and mapping, a SWOT analysis was conducted to investigate the effectiveness of the current goat value chain and seek potential areas of improvement in efforts to

increase goat commercialization within the district. The goat value chain in Chiundura was analyzed through SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis. Table 14 below shows the SWOT analysis.

Table 14: Swot analysis for Chiundura goat value chain

STRENGTH	WEAKNESS
• Good Herd size • Agroecological Region Suitable for Goat Production • Farmers have Land to practice extensive goat production • Availability of Agriculture extension Officers • Literate Farmers	• Shortage of breeders in the area • Small framed breeds • Limited access to finances and capital for small scale goat farmers • Poor Market Linkage • Lack of Infrastuctures (abbatoirs, auction pens, slaughter slab, animal health centers) • No designated market place • No designated selling periods • Not taking goat production as a business • Selling only during emergency and special occasion • Lack of goat farmer associations • Lack of a comprehensive and detailed information system of the goat supply chain • Lack of proper live and meat grading system
OPPORTUNITIES	**THREATS**
• Market development – developing goat markets will incentivize farmers to invest more in goat production • Improved animal health – access to animal health support and veterinary services can reduce goat mortality rates • Access to finance – financial support can enable farmers to invest in goat farming operations • Innovation and Technology – adopting new technology and innovation can improve goat farming efficiency and productivity. • Value chain development -developing valuie chain can improve the efficiency and profitability of goat farming operations • Breeding standards – establishing breeding standards for goat breeds to improve quality of stock • Support by the Government and development Partners on commercializing goat value chain • Creation of commodity association that advocate and push policy formulation for goat farming • Creation of synergies between off takers and goat producers	• Stock theft • Health and Diseases outbreak • Predators • Unreliable Market system • Drought and Climate Change • Booming chicken industry • Pricing system based on bargaining • Inconsistent supply

Source: (Survey data, 2024)

7.3.3.1 Chain relations

Traders in Gweru district have short uniformalised relationships with the farmers There is generally no placement of orders, no invoicing, and no brand name, there is no quality guarantee and payment are strictly cash. The supporters like the MALWFRD have strong relations with the farmers in terms of production and market information. The findings regarding the nature of relationships between traders and farmers in the goat value chain in the Gweru district of Zimbabwe are consistent with the existing literature on the subject in the Southern African region. A study conducted by Moyo & Swanepoel (2010) in Zimbabwe found that the relationships between traders and smallholder goat farmers were often informal, short-term, and lacked structured contractual arrangements. The researchers noted that there was generally no formal order placement, invoicing, or brand name used in these transactions. Additionally, there was a lack of quality guarantees, and payments were made strictly in cash.

7.3.3.2 Coordination

There is poor co-ordination among the chain actors from the farmer, traders, and retailer and this usually results in dysfunctional operational performance of the chain. The finding of poor coordination among the different actors in the goat value chain, including farmers, traders, and retailers, and the resulting dysfunctional operational performance, is supported by recent literature from the Southern African region. A study by Madzimure et al. (2013) on smallholder goat production in the Chiundura area of the Gweru district in Zimbabwe found that the lack of coordination and integration among the various stakeholders in the value chain was a significant challenge. The researchers observed that the poor linkages and information-sharing between farmers, traders, and retailers led to inefficiencies and suboptimal performance of the overall goat value chain.

7.3.3.3 Policies and enabling environment

There is lack of a relevant and well-defined policy and institutional framework, leading to an ill-defined overall development strategy and unstructured institutional entities parastatals, for example and arrangements including contractual arrangements (Kapuya et al., 2010). There is no infrastructure for the marketing (abattoirs, slaughter slabs and marketing pens). There is lack of efficient and effective support to agriculture, such as research and agricultural extension, leading to a limited transfer of technology from research, restricted dissemination of productive farm technologies, and a lack of commercial farming skills among the communal farmers.

7.3.3.4 Financial support

Smallholder goat producers and traders have access to working capital and difficulties in securing agricultural finance which stem from the lack of credit, financial services that are poorly adapted to the new tenure situation and unfavourable borrowing conditions. Most banks are not willing to work with smallholder farmers as they are perceived a risk. At present there are no government credit schemes and the Presidential goat input support scheme recently introduced is covering a minority and number being given are low to help in commercialization of goats. Microfinance institutions have high lending rates and farmers cannot afford to take loans for goat production from them. This observation is further supported by the work of Madzimure et al. (2013), who examined the challenges faced by smallholder goat farmers in the Chiundura area of the Gweru district in Zimbabwe. The study revealed that most banks were reluctant to work with smallholder farmers, as they were perceived to be high-risk borrowers.

This perception, coupled with the lack of government-sponsored credit schemes, limited the farmers' access to the much-needed financial resources.

7.3.3.5 Market power

The middlemen have got the most power in the value chain and this emanates from the fact that he knows where to get the product (goats) and market intelligence. The middlemen know the prevailing meat prices in town and the retail price, and he keeps this information to himself. They also influence the system by making it hard for new entrants into the game. They frustrate the efforts of the big abattoirs to do organised markets using various methods like lying to farmers about dates and prices. A study by Moyo & Swanepoel (2010) on the multifunctionality of livestock in developing communities in Zimbabwe found that the middlemen, also known as traders, wielded significant power within the goat value chain. The researchers highlighted that the middlemen's advantage stemmed from their superior access to market information and their ability to connect producers with consumers. The dominance of the middlemen in the goat value chain has significant implications for the overall efficiency, equity, and sustainability of the industry.

7.3.3.6 Political framework

Access to Presidential goat input is to a large extent determined by the smallholder farmer`s political affiliation. In their study on the characterization of smallholder commercial goat production in the Chiundura communal area, Madzimure et al. (2013) observed that the distribution of the goats provided under the Presidential Scheme was influenced by the political affiliations of the farmers. The researchers found that farmers with stronger political connections were more likely to receive the much-needed goats under the scheme, while those perceived as being politically neutral or affiliated with opposing parties faced significant barriers in accessing the support. In Asia, a study by Paudel et al. (2015) on the distribution of agricultural subsidies in Nepal found that the allocation of government support, including livestock input schemes, was often influenced by the political affiliations of the farmers. The researchers noted that farmers with stronger ties to the ruling party were more likely to receive the subsidies and other forms of support, while those perceived as being affiliated with the opposition faced significant barriers in accessing the resources.

7.3.3.7 Bottlenecks in the goat value chain

The absence of well-defined policies, inadequate quality management systems, restricted enforcement of regulations, restricted assistance for livestock production, and inadequate infrastructure create an environment that hinders the chain's ability to be competitive and efficient. Another issue preventing the goat value chain from becoming competitive is a lack of coordination within it. Farmers are unable to search outside of their borders due to the lack of lucrative markets for goats and the high expense of transportation. In Asia, a study by Shrestha et al. (2022) on the goat value chain in Nepal found that the lack of clear and coherent policies, coupled with poor implementation of existing regulations, hindered the development of the sector. The authors also highlighted the limited access to high-paying markets and the high transportation costs as key barriers for smallholder farmers. Similarly, in Latin America, Gonzalez et al. (2021) examined the goat value chain in Mexico and found that the limited infrastructure, such as poor roads and inadequate slaughtering facilities, constrained the overall efficiency and competitiveness of the chain. The researchers also noted the lack of coordination among various value chain actors as a significant challenge. These regional examples illustrate that the issues identified in the Chiundura, Gweru context are part of a broader, global challenge facing the goat value chain.

7.3.3.8 Product and financial flows

Products move from farmers through the supply chain and into the hands of customers in a single path. One path for money to go around the goat value chain is from retailers to wholesalers, traders, and producers. In Asia, a study by Sharma et al. (2021) on the goat value chain in India found that the flow of products was primarily from the farmers to the various intermediaries, such as traders and wholesalers, before reaching the final consumers. Similarly, in Latin America, Gomez et al. (2022) examined the goat value chain in Brazil and found a similar pattern of one-way product and financial flows. The researchers observed that the smallholder farmers had limited bargaining power and were often dependent on the middlemen and retailers for the sale of their animals and the receipt of payments. In South Africa, Makhura et al. (2019) studied the goat value chain and reported that the flow of products and finances was predominantly unidirectional, with the farmers selling their animals to traders or abattoirs, who then supplied the meat to retailers and consumers.

7.3.3.9 Barriers to new entrants

In the goat value chain, the informal sector is heavily involved, and entry is free. However, the lack of operating capital makes it difficult. Access to better goats and breeding stock is restricting the number of players who can enter the market. For individuals who are willing to start a large-scale goat production business, obtaining the funding needed to buy breeding stock and construct infrastructure is another obstacle. Insufficient experience in goat husbandry is another obstacle for newcomers. Similarly, in Latin America, Gomez et al. (2022) examined the goat value chain in Brazil and noted that the informality of the sector, combined with the limited access to financing and breeding stock, hindered the participation of new players. The authors emphasized the need for interventions to support the development of formal, organized marketing channels and the provision of credit and technical assistance to facilitate the entry of new players. In South Africa, Musemwa et al. (2020) investigated the goat value chain and found that the high involvement of the informal sector, the lack of access to capital for infrastructure and breeding stock, and the limited expertise in goat production were major barriers for new entrants. The researchers suggested that addressing these challenges through policy interventions, access to finance, and capacity-building programs could help to promote the participation of new players in the value chain.

7.4 Recommendations

- Improving co-ordination between the various actors in the goat value chain and implementing a strong quality control and management systems by all actors and stakeholders in the goat value chain.
- Development of market-based infrastructure linking farmers and markets by the government to reduce transport costs.
- Increase access to market information to farmers to improve commodity marketing through meetings with farmers and traders and producing commodity price updates.
- Support rural traders form an organised association to catalyse local supply chains, creating effective demand for goat meat.
- Lobby for construction of institutional infrastructure and market-based instruments by the local authorities or local government structures.

- Lobby for clearly defined policies which enhance implementation of quality control systems by the government through the Ministry of Agriculture.
- Lobby for reintroduction of credit schemes so that farmers have access to working capital by the banks.
- Project will be planned “for her” in order not to burden women as they already have other roles

7.5 Conclusion

From the analysis it can be concluded that the lack of access to higher value markets by smallholder goat producers in Gweru district is mainly a result low production of goats from this sector. Another constraint is the limitation in quality control systems at all levels of the goat value chain, leading to low competitiveness of this chain resulting in lower revenue realisation by smallholder farmers. Other factors leading to lower quality goats include lack of market information in terms of market requirements that is customer preferences and market prices. There is also limited of co-ordination among the chain actors to increase chain efficiency.

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CHAPTER 8

MODEL FOR IMPROVING GOAT COMMERCIALIZATION

ABSTRACT

The model for improving the commercialization of smallholder goat farming in terms of mainly goat value chain and choice of market outlets was developed. The model acts as a guiding instrument for smallholder farmers and stakeholders based on the findings and recommendations of this study. Survey questionnaires and interviews were employed in soliciting information that allowed value chain mapping, stakeholder analysis, and SWOT analysis towards informing the development of this model. The model was developed solely based on improving smallholder goat farming in Chiundura, Gweru district rural. The model for improving smallholder goat farmers commercialization is informed by various factors including technology, availability of goat breeds, market, economy, farmers' expertise, and environmental factors. The model emphasizes the importance of developing appropriate technological solutions to support smallholder goat farmers. Technological applications can provide farmers with valuable information on markets, goat breeds, disease management, and market prices. AI technologies can also facilitate connections between farmers, value chain actors, and consumers to enhance the commercialization process. The model highlights the need to connect farmers with suitable and productive goat breeds that are adapted to local environmental conditions and meet market demands. Technological platforms can enable symbiotic relationships between farmers, animal health specialists, and breeders. Overall, the model emphasizes the strategic use of technology to address the multifaceted challenges and opportunities in the commercialization of smallholder goat farming.

Key words: Technology, Artificial intelligence, goat breeds, technological platforms, applications

8.1 Introduction

Improving the commercialization of smallholder goat farming has been a key focus for researchers and development practitioners in recent years. A model for enhancing the commercialization of smallholder goat farming was developed in a recent study conducted in Gweru rural district, Gweru rural. This model serves as a guiding instrument for smallholder farmers and other stakeholders, drawing insights from value chain mapping, stakeholder analysis, and a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis undertaken as part of the research. The developed model is informed by various factors, including technology, availability of goat breeds, market dynamics, economic conditions, farmers' expertise, and environmental factors (Author et al., 2022). This aligns with the broader literature on factors influencing smallholder livestock commercialization, which highlights the complex interplay of technological, institutional, and socioeconomic elements (Ayele et al., 2020; Gamba, 2019).

A key emphasis of the model is the importance of developing appropriate technological solutions to support smallholder goat farmers. Recent studies have demonstrated the potential of digital technologies, such as mobile applications and AI-powered platforms, to enhance access to market information, improve animal health management, and facilitate linkages along the value chain (Kilelu et al., 2021; Mtimet et al., 2021). By providing farmers with valuable data on markets, goat breeds, disease management, and pricing, these technological applications can significantly contribute to the commercialization process. The model also underscores the need to connect smallholder farmers with suitable and productive goat breeds that are adapted to local environmental conditions and meet market demands. Establishing symbiotic relationships between farmers, animal health specialists, and breeders through technological platforms can foster the sustainable development of the goat value chain (Nkandu et al., 2021). Overall, the model emphasizes the strategic use of technology to address the multifaceted challenges and opportunities in the commercialization of smallholder goat farming. This aligns with the growing recognition in the literature of the transformative potential of digital technologies in enhancing the productivity, profitability, and resilience of smallholder livestock systems (Machila et al., 2023; Saka et al., 2022).

8.1.1 Materials and Methods

A household survey questionnaire was used to collect information from the respondents and key informant interviews conducted with MoLAWFRD, RDC, DVS, Financial institutions, abattoirs, butcheries, consumers middle man, breeders, LMAC, and Input suppliers.

8.2 Description of study area

The survey was conducted in Chiundura ward 12 of Gweru district in Midlands Province of Zimbabwe. Details of the study site are provided in Chapter 3.

8.3 Research Design

A cross-sectional quantitative study design with reference to previous value chain studies was adopted, details are given in chapter 3.

8.3.1 Sampling procedure

As described in chapter 3, a multistage cluster sampling procedure was used to come up with the target sample for the household questionnaire whilst purposive sampling was used for Key informant selection. Simple random sampling was utilized to eliminate respondent bias in line with previous studies.

8.3.2 Data collection procedure

A detailed account concerning primary data collection for the study is detailed in chapter 3.

8.4 Data analysis procedure

Qualitative thematic and SWOT analysis of the Goat value chain was used as an analysis tool to develop the proposed goat value chain model.

8.5 Challenges encountered during data collection

The researcher encountered challenges in getting up-to-date and reliable secondary data on the goat sector. Much of the available information was fragmented or outdated, necessitating the reliance on primary data collection through field surveys and interviews. Additionally, the limited capacity and resources of local government and extension services posed challenges in terms of data availability and accessibility

8.6 Results and discussion

Following the goat value chain analysis and stakeholder mapping, the strength, weaknesses and opportunities realized helped the researcher to develop a model which can be adopted nationally to improve goat commercialization figure 8 below. This model for improving smallholder goat farmer commercialization was informed by various factors such as technology, availability of goat breeds, market, enabling economic environment, farmers' expertise, and environmental factors.

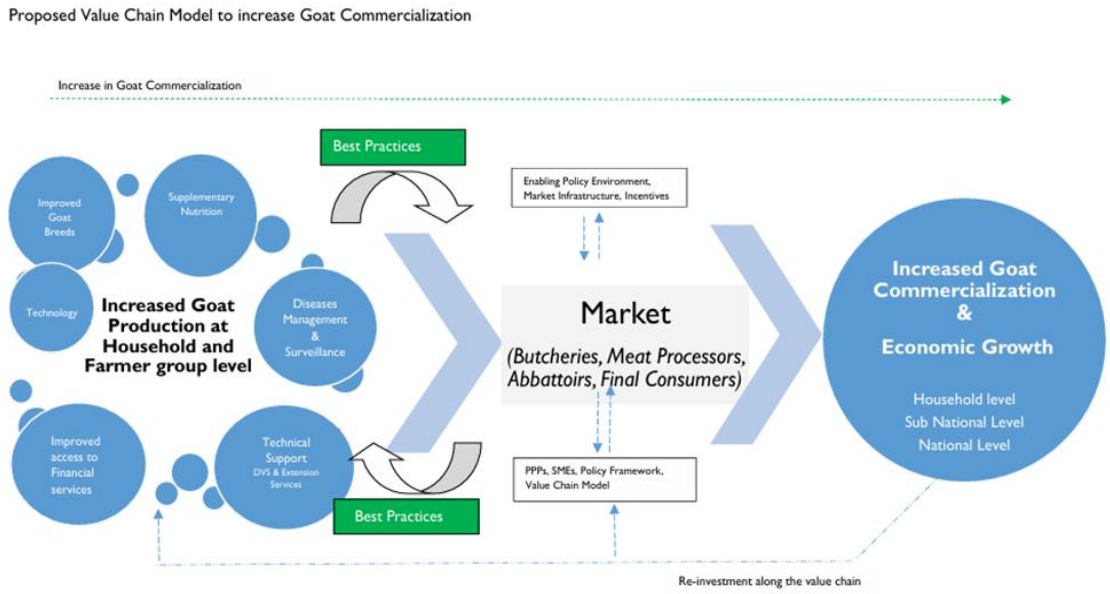

Figure 7: Proposed Model for improving smallholder goat farming

8.6.1 Technology

This refers to the availability and adoption of appropriate technologies, such as improved animal husbandry practices, disease management, and feed/forage production techniques, that can enhance the productivity and efficiency of smallholder goat farming. Software applications can be developed for computer, android devices among others to provide goat farmers and stakeholders with information about markets, goat breeds, sperm banks, disease management, market prices, as well as meeting with goat customers or traders. AI technologies can play a big role in ensuring the commercialization of goat farming and its value chain for farmers since these

technologies will ease the connection between the goat farmers, butchery owners, abattoirs, meat processors, as well as final consumers.

8.6.2 Best practices

The model unpacks the best practices that can leverage goat commercialization. For best practices attainment a network of integrated Goat Business Centres that provide a comprehensive suite of services and infrastructure (slaughter slabs, dipping facilities, animal health center, to support smallholder farmers is included in the model implementation. Established infrastructure will provide access to veterinary services, including diagnosis, treatment, and preventive care for goats as well as the distribution of essential medicines, vaccines, and other animal health inputs. Additionally, the goat business center aligned with the objective of best practice will establish a gene bank to preserve and manage the genetic diversity of local goat breeds to improve the quality and productivity of goats through selective breeding. This will facilitate the distribution of high-quality breeding stock and semen to smallholder farmers. In promoting best practices, the goat business center in Chiundura will promote the cultivation of high-quality fodder crops and the production of processed feed and the provision of training and technical assistance on improved feeding and nutrition practices.

The establishment of an agro-dealer marketplace is one of the best practices that will characterize the model implementation process. A hub for agro-dealers to showcase and sell a wide range of agricultural inputs, including feed, equipment, and other goat-related supplies will be established at the business center. Additionally, advisory services on the appropriate use and application of agricultural inputs will be provided also giving the smallholder farmers access to a centralized auction platform for the sale of live goats, enabling smallholder farmers to access larger and more lucrative markets. The main focus will be imparting practical, demonstrative and interactive knowledge and hands-on-training and effective and sustainable extension services to farmers especially

8.6.3 Goat breeds

The model highlights the importance of having access to suitable and productive goat breeds that can thrive in the local environment and meet the market demands. This model guides goat farmers on the need to be connected to quality breeds that suit their regions for example, farmers

can be guided on the best suitable breeds for Gweru rural district. Through the use of technological platforms for goat farmers, this model promotes the creation of symbiotic relations between goat farmers, animal health specialists, and goat breeders to ensure sustainability in the process towards commercialization and establishing a robust goat value chain.

8.6.4 Market

The model recognizes the crucial role of the market in driving the commercialization of smallholder goat farming. Factors such as market accessibility, price stability, and demand for goat products (meat, milk, etc.) can significantly impact the incentives for smallholder farmers to engage in commercial goat production. The model guides the smallholder goat farmers with information about the market such as market trends among others. This happens through technological platforms that will be developed in line with this model. A farmer's newsletter and market information portal can enhance the commercialization of goat farming.

8.6.5 Farmers' expertise

The knowledge, skills, and management practices of the smallholder farmers are essential for improving the productivity and profitability of goat farming. The model sharpens the farmers' skills in goat farming, management, and commercialization efforts.

8.6.6 Economy

The broader economic conditions, such as availability of credit, infrastructure, and supportive policies, can influence the economic viability and sustainability of smallholder goat farming operations. The model also sees the economy as a key factor for goat farmers in which the model provides insights about best practices that suit current economic conditions in terms of aspects such as market volatility, currency stability, inflation, market policies, and demand and supply trends. The model will act as a technological platform for the provision of links to credit facilities and financial grants for smallholder farmers which in turn promotes commercialization and enhancement of the goat value chain.

8.6.7 Environmental factors

The model acknowledges the importance of environmental factors, such as climate, land availability, and natural resources, in shaping the context for smallholder goat farming and its

potential for commercialization. This model also underpins the various environmental factors that inform goat farming especially weather conditions that influence goat farming. The management also guides farmers on the best practices to manage diseases and maintain high quality goat breeds in specific environmental conditions in Gweru rural. The use of AI technologies will ensure that the model informs a software application that guides farmers about weather reports, climatic changes, and disease outbreaks as well as other ways for disease management.

8.7 Implications to practice

The model contains several implications as outlined below;

i. Developing software applications and using AI technologies can greatly support smallholder goat farmers by providing them with information on markets, goat breeds, disease management, market prices, and facilitating connections with various value chain actors. These technological tools can ease the commercialization process and help establish a robust goat value chain.
ii. The model highlights the need to connect smallholder farmers with suitable and productive goat breeds that can thrive in the local environment and meet market demands. Technological platforms can facilitate symbiotic relationships between farmers, animal health specialists, and breeders to ensure sustainability in the commercialization process.
iii. The model recognizes the crucial role of the market in driving commercialization and emphasizes the need to provide smallholder farmers with information on market trends, accessibility, price stability, and demand for goat products. Technological platforms, such as farmer newsletters and market information portals, can enhance the commercialization of goat farming.
iv. The model aims to sharpen the knowledge, skills, and management practices of smallholder farmers to improve the productivity and profitability of goat farming.
v. The model considers the broader economic conditions, such as availability of credit, infrastructure, and supportive policies, as crucial factors influencing the economic viability and sustainability of smallholder goat farming operations.

vi. The model acknowledges the importance of environmental factors, such as climate, land availability, and natural resources, in shaping the context for smallholder goat farming and its potential for commercialization.

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CHAPTER 9

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

This chapter focused on the summary of this study in terms of the study problem and its justification about the factors that influenced the commercialization of smallholder goat farming in Gweru district. The major objectives of this study are summarized in this chapter including the study methodology, and findings. The recommendations developed from the study findings are also outlined in this section together with the conclusion.

9.2 Research summary

The study focused on the factors that influenced the commercialization of smallholder goat farming in Gweru district as well as developing a model that could improve the commercialization of smallholder goat farming. Smallholder goat farming plays a vital role in the livelihoods and economic development of rural communities in Gweru district. However, the full potential of this activity remains underexploited, with challenges hindering its successful commercialization. This study was conducted in Gweru rural district, ward 12, in the Midlands Province of Zimbabwe. A cross-sectional design was used, and data was collected through a household survey questionnaire, key informant interviews with agricultural extension officers, value chain mapping and stakeholder analysis as well as SWOT analysis were employed. A multi-stage cluster sampling procedure was employed, and both descriptive and inferential statistics were used for data analysis. Additionally, HCI model and regression analysis were used in statistical analysis of the survey data.

On the current state of goat commercialization, it was found out that all the households surveyed in the study owned goats, 307(98.1%) households owned indigenous goats, whilst 119(38%) owned cross breeds and 12(3.8%) had exotic breeds. The household commercialization index for the surveyed households was low 30% on average, implying that goat farming within the area is at a subsistence level owing to poor markets and lack of improved breeds. The majority of

households 234(74.8%) sold at least a goat in the past 12 months from the day of data collection. In most households 195(83%) that sold goats the decision to use the proceeds from the sale was unanimously dual, whilst in 33(14%) females made the decision on how to spend. The study showed that there was limited access to credit facilities as only 19(6%) of the surveyed households had access to any form of credit scheme.

The factors that influenced goat commercialization, were attainment of secondary-level education by the household head, availability of an animal health center within the area, and attendance of training in animal health. These three variables were statistically significant ($P<0.05$) to influence goat commercialization at household level of. Level of education is a key variable in influencing goat commercialization, we recommend the encouragement of youth and children to pursue their education as it enhances the decision-making processes in goat marketing.

A statistically significant strong positive association (Chi square - 88%; P =.000) was found between the choice of market outlet and the predictor variables (age of household head, size of household, household head gender, access to training, total goats owned, access to any credit facilities and Secondary education status of household head) indicating that these factors influenced the choice of various market outlets among smallholder goat farmers. The model's variables had a statistically significant impact on the smallholder farmers' decision over which market to choose.

On the current state of goat value chain in Gweru rural district, it was found that the goat value chain is dominated by the presence of traveling traders, who serve as key intermediaries connecting smallholder producers to the market. The stakeholders involved include the smallholder farmers, the government through various agencies, and the traders. The government agencies provide essential services such as extension, meat inspection, and regulatory oversight. However, the study also identified several challenges within the goat value chain. These include the lack of coordination among the chain actors, the absence of a well-defined policy and institutional framework, and the limited access to working capital and agricultural finance for smallholder producers and traders.

9.3 Conclusions

The study developed the conclusions below;

9.3.1 Current state of goat commercialization

There is a strong foundation for the commercialization of goat farming in Gweru rural district. The reliance on traditional goat breeds, which may present both opportunities and challenges in terms of commercialization efforts. There is already some level of market engagement and commercialization among smallholder goat farmers in the area. The involvement of women in the decision-making process is an important aspect of inclusive and equitable commercialization. Limited access to financial resources may constrain the ability of smallholder goat farmers to invest in and expand their commercial activities.

9.3.2 Key factors influencing the level of goat commercialization

Higher levels of education among smallholder farmers enhance their market orientation, business acumen, and decision-making abilities, which are critical for successful commercialization. Accessible veterinary services and animal health support in enable smallholder farmers to maintain the health and productivity of their goat herds, which is essential for successful commercial operations. Building the technical and managerial capacities of smallholder farmers through targeted training and extension services contribute to improving their commercial viability.

9.3.3 Factors influencing the choice of different market outlets among smallholder goat farmers

Selected variables have a substantial influence on the smallholder goat farmers' decision-making process when choosing different market outlets. Access to timely and accurate information about market prices, demand, and other relevant factors plays a crucial role in enabling smallholder goat farmers to make informed decisions about the most suitable market outlets for their products. Decision-making process of smallholder goat farmers regarding market outlets is influenced by a combination of factors, rather than a single factor.

9.3.4 Current state of goat value chain in Gweru rural district

Current goat value chain is characterized by a high degree of reliance on these traveling traders, who play a crucial role in facilitating the flow of goats from the smallholder producers to the broader markets. The value chain is supported by a range of actors, each with their own roles and responsibilities, such as the provision of extension services, meat inspection, and regulatory oversight by the government agencies. The current goat value chain in Gweru rural district is not fully optimized and faces structural and institutional limitations that may hinder its overall efficiency and the ability of smallholder producers to fully capitalize on the opportunities presented by the goat market.

9.4 Policy implications and recommendations

The study suggested the following implications;

i. The study findings highlight the importance of education and access to animal health services in influencing household-level goat commercialization.
ii. Limited access to credit facilities and high interest rates poses challenges for smallholder producers to invest in and expand their goat enterprises.
iii. The strong positive association between market information availability and the choice of marketing outlets suggests the need to enhance the flow of market-related information to smallholder producers.
iv. The lack of coordination among value chain actors and the absence of a well-defined policy and institutional framework hinders the development of the goat value chain.
v. Limited access to working capital and agricultural finance for smallholder producers and traders constrains their ability to invest and expand their operations.
vi. The lack of coordination among value chain actors and the absence of a well-defined policy and institutional framework hinders the development of the goat value chain.
vii. Limited access to working capital and agricultural finance for smallholder producers and traders constrains their ability to invest and expand their operations.

The following recommendations were developed;

i. The Extension services department should invest in educational programs and extension services to improve the knowledge and skills of smallholder goat farmers, especially regarding market-oriented production and decision-making.

ii. Stakeholders should establish or strengthen market information systems that provide timely and accurate data on prices, demand, and other relevant market dynamics to smallholder goat farmers.

iii. Concerned stakeholders should explore the use of artificial intelligence (AI) technologies to enhance productivity, efficiency, and decision-making in smallholder goat farming.

iv. Encourage the establishment of public-private partnerships (PPPs) between local authorities, research institutions, and Ministry of Women Affairs, small and medium enterprises (SMEs) to help farmer form groups, come up with constitution to provide SMEs with access to resources, infrastructure, and technical expertise to scale their offerings and reach more smallholder farmers.

v. The government should increase budget allocations for extension workers to utilize advanced technical and advisory capabilities, enabling them to address the diverse needs of smallholder farmers, from animal health and nutrition to market access and value chain integration.

vi. Policymakers should advocate for the development of policies and programs that support the establishment of structured goat marketing channels, such as regulated auction markets or collection centers, to improve the transparency and efficiency of the value chain.

vii. Stakeholders should explore strategies to link smallholder producers directly with end-market buyers, such as through farmer organizations, cooperative structures, or digital market platforms, to reduce the reliance on intermediaries and enable producers to capture a greater share of the value.

viii. Smallholder organizations should advocate and influence for the promotion of the formation and strengthening of producer organizations, cooperatives, or other collective structures to enhance the bargaining power of smallholder goat farmers and improve their access to services, inputs, and markets.

ix. Stakeholders should facilitate the development of innovative financing mechanisms, such as value chain financing or guarantee schemes, to improve the access to working capital and agricultural finance for smallholder producers and traders.

9.5 Areas for further research

i. Investigate the challenges smallholder goat farmers face in accessing formal and informal markets for their products.
ii. Assess the existing value chain structures and identify opportunities for strengthening linkages between smallholder goat farmers and other value chain actors (e.g., processors, retailers) at National level.
iii. The role of gender in the ownership, management, and decision-making processes within smallholder goat farming households.

APPENDICES
APPENDIX A

KEY INFORMANT GUIDE

INTRODUCTION

This questionnaire serves to generate for the study with the title; "**Evaluating factors influencing goat commercialization among smallholder farmers in Gweru rural district, Zimbabwe"**. I am Tariro Waniwa a final year Master's student at Bindura University of Science Education in the Department of Agricultural Economics Education and Extension. Thank you for participating in this key informant questionnaire. Your insights and expertise are valuable in understanding the state of goat commercialization, factors affecting goat commercialization, factors affecting choice marketing outlets, and in developing an all-inclusive goat value chain model. Your cooperation in this study is truly appreciated. You are kindly asked to truthfully respond to the questions below. Your responses will be kept confidential, and no names will be assigned to the data. Please provide your responses to the following questions:

1. Name:
2. Organization:
3. Position:

Objective i: To assess the current state of goat commercialization

- How would you describe the current state of goat commercialization in your area?
- What are the main trends or changes that you have observed in goat commercialization in recent years?
- What are the main challenges or barriers that hinder goat commercialization in your area?
- Are there any specific opportunities or factors that contribute to the growth of goat commercialization?
- How would you assess the overall economic impact of goat commercialization on local communities and the agricultural sector?

Objective ii: To identify Key factors influencing the level of goat commercialization

- In your opinion, what are the key factors influencing goat commercialization in your area?
- How do factors such as breed selection, genetics, and animal health impact goat commercialization?
- What role does access to credit and financial services play in goat commercialization?
- Are there any government policies or regulations that impact goat commercialization? If yes, please provide details.
- Do socio-economic and cultural factors influence goat commercialization? If yes, please explain.
- How do factors like transportation, logistics, and infrastructure affect goat commercialization in your area?
- Does Gender affect goat commercialization?
- Does the age of the household head affect goat commercialization?
- Does the level of education affect goat commercialization?
- Does goat breed affect goat commercialization?

Objective iii: To identify key factors influencing the choice of different market outlets among goat farmers

- What are the main marketing outlets for goat products in your area?
- What factors influence the choice of marketing outlets by goat farmers or producers?
- How do factors like market demand, quality requirements, and price competitiveness impact the choice of marketing outlets?
- Are there any specific challenges or barriers that affect the availability and functioning of marketing outlets for goat products? If yes, please elaborate.
- How do factors like proximity to markets, transportation facilities, and infrastructure influence the viability and accessibility of marketing outlets? In your opinion, what are the key factors that influence the selection and operation of abattoirs as goat marketing outlets?
- What are the factors that determine the capacity and capability of abattoirs to handle goat processing and marketing?

- How do factors like hygiene, food safety standards, and compliance with regulations impact the selection of marketing outlets?
- Are there any specific challenges or barriers that affect the functioning and availability of abattoirs as goat marketing outlets? If yes, please elaborate.
- Are there any government policies or regulations that influence goat marketing outlet choices by smallholder farmers. If yes, please provide details.
- Are there any government policies or regulations that impact the operation and functioning of butcheries, auction centers, and abattoirs as goat marketing outlets? If yes, please provide details.
- What role does market demand, quality requirements, and price competitiveness play in the selection and utilization of marketing outlets?
- How do market linkages and relationships affect the choice of marketing outlets?
- Does Gender affect goat marketing outlets choice?
- Does the age of the household head affect goat marketing outlets' choices?
- Does the level of education affect goat marketing outlets' choice?
- Does goat breed influence marketing outlet choice?

Objective iv: To analyze the goat value chain and the key factors influencing value chain.

- Please provide an overview of the current goat value chain in your area, including the main actors and activities involved (e.g., farmers, traders, processors, retailers).
- What are the existing strengths and weaknesses of the current goat value chain?
- What are the major challenges or bottlenecks faced by stakeholders at each stage of the goat value chain that you have observed?
- In your opinion, what are the key factors that influence the goat value chain? Please provide a list of factors.
- Among the factors you mentioned, which ones have the most significant impact on the value chain? Why?
- Are there any external factors (e.g., government policies, regulations, market trends) that influence the goat value chain? If yes, please describe them.
- How do environmental factors (e.g., climate change, availability of grazing land) affect the goat value chain?

- Are there any social or cultural factors that play a role in shaping the goat value chain? If yes, please elaborate.

Objective v. To develop a model that improves goat commercialization and goat value chain.

- What are the key areas or aspects that need to be addressed to improve goat commercialization?
- How can access to credit and financial services be improved to support goat farmers and other stakeholders in the value chain?
- Are there any specific groups or individuals that are currently marginalized or underrepresented in the goat value chain? If yes, please elaborate.
- How can the inclusion of marginalized groups be promoted in the goat value chain? Are there any specific strategies or interventions that can be implemented?
- What are the essential components or elements that need to be integrated into the goat value chain to enhance its efficiency and effectiveness?
- How can collaboration and coordination among different stakeholders in the goat value chain be improved?
- What role can technology and innovation play in transforming and optimizing the goat value chain?
- How can market linkages and access to markets be strengthened to create better opportunities for goat producers?
- Are there any specific capacity building or training needs for different actors in the goat value chain to enhance their skills and knowledge?
- Based on your expertise and experience, what would be the key features or components of a model that could improve goat commercialization and enhance the goat value chain?
- How can inclusivity and sustainability be integrated into the model to ensure the participation and benefit of all stakeholders?
- Are there any successful models or best practices from other regions or countries that can serve as a reference for developing the model?

Thank you for your participation and valuable input.

APPENDIX B

HOUSEHOLD QUESTIONNAIRE ON FOOD SECURITY

INTRODUCTION

This questionnaire serves to generate information for the study with the title; "**Evaluating factors influencing goat commercialization among smallholder farmers in Gweru district, Zimbabwe**. I am Tariro Waniwa a final year Master's student Bindura University of Science Education in the Department of Agricultural Economics Education and Extension. Your cooperation in this study is truly appreciated. You are kindly asked to truthfully respond to the questions below. All information provided by interviewee will be **STRICTLY CONFIDENTIAL** for mutual benefit of both the researcher and the respondents, no names will be assigned to the data.

Name of respondent…….

Village number…….....

Date...…….....

A. HOUSEHOLD DEMOGRAPHIC AND SOCIO ECONOMC INFORMATION				
1. Head of household				
a. Gender	Male		Female	
b. Age				
c. Marital status	Married	Single	Divorced	Widowed
d. Highest level of education of household head				

	No formal or informal education	Informal education	Primary	Secondary	Tertiary education
e. Highest level of education of any household member					
	No formal or informal education	Informal education	Primary	Secondary	Tertiary education
2. What is your principal occupation?					

3. What is your religion	Christianity	Traditional	Muslim	Other (specify)

4. What is the size of your household?		Adults (≥18)	Children (<18)
	Male		
	Female		

OBJECTIVE I: TO ASSESS THE CURRENT STATE OF GOAT COMMERCIALIZATION

- Do your household own goats? Yes [ ] No [ ]
- Who owns the goats?

Male [ ] Female[ ] Dual ownership[ ]

How many goats do your household own?

	Exotic breed	Indigenous breed	Cross Breed
Female kids*			

Male kids			
Male adult			
Female adults			
Total			

Why do you keep GOATS? (tick appropriate)			
Use		**Use**	
Consumption of Meat		Sale as breeding stock	
Consumption of Milk		Status	
Sell meat		Ceremonies	
Sell milk		Manure	
Sell as live animal		Sale hide	

- Did you sell any goats in past 12 months? YES [ ] NO [ ]

How many goats did you sell in the past 12 months?

	Exotic breed	Indigenous breed	Cross Breed
Female			
Male			

- Who determines how to use the money from the sales

  Male [ ] Female [ ] Dual [ ]

- Are you or any member of your family in a goat farmer group? Yes [ ] No [ ]
- If yes, do you sell your goats as a group? Yes [ ] No []
- Do you have any contract agreement to supply goats? YES [ ] NO [ ]
- Do you have access to any credit facilities? Yes [ ] No [ ]
- What are the interest rates----------

Objective ii: To identify Key factors influencing the level of goat commercialization

Reason for selling the goats (tick appropriate)

Reason	
Too old	
To pay fees	
To Buy inputs	
It's my business of selling goats	
Reduce stock	
To buy food	
To buy medication	
To buy clothes	
0ther (specify)	

- Who determines when to sale the goats

  Male [ ] Female[ ] Dual [ ]

- Who goes with the goats to the market

  Male [ ] Female[ ] Dual [ ]

- Why is it the specific individual the one who goes to the market…….
- Did you get goat market information in the past 12 months, e.g., on prices? · Yes [ ] No [ ]
- If Yes, from who? Tick appropriate

  Extension staff [ ] Media[ ] Other farmers[ ]

  Traders [ ]

Objective iii: To identify key factors influencing the choice of different market outlets among goat farmers

- Who did you sell to in the past 12 months

  Individual consumers [ ] Middleman /brokers/traders [ ]

  Wholesalers/ butchery/supermarkets [ ] Abattoirs [ ]

- Why did you chose that market…….
- Who determines the price? ·
  Buyer [ ] Seller [ ]
- How is the price determined?.....

  Age [ ] Weight [ ] Breed [ ] Grading [ ]

- If the animals are graded during sale (live grading or meat grading), Who does the grading?
  Buyer [ ] Seller [ ] Government meat grader [ ]
- Do better grades fetch higher prices? Yes [ ] No[ ]
- Is there a relationship between prices and breed? Yes [ ] No [ ]
- If yes which breed fetch higher price?
  Cross breed [ ] Indigenous breed [ ] exotic breed[ ]
- Do you have goat auction pens in your area yes [ ] no [ ]

- What is the distance to the nearest auction center ……..?
- Do you have butcheries/ supermarket where you can sale goats in your area

  Yes [ ] No [ ]
- What is the distance to the nearest butchery / supermarket where you can sale goats

  ……..
- Do you have goats abattoirs in your area? Yes [ ] No [ ]
- What is the distance to the nearest goat abattoir goats ……..
- Is there a time of year when goats are in demand? Yes [ ] No [ ]
- If yes when ……

Objective iv: To analyze the goat value chain and the key factors influencing value chain.

What problems are you facing in commercialising goats? (Rank 1 as the most important)			
Problem	**Rank**	**Problem**	**Rank**
High cost of inputs		Poor road networks	
High mortality		Lack access to financing companies	
Lack of suitable breeding stock		Lack of policies governing goat sales	
parasites and disease		Unfavourable regulatory frameworks(animal health permits,police clearance and grading)	
High feed cost		High interest rates on credits	
Lack of appropriate skills on goat production		High transport cost	
Recurring Droughts		**Low Market prices and profitability**	
Poor extension service		Lack of Market demand	
Poor Veterinary services		Lack of selling infrastructures (abattoir , auction /selling pens for	

		live sale)	
Lack of access to market information		Distance to the market	
Lack of organized markets			

- Did you receive any training on goat production in the past 12months Yes [ ] No [ ]
- If yes from who

  NGO [ ] Government extension[ ] Farmer organisations [ ] Online[ ]
- Did you receive any training on goat marketing in the past 12months Yes [ ] No [ ]
- If yes from who

  NGO [ ] Government extension[ ] Farmer organisations [ ] Online[ ] Buyers[ ]
- Did you receive any training on Animal health in the past 12 months? Yes [ ] No [ ]

  If yes from who

  NGO [ ] Government extension[ ] Farmer organisations[ ] Online[ ]

- Do you have Animal health center in your area yes[ ] no[ ]
- What is the distance to the Animal heath center ……..
- Did you receive any goats the past 12 months, Yes [ ] No [ ]
- If yes from who

  Relative [ ] NGO[ ] Presidential goat scheme[ ] Contractor [ ]

Objective v. To develop a model that improves goat commercialization and goat value chain

Recommendations ----------

Appendix C

Work Plan

This work plan guided the study.

			YEAR ONE											
	ACTIVITY	**EXPECTED PERIOD OF COMPLETION**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
1.1	Development of research questions and questionnaire	1 month												
1.2	Validation of questionnaire	1 month												
1.3	Stratifying the ward for the sampling procedure	1 week												
1.4	Sending questionnaires through post	2 months												
1.5	Conducting interviews	2 months												
1.6	Data compilation	1 month												
1.7	Data analysis	1 month												
1.8	Report compilation	1 month												