



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

**ASSESSING THE COMPETITIVENESS OF THE NAMIBIAN GOAT
SECTOR**

by

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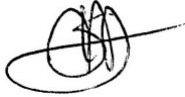
Supervisor: Mr S. Mbai

August 2025

Declaration

I, *Kunda Kalimbwe*, hereby declare that the work contained in the thesis entitled “Assessing the Competitiveness of the Namibian Goat Sector” is my own original work and that I have not previously in its entirety or in part submitted to any university or higher education institution for the award of a qualification.

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Dedication

This work is dedicated to my beloved parents. To my mother, Florence Kunda Kalimbwe, whose dreams of advancing her education were limited by conjugal duties and financial constraints, yet she instilled in me the importance of perseverance and resilience. And to my father, Dr Derrick Kawewe Kalimbwe, a renowned medical practitioner, who played a vital role in shaping my journey, guiding me to discover my passion for agriculture, and inspiring me to pursue excellence. Your constant support, unconditional love, and immeasurable sacrifices have been the foundation of my success.

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First and foremost, I am profoundly grateful to God Almighty for giving me the strength, wisdom, and perseverance to undertake and complete this study.

As I reflect on my master's journey, I am truly grateful for the guidance and mentorship from my research supervisor, Mr. Salomo Mbai. From him, I learnt three things that have shaped both my academic path and my outlook on life. The first is composure — he showed me that when things don't go as planned, the best response is to remain calm, think clearly, and find new ways forward, and when things do go well, it is equally important to remain calm, stay grounded, and progress with wisdom and caution. The second lesson is patience — he reminded me that good things take time, that growth is a process, and that persistence is often the difference between giving up and achieving something meaningful. And the third is being streetwise — the ability to adapt, to use practical wisdom, and to navigate challenges with awareness and resilience. These three lessons — composure, patience, and being streetwise — have carried me through my master's, giving me not only the ability to achieve what I have so far but also the belief that I am ready for the journey ahead.

I am also greatly grateful to Mr Kelvin Kamalata for providing essential financial assistance, without which this research would not have been possible. Finally, I sincerely appreciate Mr Victor Klazen of the Livestock and Livestock Products Board of Namibia (LLPBN) for his dedication and efforts in facilitating the quick data collection process under limited financial resources. Your collective contributions have been vital to this achievement.

Summary

Despite the goat sector potential, limited literature on its competitive performance, and noticeable disinvestment, originating from beliefs of unprofitability, have highlighted the need to evaluate its competitiveness. Therefore, the primary objective of this study was to assess the competitive performance of the Namibian goat sector at both micro and macro levels. The study's specific objectives were to analyse the profitability of goat production in Namibia, measure the competitive performance of Namibia's goat sector, and examine factors influencing the sector's competitiveness.

The study relied on primary data collected from a survey of key stakeholders within the Namibian goat sector to achieve Objectives 1 and 3. Additionally, secondary data was obtained from ITC for the product HS Code: 0104210 (Live goats) to accomplish Objective 2. The research employed a six-step analytical framework, which comprised: (1) defining competitiveness within the context of the Namibian goat sector through a review of relevant literature, (2) analysing the profitability of goat production in Namibia using GMA and sensitivity analysis, (3) assessing the competitive position of the goat sector, (4) identifying major factors affecting competitiveness, (5) categorising the determinants according to Porter's Diamond framework, and (6) proposing potential strategies to improve competitiveness.

Competitiveness was defined as the Namibia goat sector's ability to thrive in international markets by fostering sustainable growth through the generation of sufficient returns, maintaining production costs below market prices, and covering at least the opportunity cost of the resources employed. The profitability analysis revealed that commercial goat producers (N\$666.53) made higher profits per goat sold than non-commercial goat producers did (N\$142.77). Despite challenges and signs of disinvestment, both farming systems proved profitable, strengthening the goat sector's competitive performance and ongoing investment. The analysis using the RCA and RSCA indicated that the Namibian goat sector had a competitive advantage from 2001 to 2022. Additionally, the results from the inter-country analysis using the NRCA and production mapping (RSCA and TBI) showed that Namibia was the third most-competitive country globally, behind leaders Somalia and Oman. Findings from production mapping indicated that only Namibia and Somalia remained competitive and net exporters from 2001 to 2022.

Out of a total of 34 factors affecting the sector's competitiveness, experienced farmers' advantage was the most beneficial factor, while crimes, predation, and similar issues, along with skilled labour availability, were the most limiting. When the factors were categorised into the six diamond model

determinants, it was found that chance, production conditions, and government support and policies were the most restrictive. The other determinants of the diamond model were found to be moderately beneficial.

In conclusion, the findings suggest that the goat sector operates in a highly competitive environment. Consequently, strategies have been suggested to boost the sector's competitiveness. Firstly, offering training programmes for farm workers by government agencies to address the gap between skilled and unskilled labourers would enhance their skills and equip them with the necessary knowledge to minimise animal losses caused by predation, stock theft, and diseases. Secondly, there is a need to develop microfinancing programmes that are customised for goat farmers and to review the criteria necessary for successful financial aid to promote equality in opportunities, especially during droughts and challenging economic conditions. Thirdly, investing in household fodder production could help to mitigate the effects of unpredictable weather. Additionally, encouraging the formation of cooperatives enables bulk purchasing and cost-sharing among farmers, helping them to cope with high input costs. Lastly, policies such as the 2006 export levy on live goats and others impacting on the goat sector should be reviewed.

Table of Contents

Declaration	ii
Retention and Use of Thesis	iii
Dedication	iv
Acknowledgements	v
Summary	vi
Table of Contents.....	viii
List of Tables	xi
List of Figures.....	xii
List of Equations	xiii
List of Abbreviations	xiv
Chapter 1: Introduction.....	1
1.1 Background of the Study.....	1
1.2 Problem Statement	1
1.3 Research Questions.....	2
1.4 Objectives of the Study	3
1.4.1 Overall objective.....	3
1.4.2 Specific objectives	3
1.5 Research Hypotheses	3
1.6 Significance	3
1.7 Limitations of the Study	4
1.8 Delimitations of the Study	4
1.9 Outline of the Study	4
Chapter 2: An Overview of the Goat Sector.....	5
2.1 Introduction	5
2.2 Global Overview	5
2.3 Global Trade of Goats	7
2.4 Overview of the Namibian Livestock Sector	8
2.5 Goat Production in Namibia.....	9
2.6 Namibian Goat Exports	10
2.7 Domestic Market.....	11
2.8 South African Market	12
2.9 Other International Markets and Potential	12
2.10 Namibian Goat Imports.....	13
2.11 The Namibian Goat Sector Supply Chain	13
2.11.1 Understanding the different processes or stages of the supply chain	15

2.12	Challenges of the Namibian Goat Supply Chain	16
2.13	Conclusion	16
Chapter 3: Literature Review		17
3.1	Introduction	17
3.2	Conceptual framework.....	17
3.2.1	Profitability	17
3.2.2	Trade competitiveness	18
3.2.3	Competitiveness determinants	20
3.3	Understanding Competitiveness.....	23
3.3.1	The difference between comparative advantage and competitive advantage	23
3.3.2	Competitiveness defined.....	24
3.4	Empirical Literature Review	25
3.4.1	Application of GMA in agriculture.....	25
3.4.2	Previous studies analysing competitiveness using trade-based measures	25
3.4.3	Previous studies on the determinants of competitiveness	26
3.5	Conclusions	27
Chapter 4: Methodology		28
4.1	Introduction	28
4.2	Study Area	28
4.3	Research Design	29
4.4	Data and Data Collection	29
4.4.1	Primary data	29
4.4.2	Secondary data	29
4.5	Population and Sampling	29
4.5.1	Phase 1	29
4.5.2	Phase 2	30
4.6	Analytical Framework	31
4.6.1	Step 1: Defining competitiveness in the context of the Namibian goat sector.....	32
4.6.2	Step 2: Analysing the profitability of goat production in Namibia	33
4.6.3	Step 3: Measuring the competitive status of the goat sector	33
4.6.4	Step 4: Identifying the major factors affecting the competitiveness of the sector.....	35
4.6.5	Step 5: Grouping factors according to the six determinants of the Diamond model.....	35
4.6.6	Step 6: Proposing sector-level strategies that can increase the competitive performance of the sector	35
4.7	Reliability and Validity.....	35
4.7.1	Reliability	36
4.7.2	Validity.....	36
4.8	Conclusion	36

Chapter 5: Results and Discussions	37
5.1 Introduction	37
5.2 Descriptive Statistics	37
5.3 Profitability of Goat Farming in Namibia	39
5.3.1 Commercial farmer's gross margins	39
5.3.2 Non-commercial (Communal plus Resettled) farmers' gross margins	41
5.3.3 Profitability of commercial vs non-commercial goat farmers and how this affects their competitiveness	42
5.4 Competitiveness of the Namibian Goat Sector (RCA & RSCA)	43
5.5 Inter-Country Analysis (RSCA, NRCA, TBI, and Production Mapping)	45
5.6 Factors Affecting the Competitiveness of the Namibian Goat sector	47
5.7 Factors Affecting Competitiveness according to Porter's Diamond Determinants	49
5.7.1 Production conditions	51
5.7.2 Demand conditions	53
5.7.3 Government support and policies	55
5.7.4 Firm strategy, structure, and rivalry	56
5.7.5 Related and supporting firms	58
5.7.6 Chance factors	60
5.8 Conclusion	61
Chapter 6: Conclusion and Recommendations	62
6.1 Introduction	62
6.2 Summary of Major Findings	62
6.3 Proposed Strategies to Enhance the Sector's Competitiveness	63
6.3.1 Production condition	63
6.3.2 Demand conditions	63
6.3.3 Government support and policies	64
6.3.4 Firm strategy, structure, and rivalry	64
6.3.5 Related and supporting firms	64
6.3.6 Chance factors	64
6.4 Validation of the Research Hypotheses	64
6.5 Recommendations for Future Research	65
References	66
Annexures	71
Annexure A: Goat Sector Stakeholder's Questionnaire	71
Annexure B: Additional Results	75

List of Tables

Table 2.1: Share in world trade of live goats in 2022 (HS Code: 0104210 Live goats)	8
Table 5.1: GSSS respondents characteristics	38
Table 5.2: Gross margin estimates for commercial farmers	40
Table 5.3: Commercial goat farming sensitivity analysis results	40
Table 5.4: Gross margin estimates for non-commercial (communal and resettled) farmers	41
Table 5.5: Non-commercial goat farming sensitivity analysis results	42
Table 5.6: RCA and RSCA indices	43
Table 5.7: Production mapping	47
Table 5.8: Most enhancing and constraining factors	49
Table 5.9: Porter's Diamond determinants of competitiveness	50
Table 5.10: Production conditions factors of competitiveness	52
Table 5.11: Demand conditions factors of competitiveness	54
Table 5.12: Government support and policy determinants of competitiveness	56
Table 5.13: Firm strategy, structure, and rivalry determinants of competitiveness	58
Table 5.14: Related and supporting firms' determinants of competitiveness	59
Table 5.15: Chance factors of competitiveness	61
Table B.1: RSCA index	75
Table B.2: TBI index	76

List of Figures

Figure 2.1: Goat production share by region (2001–2022)	6
Figure 2.2: Global trade of goats	7
Figure 2.3: Namibia's livestock population.....	9
Figure 2.4: Namibian Goat population	10
Figure 2.5: Namibia's goat exports	11
Figure 2.6: Namibia's goat exports to South Africa	12
Figure 2.7: Namibia's goat imports.....	13
Figure 2.8: Namibia's goat sector supply chain	14
Figure 3.1: Porters Diamond Model	21
Figure 3.2: Competitiveness conceptual framework.....	23
Figure 4.1: Map of the study area	28
Figure 5.1: Namibia's competitive performance based on RCA and RSCA.....	45
Figure 5.2: NRCA index	46
Figure 5.3: Factors affecting the competitiveness of the Namibian goat sector	48
Figure 5.4: Porter's Diamond determinants of competitiveness	50
Figure 5.5: Production conditions factors of competitiveness.....	53
Figure 5.6: Demand condition factors of competitiveness.....	54
Figure 5.7: Government support and policies determinants of competitiveness.....	56
Figure 5.8: Firm strategy, structure, and rivalry determinants of competitiveness.....	58
Figure 5.9: Related and Supporting Firms' determinants of competitiveness.....	60
Figure 5.10: Chance factors of competitiveness.....	61

List of Equations

4.1	30
4.2	33
4.3	34
4.4	34
4.5	34
4.6	34

List of Abbreviations

Agribank	Agricultural Bank of Namibia
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	Food and Agriculture Statistical Database
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMA	Gross margin analysis
GSSS	Goat sector stakeholder survey
H-O	Heckscher-Ohlin theorem
HS	Harmonized System
ITC	International Trade Centre
LLPBN	Livestock and Livestock Products Board of Namibia
NRCA	Normalised revealed comparative advantage
RCA	Revealed comparative advantage
RSCA	Revealed symmetric comparative advantage
TBI	Trade balance index
USA	United States of America
USD	United States Dollar
VCF	Veterinary cordon fence

Chapter 1: Introduction

1.1 Background of the Study

Namibia's agricultural sector is one of the country's main primary sectors, recognised as a key contributor to employment, food security, and rural livelihoods (FAO, 2023). The goat sector holds considerable potential within Namibia's agriculture because goats are hardy in the country's arid and semi-arid climates, have significant economic value, and are culturally important (Ministry of Agriculture Water and Forestry, 2015). Although the local goat market is primarily informal, mainly in communal areas (Marius et al., 2021), the sector remains important due to its export focus.

With the absence of a formal market attractive for local goat farmers, a report by the Meat Board of Namibia (2021) reveals that there is significant demand for Namibian goats from abroad. Therefore, it is crucial to understand the competitive performance and the factors affecting the competitiveness of the Namibian goat sector. Moreover, Angala (2015) suggests that only a progressively competitive sector can endure to deliver economic, social, and financial benefits in today's interconnected world of trade. Therefore, this study aims to fill the existing void in the literature and provide evidence to inform policy formulation, thereby improving the overall performance of the sector.

In addition, there has been a noticeable increase in interest in competitive studies, particularly in the field of agricultural economics research in southern Africa (Abei, 2017; Boonzaaier & Van Rooyen, 2017; Dlikilili, 2018; Jafta, 2014; Jantjies, 2024; Sibulali, 2018; Sihlobo, 2016). Equally important, Namibia demonstrates visible progress in competitive assessments at both micro- and macro-levels (Angala, 2015; Bahta & Mbai, 2023; Mawenge, 2020; Mbai et al., 2021). Therefore, this study aimed to evaluate the competitive performance of the Namibian goat sector to support policy development in the country.

1.2 Problem Statement

Despite the goat sector's potential, there is limited literature on its competitiveness, making it necessary to examine the sector's competitive performance both locally and internationally. Equally important, the sector faces disinvestment, driven by perceptions of low profitability attributable to frequent droughts and restrictive export policies. Continued disinvestment within the sector would eventually impact the sustainability of its competitive performance. Moreover, Tey and Brindal (2015) emphasise that, to maintain the sustainability of commercial activities in the long run, an enterprise

must remain profitable, thereby validating the inclusion of profitability analysis alongside other measures of competitive analysis.

According to Togarepi et al. (2018), drought, predation, animal theft, diseases, and parasites are among the challenges faced in goat production. On the other hand, Kandiwa et al. (2020) reveal that goats require low maintenance, have a faster reproduction rate compared with other livestock, and are a profitable venture for farmers dealing with the negative effects of climate change. However, the profitability of goat production in Namibia has yet to be assessed, creating a gap that this study aims to fill.

According to Jantjies (2024), there are various methods to assess competitiveness, including cost-benefit measures (profitability analysis). Existing studies on the goat sector, such as those by Kandiwa et al. (2020); Marius et al. (2021); and Togarepi et al. (2018), have concentrated on domestic production, marketing, constraints, and opportunities in the Namibian goat sector. In addition, a study by Mawenge (2020) assessed the export competitiveness of Namibia's hides and skins, highlighting the strength of the country's goat skins, but not the entire goat value chain. None of the existing studies assesses the competitiveness of the goat sector over time while including a profitability analysis to support such an assessment. Therefore, this study aims to fill this gap by examining the sector's competitiveness and suggesting strategies to improve it.

1.3 Research Questions

Based on the problem statement discussed above, the study aimed to answer the following questions:

- i. How profitable is goat production in Namibia?
- ii. How competitive has the Namibian goat sector been over time?
- iii. What factors influence the competitiveness of the Namibian goat sector?

The questions posed above shaped the formulation of the study's research objective.

1.4 Objectives of the Study

1.4.1 Overall objective

The overall objective of this study was to assess the competitive performance of the Namibian goat sector at both micro and macro levels.

1.4.2 Specific objectives

- To analyse the profitability of goat production in Namibia.
- To measure the competitive performance of Namibia's goat sector.
- To analyse factors affecting the competitive performance of Namibia's goat sector.

1.5 Research Hypotheses

Based on the problem statement, the research questions, and the objective of the study, the following hypotheses guided this analysis.

Hypothesis 1: Goat production in Namibia is economically profitable for both the communal and commercial farming systems.

Hypothesis 2: The Namibian goat sector has exhibited sustained international competitiveness over the years, regardless of unfavourable policy and climatic conditions.

Hypothesis 3: The competitive performance of the Namibian goat sector has been influenced by various factors, such as production conditions, market demand, policy frameworks, and external shocks beyond the sector's control.

1.6 Significance

Although Namibia has established a line of trade in the global market for goats and has been actively participating by exporting them, the competitive performance of the country's goat sector has yet to be assessed. Therefore, this research will help to evaluate the competitiveness of the Namibian goat sector by analysing the profitability of goat production, the sector's comparative advantage, and the factors influencing its global competitiveness. The findings will support the enhancement of business intelligence by informing policy and strategic decisions at the government, sector, and farm levels to improve competitive performance. Additionally, the study's results will add to the existing knowledge on the competitiveness of Namibia's goat sector.

1.7 Limitations of the Study

This study experienced a low response rate from stakeholders in the goat sector supply chain. To address this, the sample size was carefully adjusted to ensure representativeness, enabling meaningful conclusions to be derived from the available data. Despite these adjustments, the study successfully achieved its objectives. Future research could expand on these findings by conducting a comprehensive countrywide assessment, covering all 14 regions of Namibia, rather than focusing solely on the two case study regions (Omaheke and Hardap).

1.8 Delimitations of the Study

This study evaluated the competitive performance of the Namibian goat sector through profitability analysis, trade-based indices, and Porter's Diamond Model. It aimed to identify key factors that could enable the sector to thrive internationally, without attempting to forecast the future or propose farm-level strategies. The study used data from regions with significant goat production, with trade data specifically on live goats from 2001 to 2022, and examined trends in other leading exporting countries. Data collection was restricted to stakeholders involved in the goat supply chain.

1.9 Outline of the Study

This thesis is organised into six chapters. **Chapter 1** presents the background, problem statement, research objectives, significance, limitations and delimitations, providing the overall context of the study. **Chapter 2** provides an overview of the goat sector. **Chapter 3** presents a review of the relevant literature, including on the conceptual framework, definitions, and empirical studies on competitiveness in agriculture.

Chapter 4 describes the methodology and data requirements for this study, including a detailed explanation of the six-step analytical framework used. **Chapter 5** presents the study's findings. Finally, **Chapter 6** synthesises the main conclusions, provide recommendations, and offers suggestions for further research on the Namibian goat sector.

Chapter 2: An Overview of the Goat Sector

2.1 Introduction

The primary aim of this chapter is to provide a concise overview of the goat sector. While the main focus is on the performance of the Namibian goat sector, it was considered suitable to also review the global situation. This section begins with a global overview and then proceeds to a summary specific to Namibia.

2.2 Global Overview

Goats (*Capra hircus*) are small ruminants that were the earliest and most domesticated group of livestock (Marius et al., 2021). They are kept for their meat, skins, milk and manure, and are used in traditional rituals, but most importantly, they are a source of income, worldwide (Togarepi et al., 2018). There are no restrictions on the production, slaughter and consumption of goats related to religion or culture, except for the Halaal slaughter requirements in Islam. Compared with red meat from other species, goat meat is the most widely consumed (Celozzi et al., 2022).

According to Celozzi et al. (2022), the global goat population has been rising over the years, with Africa and Asia standing as the leading goat producers. Figure 2.1 shows that Asia and Africa account for 95% of the world's goat production, with Asia contributing 55% and Africa 39%. Furthermore, data from the FAO suggests that there are 1,145,385,536 goats worldwide, with India (13%) as the leading producer, followed by China (12%), Nigeria (8%) in third place, and Pakistan (7%) and Bangladesh (5%) occupying fourth and fifth positions, globally (data retrieved from FAOSTAT; <https://www.fao.org/faostat/en/#data/qcl>; last accessed on 9 April 2024).

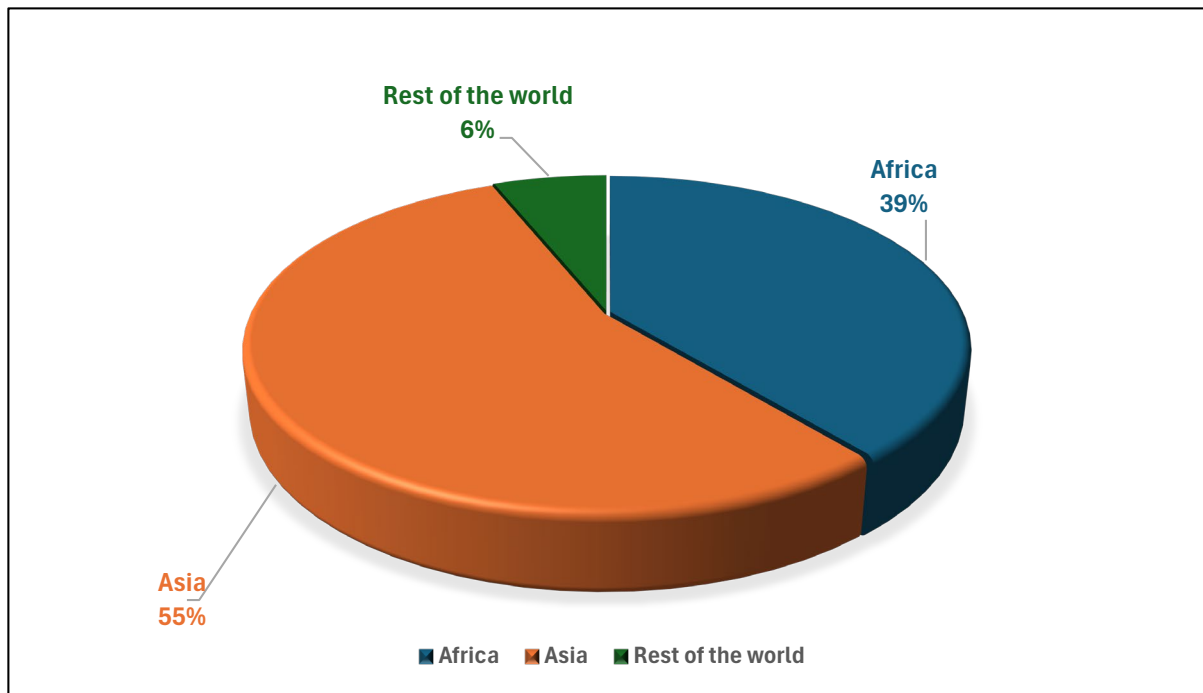


Figure 2.1: Goat production share by region (2001–2022)

Source: Author's computation (FAO, 2024)

Goat meat is regarded as an important source of protein in developing countries where goats are farmed and consumed in substantial quantities (Abhijith et al., 2023). The domestic and export markets categorise goat meat into two types: capretto or cabrito (Vincent, 2018) and chevon (Gawat et al., 2023). Capretto is the meat of suckling goat kids, commonly found throughout Europe and various regions of Latin America and the Caribbean (Vincent, 2018). Chevon is meat from mature or adult goats (although it is the common term for goat meat) and is characterised by a “goaty” smell or sweaty odour, being tough and having a flavour similar to that of mutton or lamb. As a result, chevon usually faces discrimination compared with cabrito because kid meat is of an eating grade (Gawat et al., 2023).

Without a doubt, goat production is a significant source of income and a substantial contributor to human nutrition. However, poor goat farming and management practices may lead to the depletion of natural vegetation in the environment as a result of overgrazing and browsing (Gawat et al., 2023). Since the type of goat breed directly affects stocking rates for pasture management, good management – which includes understanding the varying grazing performances of different breeds – can mitigate the negative effects of goat farming (Gawat et al., 2023).

2.3 Global Trade of Goats

Goats are traded in various forms around the world, either as live animals or in meat (carcass) form, along with other products such as skins, offal, and milk. However, Namibian goats are mainly traded live to other countries, as data indicates that Namibian goat meat imports and exports are minimal. Therefore, the trade discussion in this study will primarily focus on comparisons of live goat trades because of the limited data available on Namibian goat meat trade.

Figure 2.2 depicts global trends in the value of imports and exports of live goats and goat meat. From 2001 to 2022, the trade of these products has fluctuated, exhibiting overall growth. In 2001, both live goat imports and exports exceeded those of goat meat, with the latter's trade volumes reaching their lowest recorded levels that year. The demand for live goats increased over the years until 2015, when live goat imports recorded the highest value ever in goat trade, surpassing both exports of live goats and the trade in goat meat. However, after 2015, the global trade continued to fluctuate, with a noticeable downward trend in live goat trade, while the trade of goat meat in subsequent years fluctuated with an upward tendency trend.

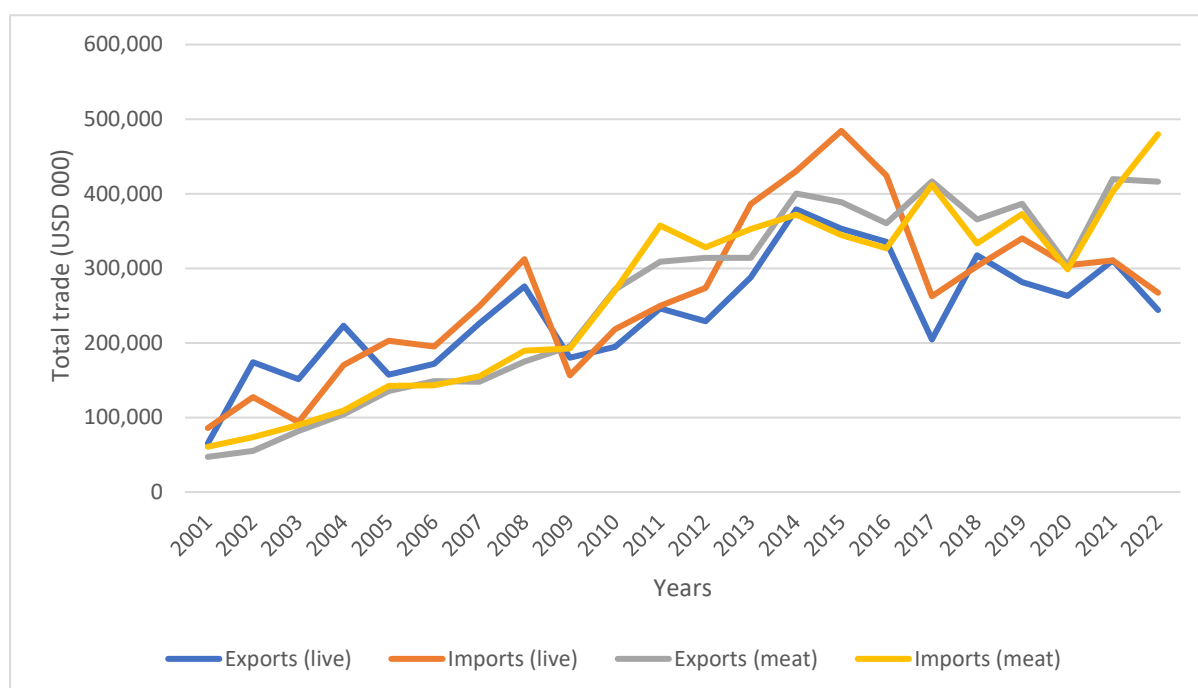


Figure 2.2: Global trade of goats¹

Source: Author's computation (ITC, 2024)

In 2022, Oman, Somalia, Thailand, Namibia and India were the five leading live goat-exporting countries (by value), accounting for 91% of the total global goat exports (Table 2.1). Oman was the

¹ Imports and exports (live) represent the trade of HS Code: 0104210 (Live goats), whilst imports and exports (meat) represent the trade of HS Code: 020450 (Fresh, chilled, or frozen meat of goats).

leading goat exporter, accounting for 48.8%, followed by Somalia with 30.6%, and Thailand in third place (with 7.2%), with Namibia (2.9%) and India (1.5%) in fourth and fifth places, respectively (Table 2.1). The remaining 9% of the total goat trade around the world was shared among different countries in smaller fractions, compared with the top five exporting countries (Table 2.1).

Regarding imports of live goats, Oman remained the top among the five leading goat-importing countries around the world, which suggests that Oman may have been importing goats for re-export purposes (Table 2.1). Table 2.1 below shows that Oman was the leading (68.3%) importing country of live goats (i.e. by value) globally, followed by the United Arab Emirates (7.9%), Lao People's Democratic Republic (6.5%), Qatar (2.8%), and South Africa (2.4%).

Regarding the goat meat trade, none of the five leading countries exporting live goats appeared among the top exporters of goat meat. The same is true when comparing the top importers of live goats with those of goat meat, except for the United Arab Emirates, which was the second-largest importer of both live goats and goat meat.

Table 2.1: Share in world trade of live goats in 2022 (HS Code: 0104210 Live goats)

HS Code: 0104210 Live goats				
Position	Exporters	Share in world exports (%)	Importers	Share in world imports (%)
1	Oman	48.8	Oman	68.3
2	Somalia	30.6	United Arab Emirates	7.9
3	Thailand	7.2	Lao People's Democratic Republic	6.5
4	Namibia	2.9	Qatar	2.8
5	India	1.5	South Africa	2.4
	Rest of the world	9.0	Rest of the world	12.1
HS Code: 020450 Fresh, chilled, or frozen meat of goats				
Position	Exporters	Share in world exports (%)	Importers	Share in world imports (%)
1	Australia	45.9	United States of America	32.1
2	Ethiopia	19.7	United Arab Emirates	26.7
3	Kenya	11.9	Korea, Republic of	7
4	Spain	4.9	Saudi Arabia	5.3
5	France	4.4	Portugal	3.6
	Rest of the world	13.2	Rest of the world	25.3

Source: Author's computation (ITC, 2024)

2.4 Overview of the Namibian Livestock Sector

Namibia is characterised by two types of farming, namely commercial and subsistence farming, with an export-oriented and lucrative livestock sector forming a significant part of the country's agricultural

sector (GIZ, 2022). The country is divided by a veterinary cordon fence (VCF), also known as the redline, which separates it into northern and southern livestock production zones. South of the redline lies the export-oriented communal and commercial livestock production sector, characterised by sophisticated infrastructure, capital-intensive management, and free of foot-and-mouth disease (Marius et al., 2021).

On the other hand, in the northern part of the redline are the subsistence livestock producers in what is known as the Northern Communal Areas (Marius et al., 2021). The northern communal areas are characterised by high disease prevalence (e.g. foot-and-mouth disease), limited market access, and low input and capital. With little or no success, the Namibian government has been implementing projects to endeavour to improve market access for livestock farmers in the communal sector (Ministry of Agriculture, Water and Forestry Annual Report 2015, as cited in Marius et al., 2021).

Livestock production makes up two-thirds of the country's total agricultural output (GIZ, 2022). The Namibian livestock sector includes cattle, goats, sheep and swine. Cattle, sheep and goats alone make up 95% of Namibia's total livestock (Figure 2.3). Cattle production (46%) leads the sector, followed by goats (28%) and sheep (21%).

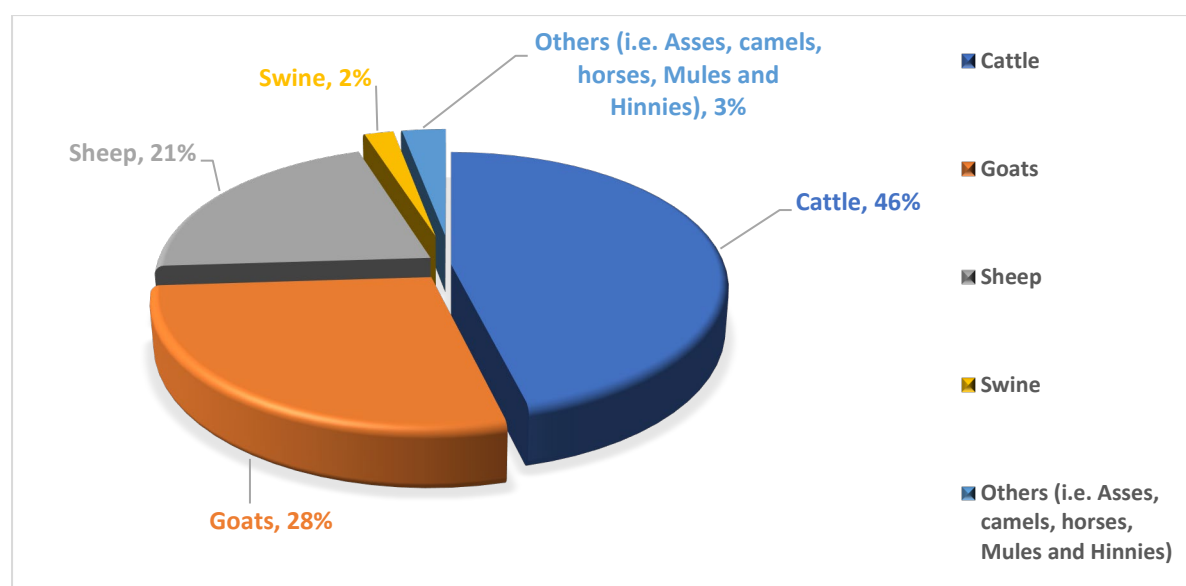


Figure 2.3: Namibia's livestock population

Source: Authors' computation (FAOSTAT, 2024)

2.5 Goat Production in Namibia

Over the years, the goat population in Namibia has been fluctuating, but at a decreasing rate (Figure 2.4). The highest population of at least 2.1 million goats was recorded in 2011, and after that, the population declined, with 2020 having the lowest (1,618,204) goat population recorded in the country

since 2001. The goat population increased in subsequent years, reaching at least 1.8 million goats in 2022 (Figure 2.4).

In 2016, it was estimated that 62% of the entire goat population in Namibia was located in the northern communal areas (Ministry of Agriculture, Water and Forestry, 2017, as cited in Togarepi et al., 2018). The authors further reveal that the northern communal areas had four predominant breeds, namely Owambo, Kavango, Caprivi and Kunene, while the southern part of the red line had breeds such as the Boer goat, Kalahari red, Angora, Mohair, and Saanen.

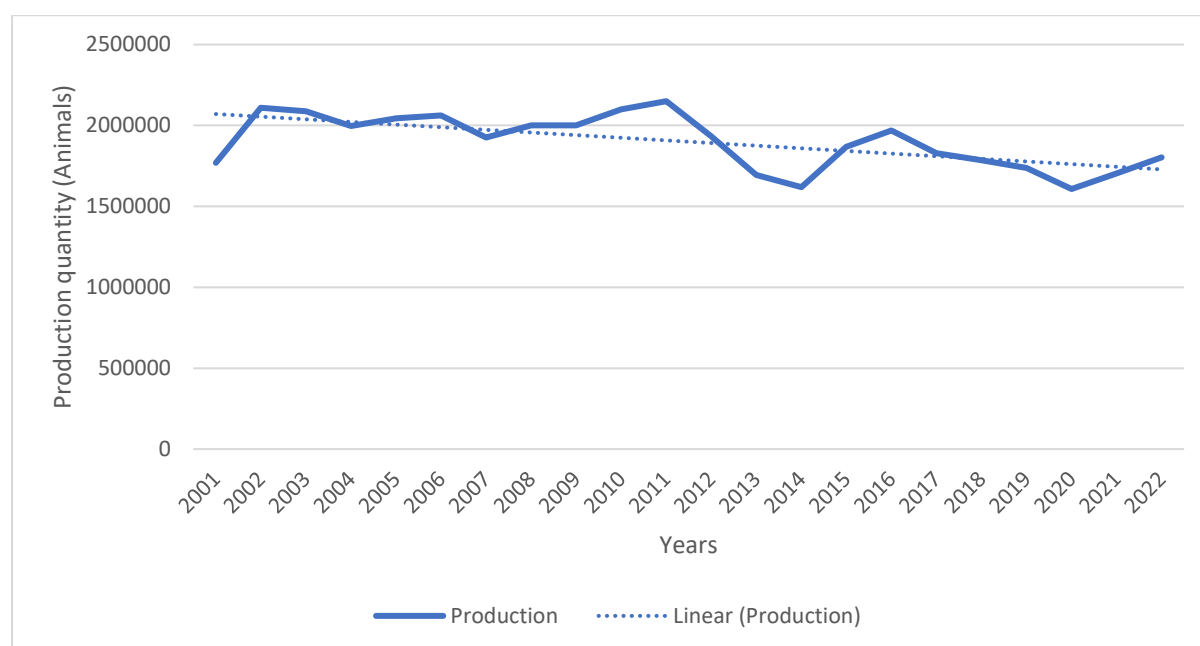


Figure 2.4: Namibian Goat population

Source: Author's computation (FAO, 2024)

2.6 Namibian Goat Exports

Most sheep and almost all goats were exported to South Africa on hoof until 2006, when the government developed the "Growth at Home" initiative, which discourages the export of live animals in favour of local slaughter and value addition (Kandiwa et al., 2020). This initiative involved the introduction of a levy on live animal exports. As a result, this has since led to increased demand and success for lamb in the formal market, but not for Chevon or Cabrito. As a result, both the quantity and value of Namibian goat exports have declined since 2006 (Figure 2.5). Given the sector's heavy reliance on live exports, the levy's implementation had a negative impact on performance, resulting in decreased trade volumes and values. Additionally, the limited or absent data on goat meat exports suggest that the initiative was not successful. However, the initiative has since continued to be effective within the sector.

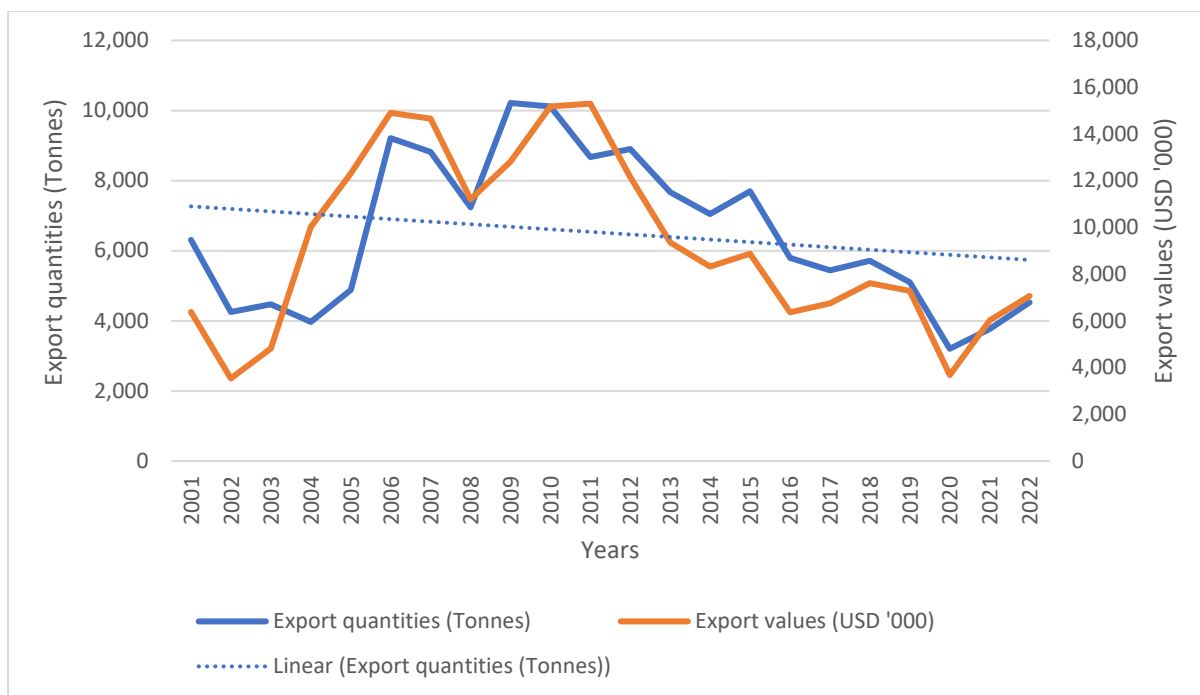


Figure 2.5: Namibia's goat exports

Source: Author's computation (ITC, 2024)

2.7 Domestic Market

According to Togarepi et al (2018), the domestic market for goats in Namibia consists of both formal and informal markets. In the former, the market is well structured (or at least one can assume that) because there is proper price determination and advertising with tax included. The communal areas of Namibia lack a well-developed market structure, similar to the formal market, leading to informal sales of goats. These sales often involve selling to friends and others, such as street vendors who barbeque (Okapana) the meat and sell it. However, there is also a noticeable rise in demand for goats on the informal market during festivities, resulting in an increased number of goats sold by farmers informally in the communal areas. Additionally, on the informal market, goats are sold on a cash basis by communal farmers, whereas on the formal markets, sales are more organised and/or prearranged through auctions and exports (Togarepi et al., 2018).

The study by Togarepi et al (2018) further reveals that there is limited information regarding why goat products like goat meat and milk are scarcely available on the formal market after unsuccessful attempts to promote their consumption in local restaurants and retail outlets.

The author further concluded that marketing channels for the Namibian goat sector are not well developed.

2.8 South African Market

Over the years, South Africa has been a key destination for live goat exports from Namibia. Kwazulu-Natal and the Eastern Cape in South Africa were major destinations (attributable to demand from the Muslim community, Zulu people, and Xhosa people) for goats from Namibia, where, in many cases, goats are used for religious ceremonies and rituals as they are bled for the proceedings of these events (Mendelsohn et al., 2006). Between 2001 and 2022, the export of goats to South Africa – in both quantities and values – fluctuated, with the highest quantity exported (9,551 tonnes) in 2009, and the highest value (14.8 million USD) in 2006 (Figure 2.6).

However, exports to South Africa have significantly declined over the past 10 years (Figure 2.6). In 2020, both quantities (2,998 tonnes) and values (3.2 million USD) reached their lowest levels, and notably, quantities in 2022 were lower than in 2001. The occurrence of events such as drought, the COVID-19 pandemic and the export levy, led to a decrease in exports.

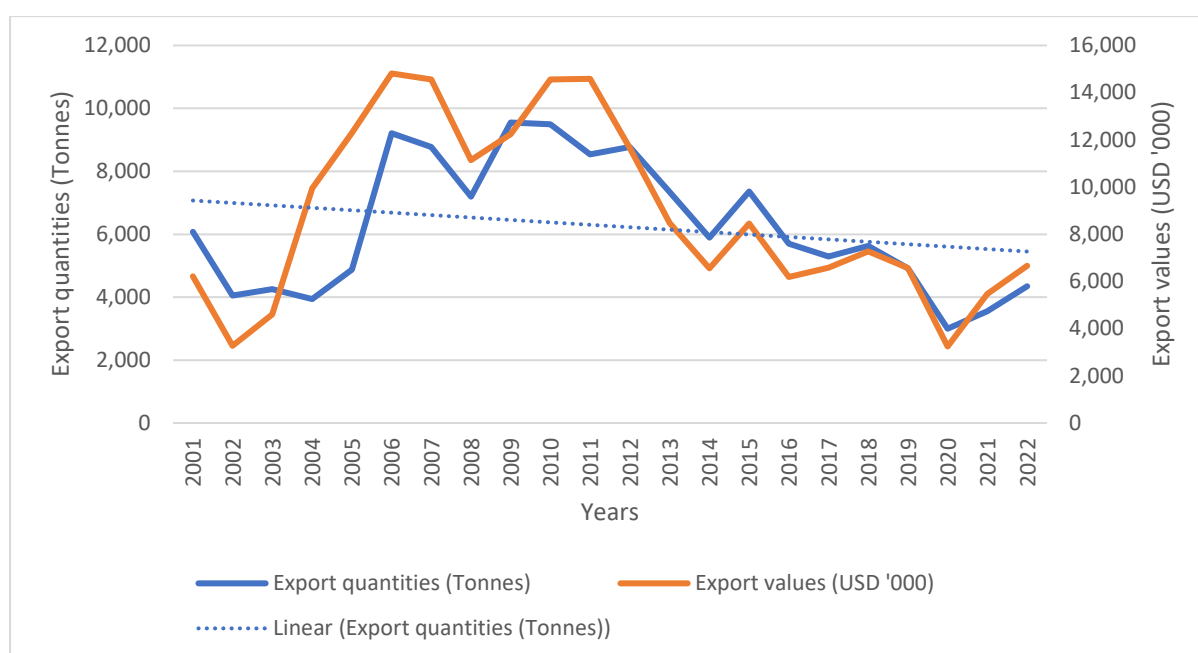


Figure 2.6: Namibia's goat exports to South Africa

Source: Author's computation (ITC, 2024)

2.9 Other International Markets and Potential

Although South Africa is the main destination for Namibian goat exports (at least three-quarters), statistics from (ITC, 2024) show that Namibia exported goats to other countries such as Angola, Botswana, Zimbabwe, and Zambia. However, the named countries did not rank among the top live goat-importing nations globally. Therefore, Namibia could explore the international market by establishing trade with other leading importing countries, aside from South Africa.

2.10 Namibian Goat Imports

Because of a lack of a well-developed market or low demand for goat meat and goat products, Namibia still imports goats from around the world in relatively low quantities and values (Figure 2.7). However, these imports are believed to be for breeding purposes. Figure 2.7 shows that imports of goats decreased over the years (2001–2022). Both quantities and values reached their peak in 2001 and then declined in subsequent years, with noticeable fluctuations in values compared with the almost constant quantities. Moreover, both quantities and values were lower in 2022 than in 2001.



Figure 2.7: Namibia's goat imports

Source: Author's computation (ITC, 2024)

2.11 The Namibian Goat Sector Supply Chain

In agriculture, goat supply chains are open networks with a one-way flow of products from producers to consumers through key processes such as input service provision, production, trading, processing, wholesaling, and retailing (Nguyen et al., 2023). In Namibia, the goat supply chain consists of 6 main processes: input and service supply, production, marketing, processing, consumption and export. Figure 2.8 provides a visual diagram of the Namibian goat supply chain.

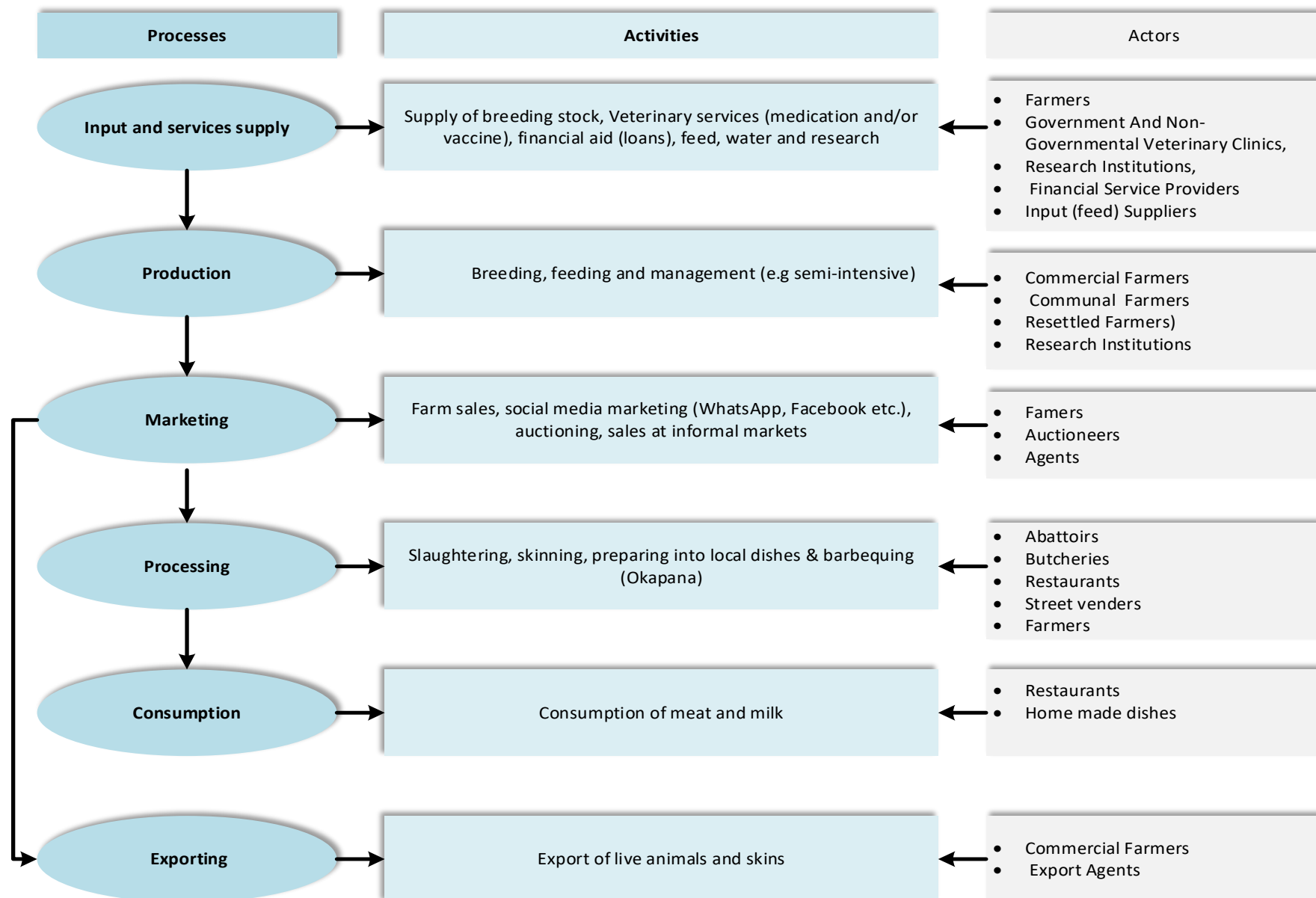


Figure 2.8: Namibia's goat sector supply chain

Source: Author's compilation

2.11.1 Understanding the different processes or stages of the supply chain

2.11.1.1 Input and service supply

The first stage, which is input and service supply, involves the provision of various resources used in the production process by producers (farmers), such as breeding stock, feed, water, veterinary services, and credit. Therefore, key stakeholders in this stage include financial service providers, researchers, veterinarians and farmers. Goat breeders supply replacement stock and goats to farmers who wish to start farming. Financial service providers, like the Agricultural Bank of Namibia (Agribank), offer financial assistance through loans to farmers and provide training on different farming practices.

2.11.1.2 Production

The second stage involves goat production, which primarily involves various feeding and management practices. In Namibia, there are three types of goat farmers: commercial, communal, and resettled.

2.11.1.3 Marketing

The marketing of goats in Namibia occurs through various methods such as auctions, farm sales and informal markets, and the use of social media platforms like WhatsApp and Facebook. With recent technological advancements, goats are also being advertised on these social media platforms, which are considered more cost-effective options for marketing compared with auctioning, where farmers are expected to pay a commission to auctioneers.

2.11.1.4 Processing

The unsuccessful attempts to promote goat products in the formal market have caused this part of the supply chain to remain mostly informal. This is because activities such as slaughtering, skinning, and preparing goat meat for various local dishes are generally done informally. Additionally, local vendors barbeque the meat, creating “Okapana” (the local name for small pieces of grilled meat), which they sell in informal markets.

2.11.1.5 Consumption

Goat meat and other products, such as milk, are mainly consumed informally, i.e. through the preparation of various local meals in informal settings, including markets.

2.11.1.6 Exporting

Live animal exports are a key driver of the goat sector. However, goat skins are among the goat products exported from Namibia. Exporting of live goats is carried out by commercial farmers and agents on the southern side of the Red Line (VCF).

2.12 Challenges of the Namibian Goat Supply Chain

Namibia is one of Africa's driest countries, facing water stress caused by high evaporation rates combined with low and highly irregular rainfall (Shikangalah, 2020). Furthermore, the country is prone to floods and droughts. As a result, the National Drought Policy and Strategy of 1997 was developed as a mitigation measure. Typically, periods of drought lead to decreased livestock production attributable to a lack of forage for animals and a reduction in drinking water from various sources for livestock. The 2019 drought is considered the harshest in the country's history. As a result, many heads of livestock, including goats, died, leading to decreased production (Schwieger, 2023; Shikangalah, 2020).

A study conducted in the northern communal areas of Namibia by Togarepi et al (2018) confirms that droughts are the main cause of feed shortages in the country. Furthermore, the authors identified predation, animal theft, diseases, and parasites as key challenges to goat production. Additionally, they highlighted the point that conditions such as lumpy skin, fever, and tick-borne diseases, when combined with feed shortages, can easily lead to mortalities. Conversely, dogs are the primary predators attacking vulnerable kids and increasing cases of animal theft are hindering herd growth (Togarepi et al., 2018).

Similarly, research by Marius et al. (2021) revealed the marketing challenges faced in Namibia's goat sector. The findings of this study suggest that the absence of price incentives, a profitable local market, limited marketing infrastructure, and minimal government support incentives are among the key constraints to goat marketing in Namibia. Moreover, the lack of goat meat in retail outlets locally strongly supports the findings of this study and poses a serious weakness to the country's goat supply chain.

2.13 Conclusion

The global goat population has been steadily increasing, with Africa and Asia emerging as the leading regions in goat production. Among red meats, goat meat is the most widely consumed, globally. However, compared with other major goat-exporting nations, Namibia remains a relatively small player in the international market. Namibia's goat sector faces significant marketing challenges, intensified by harsh environmental conditions and restrictive policies, which undermine its competitive performance. This study identified key constraints, including the absence of price incentives, a lack of a profitable local market, insufficient marketing infrastructure, and minimal government support incentives. Furthermore, the absence of goat meat in local retail outlets aligns with these findings, highlighting a critical weakness in the country's goat value chain.

Chapter 3: Literature Review

3.1 Introduction

This chapter examines the relevant literature that informs the methodological and analytical approach of this research. Firstly, it discusses the conceptual framework of competitiveness used in this study. Secondly, it provides a clear definition of competitiveness and explains how it differs from its often-mistaken counterpart, comparative advantage. Lastly, the chapter reviews the empirical literature relevant to the study.

3.2 Conceptual framework

The conceptual framework of this research comprises three dimensions used to gain an understanding of the competitiveness of the Namibian goat sector: profitability, trade competitiveness, and competitive determinants. It was based on an analytical framework that has been widely used in assessing competitiveness in agriculture, combining the use of the comparative advantage theory and Porter's Diamond Model (Angala, 2015; Dlikili, 2018; Jantjies, 2024; Sibulali, 2018). However, this study adds a new dimension by including cost-benefit measures to assess the sector's profitability.

3.2.1 Profitability

Profitability generally pertains to an enterprise's earnings generated from its revenue, after deducting the costs incurred within a specific period (Alarussi & Alhaderi, 2018). The authors further emphasise that the survival of any enterprise over the long term mainly depends on profitability. Tey and Brindal (2015) were to the same effect, noting that the element of profitability was obvious in agriculture (which is considered a business), and that the sustainability of any commercial activity depends on the ability to remain profitable over time. Furthermore, numerous agricultural producers have exited the sector amid unsustainable profitability and growth conditions (Tey & Brindal, 2015). Positive profit allows a firm to sustain its market share, thereby gaining a competitive advantage (Latruffe, 2010). Hence, this justifies the inclusion of a profitability analysis in this study to assess the competitiveness of the goat sector.

Despite the availability of advanced methods for assessing farming profitability, gross margin analysis (GMA) remains a reliable technique (Nkadimeng et al., 2021). The authors further reveal that GMA is a straightforward technique for calculating the financial returns on a production process. Because of its ease of use and the minimal data required to calculate profits, GMA is commonly employed to assess the viability of smallholder agricultural production systems (Nkadimeng et al., 2021).

3.2.2 Trade competitiveness

Various trade theories have been developed globally, aiding in guiding decision-making and understanding how competitiveness can be achieved. Mercantilism is among the earliest trade theories, developed from the 15th to the 17th centuries. According to mercantilist theory, it was assumed that a nation's economic strength came from its ability to remain a net exporter (Sihlobo, 2016). The implications of trade with this theory are to promote exports and discourage imports through tariffs on foreign goods (Dlikilili, 2018).

In the 18th century, Adam Smith strongly criticised the mercantilist theory, which he argued turned trade under mercantilism into a zero-sum game (Jantjies, 2024). Adam Smith's 1776 theory of absolute advantage proposes national specialisation in goods where production efficiency is maximised (Smith, 1776). Focusing on goods and services that a nation can produce at a lower cost than another country can indicates that the nation has an absolute advantage in producing those goods or services. Therefore, mutual trade was encouraged in other goods that were more expensive to produce domestically than in other countries (Smith, 1776).

However, Langdana and Murphy (2014) argued against the theory of absolute advantage, revealing that it was problematic when a third nation that lacked efficiency in the production of any commodity compared with the other two nations was introduced. The reason is that only two nations are considered with the absolute advantage theory. Hence, David Ricardo proposed the theory of comparative advantage in 1817. The theory of comparative advantage suggests that, regardless of whether a country possesses an absolute advantage in the production of all goods, if both countries concentrate on producing the goods that they can produce most efficiently (with the lowest opportunity cost), there would be mutually beneficial trade (Ricardo, 1817).

However, the theories of absolute advantage and comparative advantage have faced widespread criticism because they only assume a single factor of production (Dlikilili, 2018). This single-factor approach may be impractical in the diverse real world, with many countries, forcing nations to open unwillingly for trade without considering other factors, such as the exchange rate. Consequently, Heckscher (1919) and Ohlin (1933) developed the Heckscher-Ohlin (H-O) theory in the 20th century.

The H-O theory introduces the idea that goods utilising a nation's abundant resources are exported, while those using scarce resources are imported. This theory suggests that factor endowments decrease production costs and that all nations engage in mutually beneficial trade (Sibulali, 2018). Three key theorems have been added to the H-O model: the Stolper-Samuelson theorem, the factor price equalisation theorem, and the Rybczynski theorem. The H-O model boasts numerous enticing

features, including straightforwardness, logic, common sense, and self-evidence. Nevertheless, empirical testing of the model revealed an unforeseen outcome.

A study focused on the verification of the H-O model was conducted by Leontief (1953) in the United States of America (USA), with the assumption that the United States would export capital-intensive goods and import labour-intensive goods. However, Leontief's findings contradicted earlier assumptions: US exports were less capital-intensive than anticipated, while imports were more capital-intensive. These findings by Leontief led to the term "Leontief paradox" (Sibulali, 2018). Reekie (1989) claimed that Leontief was perplexed and that this outcome presented a paradox to him and others. Several academics have since contested the notion of comparative advantage, including Krugman (1979), Lancaster (1979), Linder (1961), and Vernon (1966).

However, Latruffe (2010) concluded that a country's competitiveness is based on the principle of comparative advantage, which David Ricardo and the H-O model conceptualised. Trade-based indices have been widely used to assess the competitiveness of various agricultural commodities, worldwide. Nonetheless, the choice of indices largely depends on the context and the appropriateness of the index in predicting the desired results. In this study, four indices were identified as suitable and aligned with the research objectives.

First, the study makes use of the popular Revealed Comparative Advantage (RCA) index (Balassa index), developed by (Balassa, 1965), to represent the comparative and competitive position of a country in terms of exports. The RCA determines whether a product's export participation in the export schedule of the analysed nation is high or low, reflecting the nation's engagement in the international market. According to Norton (2016), the Balassa index, among other trade indices, is an insufficient measure of comparative advantage for a country's commodity because of its limitations. Topcu (2023) reveals that three key causes of the criticism of the RCA are: (1) it cannot be used for inter-country comparisons; (2) it is asymmetric; (3) it has a lack of consideration of the size of a nation and the commodity's market.

Mbai et al (2021) further recommend using the modified version of the RCA, known as the Revealed Symmetry Comparative Advantage (RSCA) index, to normalise the high values (as was the case in this study) of the RCA, making it the second index examined in this study. However, Laursen (2015) emphasises that both the RCA and RSCA should not be used as measures of international competitive performance, but rather as measures of international specialisation.

Therefore, the third index considered in this study was the Normalised Revealed Comparative Advantage index (NRCA), which has been regarded as reliable for inter-country analyses, particularly for export-focused assessments or in situations of low imports (Jantjies, 2024).

The fourth index was the Trade Balance Index (TBI) developed by (Lafay, 1992). According to Topcu (2023), this index is employed to deduce whether a nation is a net exporter or net importer. Thus, it will serve the same purpose in this study as revealed by Topcu. Since the RCA, RSCA, and NRCA are often criticised for not considering a nation's imports, the TBI was regarded as a relevant measure to address the specific concerns associated with the other indices.

3.2.3 Competitiveness determinants

The trade theories discussed above are inadequate for answering common questions, such as why some businesses succeed and others fail, from an international perspective (Dlikilili, 2018). In response to the recurrent questions, Porter (1990) introduced a Diamond Model, often called Porter's Diamond or the Diamond Model. Porter's Diamond provides a basis on which to analyse the factors that determine an sector's competitiveness. Porter (1990) reveals that four key characteristics of a nation determine its competitiveness. These attributes comprise: demand conditions; firm strategy, structure and rivalry; related and supporting industries; and factor conditions (Porter, 1990).

However, Porter (1998) expanded the diamond framework, adding chance and governance, converting it to a six-characteristic model where mutually reinforcing elements drive international competitive advantage (Dlikilili, 2018). Nehme and Nehme (2014) emphasise that the six features of the diamond model depend on each other and that all of them are individually significant to achieving international competitive advantage.

The diamond model is appropriate to the objectives of this study, given the emphasis it places on the determinants of competitiveness. This study aims to analyse the competitive performance of the Namibian goat sector and identify the factors that influence its competitive performance. Hence, Porter's Diamond Model is more relevant to this study. Figure 3.1 shows a visual representation of Porter's Diamond Model.

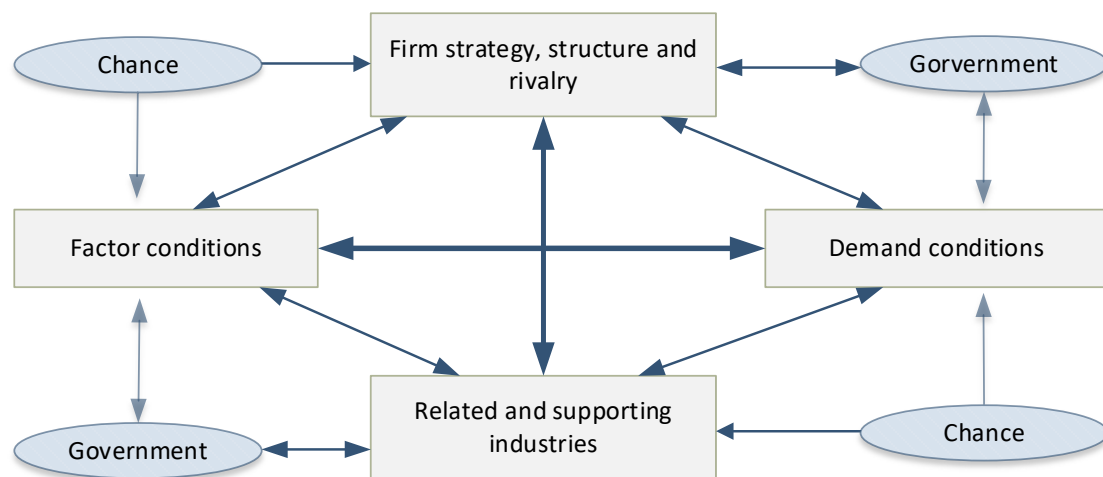


Figure 3.1: Porters Diamond Model

Source: Porter (1998)

The next subsection covers each of the Porter qualities.

3.2.3.1 *Production or factor conditions*

This refers to a country's factors of production, which include labour, land, natural resources, capital, and infrastructure. According to Jafta (2014), a country should not rely on the abundance of non-key factors of production that can be easily attained, such as unskilled labour and raw materials, to create a sustainable competitive advantage. Rather, factors such as skilled labour, capital and infrastructure can lead to a competitive advantage, since they are not easily replicated. Furthermore, Porter (1990) adds that these factors of production that create competitiveness are developed rather than inherited.

3.2.3.2 *Demand conditions*

These conditions are based on local demand for the products or services that an sector offers. The demand conditions include the impact of the domestic structure, demand size, growth patterns, and interactions of demand conditions (Porter, 1990). When a domestic market is sophisticated, a country, sector, or company is compelled to produce higher-quality goods and services. The same applies from a global market perspective (Angala, 2015), thereby fostering competitiveness.

3.2.3.3 *Related and supporting industries*

These refer to the presence or absence of internationally competitive suppliers and related industries within the country. Porter (1990) explains the importance of a strong, interconnected, and supporting sector cluster for the competitiveness of industries or businesses. These industries include providers of inputs and services, as well as the quality of skilled labour accessible to them.

3.2.3.4 Firm strategy, structure, and rivalry

This component evaluates the composition, organisation and management of a nation's sector, as well as the level of domestic competition, to determine that nation's competitive advantage (Porter, 1990). According to Porter, managerial abilities and company structure vary by sector. By this, he indicates that the organisational culture that is preferred in that nation and management activities that coincide lead to competitiveness in that specific firm (Nehme & Nehme, 2014). Porter argues that fierce competition in regional markets is likely to enhance productivity and creativity, thereby boosting a country's competitiveness on the global stage.

3.2.3.5 The role of government and policy interventions

The government has a significant impact on the competitiveness of industries on the world stage, as it has the power to positively or negatively influence every segment through operational capability and policy. These regulations may take the form of property ownership, taxation, subsidies, or educational initiatives that influence workers' skill levels (Dlikilili, 2018). Government policy execution, however, should promote a favourable business environment that enables industries to gain a competitive edge, rather than directly affecting the competitiveness of their respective industries (Dlikilili, 2018).

3.2.3.6 The role of chance

The term "role of chance" refers to events that are mostly beyond the control of businesses (and often the national government) and have minimal direct impact on conditions in a country or sector. In his model of competitive advantage, Porter (1990) emphasises the significance of chance, arguing that random events can either benefit or hinder a firm or sector's ability to compete. Events that can be classified as chance include wars, political actions by foreign governments, significant increases in demand, changes in global financial markets and currency rates, important technological advancements or inventions, and input demand.

The Diamond model complements other quantitative methods used for assessing competitiveness by offering qualitative descriptions of influencing factors. Porter's approach enables the evaluation of the competitiveness of various supply chain stakeholders (Sinngu & Antwi, 2014). This approach is considered accurate, as the sample for this assessment will be drawn from the Namibian goat sector, including goat farmers, traders and sector associates. Therefore, the model will be used to identify factors affecting the competitiveness of the Namibian goat sector.

Having discussed profitability, trade competitiveness, and competitive determinants, a diagrammatic representation of the study's conceptual framework is shown in Figure 3.2.

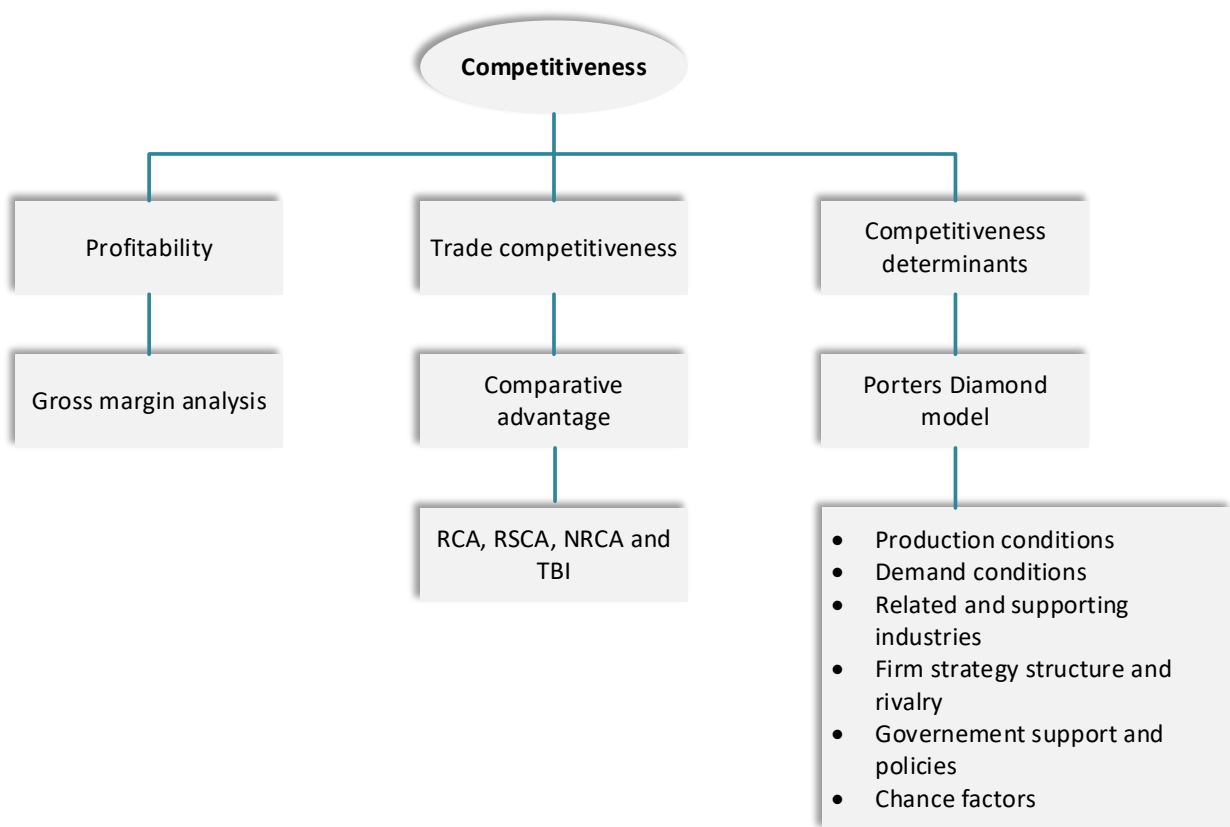


Figure 3.2: Competitiveness conceptual framework

Source: Author's computation

3.3 Understanding Competitiveness

3.3.1 The difference between comparative advantage and competitive advantage

The concepts of comparative advantage and competitive advantage (or competitiveness) are recognised as significant and form the foundation for understanding international trade (Porter, 1990). However, people often mistake or confuse these two concepts with each other (Dlikilili, 2018). Comparative advantage refers to a country's ability to produce a product at a lower opportunity cost, as compared with another country (Lipsey et al., 1993; Serin & Civan, 2008).

According to Lipsey et al. (1993), comparative advantage explains how trade, particularly in a free market environment, can benefit countries by enabling the more efficient use of resources such as land, labour, and capital. Pugel (2004) concludes that comparative advantage indicates whether expanding the production and trade of a specific good would be beneficial to the economy. However, Kannapiran and Fleming (1999) believe that comparative advantage is not relevant for inter-country comparisons, but rather relates to inter- and intra-sector differences within a country in the traded goods sector.

On the contrary, competitive advantage has been defined by Worley (1996) and Van Rooyen et al. (1999) as a concept that expands on the prevailing trade patterns as they occur in the real world, and considers all distortions to trade that are typically overlooked by comparative advantage. The overlooked distortions to trade include the effects of policies, price differences, variations in product quality, and the marketing skillset of an sector. Porter (1990) concluded that competitive advantage is formed and gained from a highly localised process, with national values, culture, economic structure, institutions, and histories all contributing to competitive success.

Therefore, the main difference between comparative advantage and competitive advantage is that the former supports a free market economy without distortions, while the latter considers market distortions. Additionally, the former focuses on the optimal allocation of scarce resources, whereas the latter emphasises the commercial performance of a country, firm, sector, or sector (Dlikilili, 2018).

3.3.2 Competitiveness defined

Literature provides a wide range of definitions for the concept of competitiveness, with all definitions being based on different perspectives (Dlikilili, 2018). Freebairn (1986) defines competitiveness from a business perspective as the capability of an sector to successfully trade its commodities, thereby attaining business growth that can be sustained in a global setting, while earning at least the opportunity costs on the resources employed. The Organisation for Economic Cooperation and Development (1992) based its definition of competitiveness on a national level, describing it as a country's ability to produce goods and services of sufficient quality to compete internationally, while also maintaining and increasing domestic real income, assuming a free trade environment.

According to Ortmann (2000), competitiveness is the ability of a nation or enterprise to produce a product at an average variable cost below its market price. This definition of competitiveness aligns with the notion of profitability, as conceptualised in the framework developed in this study. Scott and George (1985) also defined competitiveness as a country's capacity to supply goods and services in international trade while achieving higher returns on its resources.

From the definitions of competitiveness given above and as part of this study's purpose, competitiveness in the context of the Namibian goat sector is defined as follows:

“The sector's ability to thrive in international markets by fostering sustainable growth through the generation of sufficient returns, maintaining production costs below market prices, and covering at least the opportunity cost of the resources employed.”

3.4 Empirical Literature Review

3.4.1 Application of GMA in agriculture

Over the years, gross margin analysis, GMA, has been widely used to analyse the profitability of various commodities in the agricultural sector, worldwide (Ganiu, n.d.; Janet, 2019; Mwaniki, 2022). A study by Gbenga (2021) employed GMA to evaluate the profitability of goat farming among rural households in Nigeria. This study found that goat rearing generated positive profits and was considered a profitable venture. Furthermore, when the cost of production increased, there was a noticeable negative impact on profitability, leading to the conclusion that profitability was influenced by the amount of resources utilised. The results of this study were similar to those of other scholars (Baruwa, 2013; Rahman, Hossain & Miah, 2017; and Kaumbata et al., 2020, as cited in Gbenga 2021).

Another study was conducted in Malawi to analyse the profitability of smallholder goat farmers by Kaumbata et al (2020), who used GMA to conduct the analysis and concluded that goat production was profitable. The authors emphasised that greater profits were related to high average prices per goat within the study area. Conversely, the authors agreed that production costs adversely impacted profitability, as reduced production expenses led to higher profits.

Namonje-Kapembwa et al (2019) conducted a value chain analysis of goats in Zambia and used the GMA to assess the profitability of goats for various actors across the supply chain. The findings revealed that the commercialisation of goats generated positive profits, although producers received the lowest gross margins compared with other participants in the value chain. These findings suggest that value addition yields higher margins compared with trading live animals; however, farmers are less likely to benefit from this approach than abattoirs are.

3.4.2 Previous studies analysing competitiveness using trade-based measures

In Namibia, there has been increasing interest from researchers (Angula et al., 2024; Bahta & Mbai, 2023; Mawenge, 2020; Mbai et al., 2021) in studying competitive performance in recent years. The competitiveness studies conducted in Namibia employed various quantitative measurement techniques, such as the Relative Trade Advantage (RTA) and Porter's Diamond (Angala, 2015), RCA, Index of Contribution to Trade Balance, Grubel-Lloyd Index, and the Michaely Index (Mawenge, 2020), RCA and RSCA (Mbai et al., 2021), RCA, Lafay Index, Export Diversification, Hirschman, Major Export Category (Bahta & Mbai, 2023) and the NRCA (Angula et al., 2024).

Evidently, from the past competitiveness studies emanating from Namibia, the common use of trade-based indices is a noticeable trend. Most of all, one index stands out as the most used (Bahta & Mbai, 2023; Mawenge, 2020; Mbai et al., 2021) for competitiveness studies in Namibia, which is the RCA.

According to Topcu (2023), the RCA is the most widely used measure of comparative advantage in assessing competitive performance. Although the RCA was improved by Vollrath (1991) to the Relative Trade Advantage Index, which captures both imports and exports, the RCA is still considered as being a sufficient index for use in competitiveness studies, especially in studies that focus on exports or in circumstances of low imports (Jantjies, 2024).

Angula et al (2024) used the NRCA for inter-country comparisons of competitiveness, which confirms the earlier discussion of the notion that the NRCA is best suited for such purposes over the conventional RCA and RSCA (Section 3.2.2).

3.4.3 Previous studies on the determinants of competitiveness

The Porter's Diamond Model has been widely applied in agriculture to analyse the determinants of competitiveness, with numerous South African studies (Boonzaaier & Van Rooyen C.J., 2017; Dlikilili, 2018; Jafta, 2014; Jantjies, 2024; Sibulali, 2018) showing its repeated and effective application. Over the years, the Diamond Model has been increasingly applied in Namibia's agricultural sector. However, there is a lack of application of the model in the country's livestock sector.

A study by Angala (2015) applied the Diamond Model to recognise the factors influencing the competitiveness of the Date industry. The findings from this study indicate that, out of the six broad determinants of competitiveness outlined in the Diamond Model, only chance factors, Government support, and policies were found to be enhancing determinants. However, the author emphasised that these two named factors were only moderately enhancing, as they had an average rating close to 3, since the factors were rated from 1 to 5, with 1 being the most constraining and 5 being the most enhancing, and 3 being neutral. The determinant production conditions were rated as neutral, and the rest of the determinants were considered as constraining. Angala (2015) concluded that these results showed an overall lack of collaboration within the Date industry in Namibia.

A recent study by Angula et al (2024) applied the Diamond Model to the country's grape industry. Similarly, this study used a 5-point Likert scale, ranging from 1 to 5, and found that only two factors – government support and policies, as well as related and supporting firms – were the only enhancing factors.

Based on the findings from the two Namibian studies, it can be inferred that determinants, such as demand conditions, firm strategy, structure and rivalry, and production conditions, are generally constraining factors in the Namibian agricultural sector.

3.5 Conclusions

The literature review emphasises the importance of competitiveness assessments in agriculture, particularly through the application of profitability assessments, trade-based indices, and the diamond model. The named approaches have been widely used in agriculture, emphasising various factors that influence competitiveness, such as the cost of production from a profitability standpoint and demand conditions from a strategic perspective, among other determinants of competitiveness. However, this literature review also highlights existing gaps in factors affecting the competitiveness of the Namibian goat sector, with emphasis on trade and local production.

This study aimed to fill these gaps by applying a comprehensive analytical framework and selecting an appropriate methodology based on insights from the literature and proposing actionable strategies to enhance the sector's competitiveness in the subsequent chapter.

The next chapter will outline the research approach designed to integrate and address all these concepts effectively.

4.3 Research Design

This study used a mixed-method (qualitative and quantitative methods) approach for data collection and analysis. The profitability and competitiveness of the Namibian goat sector were assessed using quantitative data, while qualitative data derived from a survey provided insight into the factors affecting competitiveness.

4.4 Data and Data Collection

4.4.1 Primary data

To assess profitability and identify factors affecting competitiveness, primary data were collected through a goat sector stakeholder survey (GSSS) conducted among various stakeholders in the goat supply chain. A questionnaire was designed to collect primary data. The questionnaire was divided into three main sections: the first focused on the respondent's biographical information, the second focused on profitability information, and the last focused on competitiveness factors (Annexure A). The questionnaire included multiple-choice, open-ended, and a Likert scale ranging from 1 to 5, where 1 indicated a negative effect or the most constraining, and 5 represented the most enhancing.

Various survey techniques were employed to collect data, including an online platform (Kobo Toolbox), face-to-face interviews, telephonic interviews, and mailing hard-copy questionnaires to various identified stakeholders.

4.4.2 Secondary data

This study utilised secondary data sourced from the International Trade Centre (ITC/Trade Map) (<http://www.trademap.org>) to analyse the competitiveness of the Namibian goat sector.

4.5 Population and Sampling

This study employed a synthesised multi-phase and multi-stage sampling procedure for data collection, which consisted of two phases, with the second phase comprising multiple stages.

4.5.1 Phase 1

This study purposively sampled one product with HS Code: 010420, representing “Live goats.” The dataset focused on imports and exports for the top five live goat exporting countries – India, Namibia, Oman, Somalia, and Thailand – from 2001 to 2022.

To assess the competitiveness of Namibia's goat sector, the commodity “Live goats,” was selected because there was limited data available on imports and exports of other goat products on ITC. Namibia was among the top five live goat-exporting countries in 2022; hence, it was deemed

imperative to compare its competitiveness with the remaining four countries that make up the top five.

4.5.2 Phase 2

4.5.2.1 Stage 1

The region south of the VCF was intentionally chosen for primary data collection to conduct the GMA and examine the determinants of competitiveness in the Namibian goat sector. This area was selected because of its export-oriented nature (Marius et al., 2021), making it well-suited for an international competitiveness assessment.

4.5.2.2 Stage 2

Two regions, namely Omaheke and Hardap, were purposively sampled from among other regions south of the VCF because they are high-volume goat-producing regions.

4.5.2.3 Stage 3

A total of 80 stakeholders were randomly selected from various farming communities in the two regions, including input and service providers, producers, and traders. Taking into consideration the verification of registered stock brand owners that was underway by the LLPBN, the population for the study was unknown.

According to Chaokromthong and Sintao (2021), in a situation where the population is large or unknown, and the population proportion is known or unknown, the Cochran formula is best suited for estimating an optimum sample size. Hence, the Cochran method was deemed suitable to determine the optimum sample to be used for this study, and is formulated as follows:

$$n_o = \frac{Z^2 pq}{e^2} \quad 4.1$$

where:

- 'n_o' is the sample size
- 'e' is the desired level of precision, which was 0.09 at a confidence level of 91%.
- 'z' is the z-value from the table at a given confidence level, which was 1.695
- 'p' is the estimated population proportion given the attribute. In the case where the proportion of the population to be estimated is not known, a *p*-value of 0.5 was used for maximum variability

- 'q' is $1 - p$

Although the calculated sample size based on the formula was 89, the final sample size achieved for this study was 80, owing to challenges in response rates and data collection. This sample size is considered sufficient to provide meaningful insights for the research objectives.

4.6 Analytical Framework

An analytical framework popularised by Angala (2015); Dlikilili (2018); Jafta (2014); Sibulali (2018), among others, was adopted and used in this study. This framework consists of five steps: (1) defining competitiveness in the context of a particular research focus; (2) measuring competitive performance using trade-based indices; (3) establishing major determinants of competitiveness; (4) identifying factors of competitiveness regarding the Porter's Diamond Model; and (5) proposing possible strategies that might enhance competitiveness.

However, because investigating the viability of goat production in Namibia was among the study's objectives, the five-step framework was modified to include an additional step: (i) determining the profitability of goat production in Namibia. Therefore, the modified framework consisted of six steps

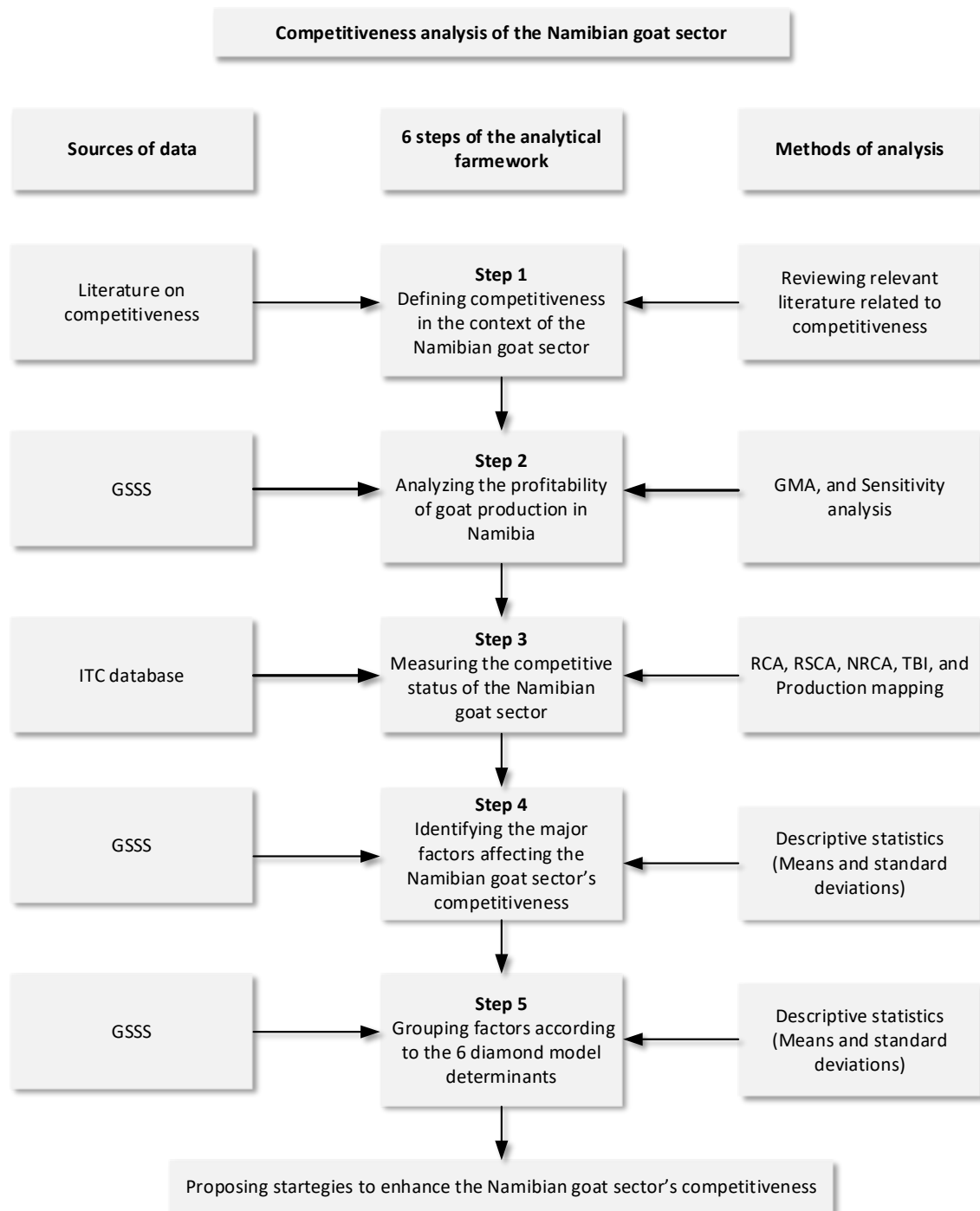


Figure 4.2: Analytical framework

Source: Author's computation adapted from Angala, (2015); Dlikilili (2018); Sibulali (2018)

4.6.1 Step 1: Defining competitiveness in the context of the Namibian goat sector

The first step in the analytical framework of this study was to define competitiveness within the scope of the Namibian goat sector, which was achieved by reviewing literature related to the subject. The objective of this first step of the analytical framework was achieved, as discussed in Chapter 3 (section 3.3.2), whereby competitiveness within the scope of the Namibian goat sector was described as:

“The sector’s ability to thrive in international markets by fostering sustainable growth through the generation of sufficient returns, maintaining production costs below market prices, and covering at least the opportunity cost of the resources employed.”

Therefore, having already achieved the aim of the first step of this analytical framework, the study proceeded to accomplish the goals of the succeeding steps.

4.6.2 Step 2: Analysing the profitability of goat production in Namibia

Gross margin analysis (GMA) was utilised to estimate the profitability of goat production in Namibia. According to Namonje-Kapembwa et al. (2019), GMA is an estimation of financial profitability and has been used to determine goat-related returns for Zambian goat farmers and traders. However, in this study, the GMA analysis was only used to assess the profitability of goat production and to determine whether the disinvestment observed within the sector could be attributed to goat production not being profitable.

Following Mwaniki (2022), the Gross Margin (GM) was computed by subtracting the total variable costs of production from the total revenue generated, with the exclusion of fixed costs. Therefore, the GM model was given as follows.

$$GM_i = TR_i - TVC_i \quad 4.2$$

where i in Equation 4.2 represents goats, GM stands for gross margin, TR is the total revenue, and TVC is the total variable cost.

In addition, sensitivity analysis was incorporated to support the GMA. The approach of incorporating the sensitivity analysis has been widely (<https://www.elsenburg.com/enterprise-budgets/enterprise-budgets-livestock-2024/>) utilised by the Western Cape government for similar analyses for different agricultural products. The Western Cape government used sensitivity analysis to evaluate how changes in price and quantity sold would affect profits (gross margins). Hence, it was deemed essential to include sensitivity analysis in the profitability analysis to account for latent risks and uncertainties, such as price volatility, in the sector.

4.6.3 Step 3: Measuring the competitive status of the goat sector

The RCA, RSCA, NRCA, and TBI were the trade-based indices chosen over other methods because they were deemed as best suited for export-oriented studies, as discussed in Chapter 3. In addition, production mapping, a technique used to compare the balance of trade and competitiveness of different countries for a specific commodity (Topcu, 2023), was used in this study to compare the balance of trade and competitiveness of the top five countries that export live goats.

The RCA, RSCA, NRCA, TBI, and production mapping are specified as follows;

i. Revealed Comparative Advantage (Balassa) Index

$$RCA_{ij} = \left(\frac{\frac{X_{ij}}{X_i}}{\frac{X_{refj}}{X_{ref}}} \right) \quad 4.3$$

In this equation, X represents the export value of commodity j from country i , X_{refj} denotes the export value of commodity j relative to a group of reference countries excluding i , and X_{ref} refers to the total exports of a group of countries other than i . Country i is considered to have a comparative advantage in commodity j if the RCA_{ij} value is greater than one, and a comparative disadvantage if the index value is less than one, indicating that this commodity holds less significance in the country i 's exports compared with exports of the reference countries.

ii. Revealed Symmetric Comparative Advantage Index

$$RSCA_{ij} = \left(\frac{RCA - 1}{RCA + 1} \right) \quad 4.4$$

where $RSCA_{ij}$ represents the RSCA index for commodity i for nation j . the RSCA values range from -1 to 1, with values greater than 0 depicting comparative advantage, and comparative disadvantage if the values are below 0 (Mbai et al., 2021).

iii. Normalised Revealed Comparative Advantage Index

$$NRCA_{ij} = \left(\frac{E_{ij}}{E_k} \right) - \left(\frac{E_j \cdot E_i}{E_k \cdot E_k} \right) \quad 4.5$$

where $NRCA_{ij}$ represents the NRCA index for a commodity i of country j . E_{ij} is the country j 's export of commodity i , E_k stands for total world exports, E_j is the total world exports for commodity j , and finally, E_i represents the country i 's total world exports.

iv. Trade Balance Index

$$TBI_{ij} = \left(\frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}} \right) \quad 4.6$$

In the equation TBI is the trade balance index, X_{ij} represents exports of commodity i for nation j , and M_{ij} represents the country j 's imports of commodity i . The TBI values range from -1 to 1, with values greater than zero indicating that a country is a net exporter, and a net importer if the TBI values are below zero.

v. Production mapping

Production mapping is achieved by using the RSCA and TBI indices together (Topcu, 2023). Following the methodology used by Topcu, production mapping in this research is separated into four categories, A, B, C, and D.

- A nation in Category A has attained a comparative advantage and is a net exporter (RSCA > 0, TBI > 0).
- A nation in Category B has attained comparative advantage and is a net importer (RSCA > 0, TBI < 0).
- A nation in Category C has not attained comparative advantage but is a net exporter (RSCA < 0, TBI > 0).
- A nation in Category D has not attained comparative advantage and is a net importer (RSCA < 0, TBI < 0).

4.6.4 Step 4: Identifying the major factors affecting the competitiveness of the sector

This step involved analysing the factors that were rated as the most constraining and enhancing factors of competitiveness, based on data from GSSS. Descriptive analysis was employed in this step to compute the average (Mean) rating and level of agreement (Standard deviations).

4.6.5 Step 5: Grouping factors according to the six determinants of the Diamond model

This step complemented Step 4 of this research's analytical framework. To further analyse the determinants of competitiveness, the factors were categorised based on Porter's Diamond Model (Porter, 1990, 1998) discussed in Chapter 3 for further analysis and discussion by application of theory.

4.6.6 Step 6: Proposing sector-level strategies that can increase the competitive performance of the sector

The final step of this framework involved proposing possible sector-level strategies to enhance the competitive performance of the Namibian goat sector, based on the results. Furthermore, the proposals could be viewed as recommendations and could be considered for implementation in the sector to improve competitiveness.

4.7 Reliability and Validity

This sub-section explains how the methods used in this study assure the reliability and validity of the results.

4.7.1 Reliability

Various initiatives were applied to assure reliability in this study. Firstly, established methods of calculating the gross margin were uniformly applied across all data points to ensure homogeneity in the computation of revenues and variable costs. Secondly, the sensitivity analysis evaluated probable scenarios that included fluctuations in the quantity of goats sold and the price per goat, ensuring that the results consistently represented economic changes. In addition, worldwide-approved indices (RCA, RSCA, NRCA, and TBI) were used to maintain global standards, and trade data was sourced from a reliable database (ITC). Finally, the Porter's Diamond Model was applied to systematically analyse the factors influencing the sector's competitiveness, using a reliable framework.

4.7.2 Validity

Several measures were utilised to ensure the validity of the methods employed in this study. For the GMA, relevant variables were included and captured through the GSSS, i.e. cost of inputs, market prices, production volumes and quantity sold, thus ensuring that the analysis reflected real-world economic conditions. Sensitivity analysis provided further validation of the GMA results by assessing the stability of profitability under various changes (i.e. changes in price and quantity). In addition, primary data on profitability and determinants of competitiveness was established in a GSSS, which ensures the relevance to the Namibian context and this study. Results were validated for accuracy through consultations with sector experts.

4.8 Conclusion

This section has given a thorough breakdown of the methods of data collection and analyses used in this study. The findings of the analysis are presented in Chapters 5 and 6.

Chapter 5: Results and Discussions

5.1 Introduction

This chapter provides an overview and discussion of the findings derived from the analysis described in Chapter 4. Firstly, it discloses the profitability of goat farming in Namibia. Secondly, it reveals Namibia's competitive position internationally. Finally, it unveils the factors that influence the competitive performance of the goat sector.

5.2 Descriptive Statistics

From the 80 goat sector stakeholders (Chapter 4) who took part in the study's survey, Table 5.1 shows that the majority (82.10%) were farmers, followed by traders and/or marketers (14.70%), with the input or service providers (3.20%) being the minority. This study recorded a high response rate of 52.60% among farmers from the Hardap region and 47.40% from the Omaheke region, with a total of 66.70% (52 farmers) being male and 33.30% (26 farmers) being female. This study ascertained that 91% of the respondents had more than five years of experience in goat farming.

Furthermore, communal farmers represented the majority (75.90%), compared with commercial farmers (19%), with resettled farmers accounting for only 5.10%. Because of the dualistic nature of the Namibian goat sector, which allows farmers to be commercial farmers and at the same time be communal or resettled farmers, one respondent exhibited dual characteristics (being both communal and commercial). The Boer goat breed was the dominant breed that most (54%) producers farmed, together with other goat breeds, which conforms to a study by Marius et al (2021) that found that most goat farmers in Namibia farmed with Boer goats (Table 5.1).

Table 5.1: GSSS respondents characteristics

Charateristics	Frequency	Percentage (%)
Position in supply chain		
Input or service providers	3	3.20
Farmer or producer	78	82.10
Trader or Marketer	14	14.70
Total	95	100.00
Farmers characteristics		
Gender		
Female	26	33.30
Male	52	66.70
Total	78	100.00
Age (Year)		
30 and below	14	17.90
31 - 40	18	23.10
41 - 50	13	16.70
51 - 60	16	20.50
Above 60	17	21.80
Total	78	100.00
Years of farming experience		
Less than 5	7	9.0
5 - 15	41	52.6
16 - 20	10	12.8
More than 20	20	25.6
Total	78	100.0
Farming region		
Omaheke	37	47.40
Hardap	41	52.60
Total	78	100.00
Type of farming		
Commercial	15	19
Communal	60	75.9
Resettled	4	5.1
Total	79	100
Goat breed		
Boer goats	54	54.00
Kalahari red	16	16.00
Angora	1	1.00
Saanen	1	1.00
Alphine	1	1.00
Indeginous_breeds	27	27.00
Total	100	100.00

Source: Authors computation based on GSSS

5.3 Profitability of Goat Farming in Namibia

Utilising the pricing and cost data obtained from the GSSS, the financial profitability of goats for both commercial and non-commercial (communal and resettled) farmers was estimated.

The following assumptions were made:

- i. Goats were reared under semi-intensive systems;
- ii. Supplementary feeding was only done during the dry season and the goats also fed on feed from other livestock on the farm such as cattle; and
- iii. The goats were sold at nine months old.

Based on the assumptions made, costs such as feed and labour (shearing) were estimated. In addition, because goats, like other livestock, were susceptible to diseases (Marius et al., 2021) veterinary costs, such as deworming and vaccines, were also estimated. To estimate the gross margin, the average price (based on the survey data) of a live goat was used when selling at an auction. Since goat prices exhibit volatility, sensitivity analyses helped to visualise how different pricing and the number of goats sold would affect the gross margins. The succeeding Sections, 5.3.1 to 5.3.3, present the results of these computations.

5.3.1 Commercial farmer's gross margins

Table 5.2 shows the gross margin estimated in a case where a commercial farmer sold a live goat at an auction. The results reveal that, if each farmer sold an average of 46 medium-sized goats annually, an estimated N\$63,600.00 was received at an average price of N\$1,392.70 per goat. The sum of variable costs comprising feed, veterinary care, labour, marketing (auctioneers commission), and transportation costs, was estimated to be approximately N\$726.17 per goat and N\$33,161.88 for 46 goats. The estimated gross margin per goat was N\$666.53 and N\$30,438.12 for 46 goats, approximately 47.87% of the total income if the goats were reared under semi-intensive systems. These results indicate that commercial goat production is a profitable endeavour. However, it is important to note that the estimated gross margin does not include other benefits such as goat manure, milk, and carcass sales.

Table 5.2: Gross margin estimates for commercial farmers

Estimated income	Average quantity (batch) sold annually	Value per goat sold	Value per batch sold
Revenue from goat sales			
Live animal	46	1392.70	63600.00
Total revenue		1392.70	63600.00
Estimated costs		Cost per animal sold	Cost for batch sold
Variable costs			
Feed		357.02	16303.95
Veterinary costs		28.21	1288.03
Labour		215.38	9835.90
Transport		42.00	1918.00
Marketing costs		83.56	3816.00
Total variable costs		726.17	33161.88
Gross margin		666.53	30438.12

Source: Author's computation based on GSSS data³

The results in Table 5.3 show the effect of a change in price and quantity on gross margin. Holding other variable costs constant, the findings show that an increase in the number of goats sold and/or the price per animal yielded higher margins. For instance, selling 55 goats for N\$822.38 each would yield a gross margin of N\$12,283.16, which is significantly lower compared with the profit (N\$30,442.73) generated from our current model. However, at N\$1,531.97, selling 46 goats (our estimated average quantity sold annually) would create a profit greater than the actual estimated profit (N\$30,442.73). This implies that the gross margin for commercial farmers is more responsive to price change than to change in quantity (Table 5.3).

Table 5.3: Commercial goat farming sensitivity analysis results

Price (N\$) at 10% change	Quantity (Animals sold) at 10% change							
	27	30	33	37	41	46	50	55
822.38	-10984.32	-8520.15	-5782.18	-2739.99	640.22	4396.01	8151.79	12283.16
913.75	-8520.15	-5782.18	-2739.99	640.22	4396.01	8569.10	12742.20	17332.61
1015.28	-5782.18	-2739.99	640.22	4396.01	8569.10	13205.88	17842.66	22943.11
1128.09	-2739.99	640.22	4396.01	8569.10	13205.88	18357.85	23509.83	29177.00
1253.43	640.22	4396.01	8569.10	13205.88	18357.85	24082.27	29806.68	36103.54
1392.70	4396.01	8569.10	13205.88	18357.85	24082.27	30438.12	36803.19	43799.70
1531.97	8151.79	12742.20	17842.66	23509.83	29806.68	36803.19	43799.70	51495.86
1685.17	12283.16	17332.61	22943.11	29177.00	36103.54	43799.70	51495.86	59961.63
1853.68	16827.67	22382.06	28553.61	35410.89	43030.08	51495.86	59961.63	69273.98
2039.05	21826.62	27936.45	34725.16	42268.16	50649.28	59961.63	69273.98	79517.57

Source: Author's computation based on GSSS data

³ The average head size for commercial farmers was approximately 164.

5.3.2 Non-commercial (Communal plus Resettled) farmers' gross margins

Table 5.4 shows results from the gross margin estimation for non-commercial farmers who sold medium-sized goats at auctions, with an estimated value of N\$18,464.78, for an average of 19 goats sold annually. The average price per goat sold was estimated to be N\$977.46. The estimated value received from goat sales resulted in margins of N\$142.77 per goat and N\$2,697.06 for 19 goats sold per annum if the goats were raised using a semi-intensive system. The profit accounted for approximately 14.60% of the total revenue, suggesting that goat farming was profitable for communal and resettled farmers, comparable to commercial farmers, even without considering the additional benefits associated with goat rearing.

Table 5.4: Gross margin estimates for non-commercial (communal and resettled) farmers

Estimated income	Average quantity (batch) sold annually	Value per goat sold	Value per batch sold
<u>Revenue from goat sales</u>			
Live animal	19	977.46	18464.78
<u>Total revenue</u>		<u>977.46</u>	<u>18464.78</u>
Estimated costs		Cost per animal sold	Cost for batch sold
<u>Variable costs</u>			
Feed		447.30	8449.80
Veterinary costs		39.94	754.46
Labour		246.80	4662.17
transport		42.00	793.41
Marketing costs		58.65	1107.89
<u>Total variable costs</u>		<u>834.68</u>	<u>15767.72</u>
Gross margin		<u>142.77</u>	<u>2697.06</u>

Source: Author's computation based on GSSS data⁴

The sensitivity analysis results for non-commercial farmers are presented in Table 5.5, showing how sensitive gross margin is to changes in price and number of animals sold. Like commercial farmers, non-commercial farmers' gross margins noticeably increase as prices and/or quantities increase. At N\$712.75, farmers would need to sell approximately 28 medium-sized goats to generate a profit greater than the actual estimated profit (N\$2,697.06). However, because of the low annual average number of goats sold by non-commercial farmers, it would be more realistic to rely on a price increase to generate greater profit. For instance, with all variable costs remaining constant, at an average of 19 goats sold annually, any price greater than N\$977.46, such as N\$1,075.21, would yield a gross margin (N\$ 4,542.92), greater than that of our current estimated model.

⁴ The average head size for non-commercial farmers was approximately 78.

Table 5.5: Non-commercial goat farming sensitivity analysis results

Price (N\$) at 10% change	Quantity (Animals sold) at 10% change							
	14	15	17	19	21	23	25	28
712.57	-5955.08	-4864.78	-3653.35	-2307.30	-961.26	519.38	2148.09	3939.67
791.74	-4864.78	-3653.35	-2307.30	-811.70	683.90	2329.06	4138.74	6129.39
879.71	-3653.35	-2307.30	-811.70	850.08	2511.86	4339.81	6350.57	8562.40
977.46	-2307.30	-811.70	850.08	2697.06	4542.92	6573.99	8808.16	11265.74
1075.21	-961.26	683.90	2511.86	4542.92	6573.99	8808.16	11265.74	13969.09
1182.73	519.38	2329.06	4339.81	6573.99	8808.16	11265.74	13969.09	16942.77
1301.00	2148.09	4138.74	6350.57	8808.16	11265.74	13969.09	16942.77	20213.82
1431.10	3939.67	6129.39	8562.40	11265.74	13969.09	16942.77	20213.82	23811.97

Source: Author's computation based on GSSS data

5.3.3 Profitability of commercial vs non-commercial goat farmers and how this affects their competitiveness

The results from the profitability assessment show some underlying differences between commercial and non-commercial farming. Firstly, the average estimated price received for a medium-sized goat for a commercial farmer (N\$1,392.70) was higher than that of non-commercial farmers (N\$977.46).

Secondly, commercial farmers sold a larger quantity of goats (46) per annum, compared with non-commercial farmers (19). The number of goats sold annually can be related to herd size. Non-commercial farmers had an average herd size of 78 goats, compared with commercial farmers who had an average herd size of 164 goats. Since most farmers (54%) in this study used the Boer goat breed, a larger herd size would translate to more animals being available for sale. According to Kandiwa et al, (2020), Boer goats are known for their high kidding rate, which is attributed to the high incidence of twin births compared with singleton births, with triplets and quadruplets also being possible in this breed. Hence, it can be inferred that a larger herd size results in more animals being sold annually.

Thirdly, commercial goat farming was found to be significantly more cost-efficient compared with non-commercial farming. Based on the profit estimations, commercial farmers retained a larger portion (47.87%) of their selling price (N\$1,392.70) as profit (N\$666.53), compared with non-commercial farmers, who only retained 14.60% of their selling price (N\$977.46) as profit (N\$142.77). Generally, because commercial farming often operates on a larger scale, which can translate to reduced production costs per unit, i.e. purchasing feed in bulk increases the likelihood of getting discounts. These findings also align with the literature by Kaumbata et al (2020), which indicates that high goat prices are associated with greater profits.

Lastly, both commercial and non-commercial goat production were found to be profitable ventures, thereby enhancing the competitiveness of the goat sector as a whole. Although there has been noticeable disinvestment within the sector, the findings of this study revealed why significant and ongoing investment has persisted. Therefore, it can be deduced that disinvestment does not necessarily translate to underperformance of the sector, but rather is caused by localised challenges, such as restrictive policies, harsh environmental conditions and limited market access, as discussed in Sections 2.13 and 2.14. Thus, the coexistence of disinvestment and ongoing investment is not contradictory, but reflects the dynamic nature of the sector, where profitability and perceived future potential continue to drive competitiveness and investor interest. On the other hand, farmers operating under favourable conditions continue to excel and expand their operations, thereby enhancing the sector's competitiveness.

5.4 Competitiveness of the Namibian Goat Sector (RCA & RSCA)

Table 5.6 shows the results of the RCA and the RSCA indices for Namibia's live goat exports. The two indices consistently show that Namibia had a competitive advantage from 2001 to 2022.

Table 5.6: RCA and RSCA indices

Year	RCA	RSCA
2001	439.86	1.00
2002	101.72	0.98
2003	182.83	0.99
2004	160.81	0.99
2005	297.22	0.99
2006	306.94	0.99
2007	221.50	0.99
2008	137.58	0.99
2009	150.35	0.99
2010	200.93	0.99
2011	191.09	0.99
2012	181.43	0.99
2013	96.69	0.98
2014	69.22	0.97
2015	89.26	0.98
2016	62.32	0.97
2017	111.70	0.98
2018	61.90	0.97
2019	75.43	0.97
2020	45.16	0.96
2021	96.38	0.98
2022	118.96	0.98

Source: Author's calculation based on data from (ITC, 2024)

Figure 5.1 is an illustration of the trends in the export competitiveness of Namibia's live goat sector, based on the RCA index and RSCA index. From 2001 to 2022, Namibia's competitiveness fluctuated at a decreasing rate, with 2001 showing the highest competitive advantage, while 2020 had the lowest. In addition, Figure 5.1 indicates various events that occurred from 2001 to 2022, including the introduction of an export levy on live goats, drought, and the occurrence of the COVID-19 pandemic.

There are visible changes in trends of Namibia's competitiveness following the occurrence of drought, COVID-19, and the introduction of an export levy on live goats (Figure 5.1). For instance, the downward trend in competitive advantage between 2006 and 2008 is attributed to the introduction of an export levy on live goats. The imposition of a levy (tax) on exports can result in local goods becoming expensive on the international market (OECD, 2019), which could result in reduced demand. Consequently, the levy might have diminished profitability, leading to disinvestment and reduced supply among local goat farmers, ultimately impairing their competitiveness.

Similarly, the downward trend in competitiveness between 2012 and 2019 can be attributed to drought occurrences from 2012 to 2016 and from 2018 to 2019. Typically, periods of drought lead to decreased livestock production as a result of reduced forage for animals and diminished access to drinking water from various water sources. The 2019 drought is considered to be the harshest in the country's history. As a result, many animals, including goats, died, leading to a drop in livestock production in the country (Schwieger, 2023; Shikangalah, 2020).

Additionally, farmers are known to engage in destocking as a drought-coping strategy. A study by Shiimi et al. (2023) confirms that destocking, the sale of livestock to purchase food, nomadic pastoralism and supplementary feeding, among other approaches, have been implemented as drought management measures. The increased sales of goats during acts of destocking and similar activities in drought periods could further explain why there were some spikes (i.e. 2015 and 2019) in competitive advantage during the drought period (Figure 5.1).

Furthermore, after the 2019 drought, there was a noticeable increase in competitive advantage from 2020 onwards, which coincided with the COVID-19 pandemic period. According to Nickanor et al. (2023) on 14th March 2020, Namibia confirmed its first few cases of the coronavirus, after several food-exporting nations had already imposed restrictions on exports to protect local supplies. Equally important, the Namibian dollar depreciated significantly against the United States Dollar (\$) (i.e. \$1 = N\$19.01 on April 05, 2020, compared with \$1 = N\$14.26 in the previous year) during the pandemic, which made local products cheap on the international market (Homateni et al., 2020). Hence, this

implies that the Namibian goats might have been more affordable, attracting greater demand from the international market, which would result in a competitive advantage.

According to ITC data, Namibia has maintained at least a 90% share in live goat exports to South Africa since 2010, making it the leading exporter of live goats to South Africa (Data retrieved from ITC; https://www.trademap.org/Country_SelProductCountry_TS.aspx?nvpm, last accessed on 23rd July 2024). ITC data further reveal that the value of Namibian live goat exports increased from \$3.1 million in 2020 to \$5.2 million in 2021, and \$6.3 million in 2022. Therefore, the trade restrictions imposed by other countries and the depreciation of the Namibian currency against the USD could explain the spike in Namibia's competitive advantage during the pandemic period.

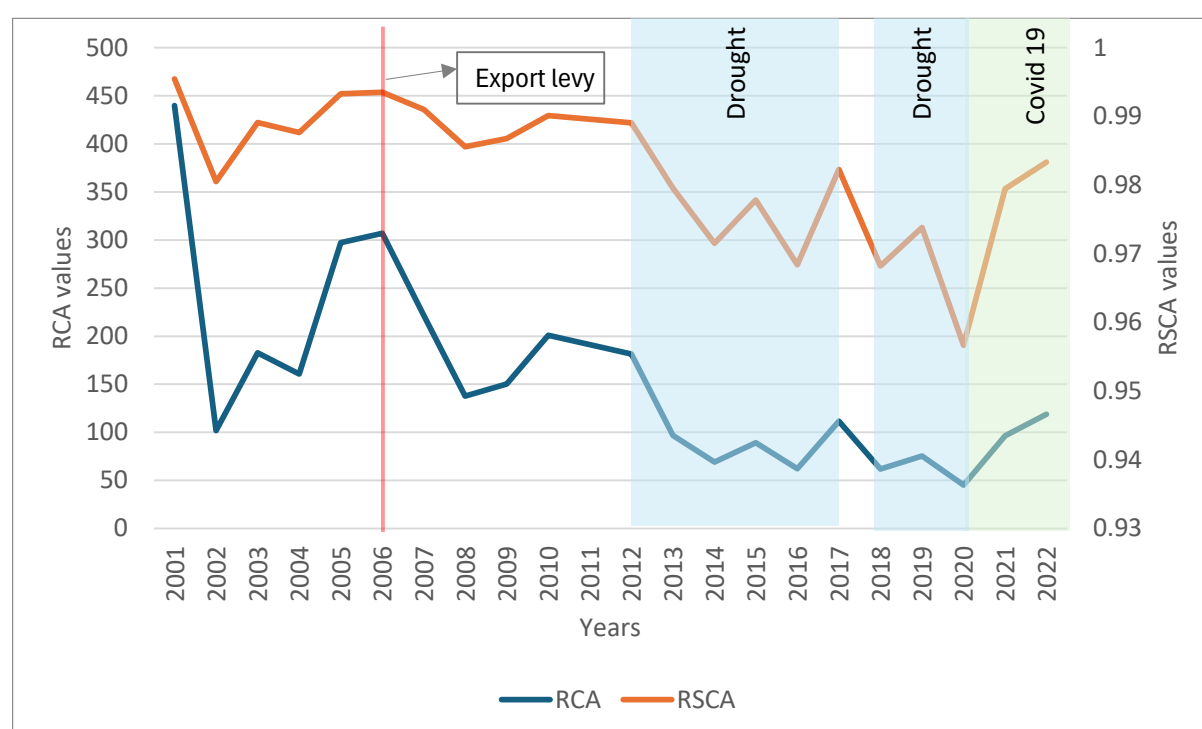


Figure 5.1: Namibia's competitive performance based on RCA and RSCA

Source: Author's calculation based on data from (ITC, 2024)

5.5 Inter-Country Analysis (RSCA, NRCA, TBI, and Production Mapping)

Figure 5.2 shows the results of the calculated NRCA index for the top five countries exporting live goats, globally. The results reveal that Somalia has had the greatest competitive advantage for most of the years. However, since 2015, Somalia's competitive advantage has been declining, although it started increasing from 2018 to 2020, when it dropped again. On the other hand, Oman increased its competitive advantage from 2017 onwards, overtaking Somalia in 2018 and 2021, and maintaining this position through 2022.

Namibia had the third-highest competitive advantage for most of the years, but was nowhere near its top two competitors. Thailand is the only country that did not have a competitive advantage from 2001 to 2021. However, in 2022, Thailand's competitive advantage increased, taking it to third place, while Namibia dropped to fourth place.

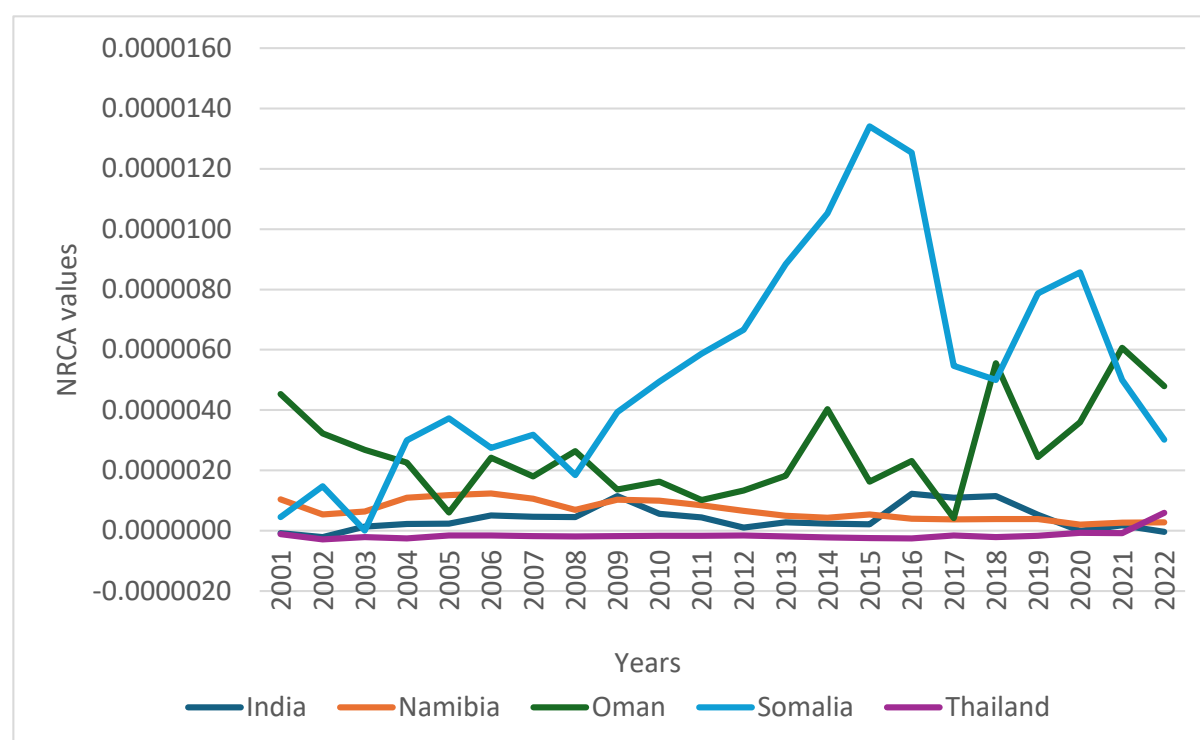


Figure 5.2: NRCA index

Source: Author's calculation from (ITC, 2024)

Table 5.7 shows results derived from the production mapping, which highlight the competitiveness and trade balance of the top five live goat exporting countries during the period under review. The findings show that Namibia and Somalia were the only countries in Category A. India was in Category D in 2001 and 2002, in Category C in 2020 and 2022, and in Category A for the other years. This implies that Namibia was able to maintain its competitive advantage, while remaining a net exporter of live goats. Oman was in Category A in 2003 only, and in Category B for the remaining period, whereas Thailand fell into Category D for the given period, except in 2001, 2008, 2009, 2014, 2015, and 2016, when it was in Category C, and in 2022, when it was in Category A.

Table 5.7: Production mapping

Year	India	Namibia	Oman	Somalia	Thailand
2001	D	A	B	A	C
2002	D	A	B	A	D
2003	A	A	A	A	D
2004	A	A	B	A	D
2005	A	A	B	A	D
2006	A	A	B	A	D
2007	A	A	B	A	D
2008	A	A	B	A	C
2009	A	A	B	A	C
2010	A	A	B	A	D
2011	A	A	B	A	D
2012	A	A	B	A	D
2013	A	A	B	A	D
2014	A	A	B	A	C
2015	A	A	B	A	C
2016	A	A	B	A	C
2017	A	A	B	A	D
2018	A	A	B	A	D
2019	A	A	B	A	D
2020	C	A	B	A	D
2021	A	A	B	A	D
2022	C	A	B	A	A

Source: Author's calculation from (ITC, 2024)⁵

5.6 Factors Affecting the Competitiveness of the Namibian Goat sector

Figure 5.3 shows the average ratings of the 34 factors rated by the Namibian goat sector stakeholders. The stakeholders rated the factors out of 5 (1 = most constraining, 3 = neutral, and 5 = most enhancing) to establish the most constraining and enhancing factors in the sector. From Figure 5.3, it can be seen that 62% of the total factors were rated as constraining, while the remaining 38% were rated as enhancing factors.

⁵ A = has attained a comparative advantage and is a net exporter (RSCA > 0, TBI > 0).

B = has attained comparative advantage and is a net importer (RSCA > 0, TBI < 0).

C = has not attained comparative advantage but is a net exporter (RSCA < 0, TBI > 0).

D = has not attained a comparative advantage and is a net importer (RSCA < 0, TBI < 0).

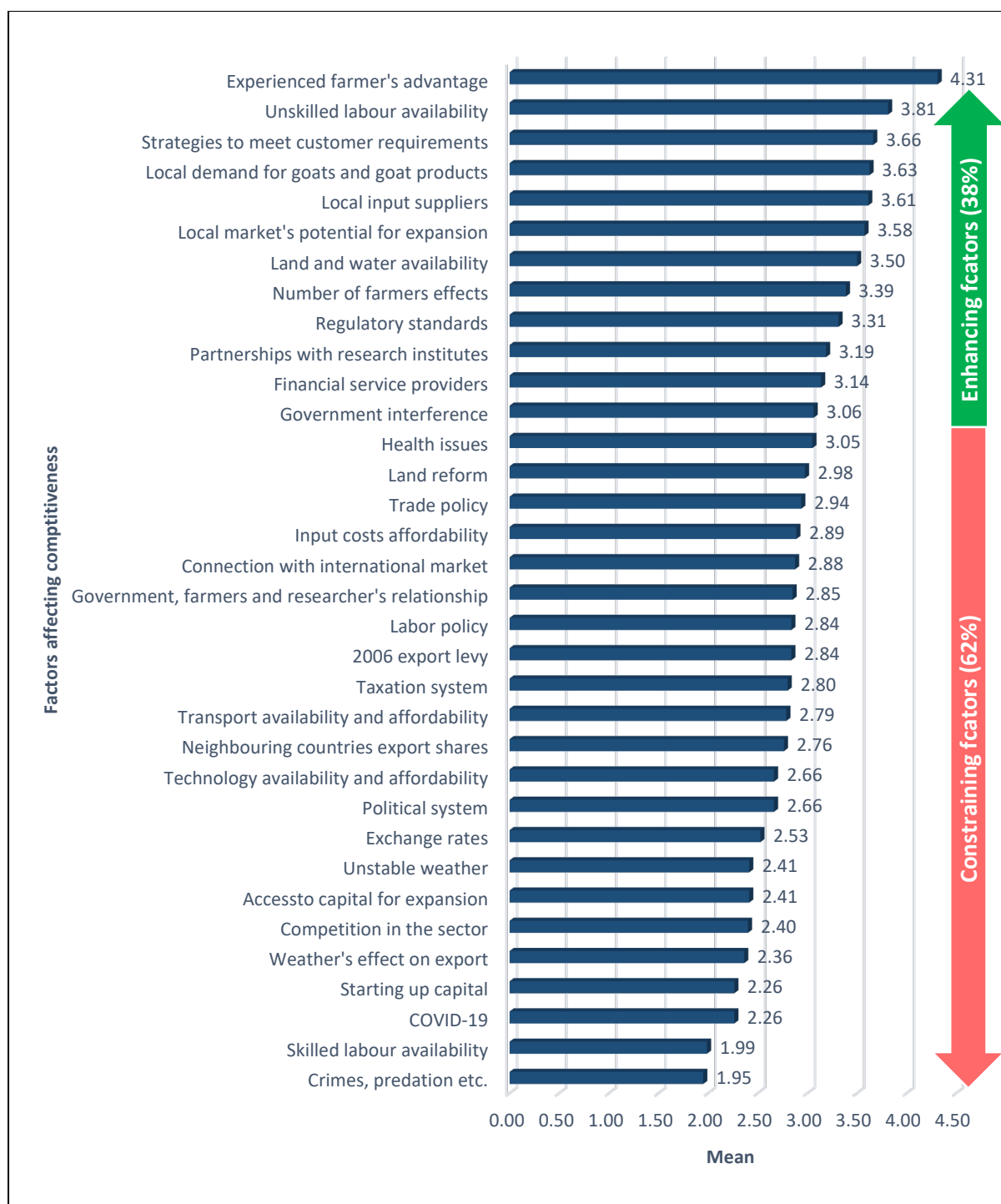


Figure 5.3: Factors affecting the competitiveness of the Namibian goat sector

Source: Author's computation based on GSSS data

Table 5.8 shows the average ratings (mean rating) and standard deviations of the 10 factors that either enhance or constrain the sector. The factor, experienced farmer's advantage, had the highest Mean (4.31) as the most enhancing factor, followed by unskilled labour availability (3.81) and strategies to meet customer requirements (3.66). On the other hand, factors such as crimes, predation and others (1.95), as well as skilled labour availability (1.99) and COVID-19 (2.26), were identified as constraints to the sector's competitiveness.

Table 5.8: Most enhancing and constraining factors

Factors	Average ratings	Standard deviation
Most enhancing factors		
Experienced farmers' advantage	4.31	1.051
Unskilled labour availability	3.81	1.092
Strategies to meet customer requirements	3.66	0.993
Local demand for goats and goat products	3.63	1.118
Local input suppliers	3.61	1.013
Local market's potential for expansion	3.58	1.100
Land and water availability	3.50	1.180
Number of farmers affects	3.39	1.131
Regulatory standards	3.31	1.208
Partnerships with research institutes	3.19	1.159
Most constraining factors		
Crimes, predation etc.	1.95	1.030
Skilled labour availability	1.99	0.787
COVID-19	2.26	1.338
Starting up capital	2.26	1.166
Weather's effect on export	2.36	1.046
Competition in the sector	2.40	1.165
Access to capital for expansion	2.41	1.309
Unstable weather	2.41	1.198
Exchange rates	2.53	0.941
Political system	2.66	1.179

Source: Author's computation based on GSSS data

To further understand the extent to which these factors affect the sector, they were grouped and discussed according to Porter's Diamond determinants in the proceeding sections.

5.7 Factors Affecting Competitiveness according to Porter's Diamond Determinants

Following Porter's Diamond theory discussed in this study's conceptual framework (Section 3.2.3), the 34 factors identified in (Section 5.6) were divided into six major determinants: (1) Production factors, (2) Demand conditions; (3) Government support and policies; (4) Firm strategy, structure and rivalry; (5) Related and supporting firms; and (6) Chance factors. These 6 determinants helped us to understand how the totality of the 34 factors impacts on different dimensions of the sector.

Table 5.9 shows the average ratings and standard deviation, while Figure 5.4 provides visual comparisons of the impacts of the different factors, based on the average ratings. Firm strategy, structure and rivalry was the determinants rated as being most enhancing, with the highest average rating of 3.31, followed by demand conditions (3.19) and related and supporting firms (3.13). However, chance factors (2.49), production conditions (2.75), and government support and policies (2.97) were rated as determinants constraining the goat sector.

These results vary from those of past competitiveness studies from Namibia, which found that the determinant, government support and policies, (Angala, 2015; Angula et al., 2024), and chance (Angala, 2015), were enhancing determinants. This suggests that, although other sectors within the agricultural sector in Namibia receive significant support and are favoured by the policy environment, the goat sector remains constrained by existing policies and limited government support. In addition, the sector remains vulnerable to the occurrence of unpredictable events, such as theft, predation and health-related issues, e.g. disease outbreaks.

Table 5.9: Porter's Diamond determinants of competitiveness

Factors	Average ratings	Standard deviation
Firm strategy, structure, and rivalry	3.31	1.06
Demand conditions	3.19	1.09
Related and supporting firms	3.13	1.13
Government support and policies	2.97	1.06
Production conditions	2.75	1.13
Chance factors	2.49	1.09

Source: Author's computation based on GSSS data

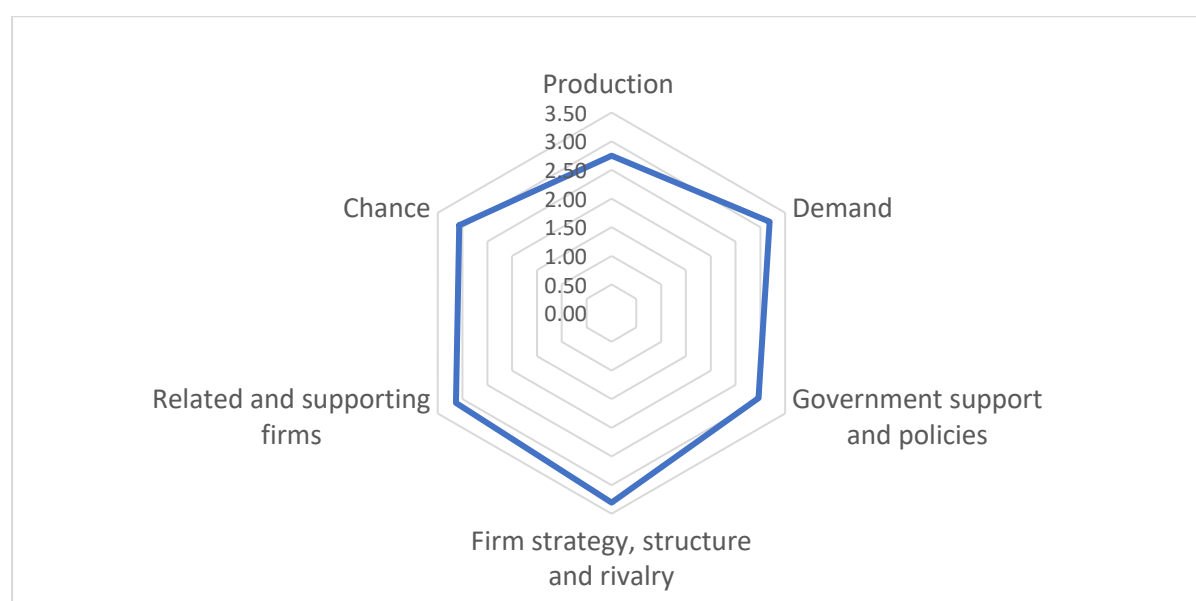


Figure 5.4: Porter's Diamond determinants of competitiveness

Source: Author's computation based on GSSS data

To further understand why the six determinants discussed earlier were found to be enhancing or constraining, various factors out of the 34 used in the GSSS were grouped according to their corresponding Porter's determinants to conduct robust discussions of each determinant in the succeeding sub-sections.

5.7.1 Production conditions

Table 5.10 and Figure 5.5 display the nine factors influencing production conditions. The majority (7 out of 9) of the factors were rated as constraining factors. The only factors rated as enhancing were unskilled labour availability, which received the highest average rating of 3.81, and land and water availability, with a Mean rating of 3.50. However, it is crucial to highlight the point that these two factors were only moderately enhancing, since their average rating was closer to 3 (neutral) than to 5 (most enhancing). Skilled labour availability (among other lowly rated factors) had the lowest average rating of 1.99, making it the most constraining factor. Equally important, the standard deviation (0.787) for skilled labour availability was quite low, indicating that most respondents rated it as low; otherwise, a high standard deviation would imply the opposite.

This study's findings ascertained that production conditions (2.75) were constrained owing to the scarcity of skilled labour, water, land, weather uncertainties, and financial and technological limitations. However, unskilled labour availability (3.81), compared with skilled labour availability (1.99), was ranked as the most enhancing factor. A study by Angula et al. (2024) on the Namibian grape industry found that unskilled labour was the most significant factor, as it was cheaper and more readily available compared with skilled labour. This indicates why the availability of unskilled labour was found to be an enhancing factor. However, some participants emphasised that the government should facilitate training programmes for farm workers to close the gap in the lack of skills.

Although the results show that land and water availability (3.50) was the second most-enhancing factor, its standard deviation of 1.180 (considered moderate) was the third highest. This meant that a larger proportion of respondents rated this factor as constraining when compared with the standard deviation of unskilled labour availability (1.092). Moreover, some respondents indicated that goats are easy to rear as free-roaming animals; however, communal areas often lack fencing, leaving farmers vulnerable to stock theft and predation. In addition, other participants revealed that there were unequal opportunities to acquire fenced resettled farms, which provided a protective shield against predators and served to reduce stock theft. Consequently, this renders communal goat production labour intensive and costly. A participant further suggested that installing predator-proof fences in communal farming areas would facilitate the implementation of free-roaming goat-rearing practices with minimal labour and losses, thereby making goat production less costly.

Participants also placed strong emphasis on the implications of unstable weather as a constraining factor to competitiveness, which corresponds with its low average rating of 2.41. They emphasised that drought leaves animals thin and vulnerable to strong cold winds that follow the heavy rains after dry spells. Malnourished animals cannot withstand this, and end up dying. However, other

respondents concluded that goats survive better than cattle do because they maintained a higher stock of goats than cattle during and after drought, despite high mortality rates.

According to Mbai (2024), Namibia has experienced a combined period of drought lasting at least 12 years (1992-93, 1995-96, 2012-19, and 2023-24) since its independence in 1991, which hinders fodder production. However, avenues remain for the sustainable extraction of groundwater or the utilisation of water from perennial rivers via programmes for producing fodder (Mbai, 2024) for the goat sector.

Notably, technology availability and affordability (2.66) had the second lowest standard deviation (1.006) among all production conditions, indicating that few respondents considered it as a constraining factor. This was supported by some participants who indicated that technology within the goat sector was available, but not affordable. This accords with Mubita (2006), who emphasised that there is a need for increased investment in technology in the agricultural sector as a whole, as this might promote sustainability. For instance, because Namibia's agricultural sector continues to be the largest consumer of water within the country, the government could consider investing in technology to support water harvesting (Mubita, 2006).

The aspect of transport availability and affordability (2.79) was regarded as a constraint, supported by various insights from the participants. Some participants stressed that high transport costs have rendered farmers price takers, i.e. they are willing to accept any price out of fear of incurring additional transport costs when returning unsold animals. As a result, buyers (export agents and/or traders) use price predetermination to purchase goats at a price that is less than their actual value.

Table 5.10: Production conditions factors of competitiveness

Factors	Average ratings	Standard deviation
Unskilled labour availability	3.81	1.092
Land and water availability	3.50	1.180
Input costs affordability	2.89	1.169
Transport availability and affordability	2.79	1.260
Technology availability and affordability	2.66	1.006
Unstable weather	2.41	1.198
Access to capital for expansion	2.41	1.309
Starting up capital	2.26	1.166
Skilled labour availability	1.99	0.787
Average	2.75	1.13

Source: Author's computation based on GSSS data

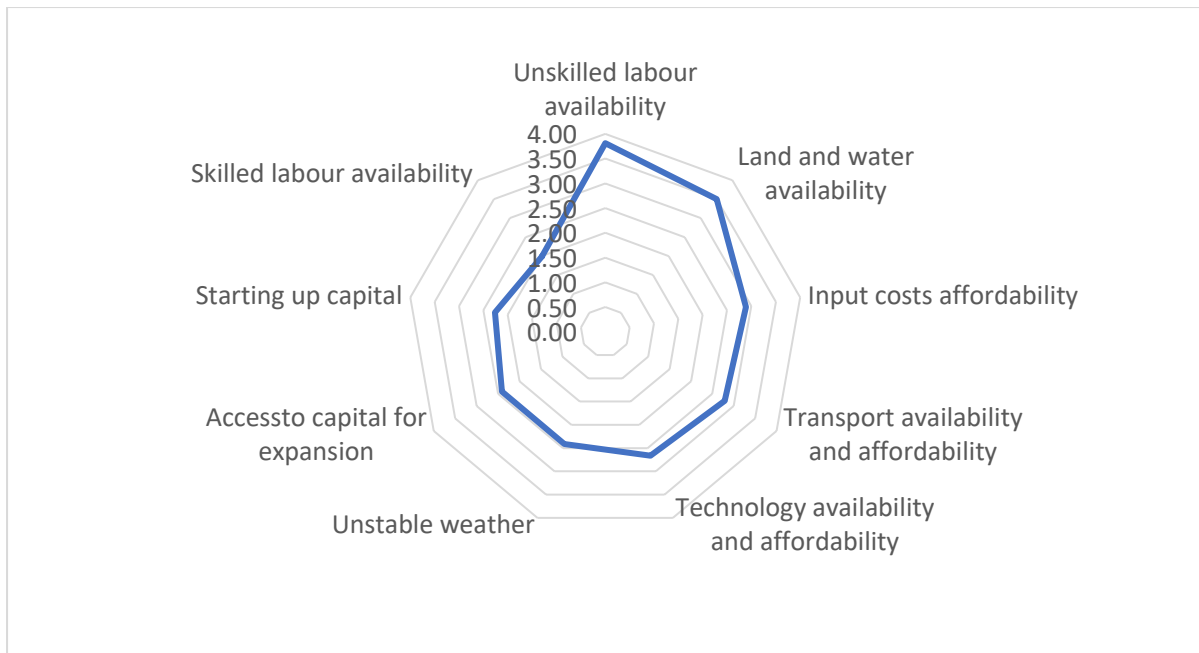


Figure 5.5: Production conditions factors of competitiveness

Source: Author's computation based on GSSS data

5.7.2 Demand conditions

The demand conditions comprised 3 factors, with the majority being rated as enhancing factors (Table 5.11, and Figure 5.6). The factor, local demand for goats and goat products, was rated (3.63) as most enhancing, followed by the local market's potential for expansion (3.58). In contrast, the weather's effect on exports was the only factor rated (2.36) as constraining. The compression seen in the radar plot in Figure 5.6 visually presents the difference in ratings.

Despite local demand for goats and goat products (3.63) and local market's potential for expansion (3.58) being the enhancing factors, the lack of a well-developed formal market for goats and goat products (Marius et al., 2021) still poses a limitation. Although participants noted that existing abattoirs have been designed to support goat slaughter and value addition, they state that the value received from a goat carcass is lower than the value received for a live goat. This could be the reason for the slow progress in value addition and the development of a formal market within the sector, as farmers opt for live goat exports, which are deemed more profitable.

A study by Dieters et al. (2021) found that rangeland goats reach a mature weight of 45 to 60 kg. In addition, goat meat is categorised into two types. Cabrito, often from suckling or weaned kids without permanent teeth, produces a light, pink meat carcass weighing between 6 and 15 kg. Chevron, from mature goats, is characterised by a dark carcass and generally weighs more than 16 kg. Cabrito is the preferred option over Chevron on the international market because it is cheaper and has a better taste

(Dieters et al., 2021). Because of the lack of a well-developed formal market for Cabrito or Chevron in Namibia, and the lower value received from a carcass (weighing 6 to 15 kg or above 16 kg) compared with live goat sales (weighing more than 16 kg), farmers prefer to engage in live animal sales.

To emphasise, respondents stressed that value addition remains a problem because the international market for goat meat prefers cabrito, as it is tender and lacks the “goaty” smell. On the other hand, because carcasses fetch lower prices compared with live animals, young goats will weigh less and fetch even lower prices. In this situation, the exporting abattoirs would be the only ones to benefit from value addition.

The effect of weather on exports (2.36) was the only constraining factor, and according to the participants, this could be best explained through the volatility in goat prices. For example, during droughts, goats typically fetch low prices owing to poor body condition, weight loss and reduced pasture availability. While demand from South Africa increases goat prices mainly during ritual periods, goats will therefore then fetch higher prices compared with other times of the year.

Table 5.11: Demand conditions factors of competitiveness

Factors	Average ratings	Standard deviation
Local demand for goats and goat products	3.63	1.118
Local market's potential for expansion	3.58	1.100
Weather's effect on export	2.36	1.046

Source: Author’s computation based on GSSS data

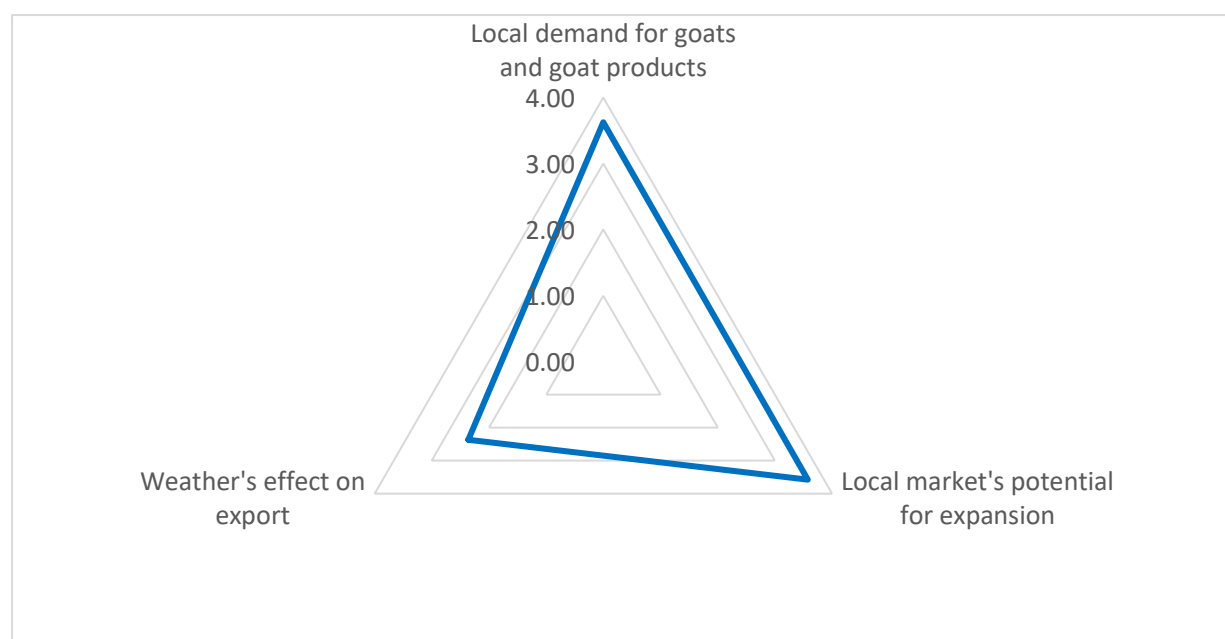


Figure 5.6: Demand condition factors of competitiveness

Source: Author’s computation based on GSSS data

5.7.3 Government support and policies

Seven factors of competitiveness of government support and policies are shown in Table 5.12 and Figure 5.7. Two out of seven factors were rated as enhancing, while the majority were rated as constraining factors. The two factors with the highest average ratings (3.31 and 3.06) were regulatory standards (3.31) and government interference (3.06). Otherwise, the lowest-rated factors were the taxation system (2.80) and the 2006 export levy (2.84) among others.

With an average rating of 2.97, it can be concluded that there was limited government support and that existing policies were not favourable for the sector. However, other participants stated that they were pleased with the regulatory standards currently in place, as they promote quality control and assurance, which, in the long run, preserves Namibia's reputation, globally. This explains why regulatory standards were rated (3.31) as the most enhancing factor.

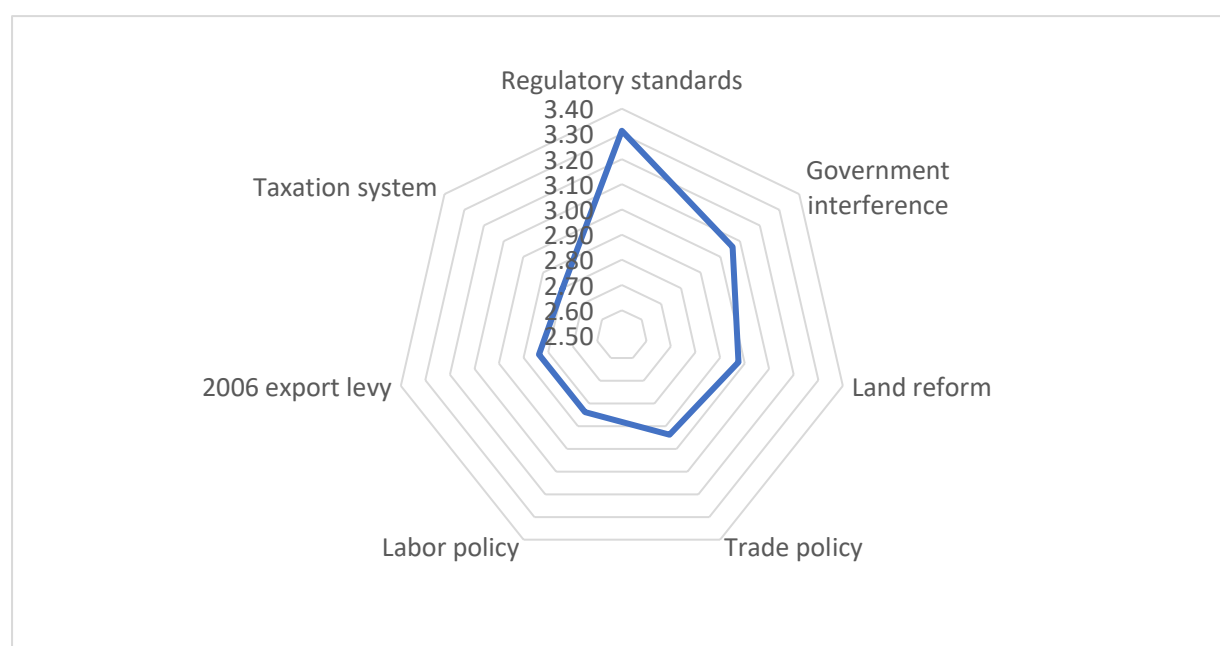
Most respondents agreed that the 2006 export levy (2.84) was constraining, as it had the lowest standard deviation compared with other factors in this category. This viewpoint was supported by the negative trend in competitiveness that followed the introduction of this levy, as discussed in Section 5.4. However, other participants explained that they were not aware of the existence of such a policy. To discourage the export of live animals, the Namibian government introduced a “Growth at Home” strategy in 2006, which led to the establishment of the 2006 export levy on live goats (Kandiwa et al., 2020). This in turn led to an increase in the domestic demand and the development of a formal market for lamb (Kandiwa et al., 2020), but not so for chevon and cabrito.

To conclude, Mbai (2024) suggested that evidence-based policy development for ensuring optimum outcomes should be supported by adequate funding. In addition, the principle of the National Planning Commission (NPC) policy formulation framework that endorses a five-year review cycle, should be utilised to review policies affecting the goat sector. Such policies include the Livestock Improvement Act (1977), the National Drought Strategy and Policy (1997), the Export Levy on live goats (2006), Water Supply and Sanitation (2008), the National Agricultural Marketing and Trade Policy (2011), the National Agricultural Policy (2015, unpromulgated), and the National Rangeland Management Strategy (unpromulgated).

Table 5.12: Government support and policy determinants of competitiveness

Factors	Average ratings	Standard deviation
Regulatory standards	3.31	1.208
Government interference	3.06	1.205
Land reform	2.98	1.043
Trade policy	2.94	0.959
Labour policy	2.84	1.174
2006 export levy	2.84	0.834
Taxation system	2.80	0.973

Source: Author's computation based on GSSS data

**Figure 5.7:** Government support and policies determinants of competitiveness

Source: Author's computation based on GSSS data

5.7.4 Firm strategy, structure, and rivalry

The factors under firm strategy, structure, and rivalry (3.31) were on average rated as enhancing because most of the factors had a rating above 3, as shown in Table 5.13 and Figure 5.8. Experienced farmer's advantage was rated 4.31 as the most enhancing. In contrast, competition in the sector had the lowest average rating (2.40), making it the most constraining factor.

The experienced farmer's advantage (4.31) was the most significant factor, as some participants noted that experienced farmers had a higher chance of acquiring loans from financial service providers, compared with those with little to no experience. Literature suggests that experienced farmers have an advantage because of their greater climate-change adaptability (Abid et al., 2014), partly because of their superior weather-forecasting abilities (Fadina & Barjolle, 2018). Other studies have also found that, as farmers age and gain more experience, their profits increase as a result of their enhanced skills

and management practices acquired with age (Akter et al., 2019). This suggests why financial service providers might give preference to experienced farmers, yet create inequalities in doing so.

The findings also indicate that participants believed that using different strategies to meet consumer requirements, such as farming with superior breeds (like the Boer goat), crossbreeding (superior breeds with indigenous, adapted breeds), and supplementary feeding to fatten animals before selling them, improved their competitiveness. This is attributable to an average rating of 3.66 for the factor strategies to meet customer requirements. This concurs with Pophiwa et al. (2020), who found that farming with breeds that have traits suitable for meat production, strong adaptability to the environment, and resistance to prevalent diseases, among other desirable traits, is a good strategy for meeting market requirements. The authors state that the Boer goat has gained prestige for its superior meat production qualities. Hence, the use of the Boer goat by this study's participants is a strategy used to meet consumer requirements, as Namibia's goat sector is dominated by meat producers.

In addition, pre-slaughter conditioning of animals by improving nutrition is used to attain good body condition for the animal, leading to the production of better-quality meat and carcass, which is also used as a strategy to meet the demand requirements (Pophiwa et al., 2020). The authors recommended that a synthesised approach connecting researchers, producers, processors and consumers to larger markets would encourage international trade.

Evidence from this study also indicates a lack of competition within the sector, with a low rating (2.40) for the factor of competition. However, respondents noted high competition among goat breeders, which improved goat prices in the sector.

Although the results indicate that the neighbouring country's export share (2.76) was constraining, some interviewees mentioned that the neighbouring country's export share posed no threat because Namibian goats were sought after on the international market. Other participants agreed that Namibian goats were prestigious for being rangeland goats and free of growth hormones, but above all, the entire sector has international recognition for its strong traceability schemes, high-quality standards, and disease-free zones.

Table 5.13: Firm strategy, structure, and rivalry determinants of competitiveness

Factors	Average ratings	Standard deviation
Experienced farmer's advantage	4.31	1.051
Strategies to meet customer requirements	3.66	0.993
Number of farmers effects	3.39	1.131
Neighbouring countries export shares	2.76	0.971
Competition in the sector	2.40	1.165

Source: Author's computation based on GSSS data

**Figure 5.8:** Firm strategy, structure, and rivalry determinants of competitiveness

Source: Author's computation based on GSSS data

5.7.5 Related and supporting firms

The factors in this section were grouped to understand how the different networks of complementary institutions, businesses and other entities affect the sector's competitiveness. Table 5.14 and Figure 5.9 illustrate that local input suppliers (3.61), partnerships with research institutes (3.19), and financial service providers (3.14) were rated as the only enhancing factors. On the other hand, connections with the international market (2.88) and the government, farmers, and researchers' relationship (2.85), were the most constraining.

Respondents reported that the medication they purchased was unreliable because it did not work. This resulted in the purchase of alternative medications, making veterinary care more expensive. However, other respondents argue that farmers commonly relied on their experience to prescribe drugs for their goats, which could have resulted in the wrong prescription and purchase of the wrong medication. On the contrary, other participants emphasised that farmers are forced to self-prescribe and diagnose ill animals because of the lack of farm visits by veterinarians.

The financial service providers (3.14) constituted an enhancing factor, according to the results. However, some participants believed that financial service providers restricted competitiveness because they had too many rigid requirements that needed to be met to qualify for financial assistance (loans). Additional insights from interviewees suggested that financial service providers do not offer tailor-made packages for specific livestock, such as goats, but rather provide general livestock packages.

Several participants revealed that there was no connection between the government, farmers, and the researchers. This was because some interviewees believed that the government was not aware of the struggles of farmers, as evidenced by the lack of assistance to drought-stricken farmers. Furthermore, other respondents emphasised that the lack of assistance from the government resulted in farmers travelling long distances to purchase feed, which was an extra cost (transport) for farmers. Instead, if government officials were experienced farmers, they would better understand the needs of farmers. Equally important, it was noted that extension officers and veterinary doctors did not visit farmers, and that farmers struggled to access veterinary services, leading to them often having to help themselves.

The numerous constraints expressed by respondents regarding the relationship between government, farmers, and researchers could explain its low average rating of 2.85. Nevertheless, participants further recommended that farmers who have experienced hardship with farming should be a criterion for employment for government officials in the agricultural sector as a whole. This would aid with effective drought mitigation, prevention, and adaptation. Hence, improving the connection between the government, researchers, and farmers.

The factor connection with the international market was also rated as constraining, with participants indicating that only agents can afford to export goats and that it is a monopoly.

Table 5.14: Related and supporting firms' determinants of competitiveness

Factors	Average ratings	Standard deviation
Local input suppliers	3.61	1.013
Partnerships with research institutes	3.19	1.159
Financial service providers	3.14	1.188
Connection with international market	2.88	0.986
Government, farmers, and researchers' relationship	2.85	1.284

Source: Author's computation based on GSSS data

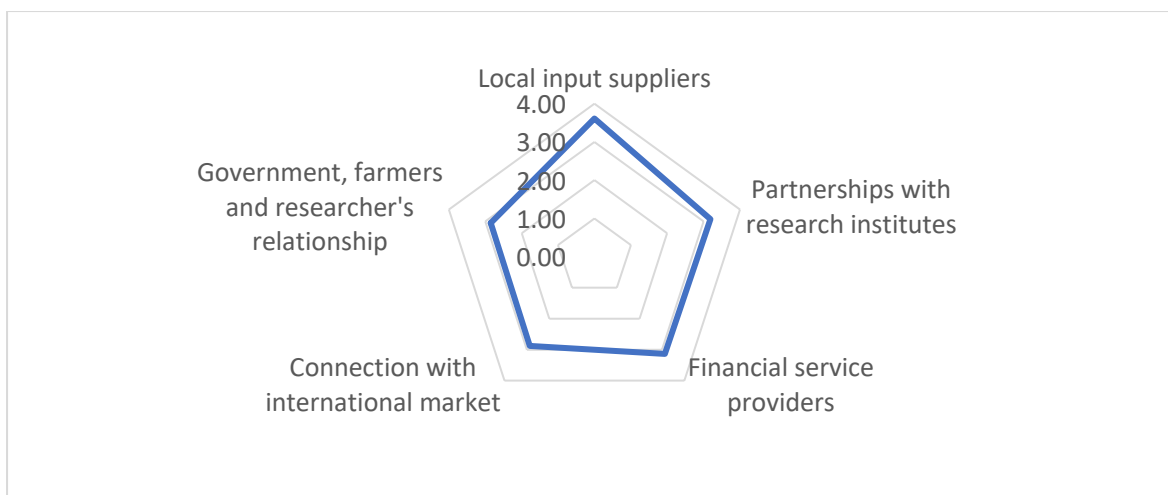


Figure 5.9: Related and Supporting Firms' determinants of competitiveness

Source: Author's computation based on GSSS data

5.7.6 Chance factors

Table 5.15 and Figure 5.10 present the results for different factors over which the sector has no control. Health issues (3.05) comprised the only enhancing factor, while crimes, predation, etc. showed the lowest average rating of 1.95, with COVID-19 (2.26) being the second least-constraining factor.

The average rating for Chance factors was 2.49, showing how constraining those factors were. Moreover, an average rating of 3.05 for the factor Health issues implied that the factor was slightly enhancing because its mean was closer to 3, rather than 5. Feedback from the participants suggested that health issues affect goat farming because farm workers tend to take advantage of their ill employers by stealing and selling goats. To cover their act of theft, farm workers claimed that the goats died from diseases and were burned to prevent further infection within the herd.

Other participants explained that health conditions increase farming costs. For instance, a subsistence farmer with 10 goats is forced to hire a farm worker to assist the sick farmer with rearing the herd in order to continue sustaining the farmer's family. However, in the long run, farmers tend not to be able to afford workers' salaries, leading to destocking to pay the workers and eventually, disinvestment in goat production. This also translates to increased unemployment and poverty exacerbation.

Crimes, predation, etc. (1.95) was the most constraining factor of the total 34 different factors, and insightful feedback was received from participants to support this. Firstly, predation is costly and inhibits herd size growth, with zero assistance coming from the government for the lost animals. Secondly, most predators are protected as wildlife and are heavily regulated by conservation authorities, discouraging their killing. However, the lack of fencing in communal areas allows these

animals to continue terrorising goat farmers. Lastly, only farmers who can afford insurance and those with the capacity to report livestock losses receive compensation for the animals killed.

Without a doubt, COVID-19 (2.26) significantly affected the goat sector, as discussed in Section 5.4, which is why it was ranked as the second most-constraining factor over which the sector had no control.

Table 5.15: Chance factors of competitiveness

Factors	Average ratings	Standard deviation
Health issues	3.05	1.242
Political system	2.66	1.179
Exchange rates	2.53	0.941
COVID-19	2.26	1.338
Crimes, predation etc.	1.95	1.030

Source: Author's computation based on GSSS data

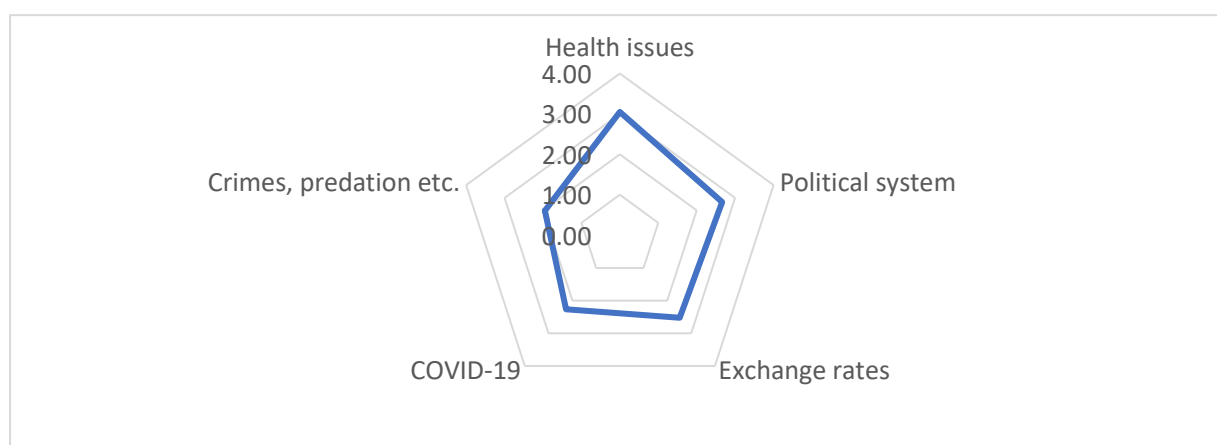


Figure 5.10: Chance factors of competitiveness

Source: Author's computation based on GSSS data

5.8 Conclusion

This chapter has presented findings derived from the qualitative and quantitative analysis, based on the analytical framework of the study. Through the GSSS, stakeholders in the Namibian goat supply chain conveyed a variety of perspectives and viewpoints on the competitiveness of the sector. After conducting a profitability assessment of goat production among commercial and non-commercial farmers, and incorporating the use of trade-based indices, the Porters Diamond Model was used to identify the factors that enhance or constrain competitiveness, following the findings that indicated the sector's competitiveness over the years. The subsequent chapter provides a summary, conclusion, and recommendations based on the results.

Chapter 6: Conclusion and Recommendations

6.1 Introduction

This chapter serves to provide a summary of the key findings and insights derived from the research, addressing the objectives outlined at the outset. This study evaluated the competitiveness of the Namibian goat sector by using a well-established analytical framework, focusing on profitability analysis, trade-based indices, and the application of Porter's Diamond Model to identify factors influencing the sector's competitive performance.

This chapter presents a synthesis of these findings to draw overarching conclusions, highlight implications, and propose strategies to enhance the sector's competitive performance. By doing this, it connects the findings and recommendations directed at the sector's stakeholders. The following subsection presents a summary of the findings based on the six steps of the analytical framework used in this study.

6.2 Summary of Major Findings

The overall objective of this study was to assess the competitive performance of Namibia's goat sector at both the micro and macro levels. Based on the findings from the analysis in the previous chapter, firstly, this study proposed a definition of competitiveness as "the Namibia goat sector's ability to thrive in international markets by fostering sustainable growth through the generation of sufficient returns, maintaining production costs below market prices, and covering at least the opportunity cost of the resources employed." This definition was a starting point for gaining an understanding of the sector's competitiveness.

Secondly, results from the GMA revealed major differences between commercial and non-commercial goat farmers, showing that commercial operations were more profitable. Non-commercial farmers earned a lower average price per goat (N\$977.46), as compared with commercial farmers (N\$1,392.70), who also sold more goats annually owing to their larger herd size. Commercial farming was confirmed as being more cost-efficient, as commercial farmers retained 47.87% of their selling price as profit (N\$666.53), compared with non-commercial farmers who retained only 14.60%, indicating that the costs of production absorbed a significant share of their revenue. The costs of feed were significant expenses, estimated at 49% of the total variable cost for commercial farmers and 54% for non-commercial farmers. Despite challenges and signs of disinvestment, both farming systems

proved to be profitable, thereby strengthening the goat sector's competitive performance and encouraging continued investment.

Thirdly, findings from the trade-based assessment showed that Namibia's goat sector had a competitive advantage from 2001 to 2022. However, the sector's competitiveness fluctuated decreasingly, with noticeable influence from policy interventions, climate, and the COVID-19 pandemic, among other factors. The RSCA and NRCA results from the inter-country analysis of the top five live goat-exporting countries, which include Namibia, revealed that Somalia was the most competitive country. Oman was the second most-competitive country, followed by Namibia, India and Thailand as the nation with the weakest competition. Furthermore, production mapping revealed that only Namibia and Somalia remained both competitive and net exporters from 2001 to 2022.

Lastly, the analysis of the factors affecting the sector based on Porter's Diamond determinants revealed that chance factors (2.49), production conditions (2.75), and government support and policies (2.97) were the most constraining factors. However, the other three determinants, firm strategy, structure, and rivalry (3.31), demand conditions (3.19), and related and supporting firms (3.13), were rated as moderately enhancing. It should be remembered that a rating of 1 (out of 5) was considered as most constraining, 3 as neutral, and 5 as most enhancing. The findings indicate that the goat sector is facing a constraining competitive environment.

6.3 Proposed Strategies to Enhance the Sector's Competitiveness

6.3.1 Production condition

Offering training programmes for farm workers by government bodies to bridge the gap between skilled and unskilled labour would increase competency among workers and equip them with adequate knowledge to reduce goat losses. There is a need to develop microfinancing programmes that are customised for goat farmers, together with a review of the criteria that need to be met for successful financial aid to foster equality along the supply chain. A more focused investment should be made in fodder production to mitigate the effect of unpredictable weather conditions. Steps should be taken to foster the creation of cooperatives to enable bulk purchasing and cost-sharing among farmers to cope with the high input costs.

6.3.2 Demand conditions

To mitigate the price instability that follows drought periods, and since Namibia mainly exports goats to South Africa, diversification in export routes and target markets would help to reduce the risks

associated with weather fluctuations. Hence, there is a need for an assessment to be made of the Namibian goat sector's export potential and the factors hindering its export diversification.

6.3.3 Government support and policies

There is a need to review policies, such as the 2006 export levy on live goats, which negatively affect the goat sector. Considering the reduction of the levies would enhance the competitiveness of the sector.

6.3.4 Firm strategy, structure, and rivalry

Since Namibia significantly only exports live goats, a diversification introduced in the trade of goats and goat products by tapping into niche markets for goat products, such as meat and milk, would help to cushion the effect of the neighbouring country's export shares.

6.3.5 Related and supporting firms

The creation of farmer-led research programmes, supported by academic institutions, would help to identify constraints among farmers and lead to the development of policy-based alleviating recommendations. This could be made possible through the development of policies aimed at formalising communication and collaboration between the government, researchers, and farmers.

6.3.6 Chance factors

Collaborating with government agencies to monitor instabilities in the exchange rate and providing support during major fluctuations would help to mitigate the effects of exchange rate volatility. There is also a need to develop adaptability strategies aimed at mitigating future shocks such as COVID-19. Additionally, fostering community-based predator and theft control strategies, such as fencing and encouraging the use of guard animals, would help to mitigate predation and theft.

6.4 Validation of the Research Hypotheses

The purpose of this section is to validate the three hypotheses deduced in the first chapter of the study, in Section 1.5.

The first hypothesis assumed that “goat production in Namibia is economically profitable at both the communal and commercial farming levels”.

A quantitative analysis conducted by using GMA and sensitivity analysis showed that commercial goat farming in Namibia was more profitable than non-commercial farming was, with higher prices, larger sales volumes, and greater profit margins, despite high feed costs in both systems.

The second hypothesis assumed that “the Namibian goat sector has exhibited sustained international competitiveness over the years regardless of unfavourable policy and climatic conditions”.

Trade-based analysis revealed that Namibia's goat sector had a competitive advantage from 2001 to 2022, despite fluctuating trends influenced by various factors. It ranked third in competitiveness among top exporters, behind Somalia and Oman, and remained a consistent net exporter throughout the period, alongside Somalia.

The third hypothesis assumed that “the competitive performance of the Namibian goat sector has been influenced by various factors, including production conditions, market demand, policy frameworks, and external shocks beyond the sector's control”.

Porter’s Diamond analysis revealed that production conditions and government support were the most constraining factors in Namibia’s goat sector, while the other determinants were moderately enhancing, indicating an overall challenging competitive environment.

6.5 Recommendations for Future Research

Further research should be conducted on the competitiveness of the Namibian goat sector to include:

- An extended version of Porter's Diamond Model, which includes realities such as transformational and social developments.
- An analysis of how profitable and competitive the goat sector is compared with other sectors within the agriculture sector. This would reveal the opportunity cost of investing in goats in Namibia. Additionally, it would reveal the relationship between profit and competitiveness by answering questions, such as whether there is a correlation between profit and competitiveness ratings, or whether a high opportunity cost results in lower profits, despite strong competitiveness.
- An analysis of the export potential and the factors hindering the export diversification of the goat sector.

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Annexures

Annexure A: Goat Sector Stakeholder's Questionnaire

This survey takes approximately 5-10 minutes to complete and aims to gather key data on the Namibian goat sector, focusing on factors affecting competitiveness and data for calculating profitability. Your responses will help assess the sector's environment and economic performance. Your participation is crucial for improving the sector's competitiveness and profitability. All information provided will be kept strictly confidential.

SECTION 1: PARTICIPANTS DETAILS

1. What is your name: _____
2. What is your cellphone number: _____
3. What is your gender? *Mark with X in the appropriate box below:*
☐ Male ☐ Female
4. What is your age: _____
5. What is your position in the goat supply chain? *Mark with X in the appropriate box below. You can choose/tick more than one option.*
☐ Input/service provider ☐ Farmer/Producer ☐ Processor ☐ Trader/marketer

SECTION 2: GOAT FARMING ENTERPRISE INFORMATION

**!!NOTE THAT: THIS SECTION IS ONLY FOR GOAT FARMERS. IF YOU ARE NOT A GOAT FARMER
PROCEED TO SECTION 3**

6. What type of goat breeds do you farm with? *Mark with X in the appropriate box below. You can choose/tick more than one option.*
☐ Boer goat ☐ Kalahari red ☐ Angora ☐ Saanen ☐ Indigenous breeds ☐ Other
7. If you chose "other" in question 6, please specify if you farm with any other goat breeds:

8. In what region do you farm with goats? Please specify the name of the district, constituency, village, etc.:

9. For how many years have you farmed with goats: _____
10. What is the size of your farm (in hectares) _____
11. How many goats do you currently have on your farm? _____

12. How much do you usually spend to feed (**hay, lucerne, supplements, and licks etc.**) your goat herd every month? (**total amount**) N\$ _____
13. How many times do you vaccinate and deworm your goats in a year? Mark with X in the appropriate box:
☐ Once ☐ Two times a year ☐ Four times a year ☐ Every month
14. How much do you usually spend on veterinary costs for your goat herd per year? N\$ _____
15. How many workers are on your farm looking after goats only? _____
16. What is the average monthly salary per worker? _____
17. How many goats do you usually sell in a year? _____
18. How much do you usually make from the sale of goats in a year? N\$ _____
19. How many goats died, or were lost at your farm last year because of theft, drought and or predation, etc.? _____

SECTION 3: DETERMINANTS OF COMPETITIVENESS OF THE GOAT SECTOR

COMPETITIVENESS MEANS HOW WELL YOU CAN STAND OUT AND SUCCEED COMPARED TO OTHERS. IT INVOLVES BEING BETTER IN AREAS-LIKE QUALITY, COST, OR SERVICE. IN GOAT FARMING, FOR EXAMPLE, IT MEANS PRODUCING MORE OR BETTER GOATS THAN OTHER FARMERS OR COUNTRIES AND DOING IT EFFICIENTLY.

Below are tables with statements regarding factors of competitiveness in the goat sector. Please rate your level of agreement or disagreement with each statement on a scale of 1 to 5 by marking with an X in the corresponding box (**Note that: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, & 5 = Strongly Agree**).

Production conditions	1	2	3	4	5
a) Land and water are readily available					
b) Unstable weather does not affect your goat farming					
c) Starting up doesn't require lot of capital (like loans, funds, or goat stock)					
d) It is easy to access to capital (like loans, funds, or goat stock) for expansion					
e) Transport for exporting and selling goats is available and affordable					
f) Skilled labour (experienced or qualified workers) is easy to find and affordable					
g) Unskilled labour (workers with no experience or not qualified) is easy to find and affordable					
h) Input costs, such as feed and veterinary care, are affordable					
i) There is enough affordable technology (like feeding machines, health monitoring devices, etc.) in the sector					

Demand conditions	1	2	3	4	5
a) The demand for goats and goat products (like milk & meat) is high in Namibia					
b) The local market of goats and goat products has the potential for expansion					
c) Weather changes don't affect the export market buying pattern					

Government support and policies	1	2	3	4	5
a) The 2006 export levy on live goats promotes goat exports					
b) The taxation system in Namibia promotes business investment					
c) Complying with regulatory standards promotes competitiveness					
d) Government interference doesn't affect your operations					
e) Namibia's trade policy enhances your business					
f) Namibia's Land Reform policy enhances your business's competitiveness					
g) Namibia's labour policy (e.g. minimum wage) doesn't limit your competitiveness					

Firm strategy, structure, and rivalry	1	2	3	4	5
a) The number of farmers doesn't affect the way you operate					
b) Experienced farmers have a better advantage					
c) Neighbouring countries' export shares don't affect the sector's competitiveness					
d) You use various strategies, like price control and quality breeds, to meet customer requirements					
e) Competition in the sector is low					

Related and supporting industries	1	2	3	4	5
a) Partnerships with research institutes have boosted the sector's success					
b) The connection between local suppliers and the international market is effective					
c) Government, farmers, and researchers have a strong working relationship					
d) Financial service providers (like AGRIBANK) enhance your business's competitiveness					
e) Local input suppliers of feed, supplements, and vaccines are sufficient and reliable					

Chance factors (factors over which your firm has no control and are external)	1	2	3	4	5
a) Exchange rates (like the US dollar vs N\$) don't affect goat trade					
b) Namibia's political system promotes the goat sector's competitiveness					
c) Crimes, like theft, and events like predation don't affect your business					
d) COVID-19 didn't affect your business					
e) Health issues like HIV/AIDS and TB don't affect your business					

GENERAL QUESTIONS

1. What factors do you consider as most enhancing and why?

2. What factors do you consider as most constraining and why?

3. What do you suggest can be done to enhance competitiveness in the sector

Thank you!

Annexure B: Additional Results

Table B.1: RSCA index

Year	India	Namibia	Oman	Somalia	Thailand
2001	-1.00	1.00	0.99	1.00	-0.99
2002	-1.00	0.98	0.97	1.00	-1.00
2003	0.30	0.99	0.98	0.79	-1.00
2004	0.35	0.99	0.97	1.00	-0.99
2005	0.45	0.99	0.92	1.00	-0.94
2006	0.63	0.99	0.98	1.00	-1.00
2007	0.57	0.99	0.97	1.00	-0.99
2008	0.54	0.99	0.97	1.00	-0.98
2009	0.73	0.99	0.95	1.00	-1.00
2010	0.60	0.99	0.96	1.00	-1.00
2011	0.49	0.99	0.94	1.00	-1.00
2012	0.21	0.99	0.95	1.00	-1.00
2013	0.34	0.98	0.95	1.00	-1.00
2014	0.26	0.97	0.97	1.00	-0.84
2015	0.24	0.98	0.95	1.00	-0.79
2016	0.64	0.97	0.97	1.00	-0.81
2017	0.74	0.98	0.91	1.00	-0.99
2018	0.68	0.97	0.99	1.00	-0.95
2019	0.50	0.97	0.98	1.00	-0.75
2020	-0.01	0.96	0.98	1.00	-0.22
2021	0.26	0.98	0.99	1.00	-0.31
2022	-0.11	0.98	0.99	1.00	0.72

Source: Author's calculation from (ITC, 2024)

Table B.2: TBI index

Year	India	Namibia	Oman	Somalia	Thailand
2001	-1.00	0.96	-0.05	1.00	1.00
2002	-1.00	0.98	-0.14	1.00	-1.00
2003	0.83	0.99	0.83	1.00	-0.97
2004	0.92	0.98	-0.11	1.00	-0.98
2005	0.99	1.00	-0.21	1.00	-0.47
2006	1.00	0.99	-0.03	1.00	-1.00
2007	1.00	0.99	-0.04	1.00	-0.59
2008	1.00	0.99	-0.10	0.99	1.00
2009	1.00	0.99	-0.32	1.00	0.00
2010	1.00	0.99	-0.17	1.00	-1.00
2011	1.00	1.00	-0.29	0.97	-1.00
2012	1.00	1.00	-0.30	0.99	-1.00
2013	1.00	1.00	-0.29	0.99	-0.99
2014	1.00	0.98	-0.04	0.99	0.52
2015	1.00	0.98	-0.50	0.96	0.47
2016	1.00	0.98	-0.44	0.99	0.22
2017	1.00	0.98	-0.77	1.00	-0.95
2018	1.00	0.98	-0.01	1.00	-0.89
2019	1.00	1.00	-0.51	1.00	-0.53
2020	1.00	1.00	-0.48	1.00	-0.27
2021	1.00	1.00	-0.20	1.00	-0.23
2022	1.00	1.00	-0.21	1.00	0.57

Source: Author's calculation based on data from (ITC, 2024)