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MPhil

Agricultural commercialisation through innovation platforms: A case for goat production

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by

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ABSTRACT

Empirical evidence has shown that goats are of significance in marginalised, poor, and rural economies and this information has been well documented in scholarly research. Despite its importance and potential contribution, goat farming remains underutilised and undeveloped in the rural economy – particularly in South Africa. Developmental intervention has focused on improving productivity with minimal effort aimed at the integration of key role players in the value chain, and even less emphasis on improving farmers' attitudes.

The largest goat population in South Africa is found in the Northern Cape where there is great potential to be realised for goat farming. The main objective of this study was to identify supply side (production) factors constraining subsistence goat production in South Africa, with the view of identifying key actors to establish an innovation platform through vertical integration. By transforming the subsistence farming orientation of goat farmers into a commercial (market) orientation, the welfare of communities can be improved through the commercialisation of small-scale goat farmers.

Studies highlight the need to enhance goat production beyond subsistence goat rearing and towards commercialisation through access to markets, veterinary services, credit facilities, and government support. Furthermore, a focus on market development, value chain integration and innovation platforms can improve the efficiency of the goat farming sector.

This study contributes to the existing body of knowledge on goat farming in South Africa and offers an innovation platform to foster partnerships among the actors along the value chain, creating an enabling environment for the easy flow of market information and infrastructure development.

A praxis model is incorporated into this research. This takes the form of a business model and is provided in Appendix A as a practical way of applying the knowledge gathered in this research.

DECLARATION

(1) I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

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Mothupi Modiba

Signed at ……Johannesburg……

On the ….17th……. day of ……October…… 2020.

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INTRODUCTION AND PURPOSE OF THE STUDY

1.1 Research Area and Problem

African agriculture is faced with major challenges and is often uncompetitive as a result of old and archaic farming methodologies. The failure to improve farming technologies affects productivity and profitability (IAC, 2004; Tenywa et al., 2011). Subsistence agriculture in Africa faces the further challenge of weak linkages between stakeholders. Researchers argue that there is little or no interaction between key stakeholders such as extension agents and small-scale farmers as well as input and output markets. In addition, unfavourable and poorly implemented policies, inadequate infrastructure, and unfair competition present significant challenges (Tenywa et al., 2011; Tregurtha, Vink & Kirsten, 2010). These challenges affect productivity and profitability, which further exacerbates the problems of food security, poverty, and malnutrition (Tenywa et al., 2011; Thorpe, Reid, Van Anrooy, Brugere, & Becker, 2004).

The key to improved efficiency, productivity, and profitability of the rural economy is strong market linkages and significant participation by the main players in the value chain. Here, technology provides potential for sustainable solutions to challenges and constraints; a paradigm shift through the innovation systems framework is necessary to focus on market-orientated subsistence farming (Hall, 2007; Tenywa et al., 2011).

Over the years, agricultural innovation platforms have become a tool to facilitate the development and adoption of innovative solutions designed to improve rural farming practices (Tenywa et al., 2011). Innovation platforms in the agricultural sector are centred on multi-actor arrangements, which are aimed at the inclusion of the poor as both beneficiaries and active participants in innovation processes (Nederlof, Wongtschowski, & van der Lee, 2011). It is argued that the formation of agricultural innovation platforms facilitates the involvement of key stakeholders and that success is dependent on the “local context, quality of facilitation, socio-economic, culture,

biophysical, political environment in which a common challenge and/or opportunity exists" (Tenywa et al., 2011, p. 118). The development of innovation platforms is underpinned by the ability to facilitate stakeholder participation and capacity building. However, the challenge is for development personnel and implementers to overcome the 'handout-syndrome', which often reduces the probability of success and sustainability of the intervention.

It is estimated that more than 80 per cent of Southern Africa comprises barren areas. As far as agriculture is concerned, herbivores appear to be the principal resource that can be kept economically in these zones. Goats, in particular, could perform a vital function here, providing an ideal chance for rural development. However, small ruminant production currently contributes little to the economies of Southern Africa (Von Braun & Kennedy, 1994). This is despite the fact that goats have sustained and supported humankind for more than 7 000 years. Originally from Asia, goats have been embedded in African culture and have become a significant part of small-scale rural farming and livestock rearing.

In South Africa, the development of goat farming and the transformation of the currently fragmented industry into a formal mainstream industry has been constrained by historical, institutional, market, information and research factors (Tefera et al., 2004). It is therefore critical that integrated approaches aimed at reducing the shortcomings of the current system be applied through the construction of a goat production innovation platform, which must be inclusive and span all socioeconomic and political divides (Musara, Chimvuramahwe, Munyati, Chivheya & Mwadzingeni, 2013).

Although various factors have constrained South African informal goat producers and entrepreneurs, the potential is large enough to generate and supply a sizeable market.

Environmental and genetic issues affect the production and quality of goat meat (Warmington & Kirton 1990). Issues such as age, sex, breed, and nutrition affect the growth of goats and determine the quality and value of the meat produced (McMillin & Brock, 2005). At present, the majority of animals are marketed and distributed through unofficial or private transactions, mainly for traditional or religious uses.

Another limitation is that adult goat meat, or chevon, is known for its odour, which discourages consumption. Further reasons for low consumption levels include coarse meat fibre, bland taste in comparison to other meats, used for traditional purposes and, lastly, the tendency to keep goats as pets. In general, this means that chevon is not readily available in many shops. In many communities, there is also a perception that the goat is a "poor man's animal" (DAFF, 2010, p. 22).

Significant threats to goat farming include rural depopulation, resulting in a decline in husbandry. Research indicates that goat pastoralists do not use opportunities to their fullest, such as support from "government, research and development, as well as access to better markets based on the organisation of pastoralists for normalised and standardised production and commercialisation of goat milk products" (Gómez-Ruiz, Pinos-Rodríguez, Aguirre-Rivera, & García-López, 2012, p. 10). Optimisation depends on reducing weaknesses in flock management, lack of formalisation, lack of profitability and increasing resource efficiencies, (Gómez-Ruiz, et al., 2012).

Research conducted by Van Rooyen and Homann (2007) in Zimbabwe noted that easier access to markets and increased production were the key requirements for improving goat production and successful commercialisation. Their research was aimed at developing an integrated approach through investigating problems and possible solutions along the value chain of the goat market. Amankwah et al. (2012) posited that agricultural innovation not only supersedes the mere adoption of technology, but also requires the development of alternative ways of organising the means of production for the benefit of value chain role players. Innovation systems are underpinned by the principle that the interaction of many actors and their activities are necessary for an innovation process to succeed.

Homann et al. (2013) identified the following challenges to smallholder goat farmers: lack of functional markets, absence of incentives to improve agricultural practices, and low motivation to initiate social change. They further suggested that innovation platforms could be a way to address these challenges and their underlying dynamics.

Homann et al's (2013) study in Mozambique tested innovation platforms in areas with poor market access and with market actors who were not sharing information.

The results of their study showed that the innovation platforms significantly increased production and sales revenue. Following from their intervention, new levels of engagement and market linkages were developed over two years. Through innovation platforms, they were able to create market linkages that had the potential to be a vehicle for social change from subsistence-orientated farming and towards market-orientated farming (Homann et al. 2013).

In South Africa, farming challenges are deeply rooted in the history of the country and in colonisation. In the 1850s, British soldiers agreed to limited local governance in the Cape Colony and abandoned the Boer republics of the South African Highveld region; the basis for the Natives Land Act (No. 27) of 1913 (RSA, 1913), which constructed the geographical basis of the contemporary South African state. At that time, the agents of the different governments of the region divided, labelled, and charted most of the space within the present-day borders of South Africa. Based on this, white settlers and colonial officials claimed massive swathes of land, gradually restricted black landholders' ownership and free habitation rights to a tiny fraction of the country, and merged the land owners and landless alike into an economy dominated by coloniser and mining capital (Braun, 2014). Furthermore, the expansion of the capitalist regime in South Africa's history also shows a notable elasticity in its interaction with the government (Scerri, 2009). At the turn of the twentieth century, the needs of the mining and agricultural sectors resulted in the traumatic reshaping of the rural-urban economic relationship for black labourers and black peasantry, not only in South Africa, but also over a sizeable portion of Southern Africa (Scerri, 2009). Mining and agricultural interests dictated the numerous acts of legislation, which reinforced the labour supply for these sectors. Only when the pursuit of these interests overstepped the existing privilege of white labours did political tensions arise between government and capitalists (Wilse-Samson, 2013).

This historical background has contributed to a lack of consumer awareness of goat products and has pushed goat meat production to the periphery in South Africa, preventing producers, processors, and marketers from acquiring enough knowledge about the commercial viability and sustainability of this sector. As a result, goat meat consumption in South Africa has been generally and historically low. Although there

have been some signs of increased consumption when compared to historical trends, this has been limited and currently exists mainly within the Eastern Cape and Limpopo Provinces of South Africa (Maphosa, Sikosana & Muchenje, 2009). In contrast, goat meat is a well-known nutritional item in the Mediterranean, the Middle East, other parts of Africa, South America, Central America, the West Indies, and South Eastern Asia (Webb, 2014).

Lost economic opportunities are demonstrated by South Africa's low domestic consumption of goat meat coupled with its negligible share of the global export market. There is an over-reliance on state-led, agricultural commercialisation initiatives and programmes in South Africa, despite social entrepreneurs who could champion goat meat commercialisation and create a market. Here, social entrepreneurship refers to the rapidly growing number of organisations that have created models for efficiently satisfying the basic human needs that existing markets and institutions have failed to fulfil (Santos, 2012). The argument made in this research study is that institutional innovation is needed to improve the fragmented value chain for South African goat meat. Institutional innovation will allow organisations to learn and to generate better products, business models, and management systems. The South African goat industry requires the involvement of individuals who initiate activities that are focused on a social mission, while behaving like model entrepreneurs through their dynamism, personal involvement, and innovative practices.

Accordingly, this research sought to identify the supply side factors that constrain goat production in South Africa with the view to identifying the key actors required to establish an innovation platform, through vertical integration, for the commercialisation of goat meat and goat by-products.

1.2 Problem Statement

The development of smallholder goat farmers is a neglected area despite the knowledge that growing formal and informal markets can provide opportunities for poor communities (Musara et al., 2013; Swaans, Boogaard, Bendapudi, Taye,

Hendrickx, & Klerkx, 2014). Goat production has been constrained by colonial legacies and structures, and insufficient research.

Goats are seen as the ‘animal of the poor’ with small ruminant production increasing over the past 20 years (FAO, 2014). Historically, goat production activities have been excluded from organised and formal markets and faced tremendous development and market challenges. There is a negative perception towards goat production activities as they are deemed to be socially or economically non-viable and the amount of goat meat produced at a world scale is marginally small compared to beef. Despite these factors, demand is growing fast (Webb, 2014). According to Dubeuf (2014), research has shown that efficient goat rearing can be useful in eradicating poverty. Improved efficiency, productivity, and profitability as well as stronger market linkages and participation of key players may improve prospects for the rural economy.

Technology provides possible solutions to the key challenges highlighted above but it requires a paradigm shift through innovation systems frameworks and a move towards market-orientated, subsistence farming (Hall, 2007; Tenywa et al., 2011). Innovation platforms stem from the innovation systems approach and are considered an improvement from traditional development models because they integrate key role players in research (Mulema, 2012). This new approach supported by technology is focused on innovations that are relevant to local conditions. The complex challenges faced by rural, subsistence farmers require their active participation in the innovative process while also ensuring the involvement of multiple stakeholders (Tenywa et al., 2011).

Omiti, Otieno, Nyanamba, and McCullough (2009) argued that an efficient livestock marketing system is critical to ensure that goat farming becomes a sustainable activity and improves the livelihoods of poor farmers. Their research sought to identify key players in the value chain of goat production as the basis for establishing an innovation platform to link value chain actors within the institutional context in South Africa. The goal was to facilitate “interaction, negotiation, and collective action between farmers, researchers and other stakeholders” (Schut, Cadilhon & Misiko, 2015, p. 4).

Musara et al. (2013) showed that the benefits of goat meat and by-products to the rural and national markets are hugely underestimated, presenting in turn an opportunity to find innovative ways to bring goat meat and by-products to market. They further posited that the advantage of goat over other ruminants is the quality of meat, short cycle of production, as well as the quick returns provided to the farmer. A gap exists in the South African market for commercialising and developing an innovation platform that facilitates the collaboration of the key actors in the value chain for goat meat and by-products (Musara et al., 2013; Swaans et al., 2014).

Such efforts to develop the goat meat market must be accompanied by efforts to change the perceptions of potential customers. The United States Department of Agriculture (2019) reported that the calories, total fat, saturated fat and cholesterol content of goat meat is lower than those found in beef, lamb, pork, veal and chicken, and its iron content higher (see Table 1), which gives goat meat a nutritional advantage . These critical factors need to be leveraged in order to boost demand and replace misconceptions.

Table 1: Nutritional values of roasted meats

Per 100g of meat	Goat	Lamb	Pork	Beef	Veal	Chicken
Calories kcal	143	258	211	187	150	223
Protein g	27.1	25.55	29.41	27.42	28.07	23.97
Total fat g	3.03	16.48	9.44	7.72	3.39	13.39
Saturated fat g	0.93	6.89	3.3	2.773	1.22	3.74
Iron mg	3.73	1.98	1.12	2.24	0.9	1.26
Cholesterol mg	75	93	94	79	103	76

Source: United States Department of Agriculture (2019)

There are a number of reasons why goat meat has not been previously promoted:

- *Insufficient supply*: The consumer demand for goat products can be increased through education, promotion, and marketing programmes. The biggest challenge is whether the South African goat market will have a sufficient and constant supply of goat meat and by-products.

- *Out-of-hand sales on farms*: The market for goat meat (chevon) and goat by-products is unorganised and unsystematic, operating in an ad hoc manner, which makes it difficult for interventions, as farmers tend to sell their products through out-of-hand sales.
- *Insufficient information*: There is a lack of available information on goat meat and the indigenous goat industry.
- *Animal keepers*: Rural smallholders and producers regard their goats as financial security or wealth rather than as a product for sale, hence their intention is more likely to be to keep the goats than sell them (NAMC, 2006).

These constraints are applicable in other markets. Research by Namonje-Kapembwa, Chiwawa, and Sitko (2016) in Zambia found that there was a significant improvement in the level of income for smallholders because of commercialisation. In addition, the challenges to successful commercialisation were identified; culture, management issues, and access to the necessary services. The presence of veterinary personnel had a positive impact on goat farming, as smallholders benefitted from the services of the personnel. Finally, 80 per cent of the markets were underdeveloped and relied on individual sales and at other times traders purchased directly from the farmers.

The information derived from this research would add to the academic body of knowledge by identifying supply and demand side factors in goat production in South Africa, particularly in agricultural commercialisation and research. Another significant outcome of this study would be to create a basis for opportunities for rural economy participants to gain access to jobs and income. First, the goat industry and value chain actors require information in order to create sustainable, commercialised goat production.

1.3 Research Objectives and Questions

1.3.1 Research objectives

The overall objective of this research project was to identify supply side (production) factors as well as demand side (consumption) factors constraining non-

commercialised goat production in South Africa with the view to identifying key actors to establish an innovation platform through vertical integration. The welfare of communities in the Northern Cape could be improved by transforming the subsistence farming orientation of the goat farmers into a commercial (market) orientation. This could be achieved through the commercialisation potential for small-scale goat farmers to supply the largest market in South Africa, the Gauteng Province.

1.3.2 Research questions

(1) Is there a demand for goat meat in the Gauteng Province?
(2) What are the relevant innovations in goat meat production in Kuruman, Northern Cape?
(3) Can a social enterprise business model driven by social entrepreneurs bring about success in the commercialisation of goat meat?
(4) Who are the key players in the value chain for commercial goat production in Kuruman, Northern Cape?
(5) How can an inclusive innovation platform be established and implemented for the integration of a sustainable goat value chain?

1.4 Significance of the Study

Traditionally, non-commercial farmers in the rural areas of South Africa keep goats. The same rural areas are often plagued by unemployment, poverty, and economic inactivity. Goat production is widely regarded as a feasible means for improving the income and nutrition of rural communities, in turn incorporating these communities into commercial markets.

This research is valuable as it aimed to investigate an innovation platform that could contribute to the commercialisation of goat meat and by-products in South Africa. This research could empower communal farmers to provide goat meat, a product that has a strong nutritional value proposition.

The study articulated the commercial and financial role that goats play in rural areas

through the provision of meat, milk, wool, and skin. Numerous goat breeds produce wool (cashmere and mohair), which are highly regarded commercially, and when collected, can be utilised as a part of a household industry supplementing variable business prerequisites. Selected products from goats, such as meat, milk, hair/wool, and kidskin items from indigenous goats will be contrasted with those collected from commercial goat breeds, to show that indigenous goat items have remarkable qualities and potential (Gwaze, Chimonyo & Dzama, 2012). The study should also contribute to the advancement of indigenous goat farming and its products, through commercialisation, resulting in the improvement of the industry and contributing to the eradication of poverty. An improved goat production and marketing system is important for eradicating poverty and creating sustainable food security for low-income communities (Dube, 2015). Incidentally, in Asia, where consumption is low, poverty has been largely addressed through commercialisation (Salami, Kamara & Brixiova, 2010). Goat rearing could be a vital component of the rural and communal economy, which is critical for livelihoods in poor communities. Goats contribute significantly to food security, assisting with income generation in some parts. The advantage of goats over other livestock is that they withstand harsh climates and have a greater chance of survival. However, the potential to transform poor communities is affected by sustainability issues.

There is a gap in the goat production literature, specifically the successful transformation from subsistence to market-oriented farming for the benefit of smallholders. This knowledge gap makes it difficult for policy makers and research and development agents to implement interventions (Katiku, Gachuiri & Mbugua, 2011; Masika & Mafu, 2004; Roets, 2007; Rumosa-Gwaze, 2009). The results of this study should be significant in providing an understanding of the industry, main stakeholders, challenges, and opportunities. Key recommendations for innovation, integration of technology and multi-stakeholder participation in the value chain should provide valuable insight for policymakers and important decision-makers.

1.5 Ethical Considerations

Ethics in research seeks to ensure that “no harm occurs” whether financial or emotional (Yin, 2012, p. 65).

In this study, the following ethical considerations were followed:

- *Scientific validity*: The research was conducted in a manner that ensured its academic integrity and scientific validity. Unethical practices were avoided.
- *Sharing results*: All research was directed at broadening the knowledge base in the field. Outcomes of this research were shared with participants in the study.
- *Requests for permission to conduct the study*: Participants had the right of non-participation and protection from harm.

Beyond these considerations, ethical issues were highlighted in the introductory letter (Appendix B) sent to the participants, to obtain their acceptance to participate in the interviews. The letter provided an undertaking of confidentiality between the researcher and each participant. Furthermore, the topic of farming and land redistribution in South Africa is a sensitive subject for previously disadvantaged communities and the positionality of the researcher in relation to the social and political context of the study is very crucial in making sure the study does not offend or be bias to participants.

1.6 Organisation of the Study

This study is arranged into five chapters. Chapter 1 provides information relating to the problem statement, the objectives of the study as well as its significance. Chapter 2 provides a literature review of key concepts and frameworks in the subject area. This includes commercialisation of smallholder goat farming, the value chain approach in small ruminant farming, and the development of innovation platforms as a means of value chain integration for the inclusion of poor rural farmers. The third chapter covers the approach taken in data collection, the research methods and framework, the research design and data analysis techniques. Chapter 4 presents the data collected. Chapter 5 discusses findings, draws conclusions, and makes recommendations based on the results of the research.

1.7 PRAXIS Model

This research study was structured according to the MPhil in Inclusive Innovation degree requirements, fusing theory and practice in innovation and inclusive commercialisation of goat meat in South Africa. This section contains a brief description of the PRAXIS model, the full, detailed report is attached as Appendix A.

1.7.1 Challenge

It is widely accepted that the commercial sector is responsible for less than one per cent of the goats slaughtered in South Africa (DAFF, 2014). Surveys by the South African Meat Industry Company (SAMIC) have shown that the goats slaughtered in the commercial sector are mainly Boer goats and surplus Angora goats, which make up about 55 per cent of the goats slaughtered commercially (SAMIC, 2014). The informal sector, characterised by small-scale farmers, is inhibited by inefficient farming systems, poor nutrition of livestock and lack of technical expertise in genetic identification of the local goat population (Gandhi, 2015). South African history exhibits extensive inequality; apartheid played a role in the formation of a fragmented industry that has excluded small-scale farmers from the mainstream industry.

1.7.2 Inclusion

Various stakeholder groups are significant in the commercialisation of goat meat in South Africa, ranging from generic to specific groups (Carroll, 1998). Direct and indirect stakeholders include government institutions such as the Department of Agriculture, Forestry and Fisheries (DAFF), the Department of Environmental Affairs (DEA), departments charged with social development, rural development and so on, consumers (local and international), regulators, farmers (commercial and small-scale), previously disadvantaged women in farming, communities, farm workers, labour unions, interest groups (for-and-against a project), among others (MacMillan, Money, Downing & Hillenbrand, 2004).

In Africa and Asia, the demand of chevon is growing despite the lack of formalised marketing systems (Mazhangara, Chivandi, Mupangwa, & Muchenje, 2019). Besides being premised around social traditions, ethnic demand for chevon is also influenced by religion. The development of a formalised, national-scale marketing structure would exploit the consumption habits mediated by religious-social attitudes as well as modern, chevon consumption habits, which would stimulate the growth of the chevon industry.

1.7.3 Innovation

Small-scale farming has been characterised by lack of innovation and infrastructure. However, the Goat Meat Innovation (GMI) Contract Farming Scheme (CFS) aims to develop a process of strong technology transfer to ensure that small-scale farmers are not excluded from participating fully in the growing goat meat industry. This model will also link the small-scale farmers to global markets without burdening them with the complexities involved in reaching potential and existing markets. This technology aims to increase the production of quality goats for goat meat and to increase goat meat exports from South Africa.

1.7.4 Practicability

Due to a shortage of supply in South Africa, only a very small percentage of goats are marketed through registered abattoirs. Therefore, small-scale goat farmers in rural areas are classified as goat keepers rather than farmers. The goat meat innovation platform is a vertically integrated system comprising three major parts: GMI production, GMI processing, and GMI route-to-market. Together, these parts enable the integration of the entire industry value chain in South Africa.

The contract farming scheme seeks to promote small-scale goat farmers to commercial farmers, while guaranteeing them access to market. Currently, the industry has been unable to develop as the less informed and small-scale farmers – dominated by mainly black farmers – have been missing opportunities. However, vertical integration through co-operatives and contract farming will overcome these supply challenges through education, training, and mentorship. Training will be

provided early on in the program, with multi-day sessions completed onsite by the farmers. The initial training will cover theory, practical training, and evaluation, followed by an 18-month mentoring programme. Thereafter, specific interventions will be scheduled by the mentor and all training assessments and outcomes will be recorded on the GMI App for tracking, monitoring, and evaluation.

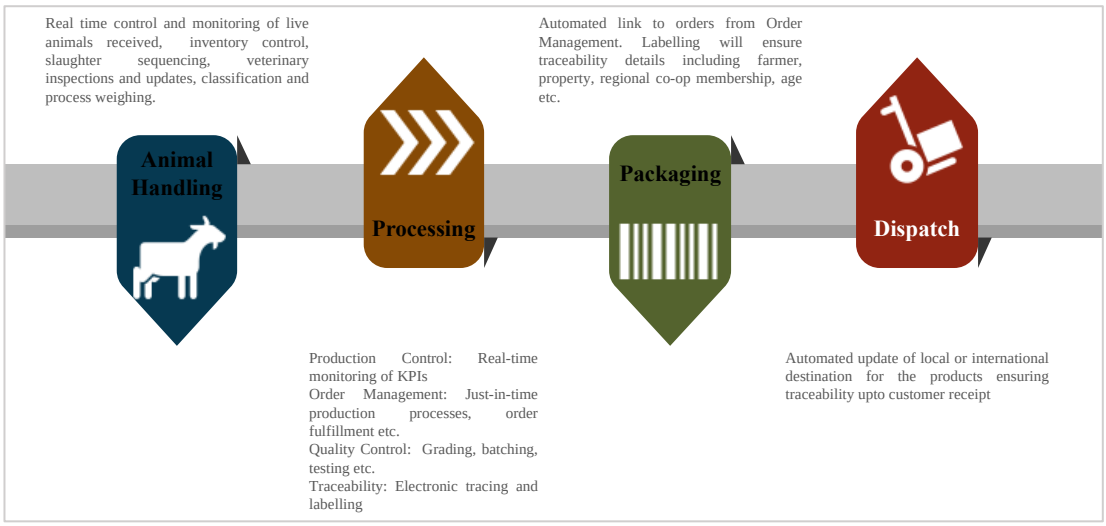
1.7.5 Sustainability

The goat meat innovation group, which encompasses GMI Production, GMI Processing, and GMI Route-to-Market, will negotiate a finance warehousing scheme with development agencies and government institutions on behalf of emerging farmers. In addition, emerging farmers will be aggregated through regional co-operatives responsible for the physical set-up and operation of emerging farmer networks. These co-operatives will be provided with mentors, training, equipment, and best-practice supply chain processes through the GMI App. The critical success factors include high quality inputs, lower transaction costs, and increased bargaining power with input suppliers.

1.7.6 Prototype

The automation in the meat processing leads to the development of non-destructive methods that can be effectively controlled and applied for quality monitoring of goat meat while the carcasses are still on the line or live animals are waiting for slaughter, as per the prototype in Figure 1.

Figure 1: Dimensions of inclusive innovation



Source: Researcher's own

CHAPTER 2:
LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

In this chapter, a variety of literature on goat meat production is reviewed in an effort to develop an understanding of the features and challenges of agricultural commercialisation. Furthermore, literature on inclusive innovation, supply and demand factors, goat production value chains, and key players is examined. The literature review provides an appreciation of goat meat production in the South African context.

2.2 Goat Farming in Africa

The challenges in goat production on the African continent have been widely researched during the past decade. A review of the literature reveals common constraints facing goat producers and the rural communities that rely on goats for income. Van Rooyen and Homann's (2007) study of goat farming in Zimbabwe identified constraints such as high mortality rates, lack of market information, high processing costs, and poor animal quality. As a result, the productivity per unit or animal and the sector's contribution to the national economy was relatively weak, despite the large population of goats.

In Ethiopia, disease, labour, and theft were the most pertinent constraints for goat production and were the most significant challenges for goat farmers, according to Tesfaye (2009). The study also confirmed other challenges including illegal markets and inadequate marketing strategies. A later study highlighted climate change and poor financial resources as more urgent constraints in Ethiopia (Arse, Feyisa, Gurmessa, Merga, & Girma, 2012). Their study revealed that specific reliance on rain-based agriculture for herd grazing presented major challenges in regions that had experienced poor rainfalls. While country specific conditions related to climate change increased production losses because of diseases and drought, other generic

issues such as poor farm management, poor animal nutrition, and a lack of vaccination were also prevalent (Arse et al., 2012).

Research conducted by Hamza, Rich, Baker and Hendrickx (2014) showed that smallholder goat keepers in Inhorasso, Mozambique, were willing to increase their herd size but were limited by insufficient financial resources. Their research also noted, like in many other African countries, that there was no information flow between producers and traders to allow producers to plan their production based on demand for quality and quantity.

Smallholder farmers in Kenya, also experienced challenges related to lack of formalised markets (Omiti et al., 2009). Like most developing nations, Kenya's goat meat market is characterised by insufficient government investments in marketing inputs and services, research, and technical support for goat production, stated Moll, Stall, and Ibrahim (2007). Their research also revealed that producers were unable to account fully for the costs of production in order to establish the profitability of their farming activities.

2.3 Goat Farming Challenges in Africa

2.3.1 Informal markets

Research on the continent has shown that formal markets and smallholder farmers' access to them is essential for developing goat farming (Omiti et al., 2009). The research of Lightfoot and Scheuermeier (2006) demonstrated that in South Africa, production without access to formal markets that offer pricing certainty and demand estimates generally lead to disincentives for farmer participation in the value chain, despite government interventions or support programs. The absence of functional markets and production planning has resulted in limited production and consequently limited consumption (Omiti, et al., 2009, Moll et al., 2007). According to Hebink and Bourdillon (2001), "one of the limits to commercial goat production is that there are limited formal marketing systems that are available for goat production and its by-products, so the goats' contribution to the rural and national economy tend to be grossly underestimated" (p. 78).

Even if markets were formalised and trading or retail channels were established, smallholder farmers are often located in marginal areas with poor infrastructure, limiting goat farmers' capacity to transport goats to available slaughter facilities (Bayer, Alcock & Gilles, 2004). In Ethiopia for instance, walking and the use of bicycles were the main means of transporting goats to the markets (Gobena, 2017). About 97.5 per cent of goat farmers walked up to 10 kilometres to sell their goats and 2.5 per cent walked distances of over 10 kilometres, noted Gobena (2017). As a result, communal farmers often resorted to informal sales where pricing was arbitrary, which led to pricing and demand uncertainty (Gobena, 2017). Alternatively, farmers sold their livestock to traders or at periodically held auctions (Simela & Merkel, 2008).

"Generally, goats and goat meat products flowed from producers to end markets through value chain actors, while money flowed from end markets to producers along the value chain. Information flow occurred in both directions" (Hamza et al., 2014, p. 121). However, Hamza et al's (2014) research found that there were challenges in transport infrastructure as well as a general lack of information flow as more popular agro-pastoral activities took priority and goat raising was considered to be secondary to those production activities. Other studies have stated that a lack of improved farming technology was the main limitation to market formalisation for goat meat (Fikru & Gebeyew, 2015).

2.3.2 Limited financial resources

Lack of financial resources for farm development and expansion has been cited as a key constraint for goat producers (Belete, Kefelegn & Kefena, 2015; Hamza, Rich, Baker & Hendrickx, 2012).

2.3.3 Feed shortage

According to Fikru and Gebeyew (2015), Ethiopian farming operations were constrained by a lack of applied feed conservation techniques. These techniques include preserving surplus feed through ensilage or haylage, which refer to the process of storing fodder and drying hay respectively, and incorporating these forms

of forage as supplementation during periods of low rainfall (Fikru & Gebeyew, 2015). Similar observations were made in the research conducted by Girma, Machado, Pettygrove, and Pates (2013). Goats kept by communal farmers generally grazed on available vegetation, which subjected them to seasonal changes. During the dry season most smallholders migrated their flocks according to the availability of vegetation, however the quality and supply of this vegetation is seasonally variable (Quinn, Wilcock, Monaghan, McDowell, & Journeaux, 2009). The lack of applied feed conservation techniques resulted in bush encroachment and overgrazing, which led to inconsistencies in feed quality. Farming operations that implemented conservation techniques were better placed to manage the nutritional value of the feed (Quinn et al., 2009; Fikru & Gebeyew, 2015).

2.3.4 Diseases and parasites

A key performance indicator for goat farmers is the mortality rate for both kids and adult animals. Factors contributing to goat mortality were poor access to animal health support, feed shortages, and inadequate housing (Homann, Van Rooyen, Moyo, & Nengomasha, 2007). Other key indicators of poor health management were high rates of disease, abortions, stillbirths, and subclinical effects manifested as weight loss (Sissay, Asefa, Uggla & Waller, 2006).

The goats of farmers experiencing financial constraints were often subjected to diseases and parasites, particularly the kids because of their fragile immune systems (Sebei, McCrindle & Webb, 2004). Research by Peacock (2005) has shown that government support for control programmes and research on disease and parasites in goats is lacking. As a result, smallholder farmers must contend with not only informal markets, lack of financial resources, and climate change, but also diseases and parasites. In most communal farms, farmers used contaminated water, which increased the vulnerability of livestock to infective agents (Peacock, 2005).

2.3.5 Poor breeding techniques

Scientific research has shown that a crucial component of any production system is the utilisation of appropriate and adapted goat breeds (Bayer et al., 2004). Most

communal farmers on the continent keep indigenous goats. The main reason for this is that indigenous goat breeds have adapted better to harsh conditions; however, their production performance was lower than exotic breeds (Homann et al., 2007). Communal goat farmers preferred a goat's endurance because of the arid conditions, while some goats of a certain colour may be preferred for cultural or ceremonial purposes (Homann et al., 2007). Both these selection criteria are non-commercial and will therefore yield sub-optimal results. Furthermore, the lack of structured breeding techniques resulted in inbreeding, poor growth rates and stillbirths (Tefera et al., 2004; Saico & Abul, 2007).

2.4 Goat Farming in South Africa

Statistics on goat production indicate that there are about six million goats in South Africa, with the majority found in three provinces namely, Northern Cape, Limpopo, and Kwa-Zulu Natal (Mohlatlole, Dzomba, & Muchadeyi, 2015). Research has shown that most of the goat population in South Africa (63 per cent), which are largely indigenous veld goats, are owned and kept by non-commercialised small-scale farmers and households (Visser & Van Marle-Köster, 2018). History reveals that the indigenous Khoi people were already goat herders by the time the first Dutch settlement was established by Jan van Riebeeck in 1652. The name 'Cape of Good Hope' was partly derived from the fact that Van Riebeeck was delighted that there was goat meat available (NAMC, 2006). Nowadays, the collective term used for all varieties of South African goat breeds is 'indigenous goat'. These goats can be loosely classified into speckled goats, Loskop South indigenous goats, KwaZulu-Natal goats, Nguni goats, and Delfzijl goats (Roets, 2007). However, since these classifications are mostly locational, they have not accommodated thousands of other species located in other parts of the country (Simela & Merkel, 2008).

Three breeds make up the commercial goat industry in South Africa; these are Boer, Savannah, and the Kalahari Red, which totals approximately 1.3 million goats (Visser & Van Marle-Köster, 2018). The Boer goat originated in the Northern Cape Province of South Africa from the mid 1900's when a few ranchers started selecting indigenous and crossbred goats for meat generation. The Boer goat name derives from the Dutch word 'boer' which means farmer and was most likely used to

differentiate the ranch goat from the Angora goat which was foreign in South Africa in the nineteenth century. In this way, the Boer goat is an indigenous breed to South Africa (Tefera et al., 2004). In the commercial goat industry, goat-slaughtering figures are usually included in the slaughter figures for sheep, making it difficult to obtain official statistics on goat slaughtering. However, it is common wisdom that while commercial slaughter mostly consists of Angora and Boer goats, indigenous goat meat is widely eaten in South Africa for religious and cultural reasons (Tefera et al., 2004).

South Africa shares most of the challenges faced by goat farmers in other African countries, but it also has its own unique challenges discussed briefly below.

2.4.1 Access to productive land

The economic development of South Africa has not been successful in remedying the country's inequalities. The legacy of the apartheid government's disregard for rural development can still be felt, specifically in the skewed distribution of land between blacks and whites (Matunhu, 2008). With respect to agricultural land specifically, racial discrimination and forceful relocations by the apartheid government resulted in agricultural land ownership by whites to the detriment of the original black inhabitants and their descendants. In 1994, white farms occupied 85.8 million hectares, 86 per cent of rural land, of which 10.6 million hectares were under arable agriculture development (Bernstein, 2013). According to the Review of Agricultural Policies and Support Instruments, by 2010, less than five per cent of commercial farmland (roughly four million hectares) had been transferred through land reform (Tregurtha et al., 2010). As a result, apartheid's spatial geography continues to exist.

According to Ntsebeza and Hall's (2007) research, approximately 65 per cent of South Africans live in rural areas, 72 per cent live in extreme poverty, that is, on less than US$1 per day. The topical debate on land reform in South Africa goes beyond the mere acquisition of agricultural land for rural development (Matunhu, 2008). It questions the government's ability to redress the spatial injustice of a poor majority living on unproductive land. The government's ability to address the issue of access to land for communal farmers might be the advantage it needs to limit the negative

impact of rural-urban migration, the growth of informal settlements, and other illegal occupation of productive land.

2.4.2 Women in agriculture

Closely linked to the land ownership challenge in South Africa, is discrimination against female smallholder farmers. Statistics provided by AGBIZ (2018) revealed that women represent 60 to 80 per cent of smallholder farmers yet make up about 15 to 20 per cent of landowners. In addition, they were getting less than 10 per cent of credit loans and seven per cent of credit extension services from financial services providers. The numbers are very telling: If the majority of a nation's smallholder farmers were able to gain access to a small portion of credit and funding facilities, how could they commercialise?

2.5 Commercialisation in Goat Meat Farming

2.5.1 Defining commercialisation

The debate on commercialisation in agriculture has been complicated by the varying opinions on what constitutes commercialisation. While a few authors have seen it as increasing the extent of promoted yield or output (Govereh, Jayne & Nyoro, 1999; Okezie, Nwonsu & Okezie, 2008), others have defined it as increasing livestock or cash crop production (Kennedy & Cogill, 1987). Other commentators have seen it as progress from subsistence farming towards market-orientated production (Von Braun & Kennedy, 1994). In Southern Africa, commercial production has been chiefly linked to a narrow viewpoint to do with large-scale farming, which has relegated all other farming activities to non-commercial (Tawonezvi & Hikwa, 2006). Poulton et al. (2008) defined commercial farming as production primarily for market. While in contrast, subsistence farming in Southern Africa has been seen as production for the sole purpose of household consumption.

Jayne, Haggblade, Rashid, and Minot (2011, p. 21) gave the following explanation of agrarian commercialisation:

> Smallholder commercialisation alludes to a high-minded cycle in which farmers increase their use of profitability upgrading innovations and technology on their homesteads, accomplish more prominent yield per unit of area and work, produce more prominent farm surpluses (or move from shortage to surplus producers), extend their investment in business sectors, and at last raise their incomes and living standards.

This explanation is a broader definition compared to the Southern African view because it emphasises progress in profitability, innovation, technology, production, and living standards.

2.5.2 Levels of commercialisation

Pingali and Rosengrant (1995, cited in Leavy & Poulton, 2007) identified three levels of commercialisation based on the level of market orientation. Table 2 provides an outline of these commercialisation levels.

Table 2: Level of market orientation in commercialisation

Level of Market Orientation	Farmer's Objective	Sources of Inputs	Product mix	Household income sources
Subsistence systems	Food self-sufficiency	Household generated (non-traded)	Wide range	Predominantly agriculture
Semi-commercial systems	Surplus generation	Mix of traded and non-traded inputs	Moderately specialised	Agricultural and non-agricultural
Commercial systems	Profit maximisation	Predominantly traded inputs	Highly specialised	Predominantly non-agricultural

Source: Adapted from Leavy and Poulton (2007, p. 9)

The goat market in rural South Africa has been primarily a subsistence system, characterised by self-sufficiency of the smallholder with inputs being household-generated income sources predominantly from agriculture (Leavy & Poulton, 2007). Van Rooyen and Homann (2007) suggested that the low commercialisation levels can be attributed to high transaction costs, low processing of goat meat and limited access to information. According to Leavy and Poulton's (2007) determination of commercialisation, profit-maximising and highly specialised activities are not found in primary agriculture. That is, the highest level of commercialisation requires value-

adding activities to produce tradeable goods or services. The goat meat landscape in South Africa and the continent in general has not evolved to this level of sophistication, which explains the prevailing levels of poor income and standards of living for goat farmers.

In order for the goat meat market to evolve from subsistence systems to commercial systems, the goat meat value chain needs to upgrade from selling livestock to selling tradeable goods. Lie, Rich, Kurwijila, and Jervell (2012) used the value chain approach to investigate this value chain upgrade. They investigated the potential for upgrading the goat milk value chain in Tanzania. Their study assessed the requirements necessary for transforming the goat milk value chain into goat milk yoghurt and its impact on the participation levels of smallholders in this value chain. The research reveals valuable insight that can be applied to goat meat value chains.

Kaplinsky and Morris (2001) offered a framework to approach the value chain with some practical implications for the goat meat value chain. Their approach consists of four main components, described below:

(1) *Activity mapping*: To map the activities in order to identify the participants;
(2) *Governance structure assessment*: To understand the existing relationships and interlinkages within the value chain, to later enable a restructure of the value chain;
(3) *Strategy upgrade*: To assess existing and develop new strategies for addressing the constraints and opportunities; and
(4) *Beneficiary evaluation:* To appraise the beneficiaries of the value chain upgrade along with different scenarios derived from different strategies.

An understanding of the value chain activities as well as the relationships and interlinkages is required in order to design upgrading strategies for smallholder goat farmers in South Africa (Katiku et al., 2011).

The next and most critical step is assessing governance structures. This involves identifying constraints and opportunities in order to restructure the value chain and upgrade smallholder farmers' participation in the value chain. This is the key motivation of this study and an area that remains largely unexplored.

Research by Van Rooyen and Homann (2007) provided key pathways to how the commercialisation levels of the goat meat market can be upgraded. They defined specific actions that need to be taken by value chain players as 'impact pathways'. The impact pathways follow from the development objectives of each value chain player, such as farmers, input suppliers, retailers, and consumers. The value chain challenges, development objectives, and impact pathways are detailed in Figure 2.

Players	*Challenges*	*Development objectives*	*Impact pathways*
Farmers	❖ High mortalities ❖ Low off-take rates ❖ Poor animal quality ❖ Low product prices	❖ Improve access to input and support services (health, feeding / water, housing, marketing)	❖ Higher goat production levels ❖ Higher incomes & food security
Input suppliers	❖ Lack of inputs, technology & information ❖ Limited service capacity ❖ Lack of policy & advocacy	❖ Improve targeting & access to inputs & technologies ❖ Create enabling legal frameworks	❖ Higher impact on technology uptake & production systems development
Market players	❖ Poor market access, organization, facilities & infrastructure ❖ Lack of market information, pricing, grading, weighing & control systems	❖ Improve access to market services & infrastructure ❖ Reduce transaction costs (transport, bureaucracy) ❖ Improve communication between stakeholders	❖ Competitive markets ❖ Investments in market development ❖ New public private partnerships sustain market activities
Processors & retailers	❖ High processing costsInconsistent product supply (volume, quality)Product demand not met ❖ Lack of information on consumer preferences & willingness to pay	❖ Evaluate market potentialsDevelop markets for low cost & high quality products ❖ Align supply & demand ❖ Higher flows of livestock products within rural and to urban areas ❖ Improve low cost & high quality protein supply	❖ New niche markets ❖ Investment in value addition & product diversification ❖ Supply of low cost & high quality products ensured
Consumers			

Figure 2: Goat value chain challenges, development objectives, and impact pathways

Source: Van Rooyen and Homann (2007, p. 3)

According to Figure 2, a key outcome of upgrading the goat meat value chain is providing consumers with low-cost and high-quality products based on consumer preferences and willingness to pay. This can be defined as the measure of success. To achieve this, many activities are required such as increased production levels, technology uptake, production systems development, market development, value addition investment, product diversification and public-private partnerships to sustain market activities (Van Rooyen & Homann, 2007). Collectively these activities will

make significant changes to the goat meat industry and thus require large-scale, co-ordinated interventions from actors that will ensure extensive facilitation as well as the appropriate adoption and implementation of sustainable strategies.

2.5.3 State-led commercialisation

The previous section on challenges to goat farming on the African continent and, more specifically, in South Africa indicated that the constraints facing smallholder farmers cannot be realistically addressed without state intervention. Moreover, accomplishing broad-based, agricultural commercialisation requires collaboration between private and public sectors. Ayanwale et al. (2014) argued that without state intervention, the scope for developing smallholder farming into sustainable, profitable opportunities is very limited. While the private sector has its role to play, state intervention is critical to limit uncertainty and minimise the impact of risk in a market-wide, commercialisation initiative. As demonstrated in the development impact pathways, upgrading the value chain requires public-private partnerships to ensure that all development activities are sustainable (Van Rooyen & Homann, 2007).

Smallholder agricultural development in most of sub-Saharan Africa involves basic state-led strategies for public investment in services, technologies, and institutions that are known to promote broad-based inclusive farm productivity growth (Jayne et al., 2011). These interventions usually aim to address market failures, such as limited credit facilities available to poor farming communities. Other forms of state intervention involve the creation of an enabling environment to encourage private investment in the various stages of commodity value chains and empower smallholders to commercialise and link to markets (Jayne et al., 2011).

According to Wessels and Nel (2016), the South African government has embraced cooperatives as an effective instrument of socio-economic change, increasing their productivity through offering grants, loans, and financial assistance to the cooperative societies. Khumalo (2014) argued that cooperatives are critical and have meaningful potential for social cohesion and employment creation in the rural community. According to research commissioned by the Department of Agriculture,

the Umzimvubu goat production and processing facility and Kalahari Kid Corporation are excellent examples of the government's efforts to mainstream goat meat consumption in South Africa (Kalahari Kid Corporation, 2016).

- *Umzimvubu Goat Production and Processing Project* is a co-operative of locals within the Alfred Nzo District Municipality in the Eastern Cape Province. Smallholder farmers are organised as registered co-operatives, with a total membership of 300 to 750 farmers from several villages. The project amalgamates components of infrastructure development, institutional improvement, and innovation exchange (Roets & Kirsten, 2005).
- *Kalahari Kid Corporation* is another example of a commercialisation initiative supported by the South African government. The company was established as a joint venture between the government and entrepreneurs with the objective of marketing, branding and promoting South African goat meat and by-products. The joint venture received R15 million funding from the IDC in 2008, to help establish local retail and international export markets (Kalahari Kid Corporation, 2016).

A key function of government is to develop policy and direct public spending towards programmes that improve the livelihoods of citizens. Agricultural development is an important means of inclusive growth, pro-poor economic development, food security, and environmental sustainability (Von Braun & Kennedy, 1994). Empirical research has established the link between agricultural growth and poverty mitigation, demonstrating that agricultural research and development has a considerable impact on food supplies, security, and poverty reduction in developing nations (Von Braun & Kennedy, 1994).

State intervention in agricultural commercialisation is also driven by food security challenges. Food security requires public policy that will promote production and productivity in response to current and future demands on food and nutrition (Mozumdar, 2012). In order to increase production and productivity, government programmes need to offer appropriate or attractive incentives to smallholders to grow their activities beyond subsistence farming. These incentives involve improved market access and technology transfer. Strategic options to improve small ruminant

production also include prioritising the development of the small-scale and traditional sector, enabling the production environment, and investment in appropriate production technology research (Pollot & Wilson, 2009).

Another argument for state intervention in commercialisation is the reality that government policy has a direct influence on market prices. Prices serve as signals of market efficiency, performance, demand, and policy outcomes. An important aspect of agricultural production is knowledge of markets (demand and supply). Smallholder goat farmers are currently unable to increase production because of prevailing constraints but more importantly, due to a lack of government policy that will encourage commercialisation of the goat meat industry (Bwire, 2008, Kilelu, Klerk & Leeuwis 2013).

Lastly, state intervention through policy, is critical to promote import substitution. Despite Africa producing 20 per cent of the world's chevon, the continent contributes less than five percent of the world's export due to several internal and external problems (Simela & Merkel, 2008). South Africa has similar statistics, with occasional increased imports of goat meat to meet local demand. Import substitution is inhibited by a lack of policy that specifically addresses animal breeding programmes and export market support. In the absence of successful breeding programs, productivity of indigenous breeds will always remain a problem for African goat producers (Kosgey & Okeyo, 2007).

2.5.4 Entrepreneur-led commercialisation

In South Africa, there is an over-dependency on state-led agricultural commercialisation initiatives and programmes, whereas inclusive business models can offer new opportunities to generate economic and social value. Specifically social entrepreneurship, designed to recognise business solutions to social problems, might be the key to unlocking the value in goat farming on the continent (Michelini, 2012).

An important aspect of production and its response to demand and supply, is knowledge of markets and marketing systems. Presently, the producers (farmers) are unable to engage in higher production because of inefficient markets. Without an

understanding of consumer preferences and demands, producers are unable to respond to changes in the marketplace that influence demand (Bwire, 2008, Kilelu, Klerk & Leeuwis, 2013). This commercialisation constraint can and should be addressed by private sector innovation rather than government intervention. According to Cankar and Petkovšek (2013, p. 1599), the private sector is "motivated by profit, market share and growth in size, but also by problem-solving and public relations" and can offer producers the appropriate learnings.

For instance, in the goat farming value chain, individual farmers sell livestock to agents, after which agents incur transaction costs such as transportation to deliver to the end-consumer. Farmers have no appreciation of whether end-consumers would prefer a live animal, frozen carcass, fresh cuts, or processed products such as minced meat. This market intelligence data could improve margins for producers targeting processed meat categories based on consumer preferences (Devendra, 2001).

2.6 Supply-side Factors in Commercialisation of Goat Meat Production

For the purposes of this study, commercialisation is defined as the transformation process from subsistence systems towards market-orientated, profit-maximising production systems (Pingali & Rosegrant, 2005). This involves coordination of agriculturists into the trade economy with the intention to produce for the market (Von Braun & Kennedy, 1994). As demonstrated by Van Rooyen and Homann (2007), the impact pathway for goat farmers as suppliers in the goat meat value chain requires increased production levels and increased incomes. This section reviews literature on supply-side factors related to limited livestock and production levels.

2.6.1 Farmers

Research conducted by Swaans et al. (2013) in Mozambique observed that farmers' production limitations is based first on farming objectives. Farmers kept goats to cover emergencies and household needs. This subsistence farming objective resulted in profits being used for household expenses instead of reinvestment into the farming activities. Similar attitudes were observed in South African goat farmers in the

Northern Cape. Burgess (2009) noted that goat farmers' objectives for goat production were not market-orientated, as they had never encountered goat meat in retail stores or butcheries and therefore did not perceive it as a product that could be sold to a market. The transition from subsistence farming to commercial farming is influenced by socio-economic, farm level (farm resources), and individual (skills) determinants (Von Braun & Kennedy, 1994). This suggests that the production limitation is influenced primarily by the farmer's farming objectives or goals. Any broad-based commercialisation initiative should therefore begin with educating farmers about commercial systems or market-orientated farming (Ahuja, Tyagi, Chauhan & Chaudhary, 2011).

The second limiting factor to supply-side production is farmers' access to credit facilities. For those farmers who have the desire to grow from subsistence systems to semi-commercial systems, the traditional banking infrastructure and its requirement for collateral becomes an obstacle (Burgess, 2009). As in any trading enterprise, the entrepreneur needs to spend on inputs such as vaccinations, feedstock, shelter, and so on, prior to receiving income from livestock sales. Lack of access to credit for input costs means that farmers will constantly rely on their own low-income levels to sustain their farming activities; thus limiting their production levels.

The third limiting factor to supply-side production is technical skills. In a study performed in Uganda's pastoral system, Byaruhanga, Oluka, and Olinga (2015) noted that farmers and labourers had received no training in goat production. This resulted in poor management of farming activities. In the absence of training on production and marketing skills, a goat farming strategy will be unsuccessful (Roets & Kirsten, 2005).

2.6.2 Input suppliers and institutional arrangements

While farmers function as the primary suppliers in the goat meat value chain, other suppliers also contribute to the development or decline of the goat meat industry. According to Roets (2007), South Africa's goat meat value chain requires the provision of collection, transportation, and processing infrastructure as well as institutional innovations. Institutional innovations specifically refer to eliminating the

current fragmented structure of the industry and adopting vertical co-ordination governed through contracts. Vertical co-ordination refers to activities of input suppliers and farmers through closely coordinated technology transfer and information sharing platforms. Vertical integration not only increases the efficiency and effectiveness of logistical operations, but also ensures that strategic alliances result in a strong market and increased production levels (Downey, 1996).

Rehber (1998) recognised four types of vertical coordination that can occur; these are briefly described below:

(1) *Coordination without a contract*: This is called a spot market or open market transaction, since there is no written or oral contract between the firms in the production and marketing chain. Players in the chain can buy or sell their inputs and outputs to whomever they please, often based on price. The disadvantage of this lack of formal relationship is the associated uncertainties in buying supplies and selling produce. This is the most prevalent market arrangement in the goat meat industry and this spot price arrangement is limiting because there is uncertainty regarding future successful transactions.
(2) *Contract farming*: This is when spot markets are replaced by relationships between producers and private or state enterprises that provide processing, export or purchasing activities and that regulate prices, production practices and product quality. These arrangements can take on a number of formats including “out grower schemes, nucleus-out grower schemes and satellite farming” (Roets & Kirsten, 2005, p. 8). These arrangements have been successful internationally and are generally promoted as the kind of institutional innovation that can improve agricultural performance and delivery of agricultural inputs in less developed countries.
(3) *Ownership integration*: Each individual firm loses its identity and becomes an entity within a larger company.
(4) *Farmer cooperatives*: The emphasis is that the firm is owned and controlled by the producers and operates for the mutual benefit of its members (producers or patrons).

A research study performed by Singh (2002) in India, reported that farmers felt that contract farming arrangements helped farmers become better producers because this

resulted in more reliable incomes, generated employment, provided new skills in farming, and eliminated the patron-client relationship between large and small producers. Contract farming enables production planning and allows farmers to procure inputs from input suppliers on a more regular and reliable basis.

Vertical integration promotes contracting, predictability, and visibility of various costs incurred by value chain players (Gow, Streeter & Swinnen, 2000; Sporleder, 1992). More specifically, contract arrangements in the value chain of goat meat products can include improved institutional arrangements that promote evolution to commercial systems. Gow et al. (2000) outlined these beneficial institutional arrangements to goat farmers as follows:

- Input provision and investment facilitation programmes for farmers that sign a long-term contract;
- A fixed base-price (slightly higher than the market price) to be paid to farmers and timely payment for deliveries, with bonuses and penalties for pre-set quality;
- Negotiated price reductions and guaranteed repayment of purchases with a select group of input suppliers that producers are encouraged to deal with; and
- Media and public relations campaigns to further assist in the dissemination of these benefits to producers (Gow et al., 2000, p. 9).

These legally binding and institutional innovations may expand goat production and increase trust between farmers and suppliers in the goat meat value chain.

2.7 Demand-side Factors in Commercialisation of Goat Meat Production

Von Braun and Kennedy (1994) designed a framework that outlines the drivers of successful commercialisation in agriculture. Figure 3 illustrates this framework.

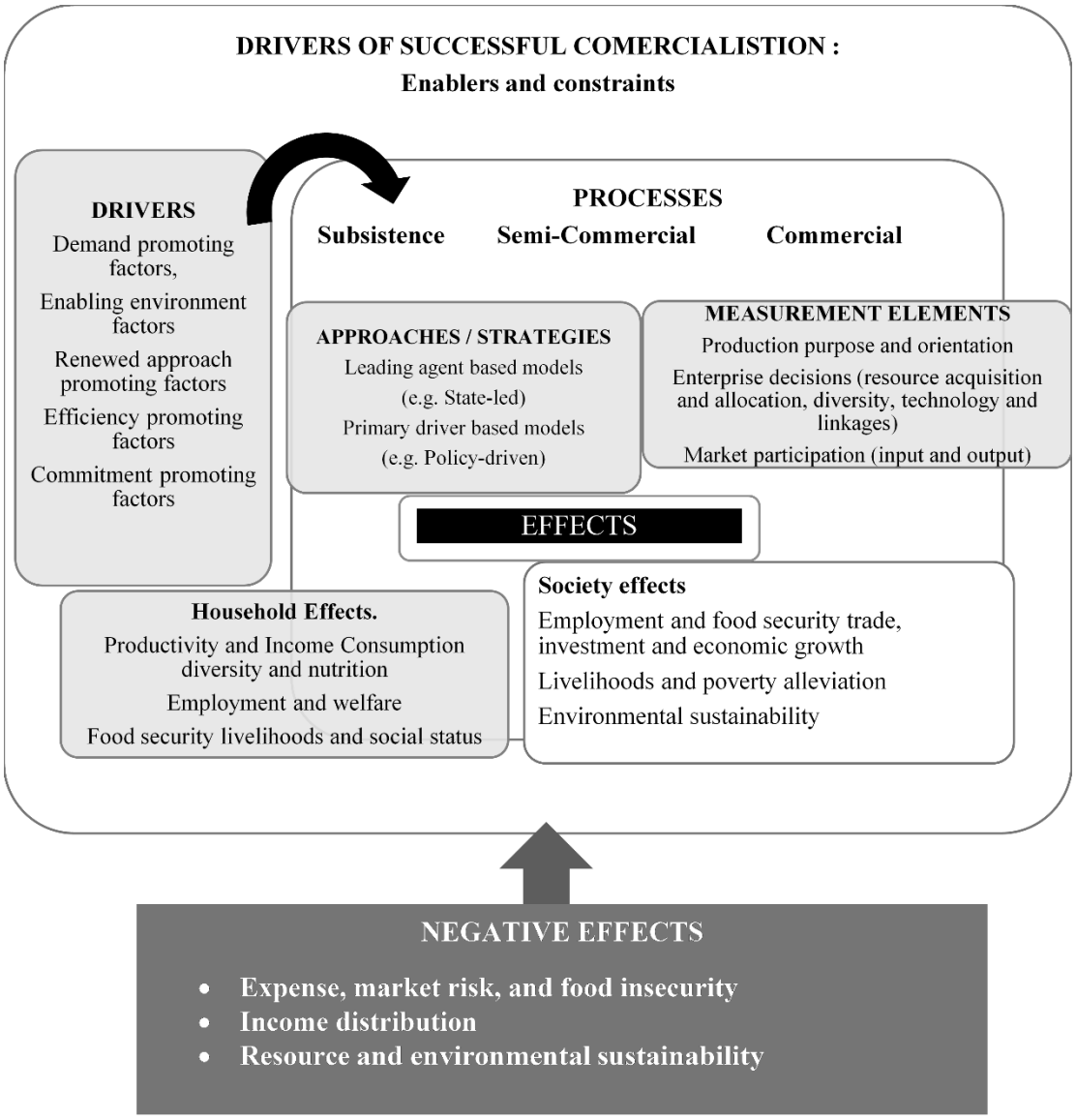


Figure 3: A conceptual model of commercialisation of goat meat.

Source: Adapted from Von Braun and Kennedy (1994)

Von Braun and Kennedy (1994) argued that when demand grows, producing for the market becomes necessary, and when appropriate technology is accessed, production for the market becomes more efficient. When demand promoting factors are favourable, they facilitate or enable the process of commercialisation; the converse applies.

2.8 Theoretical Perspectives of Inclusive Innovation in Goat Farming

According to Howaldt, Butzin, Domanski and Kaletka (2014), the term inclusive innovation is very close in meaning to frugal innovation and the two are often used interchangeably. However, the former has very recently become the more common label. Mashelkar (2013) defined inclusive innovation as a means to promote inclusive growth, which embraces the have-nots and attempts to bring them into the economic mainstream as customers, employees, distributors, and intermediaries in order to ensure that resource-poor people gain access to the essential necessities of life, at affordable prices. This approach proposes developing customised systems of support around people with a lack of time, as well as vulnerable or resource-weak individuals; it is designed to make their lives as easy and as simple as possible so they can focus on solving their own problems of scarcity, rather than grappling with a complex system.

Inclusive innovation can be a success through the use of multi-stakeholder platforms where diverse parties, such as goat farmers, input suppliers, traders, food processors, researchers, and government officials would regularly come together to develop a common vision and find a way to achieve their goals (Kilelu, Klerkx & Leeuwis, 2013). According to Michelini (2012), inclusive social innovation can refer to three main dimensions: business model, product and process, and diffusion/communication, as illustrated in Figure 4.

Individualist entrepreneurs do not initiate inclusive social innovation in isolation. It is an interactive process shaped by the collective interchange of knowledge between a wide range of organisations and institutions that influence developments in certain areas, meet a social need, or promote social development. Interactions not only promote the generation of new knowledge, but also help social enterprises to acquire and develop strengths Michelini (2012). The creation of enabling institutional arrangements that are culturally acceptable to non-commercialised farmers are key to successful commercialisation, while simultaneously addressing the challenges of quality consistency and high standards.

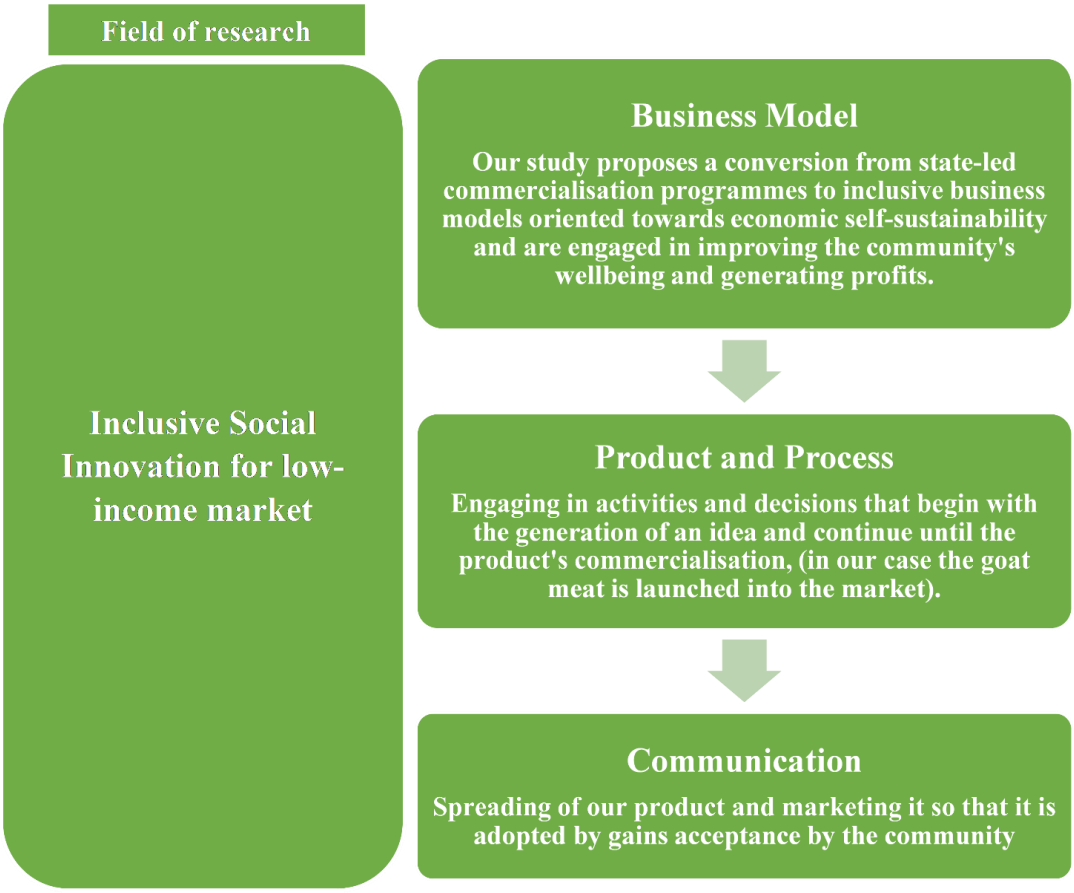


Figure 4: Dimensions of inclusive innovation

Source: Adapted from Michelini (2012)

2.9 Innovation Theories and Paradigms

"Research analysing social innovation can and has drawn on several quite different disciplines, including economics, political science, sociology, social policy, and in fewer cases, cultural studies" (European Commission, 2013, p. 24). A study performed by Perkmann et al. (2013) found that social innovation projects exhibit a varied disciplinary grounding and, in some cases, an interdisciplinary approach to theory and theoretical traditions. The projects exhibited little interest in working on theory, choosing instead to frame the project around the problem(s) and deploy the theoretical and disciplinary tools considered most appropriate. This suggests that

theoretical precision should not be a priority and the focus should be more on practical problem solving.

While the innovation required in addressing the constraints of commercialisation in goat production is practical and contextual, the frameworks and theories that have been identified are important in helping to gain a better understanding of the research subject. These identified theories include the bottom of the pyramid theory, new social product development framework, change theory, and design thinking. These are discussed briefly in the following sub-sections.

2.9.1 Pyramid theory

Prahalad's (2002) Bottom of the Pyramid (BOP) theory continues to evolve through its exploration of the bottom tier market that is made up of four billion people worldwide with a per capita income of less than $1 per day. What must be noted is that this often-overlooked market collectively possesses substantive buying power of $5 trillion. However, the concept of the Go-to-Market (G2M) products and services for such a heterogeneous group cannot be a direct duplication of mainstream solutions. Prahalad (2012) noted sufficient evidence that demonstrates a highly diverse group with a clear ability to purchase commodities, and that these commodities must be tailored to their specific context, which is largely characterised by poverty constraints.

According to Prahalad (2012), among the difficulties associated with the bottom tier market, is that it is largely unorganised and fragmented, with local monopolies, such as control by intermediaries and money lenders. Furthermore, these markets can be largely rural or urban in character depending on the region and country under observation. Prahalad (2012) divides the market into micro-consumers, micro-producers, micro-investors, and innovators, and subsequently argues that an alternative to the traditional 4Ps (Product, Price, Place and Promotion) of marketing is required in order to be adequately responsive to the unique needs of these markets. He therefore introduces the 4As, which focus on the following:

(1) *Awareness*: Creating awareness of the product and/or service such that the BOP consumers and producers know what is available, what is on offer, and how to use the product and/or service;
(2) *Access*: Permitting access of products/service for consumers and producers in remote locations;
(3) *Affordability*: Ensuring that the product or service is affordable; and
(4) *Availability*: Focusing on availability to build trust and a loyal base at the BOP, for seamless supply of products/services.

The development of innovations under constrictive conditions and environments requires carefully considered business models, processes, as well as technology. To meet these requirements, Prahalad and Hart (2002) recommended collaborative work with both customers and civil society organisations or governments. In addition, the social development players, delivery providers, and local entrepreneurs must be involved (Altman, Rego, Ross, 2009).

2.9.2 New social product development framework

Numerous frameworks for a new product development process have been developed with certain common elements regarding the main phases of the process. Michelini's (2012) model of a product innovation process is based on a consumer-driven approach. This theoretical framework describes the innovation process in a way that makes it possible for companies to improve the ethical characteristics of the product. The first phase is a product and social problems overview. It includes an evaluation of the ethical implications connected to the current company's products and an analysis of the main social problems to be solved. The process ends with the definition of a marketing mix strategy and the launch of the product or products. The new social product development is characterised by six main phases:

(1) *Idea generation*: In this phase, researchers need to investigate local and specific problems through a deep understanding of the local community, starting from the constraints and restrictions they must, or wish to, overcome. In-depth dialogue with the community is mandatory to improve the understanding of local needs.

(2) *Testing*: At this stage, the effectiveness of the product is assessed through tests in laboratories as well as in the field.
(3) *Social and economic analysis*: Here, the social product needs to be evaluated in terms of both the social effects and the direct and indirect benefits for goat farmers. This requires the identification of qualitative and quantitative indicators.
(4) *Marketing plan*: This phase involves the development of advocacy programmes aimed at local communities.
(5) *Monitoring and evaluation*: This involves the measurement and reporting on the benefits granted for the company and the community.
(6) *Scaling up*: This final step entails the diffusion of innovation at a global level (Michelini, 2012).

Three key factors must be considered throughout the entire process. First, the creation of dedicated inter-company research teams represents a critical element of thriving in the field of social product innovation. Second, the involvement of top management and cross-sectional cooperation is important. Third, it is important to partner with external stakeholders to succeed in the new social product innovation. This model is illustrated in Figure 5.

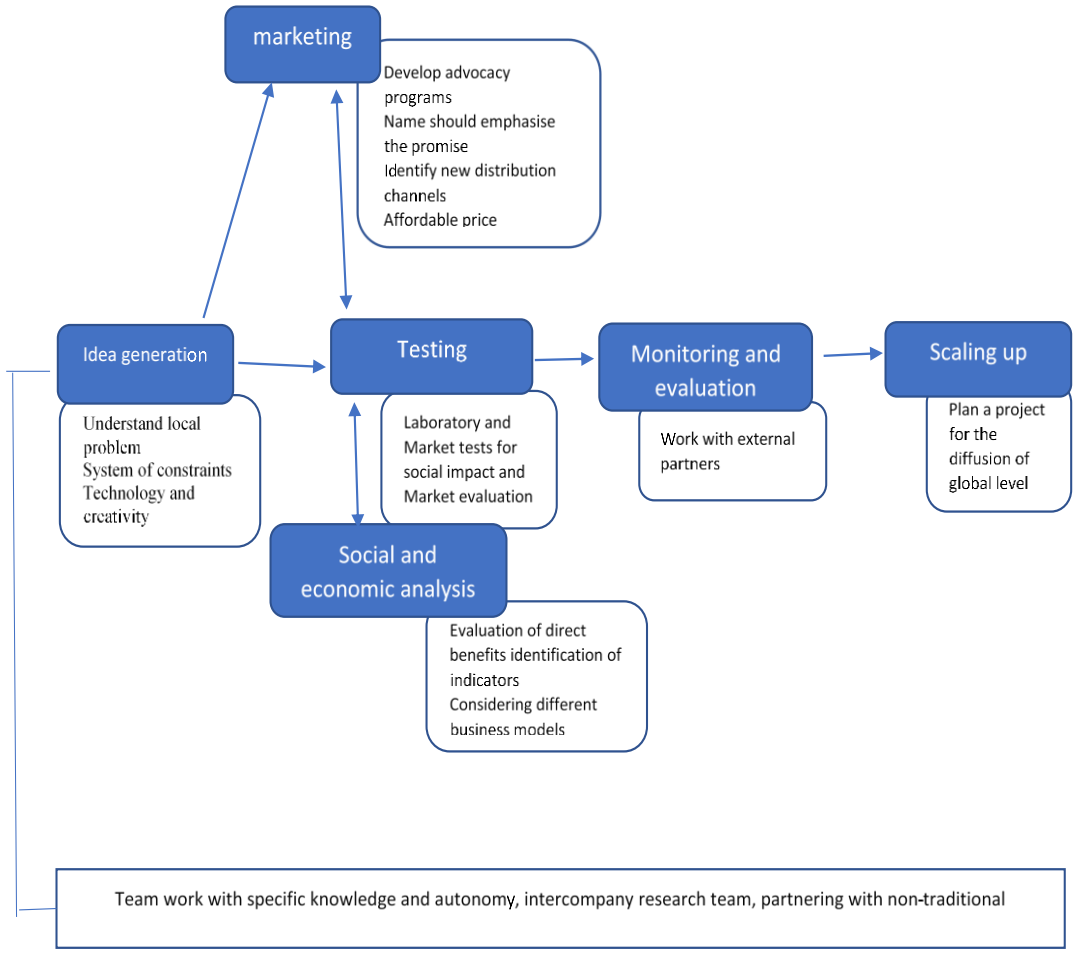


Figure 5: Key success factors in social product innovation

Source: Michelini (2012, p. 34)

2.9.3 Change theory

The Theory of Change (ToC) was developed to use participatory approaches to ensure all stakeholders are involved in describing the set of assumptions that explain both the steps that lead to the long-term goal, and the connections between programme activities and outcomes that occur at each step (Allen, Cruz & Warburton, 2017). The ToC thus focuses not only on generating knowledge about programme effectiveness, but also on explaining which methods are effective and understanding how this change is achieved (Coryn, Noakes, Westine & Schroter, 2011). Several quality control criteria have been developed to test the logic, rationale, feasibility, and testability of social initiatives (Connell & Kubisch, 1998).

According to Schmitz et al. (2013), due to the lack of standardisation for the implementation of inclusive social innovation, there is no golden rule, or practice, regarding assessment. Access to funding is often linked to having a demonstrable track record and being able to outline the expected outcomes of the intervention.

Allen, Cruz, and Warburton (2017) developed the process involved in ToC initiatives. These are illustrated in Figure 6. Similar to the innovation platform process, the ToC sequence of events starts with an appreciation of the context or the current situation in which the intervention or programme is being designed. Furthermore, like the innovation platform approach, the efficiency and effectiveness of the programme relies on good partnerships between all participants in the value chain.

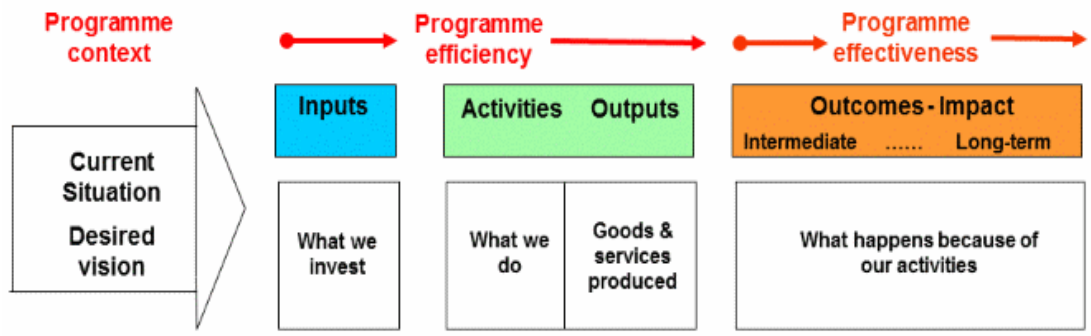


Figure 6: Theory of change

Source: Adapted from Allen et al. (2017)

2.9.4 Measuring social innovation

"Measuring social innovation can take place at interrelated levels" (TEPSIE, 2015, p. 16). This is to do with examining the impact of interventions and entrepreneurial activities on the society or context in which they are implemented. Social innovation differs in many aspects from technological innovation, but the two also have many overlapping traits and framework factors. Therefore, reviewing the existing elements of the measurement of technological innovation is worthwhile to foster synergies, instead of establishing a completely new approach to measuring social innovation. The entrepreneurial activities that produce innovations need to be completely

accounted for by indicators. This is due to the necessity for survey-based data related to social innovation.

Turning a good idea into something tangible, outside the public sector, depends on the business model, which is the clear idea of how it will generate sufficient income to produce more than it costs. For social enterprises, the business model represents a strategy for sustainability. Effective supply and effective demand need to be brought together. Effective supply means that whatever is being provided is shown to work and to be cost effective. Effective demand refers to the willingness of someone to pay for what is on offer, which might be a public agency or the public itself.

2.10 Mechanism for Inclusive Innovation in Agriculture

Innovation platforms are being used more and more in agriculture in a bid to promote inclusive innovation and involve the poor (Swaans et al., 2013). Although increasingly popular, there is a danger of misunderstanding the use and effectiveness of innovation platforms. Swaans et al. (2013) argued that the success of innovation platforms depends heavily upon the ability of the facilitator to bring key role players together and integrate the value chain.

Innovation platforms are designed to allow key role players within a system, or value chain, to come together to address issues of mutual concern and interest. Such platforms have recently been used to stimulate inclusive innovation in agricultural development and animal husbandry (Van Rooyen & Homann, 2007). They are based on systems thinking and by creating a framework for understanding the role of key actors in a value chain, they can collectively provide a solution-driven mechanism (Swaans et al., 2014).

Homann et al. (2013, p. 32) defined innovation platforms as a “mechanism of bringing together different stakeholders with the objective of identifying solutions to common problems.” An innovation platform is also used as a place to learn and change (Siziba et al., 2013). The members of the platform may design and implement activities as collaborators, or coordinate activities by individual members (Homann et al., 2013). Inclusivity is about involving smallholders both in the innovation process and in the outcome of the innovation, or the use of the innovation (Swaans et

al., 2014). Mapila, Kirsten and Meyer (2012) defined innovation platforms as an interface between value chain players who interact to identify problems and opportunities for innovation.

Van Rooyen and Homann (2007) conducted research in innovation and technology up-take. In their findings, they noted that successful innovation platforms should be marked by successful communication between farmers, input suppliers, retailers, and other service providers. They argued that other measures of success should include building the capacity of smallholders, aligning production with demand, and improving the growth of income and development of sustainability. Essentially, the innovation platform is the process of operationalising inclusive innovation by coordinating the efforts of relevant stakeholders in agricultural development (Swaans et al., 2014).

According to Jalloh, Sarr, Kuiseu, Roy-Macauley and Sereme (2012), innovation platforms are distinguished by "individual circumstances, preferences, context, and specificity" (p. 12). They can also be understood as "action-research" designed to investigate and facilitate the organisation of multi-disciplinary actors to innovate in response to changing agricultural and natural resource contexts (Tenywa et al. (2011). Various research-orientated innovation platforms have been in operation in sub-Saharan Africa, and the challenge is to establish a commercialisation-orientated innovation platform to implement the knowledge that has been accumulated and to successfully commercialise goat production in South Africa (Mulema, 2012).

Swaans et al. (2014) recommended that the establishment of innovation platforms be underpinned by a contextual, diagnostic study of the value chain, and accompanied by a long-term approach and commitment to the process. This contextual approach means that innovation platforms have the potential to address weak linkages between value chain actors in specific environments. By improving value chain linkages, processes, and structures, smallholders can develop new goods and services, address challenges, and take advantage of opportunities (Swaans et al., 2014).

2.10.1 Impact of innovation platforms

Swaans et al. (2014) conducted research in India and Mozambique, where innovation platforms were established to improve the market participation of smallholders. The results of their research indicated that innovative interventions have a positive impact on goat management practices, production, and sales income. These positive findings were similar to those of research conducted in Malawi by Mapila et al. (2012). Schut et al. (2015) also argued that innovation platforms are a promising vehicle for inclusive innovation in the agricultural sector. By providing a forum for communication between farmers and role players within the goat market, these platforms are useful in identifying challenges and opportunities in production and marketing. However, the sustainability of these positive results requires support from government and agricultural research organisations to build capacity and provide subsidies (Mapila et al. (2012).

Figure 7 illustrates how bottlenecks in the goat meat value chain were overcome through an innovation platform.

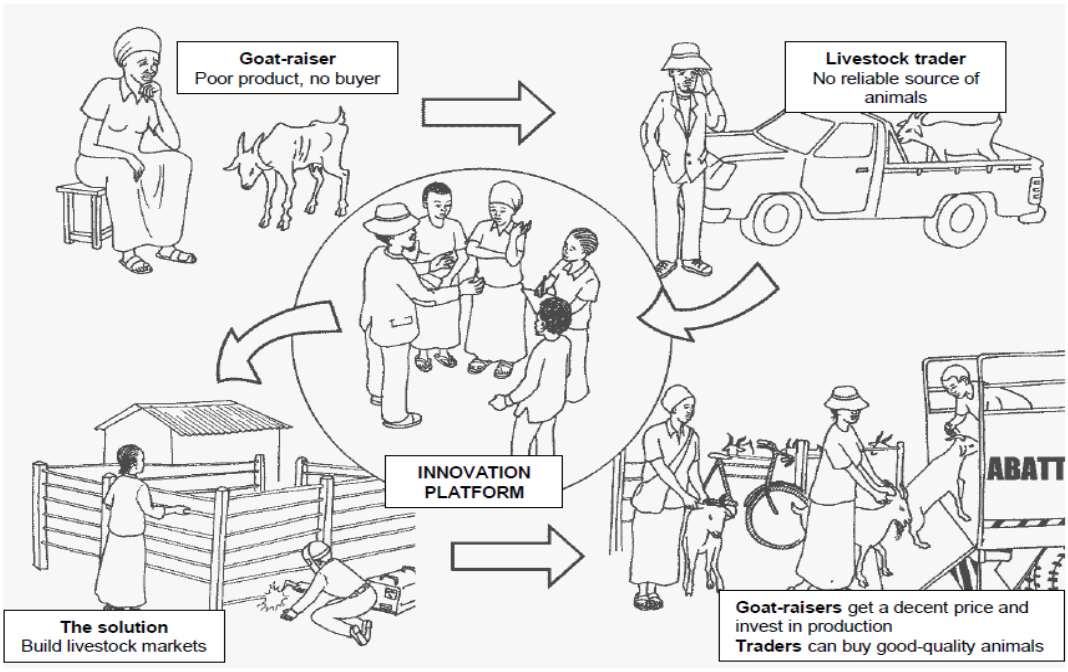


Figure 7: Innovation platform in goat value chain

Source: Birachi et al. (2013, p. 2).

Mapila et al. (2012) modelled the innovation platform based on their research and is illustrated in Figure 8. Their version of innovation platforms is to facilitate the establishment or improvement and development of technologies that are beneficial to value chain actors. Their approach utilises two key tenets, technology and market development. Through an alignment of local capacity and market needs, an efficient system is established which results in a positive impact on farmers and value chain actors (Swaans et al., 2014; Van Rooyen & Homann, 2007).

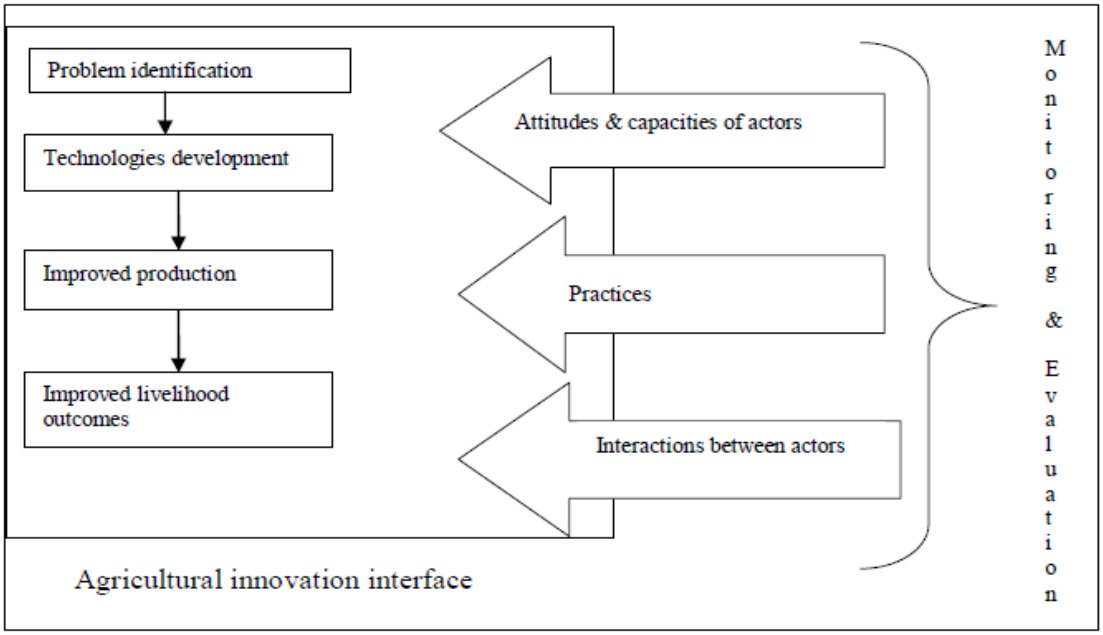


Figure 8: Agricultural innovation interface

Source: Mapila et al. (2012, p. 16)

2.10.2 Creating innovation platforms

Homann et al. (2013) illustrated the steps involved in developing an innovation platform. This seven-step cycle is discussed with particular focus on commercial goat farming as seen in Figure 9.

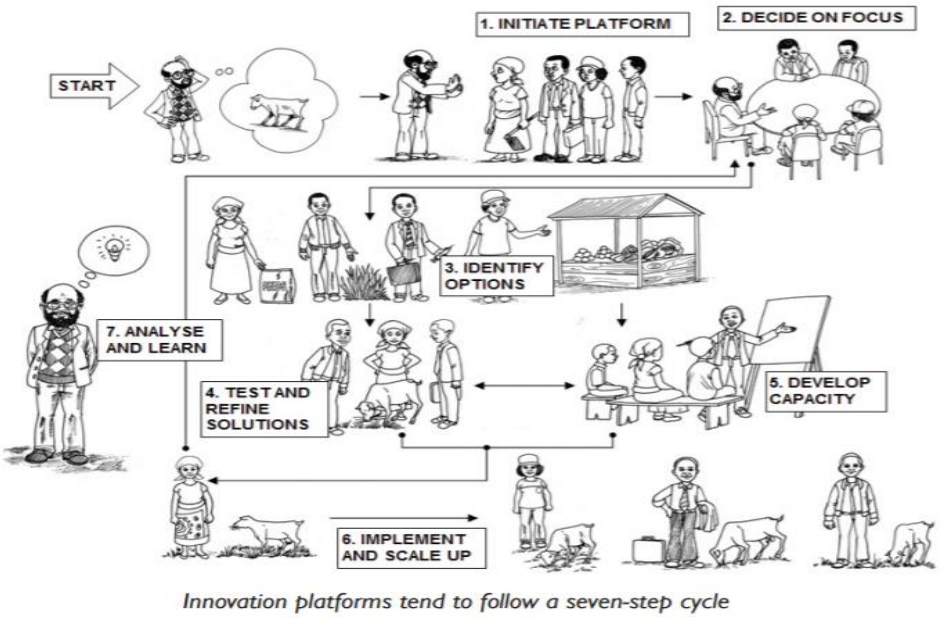


Figure 9: Steps for innovation platforms

Source: Homann, et al. (2013, p. 3)

For the implementation of an innovation platform, a clear distinction should be made between innovation platform formation and innovation platform functioning.

2.10.2.1 Steps in innovation platform formation

Innovation platform formation refers to the phase of designing and structuring the platform (Njuki, Pali, Nyikahadzoi, Olaride, & Adekunle, 2010), and the steps are as follows:

- *Scoping*: Determining the context of the platform;
- *Analysis*: Identification of knowledge and skills required, as well as problems and opportunities; and
- *Planning*: Development of a course of action (Njuki et al., 2010).

2.10.2.2 Steps in innovation platform functioning

Njuki et al. (2010) stated that innovation platform function refers to a phase of learning and innovation through regular and iterative planning, action, and reflection, which may lead to shifts in focus and priority. The steps are as follows:

- *Active participation*: Members should feel a sense of ownership of the process, actively participate, and be committed.
- *Effective information sharing*: This involves taking into consideration the diversity in knowledge and skills of actors.
- *Continuous learning*: This should be the culture adopted by all participants (Njuki et al., 2010).

2.11 Conclusion of Literature Review

This literature review has provided an overview of goat farming on the African continent, based on research in a number of countries. It also provided an in-depth analysis of the challenges faced by smallholder goat farmers on the continent and specifically in South Africa. The literature reviewed supports the common wisdom that agriculture and goat farming in particular have great potential for poverty alleviation, import substitution, and promotion of food security. Some of the challenges highlighted are specific to the attitudes and objectives of farmers.

However, there are more significant challenges requiring the involvement of the state and the development of a policy to address the large-scale issues in the goat farming sector and goat meat value chain. Supply-side factors are largely affected by education, skills and the technologies applied by farmers. Commercialisation efforts would need to address this to ensure increased production, given the general lack of education among smallholder farmers. Demand-side factors are influenced by marketing and consumer education initiatives, which the industry has not yet developed in African markets; this explains the low up-take and availability of goat meat products. These factors require a combination of impact pathways to improve commercialisation prospects, be undertaken by all key players in the goat meat value chain.

The reviewed literature supports the idea that multi-stakeholder efforts and collaboration can have a positive impact on the value chain and, most importantly, on the livelihoods of smallholder farmers. Social Innovation and Innovation Platforms have been successful in developing countries such as Malawi, India and Tanzania.

These findings are promising for the South African context and provide a framework to follow, in developing a broad-based, inclusive, commercialisation programme.

CHAPTER 3:
RESEARCH METHODOLOGY

3.1 Research Approach and Strategy

Varying research objectives call for varied research designs and approaches. Saunders, Lewis and Thornhill (2003) theorised three forms of research approaches, namely, deductive, abductive, and inductive. The deductive approach develops theory by moving from general to specific and descriptive aspects. The abductive approach on the other hand, seeks to find particular underlying norms in an occurrence while the inductive approach draws generalised interpretations from observations by gathering a deeper insight of the underlying problem (Bryman & Bell, 2007).

This study aimed to understand how the supply-side factors of the goat meat value chain in South Africa could be improved through an innovation platform. It was expected that the investigation would yield insights that reveal key value chain actors, the activities required by each of them to ensure the commercialisation of the goat meat value chain and the potential benefits of vertical integration. Consequently, the most appropriate research approach for this study was the inductive approach to illuminate the constraints experienced by goat farmers. This understanding was then used to inform the development and design of an innovation platform based on conclusions made from the data collected.

3.2 Research Philosophy

This study was modelled to understand the constraints of goat meat commercialisation in South Africa, with a specific focus on supply-side factors from the perspectives of goat farmers in the Northern Cape as well as other key value chain actors in the goat meat value chain. Yin (2012) described the research design applicable to this research objective as “exploratory” design. An exploratory study is a means of discovering “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson 2011, p. 59). To delve adequately

into the various constraints of goat meat commercialisation, three different questionnaires were modelled for three separate samples. These questionnaires comprised closed- and open-ended questions, which allowed for both structured and unstructured responses.

Sekaran and Bougie (2013) put forward several research philosophies such as positivism, critical realism, interpretivism/constructionism, and pragmatism. The research philosophy is important because when juxtaposed with the researcher's worldview influences the conclusions and interpretation of findings in the chosen field. This study was guided by interpretivism or constructionism philosophy. Accordingly, it sought to understand the development of knowledge and the nature of that knowledge (Saunders et al. 2003). This philosophical outlook promotes an understanding of variances between humans in the social actor role. That is, the research conducted sought to understand the role of goat farmers as 'actors' in the 'theatre' of goat meat commercialisation in South Africa (Leitch, Hill & Harrison, 2010). The metaphor of the theatre prescribes that humans play a vital role on the stage for this creation. In acting, actors assume roles that need to be acted in a specific way, as instructed by the director and performed in accordance with a certain understanding. Similarly, everyday social roles are understood in accordance with the meaning ascribed to these roles. Therefore, the social roles of others are understood in accordance with the audience's set of meanings.

To ensure internal consistency, coherence, and validity, the research questions for this study informed the research method (Punch & Oancea, 2014). The planning phase was used to maximise the fit between questions on the one hand and design procedures on the other hand. Furthermore, a qualitative approach was considered suitable given that this study is human-centred research, which attempted to understand and make sense of phenomena from the perspective of multiple stakeholders (Zikmund, Babin, Carr & Griffin, 2010).

3.3 Research Design

Studies in this field have utilised both quantitative and qualitative research design methods to investigate commercialisation levels in the goat meat industry and the use

of innovation platforms to achieve market-orientated farming systems (Bwire, 2008; Plewis & Mason, 2005; Zhou, Minde & Mtigwe, 2013). The perspectives of multiple players in the goat meat value chain were explored and understood using qualitative data prescribed in the interpretative paradigm (Burton, Brundrett, & Jones, 2008). For greater depth, Creswell and Creswell's (2017) proposition to use small samples and an inductive approach in order to derive comprehensive insights from examination was undertaken.

Kuruman in the Northern Cape Province was used as the case study. The practical outcome of the research was the development of an innovation platform that vertically integrates supply chain actors. Using this platform, information-sharing between farmers in the Northern Cape can facilitate the delivery of goat meat products to consumers in the target market located in the Gauteng Province. It also enabled identification of the relationships as they occur between all stakeholders and their functions (Creswell, 2007).

Questionnaires were administered, and data collected and analysed through various statistical methods in order to test the hypothesis and make inferences in addressing the research questions (Cooper & Schindler, 2014; Stangor, 2011).

Following the logic, this study was cross-sectional, descriptive, and quantitative, addressing the following concepts in its methodology:

- *Who was assessed?* Small-scale goat farmers in the Northern Cape region, as well as other key value chain actors.
- *What was assessed?* The smallholder profiles and supply side factors influencing production and commercialisation of goat products.
- *How were they assessed?* Through the questionnaires aimed at smallholders and other key value chain actors.

3.4 Population and Sample

3.4.1 Population

Population refers to the total number of subjects or elements from which the

researcher intends to make inferences (Cooper & Schindler, 2014). It can also be defined as "the complete group of specific population elements relevant to the research project," stated Zikmund (2000, p. 373). The population for this study were key players in the goat value chain in Kuruman, Northern Cape, to understand the demand side, and Johannesburg, Gauteng to understand the supply side.

3.4.2 Sample and sampling method

To develop extensive, multi-dimensional insight, this study required engagement with multiple stakeholders that played a key role in the goat meat value chain both in the Northern Cape and Gauteng. Consequently, a non-probability sampling method was used whereby the selection criteria maximised the heterogeneity of the sample, in terms of characteristics of interest, to allow comparison (Sekaran & Bougie, 2013, p. 270). Multiple stakeholders were targeted in order to select interviewees with viewpoints that reflected different, even contradictory, perspectives (Rubin & Rubin, 2005). Accordingly, random sampling was not considered appropriate for the research objectives.

The convenience sampling technique was used to obtain large numbers of completed questionnaires quickly and economically (Zikmund et al., 2010). The sampling frame (Table 3) made it possible to increase the probability of getting accurate data.

Table 3: Sampling frame

Frame	***Description***
Population	Stakeholders in the goat production value chain
Sample	30 Small-scale goat farmers in Kuruman, Northern Cape 20 Customers in Johannesburg, Gauteng 5 Government officials in Kuruman, Northern Cape
Geographic area	Kuruman, Northern Cape, South Africa
Sample design	Convenience and snowball sampling
Collection of information	Semi-structured questionnaires

To develop a clear understanding of the dominant actors in the goat meat value chain supply side questionnaires were administered to goat meat producers, demand side

questionnaires were administered to 20 consumers based in Johannesburg and a separate questionnaire was designed for other value chain actors such as five government agricultural extension agents in Kuruman, Northern Cape.

3.5 Research Instruments and Data Collection

Johnson and Christensen (2012) defined data collection methods as a technique for physically obtaining data to be analysed in a research study. Creswell (2007) described data collection as a series of interrelated activities aimed at gathering good information to answer the research questions. In this study, semi-structured questions were used to collect information from the participants in the sample. This data collection method was used by previous researchers in similar studies. Two types of data were gathered for this research, the first was the literature collected and studied (secondary data), and the second was data collected through semi-structured interviews (primary data).

To gather secondary data, the study reviewed both academic journals and published policy documents. The literature review provided an understanding of work already conducted in this field and of particularly successful instances of the use of innovation platforms in developing countries with similar goat farming constraints as those of South Africa. Primary data was collected through semi-structured interviews with smallholder households and key role players in the value chain. The interview questionnaires included questions that sought to understand the socio-economic status of participants, participants' understanding of the constraints experienced by smallholder farmers, and factors that influenced their activities. In addition, both open- and closed-ended questions were asked. The questionnaire comprised specific questions that addressed the research objectives (Fox, Hunn & Mathers, 2009).

Interviews were conducted predominantly in English, however, the two research assistants who were employed to help with the interviews and gather the data from respondents asked the questions in Setswana for interviewees who were more comfortable communicating in their first language.

Each stakeholder group had a separate questionnaire. That is, the supply-side actors, the farmers, were interviewed using the questionnaire in Appendix C. A separate

questionnaire was used to interview goat meat consumers, see Appendix D. Lastly, a different questionnaire was used to interview the government agricultural extension agents, see Appendix E. The questionnaires were structured into sections as follows.

3.5.1 Farmer group questionnaire sections

The farmer group comprised individual and communal goat farmers.

- *Section A: Demographics*: Sex, age group, occupation, tenure, and level of education.
- *Section B: Commercialisation*; The process of managing or running something for financial gain; in this context goat meat production.
- *Section C: Innovation*: Focused on Innovation Platforms, referring to the space for learning and bringing about change for the better.
- *Section D: Socio-economic*: Information relating to socio-economic factors.
- *Section E: Value chain*: Insights on goat production value chain characteristics.
- *Section F: Seasonal variations*: About efficiencies and constraints linked to seasonal variations in goat farming.
- *Section G: Social business model*: Information related to local organisations or associations to which farmers belong.
- *Section H: Socio-entrepreneurship*: Information to assist in the upliftment of smallholders in the goat industry in the longer term.
- *Section I: Distribution*: Insights on goat farmers access to markets.

3.5.2 Consumer group questionnaire sections

The consumer group comprised customers, butchers, traders, processors, and marketers including exporters.

- *Section A: Demographics*: Sex, age group, occupation, religion, and level of education.
- *Section B: Habit:* Information on settled or regular tendency or practice of consumer group.

- *Section C: Consumer preference*: Focused on subjective tastes and satisfaction of the consumer group.
- *Section D: Accessibility*: Refers to difficulties in obtaining goat meat.
- *Section E: Competition*: Insights on rivalry between suppliers of goat meat and other types of meat.
- *Section F: Price*: Price comparisons for types of meat, quality, special occasions, among others.

3.5.3 Expert group questionnaire sections

The expert group comprised government agricultural extension agents, non-governmental organisations (NGOs) specialising in agriculture and rural development.

- *Section A: Demographics*: Sex, age group, organisation and district, tenure, position, and level of education.
- *Section B: Value chain:* Information on the organisation's involvement with the goat industry.
- *Section C: Seasonal variations*: About efficiencies and constraints linked to seasonal variations in goat farming.
- *Section D: Price and distribution*: Price control, subsidies, and alternative distribution systems for the goat meat industry.

3.6 Validity and Reliability

In this study, triangulation was used to ensure validity of the data collected. Triangulation was performed by comparing interview responses to reliable literature sources. Dependability or reliability relates to how well researchers can assure readers of their findings and the process through which they arrived at them (Corbin & Strauss, 2008). Accordingly, reliability suggests that when the same method is applied to test the same question, the results that are obtained should be the same each time (Babbie & Mouton, 2010). In this study, dependability was ascertained through avoiding mistakes in conceptualising the study, collecting the data, interpreting the findings, and reporting results. For example, one of the measures

taken throughout was to revisit the research objectives frequently to be clear on the purpose of the analysis.

3.7 Data Analysis

Qualitative data from the interviews was audio recorded, as it was more effective for accurate interpretation of responses (Yin, 2012). Before analysis, the data collected from all interviews was transcribed from the voice format into a text format, as recommended by Kvale and Brinkmann (2009). Thereafter, the interview transcripts were read through multiple times and the key points and themes emanating from them were drawn out, in a process known as content analysis (Maxwell, 2005). Themes were identified (Maxwell, 2005) and grouped into more manageable groups, or sub-themes, before a summary of the main themes originating from the participants' stories was drawn up (Thorpe & Holt, 2008). Conclusions and recommendations were thus drawn from these themes. In summary, this data analysis process involved four steps, namely, data collection, data reduction, data display, and verification of conclusions. This process took place in an iterative loop-like cycle (Miles & Huberman, 1994), and is illustrated in Figure 10.

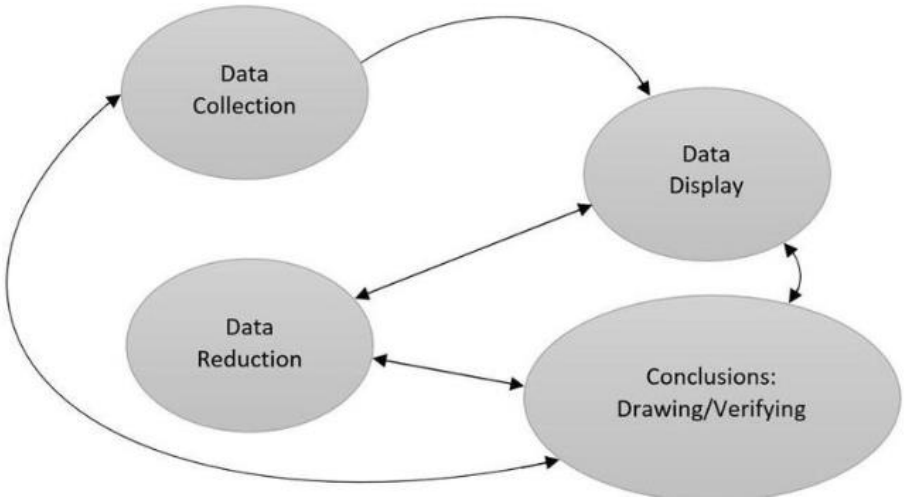


Figure 10: Steps in qualitative data analysis

Source: Adapted from Miles and Huberman (1994)

The data analysis cycle is briefly described below.

3.7.1 Data collection

This refers to the method and techniques used to gather data from participants. In this study, data was gathered using face-to-face interviews. The participants' interviews were audio-recorded and manually transcribed verbatim as soon as possible to avoid loss of data collected and backlog of audio recordings.

3.7.2 Data condensation

After transcription, the data was organised and summarised (Hair, Money, Samuel, & Page, 2007). Using guidelines provided by Miles and Huberman (1994) and Hair et al. (2007), the data condensation process involved selecting and simplifying the transcripts through thematic analysis.

3.7.3 Data display

In accordance with the guidelines provided by Sekaran and Bougie (2013) as well as Miles and Huberman (1994), the themes identified through the condensation process were organised to present a visual picture using graphical illustrations and data display matrices. These graphs also assisted in establishing patterns and drawing conclusions.

3.7.4 Drawing and verifying conclusions

Drawing conclusions includes deciding what the identified themes and patterns mean and how they help to answer the research question. After a consideration of the graphical illustrations of the data, the condensation was assessed frequently to ensure that the data supported the graphical illustrations. The conclusions were arrived at by asking questions such as "What does this mean?" and "Is it consistent or inconsistent with other data or theories?" (Weick, 1989, p. 518). The loop was followed repeatedly to ensure that the original conclusions were realistic, supportable, and valid (Hair et al, 2007). For verification of conclusions, participant feedback was used.

3.8 Limitations

Using qualitative research, a non-probability sampling method permits the heterogeneity of the sample in terms of characteristics of interest to allow comparison (Sekaran & Bougie, 2013). However, the limitation is that the researcher needs to be aware that their interactions with interviewees and asking questions would influence the data to be collected (Silverman, 2007). With all efforts to ensure the research was accurate, especially the data collection, analysis, and presentation of results, the following limitations were noted:

- This study focused on a sample of goat farmers (cooperatives) and other key stakeholders in the goat production value chain in the Northern Cape and Gauteng Provinces. The results might not necessarily be representative of the goat industry in general, as it did not involve all nine provinces in South Africa, and a convenience sample, based on availability of participants, was used which also presented potential self-selection bias.
- Unfortunately, cooperatives are structures organised by government for the benefit of previously disadvantaged communities, and most do not own land and have limited understanding of business. Their effectiveness has been widely undermined by other stakeholders in the goat meat value chain because of the lack of resources.
- Language barriers played a role in the data collection, English was not the first language of the participants; therefore, a Setswana translation of questions was done during the interviews to gather more accurate data. While measures such as prompt translation and transcription were undertaken, there was a chance that some responses may have been ‘lost in translation’ as some questions were answered in Setswana.
- The Northern Cape is South Africa’s large province and is sparsely populated. Given the need for convenience in the sample selection, and financial constraints, the sample selected was concentrated in certain areas of the Northern Cape, limiting insight to participants based in the Kuruman area. The same limitations applied in Gauteng, where the goat meat consumer base may be much larger or much smaller than anticipated. However, a lack of

formal retail statistics for goat meat sales in Gauteng limited the ability to target specific areas or community groups that were goat meat consumers.

3.9 Ethical Considerations

In this study, the following ethical considerations were followed:

- *Scientific validity*: The research was conducted in a manner that ensured its academic integrity and scientific validity. Unethical practices, such as fabrication, were avoided.
- *Participation*: The privacy of participants was observed, and the anonymity of participants maintained. Anything learnt about participants during their involvement in the study was maintained in confidence.
- *Sharing results*: All research was directed at broadening the base of knowledge in the field. Results of this research were only shared with participants in the study.
- *Permission:* Requests for permission to conduct the study, the right to non-participation and protection from harm were upheld.

Further ethical issues were highlighted in the introductory and consent letter (Appendix B) for this research, which was sent to the participants on their acceptance to participate in the interviews. For example, the letter provided an undertaking of confidentiality between the researcher and each participant as well as the assurance that the risks associated with the study were no greater than those encountered in daily life.

CHAPTER 4:
PRESENTATION OF RESULTS

4.1 Introduction

This chapter presents the results from the primary research as well as the emerging themes and patterns from the research results. Data was collected from semi-structured interviews with small-scale goat farmers and government officials in the Northern Cape Province, as well as goat meat consumers based in the Gauteng Province (Figure 11 is a map of South Africa showing provinces and Figure 12 is a map of the Northern Cape). These results are presented per participant group, including demographic profiles and responses to the respective questionnaires.

Figure 11: Map of South Africa

Source: Aimix Group (2019)

Figure 12: Map of Northern Cape Province

Source: School and College Listings (n.d.)

Figure 13 illustrates the total sample size of participants amounting to 55 respondents, with three separate interview questionnaires as per Appendices C, D and E. The grouping was as follows, 55 per cent (n = 30) were goat farmers who were members of farming co-operatives in Kuruman, the goat meat consumers based in Gauteng made up 36 per cent (n = 20) of respondents, and nine per cent (n = 5) were government officials from the Northern Cape Province.

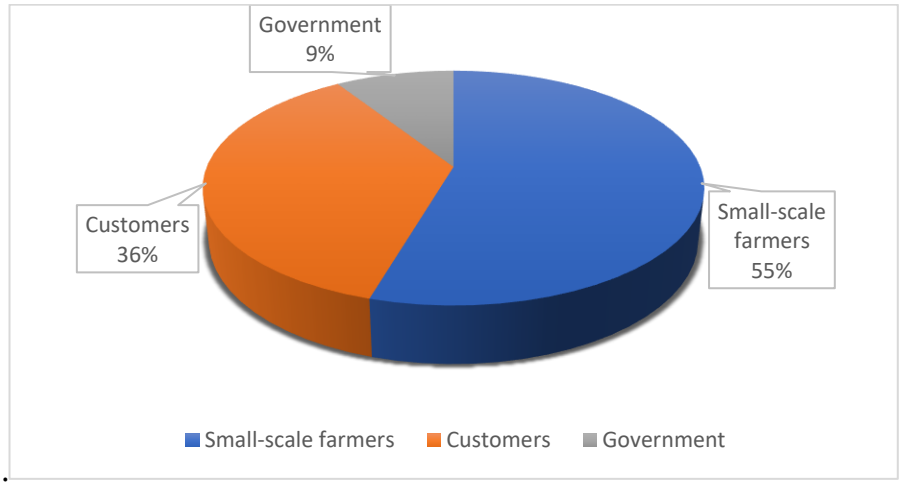


Figure 13: Respondent categories

4.2 Results from Goat Farmer Interviews

4.2.1 Demographic profile of the small-scale farmer participants

4.2.1.1 Gender

The gender distribution showed that most of the farmers were female (80 per cent, n = 24) compared to 20 per cent (n = 6) who were male. The gender distribution is illustrated in Figure 14.

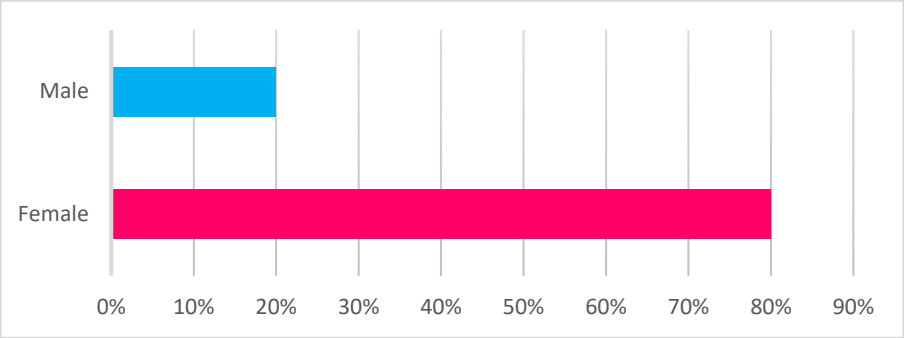


Figure 14: Gender distribution

4.2.1.2 Age

The average age of the participants was 43.6 years old. Their ages ranged from 30 to 60 years old. Half the respondents (n = 15) were between the ages of 40 and 50 years, 30 per cent (n = 9) of the respondents were 50 years or older and the remaining 20 per cent (n = 6) were younger than 40 years old.

4.2.1.3 Occupation

Livestock rearing constituted the primary activity for 12 (30 per cent) of the respondents, who were also the heads of their respective households. Mixed farming, consisting of livestock and crop farming, was the primary activity for 11 (37 per cent) of the farmers, four (13 per cent) of the respondents relied on crop production as a primary activity and source of income and three (10 per cent) of the small-scale farmers indicated that they relied on non-farm activities for income. Their occupation profiles are summarised in Figure 15.

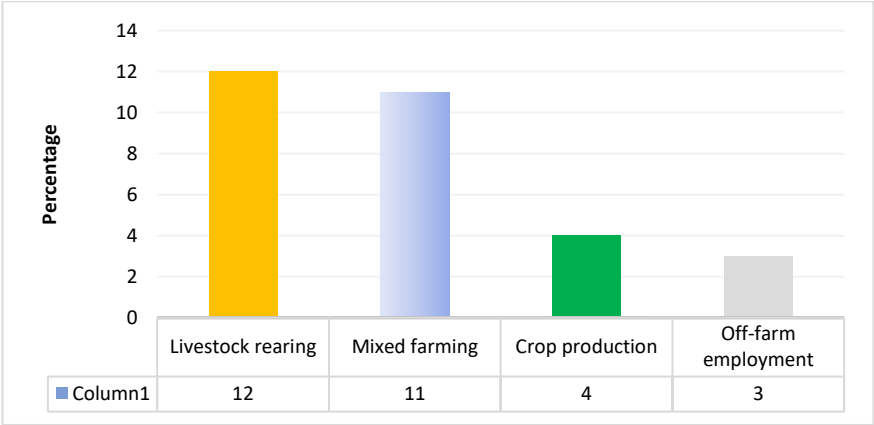


Figure 15: Primary occupation of household head

4.2.1.4 Number of years in occupation

Figure 16 provides a summary of the number of years respondents have been involved in their primary occupation. Of the farmer respondents, 35 per cent (n = 7) had been engaged in mixed farming for over 11 years. Respondents with more than 20 years of experience made up 27 per cent (n = 6), while approximately 24 per cent (n = 5) of the respondents had under 10 years' experience in livestock rearing or crop farming. While a small number of respondents (14 per cent, n = 4) had been farming for under five years. Most respondents indicated that they had not self-selected their occupation; farming activities were in response to the high unemployment levels and inability to find formal employment. Other reasons provided for farming activities were seasonal activity, family/community tradition, general interest, entrepreneurial interest, and government incentives or grants.

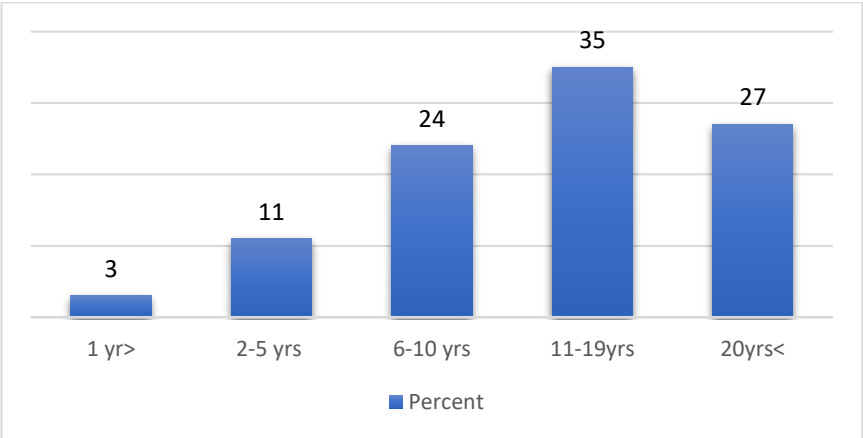


Figure 16: Years in occupation

4.2.1.5 Education levels

Only 30 per cent (n = 9) of the farmer participants in the sample had attained some secondary education, 60 per cent (n = 18) had primary education as their highest level of education, while only 10 per cent (n = 3) had completed matric and obtained a National Senior Certificate (NSC). These results are summarised in Figure 17. Participants stated that some of the reasons that they dropped out of school were that schools were at least 10 kilometres away from home, there were no water or toilets at schools, the classrooms were in bad condition. In addition, the area was full of snakes, and during either winter or summer, the weather was not conducive to traveling long distances on foot.

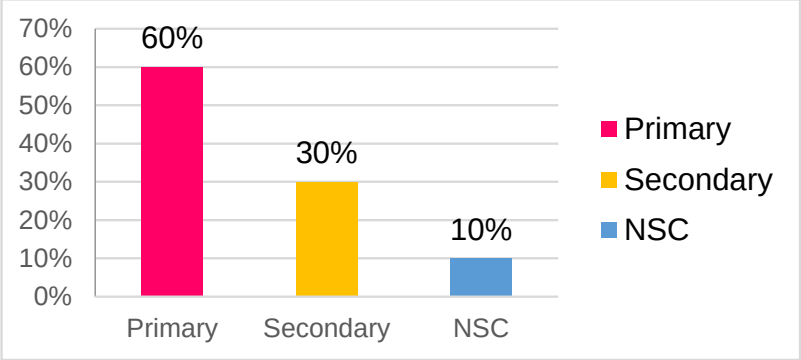


Figure 17: Highest level of education

4.2.2 Emergent themes from data collection

4.2.2.1 Theme 1: Commercialisation

Section B of the research instrument asked four questions on commercialisation, the results of which follow.

- *Question B1:* How do small goat farmers commercialise?

The three answers from which the respondents could choose are outlined in Table 4. More than half of respondents (54 per cent, n = 16) said commercialisation is achieved by managing farming activities with the objective of financial gain. Only a minority (13 per cent, n = 4) believed that goat farming for their family dowry, rituals, and cultural reasons could lead to commercialisation.

Table 4: Small goat farmers' commercialisation methods

Options	Frequency (n)	Percentage
By managing and / or running their goat herds principally for financial gain	16	54%
By breeding goat herds for their own consumption	10	33%
By keeping their goat herds for their children's dowry	4	13%

- *Question B2:* How do commercialising small farms interact with large-scale businesses in the farming supply chain?

All respondents mentioned auctions as the main interaction platform between small farmers and large-scale businesses. They also mentioned that auctions may result in undervaluation of their livestock; however, there were also instances of overvaluation. Respondents confirmed that auction sales did not promote price certainty and therefore negatively affect production planning and profitability for small-scale farmers. Pricing uncertainty also hinders buyers' planning, which is a significant factor in balancing supply and demand. Respondents further cited lack of livestock transportation to auction sites. General responses revealed that farmers did not believe that the auction system favours them.

- *Question B3:* Does commercialisation lead to increased income for goat farmers?

As seen in Figure 18, a large majority of the respondents 80 per cent (n = 24) agreed that commercialisation led to increased income for farmers. They further thought that commercialisation led to increased volumes, efficiencies, and consistency in demand.

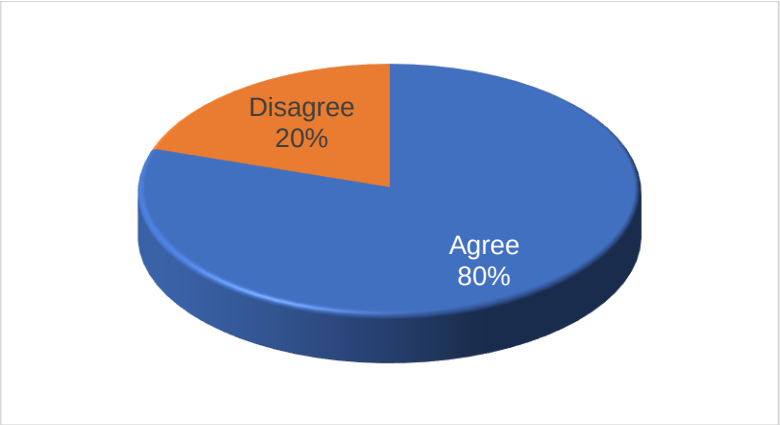


Figure 18*:* Perception of monetary benefits from commercialisation

- *Question B4:* Goat meat production brings about the following, agree or disagree

In this question respondents were allowed to indicate multiple benefits. Almost all the respondents agreed with the statement that goat meat production results in employment 95 per cent (n = 28), food security 90 per cent (n = 27) and income generation 90 per cent (n = 27). Respondents felt strongly about employment because it generated respect and appreciation in the community and also provided a sense of belonging. They were less convinced by other outcomes of goat production such as animal nutrition and improved social status, see Figure 19.

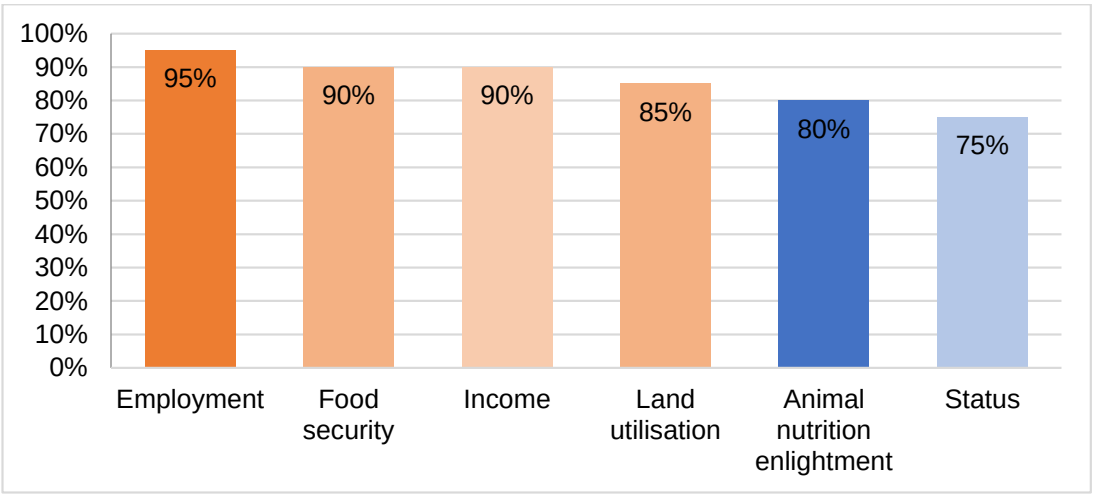


Figure 19: Perceived benefits of goat farming

4.2.2.2 Theme 2: Innovation

Innovation platforms are defined as the space for learning and bringing about change for the better, where a group of people, for example, farmers, researchers, and government officials come together to diagnose problems, identify opportunities, and find ways to achieve their goals. Section C of the research instrument asked small-scale farmers four questions on innovation, the results of which follow.

- *Question C1*: To what extent have these drivers led to the innovation platforms of goat meat production?

Figure 20 indicates that land ownership, a competitive marketing chain, seasonal variations, and labour were perceived to influence the formation of innovation platforms within the goat meat production chain. Over 70 per cent (n = 21) of the farmer respondents perceived that access to markets and technical advice would influence innovation platforms to a large extent, with 24 per cent (n = 7) of the respondents viewing access to markets as having little influence on the formation of innovation platforms.

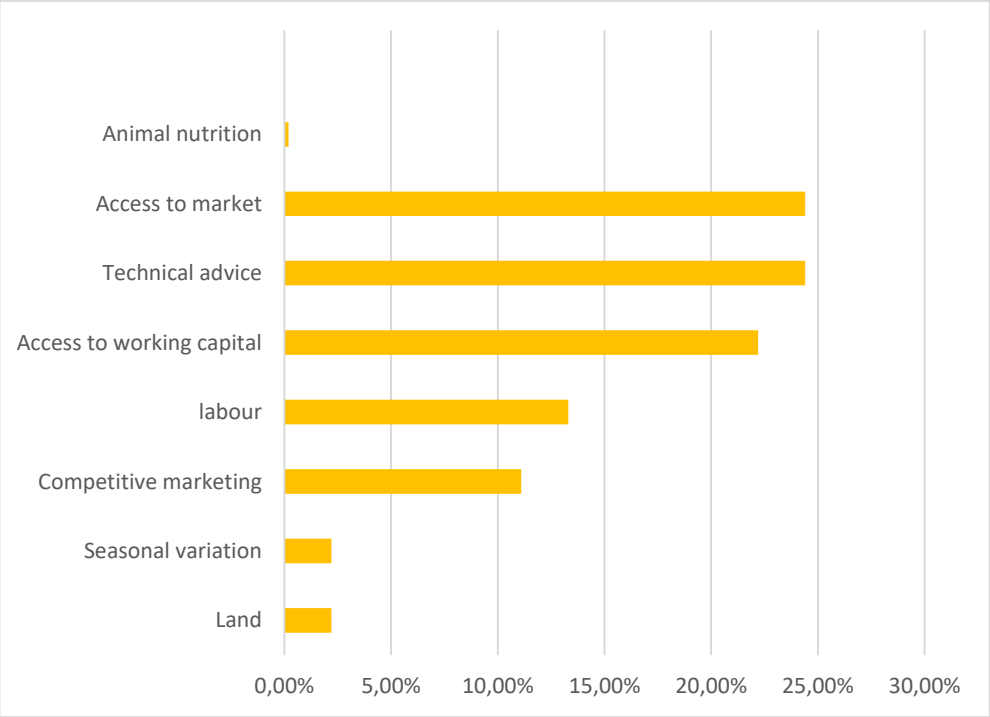


Figure 20: Drivers leading to the innovation platforms of goat meat production

- *Question C2:* What innovation platforms are being implemented by the agricultural and rural development experts' organisations in the development of the goat industry in your province?

All 30 farmer respondents mentioned goat cooperatives as the most important platform used to develop the goat industry. This brought financial resources and ideas together, which was a steppingstone to eventual full-scale commercialisation of the goat industry. The respondents indicated that agricultural and rural development experts in the Northern Cape Province (Kuruman) provided goat breeding material plus new and innovative medication to help with farming. Regular goat farming training was offered, which included education on the need to dip with new medication twice a year (usually February and November), and using the appropriate goat feeds to promote growth and development. A respondent mentioned, "*Goats are highly mobile animals and road fencing was another method being used to keep animals safe and develop this industry*".

- *Question C3:* How do you rate the problems that are hindering innovation platforms on goat production?

The respondents were allowed to select more than one of the options and elaborated on their rating. Of the small-scale farmers respondents, 77 per cent (n = 23) identified labour shortage and lack of markets as being the major problems hindering innovation platforms in goat production, while 60 per cent (n = 18) perceived land shortages as a hindrance. Only 20 per cent (n = 6) saw meat prices as negatively affecting innovative platforms in goat farming in Kuruman. One respondent expressed his views as follows, "*It is important for us to be training in order to service our customers well. The beauty about training is that it boosts your confidence and you become an informed farmer*".

- *Question C4:* Do you think the use of aromatic plants like sage, oregano, and rosemary can increase the rate of convertibility, the taste, colour, texture and better shelf life of goat meat in the distribution chain?

Of the 30 respondents, 60 per cent (n = 18) did not agree that the use of aromatic plants could increase the quality of goat meat in the distribution chain, as seen in

Figure 21. However, 40 per cent (n = 12) of the farmer respondents agreed that plants like sage, oregano, and rosemary could increase the rate of convertibility, taste, colour, texture and so on for a better shelf life of goat meat in the distribution chain. The beliefs of individuals influenced the selection of answers because the responses were based on cultural beliefs, ritual practices, and upbringing.

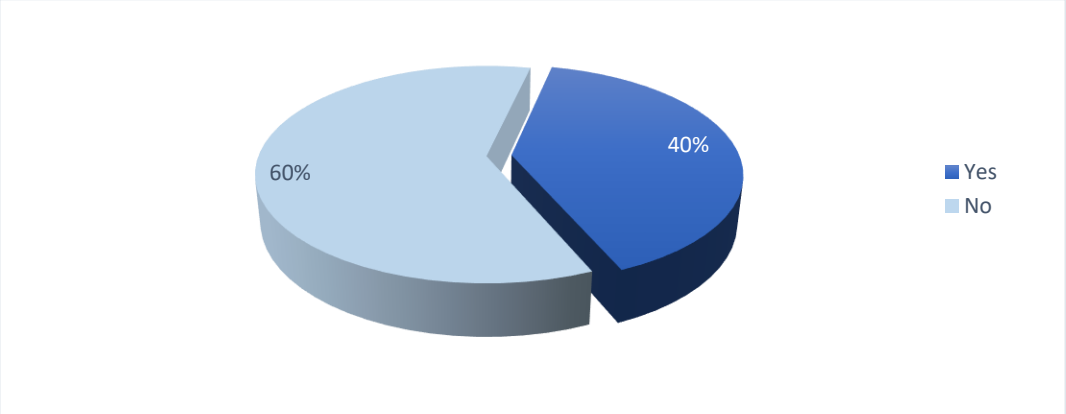


Figure 21: Aromatic plants can increase quality of goat meat

4.2.2.3 Theme 3: Socio-economic factors

This section was designed to gather information relating to the socio-economic factors. All small-scale farming respondents showed that goat meat farming brought in income. Section D of the research instrument asked five questions on socio-economic factors.

- *Question D1:* In which ways is goat meat farming helping socially and economically in your province?

Farmer respondents were allowed to select more than one option. All 30 respondents said that goat meat production brought in income. This was closely followed by job creation, which helped with poverty alleviation. Although job creation came second, there were still certain concerns based on other factors beyond the respondents' control such as climate change or drought in the province, which had a negative impact on livestock and food security. Figure 22 shows the socio-economic factors. Even though 18 respondents (60 per cent) said that the goat meat production improved their status in the community, since they were perceived as entrepreneurs or businesspeople who are contributing to the economy of the province, it was not

the main reason for social and economic improvement. One respondent explained, "*I feel proud about myself as a goat farmer, the community here in Kuruman respect me very much*".

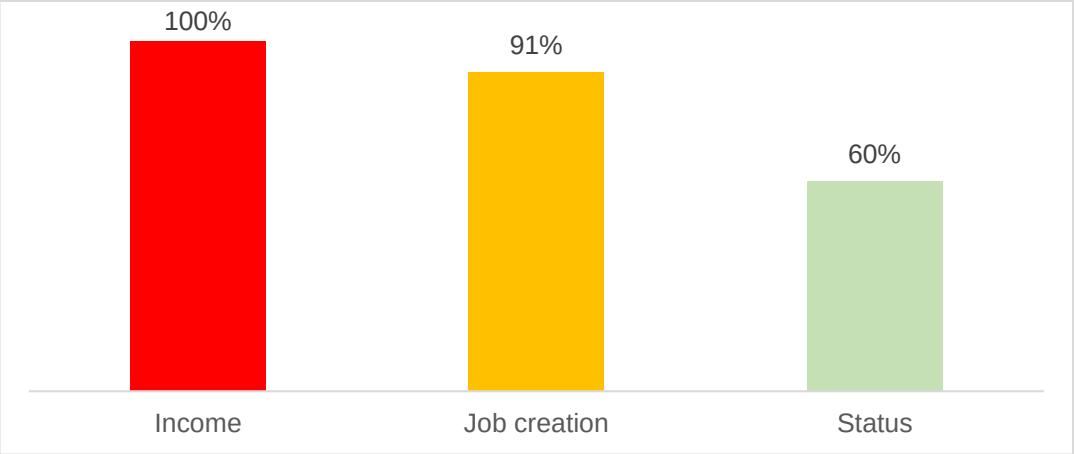


Figure 22: Socio-economic impact

The results in Table 5, which answer questions D2 to D5, show that most farmers do not own the land on which they farm; most rented or inherited their land from relatives.

Table 5: Other socio-economic factors

Factor	Option	Percentage
• *Question D2:* Do you think farmers who commercialise achieve higher gross margins from the land and labour used for their commercialised enterprises	Yes	60%
	No	40%
• *Question D3:* Are the goat farmers in this province landowners	Yes	33%
	No	67%
• *Question D4*: How did most farmers acquire the land they are farming on	Relatives / friends / neighbourhood (no cost)	43%
	Renting	40%
	Land sharing	17%
• *Question D5:* What is the highest source of income in the goat farming of this province	Breeding of goats	54%
	Sale of goats and their products	46%

Of the respondents, 60 per cent (n = 18) agreed that farmers who commercialise achieve higher gross margins from the land and labour used for commercialised enterprise. Some of reasons given were that the customer base grows, and government provides more support such as vaccines and infrastructure. Respondents who disagreed said that the responsibility becomes high and they feel that they are not skilled enough for that level. The 43 per cent (n = 13) that owned land acquired it at no cost from family, friends, relatives, and even from the government. The remaining 40 per cent (n = 12) and 17 per cent (n = 5) respectively were renting at a low cost, and sharing land that was not owned by them. The challenge with land acquired or rented from friends and family was that they could change their minds when they saw their land being used successfully, as they became jealous. The other point raised, as most respondents were female farmers, was that because of cultural reasons women in the past were not able to inherit any land when there were male siblings in the family. Historically, their land was given to relatives or even taken by the chief of the village.

Question D5 revealed that the highest source of income for the small-scale goat farmers interviewed were from breeding of goats. *"When breeding goats the only concern is that your livestock should be healthy and feed well but when you sell you need to transport, find new markets and so forth. That can be stressful".*

As per Figure 23, the farmers' sources of income were highest from the sales of animals and products at 46 per cent (n = 14), sale of crops was 17 per cent (n = 5), and petty trading was 10 per cent (n = 3). Three per cent (n = 1) of the respondents indicated that salaries or wages were their source of income and another three per cent (n = 1) said that they depended on money sent by their children in Johannesburg, as seen in Figure 23.

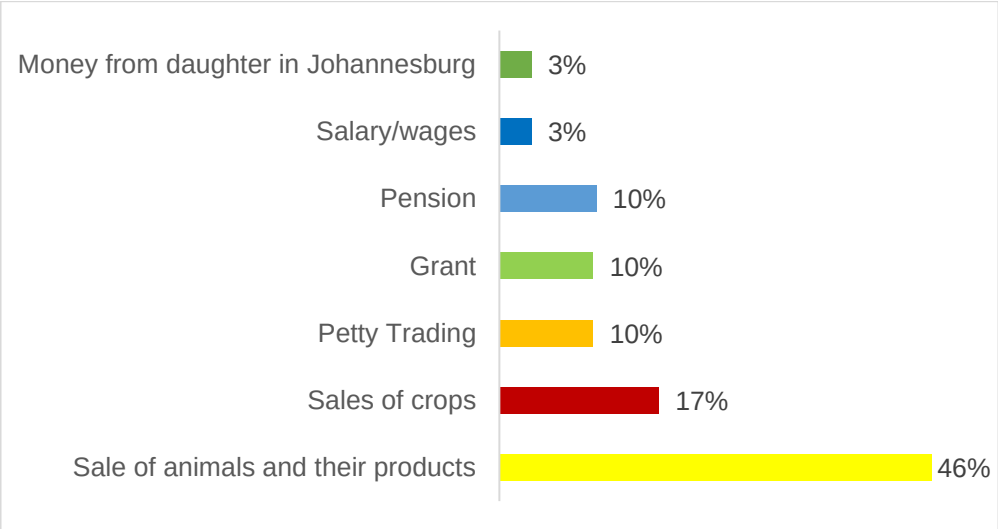


Figure 23: Farmers' sources of income

4.2.2.4 Theme 4: Value chain

Section E of the research instrument asked four questions on the goat production value chain characteristics, the results of which now follow.

- *Question E1:* Why do most people in this province keep goats?

For this question, respondents were allowed to select more than one answer. The main reasons for people keeping goats were for selling, followed by investment, dowry, and consumption, as seen in Table 6. Respondents said that they sold goats to make ends meet, feed their families, make a profit, and engage in the value chain of the goat market.

Table 6: Reasons for keeping goats

Reason	Percentage
Selling	100%
Investment (savings)	71%
Dowry (offering)	33%
Consumption	29%
Status	27%

Table 7: Assistance from agricultural and rural development experts

Question	Option	Respondents (n)	Percentage
• *Question E2:* Do goat farmers get assistance from the Agricultural and Rural Development experts?	Yes	27	90%
	No	3	10%

The results in Table 7 answer question E2. Of the respondents, 90 per cent (n = 27) stated that they got assistance and support from the government through rural and agricultural development initiatives. The government offered training, and grants in the form of money to buy livestock and crops, and pay wages, among other expenses. These respondents were grateful for the government initiatives. However, 10 per cent (n = 3) of the respondents were not receiving assistance from the Agricultural and Rural Development experts.

- *Question E3:* What are the reasons for not being rendered assistance?

Ten per cent (n = 3) of the respondents said they were not receiving assistance from Agricultural and Rural Development experts due to the following reasons

- They had not enrolled in the programme for goat farming by the local community as they did not consider it useful;
- They were not aware of any experts in the area; and
- They were subsistence farmers with few livestock.

- *Question E4:* What are your suggestions for improvement of the value chain in goat meat production?

There are several loopholes highlighted in the current value chain, which respondents felt needed addressing. Of respondents 80 per cent (n = 24) mentioned the need to be paid for their products on time. Money received early could help in early reinvestment into the industry, thereby enabling farmers to grow and become well established; a positive step in eventual commercialisation. There was a lack of information sharing and supply chain visibility from producers through to retailers and vice versa. Information sharing is required for planning purposes; farmers need

to know future expected quantities to meet demand. If information is shared, retailers will know what future quantities to expect and their estimated cost.

4.2.2.5 Theme 5: Seasonal variations

Section F of the research instrument asked for levels of agreement on two sets of seasonal variations, with the results below.

- *Question F1:* Do you agree with the following efficiencies and constraints linked to seasonal variations?

As seen in Table 8, over 90 per cent (n = 27) of the goat farmers perceived goats to be well adapted to harsh climates and easy to rear. Over 65 per cent (n = 20) of respondents noted that a lack of demand for goat meat was not related to the efficiencies and inefficiencies of goat meat production, while 40 per cent (n = 12) identified biological, economic, and cultural hindrances as being the main constraints in goat meat production.

Table 8: Efficiencies and constraints linked to seasonal variations

Efficiency/Constraint	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
Goats are hardy and well adapted to harsh climates making them easy to rear	9%	0%	0%	53%	38%
The presence of goats in a mixed species grazing system can lead to more efficient use of the natural resources	10%	0%	12%	60%	19%
Biological, economic and cultural hindrances are the main constrains that hinder goat meat production	10%	33%	0%	45%	12%
Lack of demand on goat meat constrains goat production	36%	31%	11%	0%	22%

Note: Strongly Disagree = 1, Disagree = 2, Indifferent = 3, Agree = 4, Strongly Agree =5

- *Question F2:* Do you agree that management at farm level need to counteract seasonal variations with the following solutions?

All respondents agreed that education on different seasonal patterns would greatly improve farm management and counter seasonal variations in goat farming. Over 80 per cent (n = 24) stated that supplements would assist in countering seasonal variations. Only 22 per cent (n = 7) disagreed that adjusting animal numbers and mixing species would have a positive effect on seasonal variations (see Table 9).

Table 9: Farm level management to counteract seasonal variations

Solutions	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
Educate on different seasonal patterns	0%	0%	0%	31%	69%
Introduce some alternative supplements during the drought periods	0%	11%	0%	51%	38%
Improve by adjusting animal numbers and species mix by improving the range conditions	0%	22%	0%	40%	38%

Note: Strongly Disagree = 1, Disagree = 2, Indifferent = 3, Agree = 4, Strongly Agree = 5

4.2.2.6 Theme 6: Social business model

Section G of the research instrument asked four questions on the social business model.

- *Questions G1 and G2:* Are farmers in this province members of any local organisations or association, if yes, which associations do they belong to?

Table 10 shows that all goat meat farmers belonged to a local organisation or association; all respondents belonged to the farmer's co-operative scheme empowered by the government, while 18 per cent (n = 5) belonged to the Women's Association and seven per cent (n = 2) to a savings and credit institution (private sector).

Table 10: Local organisation or association membership

Variable	Option	Percentage
Membership of any local organisation or association	Yes	100%
Organisation / Association	Farmer's Cooperative	100%
	Women's Association	18%
	Savings and Credit Institution	7%

- *Question G3:* Does the membership to affiliations benefit the goat farmers in the following respects?

The majority of goat meat farmers believed that being part of an organisation helped with pricing, or bargaining for good pricing, technical advice, and access to farming equipment. As per Table 11, 50 per cent (n = 15) of the respondents strongly agreed that reliable storage facilities were a benefit of the affiliation. Affordable input prices, strong bargaining power and low cost credit were seen by the majority of respondents as the main benefits of the association.

Table 11: Membership / Affiliation benefits

Benefits	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
Reliable storage facility	10%	0%	0%	40%	50%
Fast input delivery	10%	0%	0%	50%	40%
Increased savings	10%	0%	0%	60%	30%
Fair farm gate output price	10%	0%	0%	60%	30%
Easy Access to Credit	10%	0%	0%	50%	40%
Strong bargaining power	10%	0%	0%	70%	20%
Affordable input price	10%	0%	0%	70%	20%
Low cost credit	10%	0%	0%	70%	20%

- *Questions G4 and G5:* Are the goat farmers members of the agricultural extension package in your District? If yes, which of the following services have they received so far?

Table 12 shows the awareness of the agricultural extension packages, revealing that 93 per cent (n = 28) of the respondents knew about the packages. A good example of the agricultural extension packages in which the respondents participated included technical advice, farming equipment, capacity building training, consumables, market information, weather, and credit.

Table 12: Membership of agricultural extension package and services received

Variable	Option	Frequency (n)	Percentage
Member of the agricultural extension package	Yes	28	93%
	No	2	7%
Services received from the agricultural extension package (n=84)	Technical advice	30	100%
	Farm equipment	27	90%
	Capacity building training	26	88%
	Fertilizer	18	60%
	Improved seeds	17	57%
	Market information (input or/and output)	16	55%
	Weather related/Meteorological	10	33%
	Credit	4	12%

4.2.2.7 Theme 7: Socio-entrepreneurship

Section H of the research instrument asked five questions on socio-entrepreneurship.

- *Question H1:* Who are the major buyers of the goat meat in the district?

Table 13 shows goat meat buyers were mostly intermediaries (middlemen) from local towns, neighbouring towns, and other provinces. They mostly buy livestock to resell for rituals, celebrations, and for eating.

Table 13: Goat meat buyers

Option	Frequency (n)	Percentage
Middlemen from towns	14	47%
Rural consumers	9	30%
Cooperatives	3	10%
Urban consumers	3	10%
Others	1	3%

- *Question H2:* How do farmers acquire market information pertaining to output prices?

The respondents were allowed to select more than one option. Table 14 shows that 69 per cent (n = 21) of information comes from the government, with less than half coming from other sources such as neighbours, radio, mobile, television and middlemen.

Table 14: Acquisition of market information

Option	Frequency (n)	Percentage
Government	21	69%
Neighbours	14	47%
Radio	13	44%
Mobile	5	18%
Television	3	11%
Traders/Middlemen	3	11%

- *Question H3:* Which areas should entrepreneurs invest in if they wish to uplift the lives of small-scale farmers and create commercial markets?

Respondents considered advertising of goat meat by-products such as goat milk soap, goat milk paint, leather, goat horns, candles, or mohair could help to improve the value chain, thereby making a case for commercialisation. More research into

effective feeding techniques and feed types could also improve high quality meat availability with healthy goats available on the commercialised market.

Marketing, funding and technical support were other issues raised that could improve the value chain. Respondents highlighted investment in grassroots production and farmer education as a requirement to uplift small-scale farmers and create commercial markets. Good road infrastructure and an efficient and affordable transport system were also factors mentioned which needed much investment. Availability of land and commercially certified feed would also be required factors.

There was also mention of the need for educational programmes centred on goat farming at high-grade facilities, where new information, industry developments, and solutions are shared. These educational programmes could also promote interaction and sharing of ideas among farmers, while driving towards commercialisation.

- *Question H4:* In your opinion, do you think the government is doing enough to improve conditions for small-scale farmers in the goat industry? Please provide reason/reasons for your answer.

The consensus, by over 90 per cent (n = 27) of respondents, was that the government was not doing enough to improve small-scale farmers' conditions with the aim of encouraging commercialisation. This specifically referred to land availability and monetary subsidies to assist with buying expensive production inputs. Bureaucracy in grant approval and payments, which came via the municipality and not directly into farmer's accounts, had negative connotations because delayed money cost the business in early investment.

Ten per cent (n = 3) mentioned that the government did indeed help, and highlighted the training and information and starter pack offered by the state, which was useful in goat farming.

- *Question H5:* What efforts are done to integrate the smallholders with the market?

All respondents indicated that no efforts were being made to integrate small-scale goat farmers into the market. Respondents suggested entrepreneurs could assist with advertising.

4.2.2.8 Theme 8: Distribution

Section I of the research instrument asked six questions on distribution. follow.

- *Question I1:* Do you have road access to the nearest town/city?

According to the respondents, the Kuruman district was developing steadily and most respondents had road access to the nearest city or town, as seen in Table 15 A small percentage, however, was on the underdeveloped side of the town, making it difficult to access roads. One respondent explained that they were in negotiations with the town council about the land that they have occupied because, according to the respondents' history, the land had belonged to their ancestors and they were removed illegally to give way to white farmers who later abandoned the land. The respondent concluded, saying, "*We are confident that we will win and the government will build roads for us*".

Table 15: Road access to the nearest town / city

Option	Frequency (n)	Percentage
Yes	27	89%
No	3	11%

- *Question I2:* Where is the nearest town/city where you sell your products?

Most respondents sold their goats to markets in towns nearby such as Vryburg, Olifantshoek and Upington. Figure 24 is a map of the Northern Cape Province with the towns in the province. Kuruman town is close to the North West Province.

Figure 24: Map of Northern Cape Province

Source: Vosbol International (undated)

- *Question I3:* How do goat farmers get to the nearest output markets?

Roads were the most common mode of transporting goats from the farms to the towns for sale, with over 90 percent (n = 27) of the respondents saying they used roads. Most respondents hired trucks to transport the livestock, which had a negative impact on profit margins. Those who had their own mode of transport complained about the economy of this country having a negative impact on oil prices and rand exchange rates.

- *Question I4:* In your view, why do you think there are just a few small-scale farmers producing meat that can be sold by retailers, e.g., Pick and Pay?

Apart from the perception of low demand, over 50 per cent (n = 15) of respondents conceded to the fact that small-scale farmers could not keep up with the high quantities and quality of meat that retailers required. Therefore, retailers did not want to take the risk of listing products with intermittent supply as this affected customer service levels, giving an overall negative perception of retail brands.

Other respondents believed that retailers were unaware of the existence of the goat meat market; hence, no effort was made to list it in their retail stores. To make matters worse, there was general resistance to change where respondents thought that people preferred the meat to which they were accustomed, like beef, chicken, mutton, and pork. They also believed these are easier to farm than goats. Goat meat was perceived to be mainly for traditional, and not commercial, purposes; therefore, there was no motivation to produce high volumes because demand was not commercial.

Lack of extensive market research on the goat market was cited as another reason for so few small-scale commercial farmers producing goat meat. In the modern-day farming business, farmers needed reliable demand information to help determine estimated profitability from anticipated sales in relation to cumulative inputs needed. There was mention of direct marketing to grow this market, as well as targeting specific retail outlets for particular markets.

- *Question I5:* Do you think businesspeople could assist in solving some of the distribution problems being experiencing by goat farmers?

Table 16 shows that the majority of respondents (n = 28) believed that businesspeople could assist small-scale goat farmers to distribute their products. One respondent stated, "*Not only individual businesspeople, the private sector can participate including the motor industry, social and enterprise development programs in organisations in order to improve their transformation scorecards*". Another respondent mentioned the idea of the private sector training the youth in in the logistics and transportation business.

Table 16: Assistance from Businesspeople

Option	Frequency (n)	Per cent
Yes	28	93%
No	2	7%

- *Question I6:* Which alternative distribution systems can lead to a successful commercialisation of goat meat?

Although this question asked about alternative distribution systems, it was largely misinterpreted with the majority of respondents stating the need for advertising on TV and radio, as well as in newspapers and social media in order to gain traction for goat meat in the market.

4.3 Results from Consumer Interviews

4.3.1 Demographic Profile of Consumers

The consumer respondents in this research study consisted of 20 goat meat consumers or traders from Johannesburg, Gauteng Province. Over half of the consumer respondents were female and in the 36 to 45-year-old age group. Consumer responses indicated that goat meat consumption was largely associated with cultural and ritualistic reasons. Most consumers identified as Christians and consumed goat meat for ritual or traditional occasions. The second largest group, which identified with ‘African traditional’, religion consumed goat meat for rituals, ancestral offerings, and other traditional purposes. Consumers who identified as Islamic indicated that they consumed goat meat for feasts and celebrations. While most of the farmers only had a primary school education, just less than half of the consumers (45%, n = 9) had high school and just over half had a higher education qualification. The detailed demographic profile of the consumer group is outlined in Table 17.

Table 17: Demographic summary of consumers

Variable	Option	Frequency (n)	Percent
Sex	Male	9	45%
	Female	11	55%
Age Group	24 years and below	1	5%
	25 – 35 years	3	15%
	36 – 45 years	8	40%
	46 – 50 years	5	25%
	51 – 60 years	3	15%
Religion	Christianity	14	70%
	African traditional and Diasporic	2	10%
	Islam	2	10%
	Buddhism	1	5%
	Hinduism	1	5%
Level of education	High School	9	45%
	Diploma	4	20%
	Bachelor's Degree	5	25%
	Masters	1	5%
	Doctorate	1	5%

4.3.2 Emergent themes from data collection

This section presents consumers' responses to the consumer interview questionnaire, which investigated consumer behaviour, patterns, and preferences regarding goat meat.

4.3.2.1 Theme 1: Consumer habits

Habit refers to a settled or regular tendency or practice, especially one that is difficult to give up. Section B of the research instrument asked three questions on customer habits, or regular practice and these results are discussed below.

The majority of respondents (70 per cent, n = 14) indicated that goat meat consumption was a regular part of their lifestyle. These consumers used goat meat regularly for rituals that were important for their well-being. One respondent explained that Zulu traditional rituals required the use of live goat animals and goat skin, following which the goat meat was eaten. Close to half the respondents (45 per cent, n = 9) said they would purchase goat meat if it were readily available. The same number confirmed that they would incorporate it into their diet, by replacing other

meat protein with chevon. Half the respondents (50 per cent, n = 10) indicated that they would not incorporate goat meat into their diet even though they consumed it for traditional or ritual purposes. The detailed results are listed in Table 18.

Table 18: Goat meat preferences

Variable	Option	Frequency (n)	Percentage
• *Question B1:* When you think of goat meat. Do you think that it is something that you need or do not need?	Need	14	70%
	Do not need	6	30%
• *Question B2:* If goat meat were available today in your local supermarket, how likely would you buy it?	Not likely	5	25%
	Not sure	5	25%
	Very likely	9	45%
• *Question B3:* Would you replace your meat consumption with goat meat?	Yes	9	45%
	No	10	50%

4.3.2.2 Theme 2: Consumer preferences and tastes

Section C of the research instrument asked one question on consumer preferences or subjective tastes of individual consumers measured by their satisfaction after purchase.

- *Question C1:* Tick the features that affect your purchasing decisions of goat meat, according to importance.

The majority of consumers identified as Christians and therefore did not believe that Halal certification of the goat meat product was important, accordingly only 35 per cent (n = 7) considered it as vital. Most consumers 85 per cent (n = 17) considered quality to be the most important factor in their purchase consideration. Quality compensated for the "*unpleasant goat meat smell*". Responses are outlined in Table 19.

Table 19: Features affecting purchasing decisions of goat meat according to importance

Feature	Frequency		
	Not important	**Average Importance**	**Most Important**
Quality	5%	10%	85%
Ability to secure live animal	5%	35%	60%
Fat content	10%	35%	55%
Leanness	5%	55%	45%
Fresh (not frozen)	15%	35%	50%
Halal Certification	35%	35%	35%

Note: Not important = 1, Average = 2, Importance = 3, Most Important = 4

4.3.2.3 Theme 3: Accessibility

Accessibility refers to the quality of being able to be reached, obtained, or understood. Section D of the research instrument asked two questions on accessibility or the ability to easily reach, obtain, or understand goat meat products. The results are discussed below.

- *Question D1:* To what extent do the following factors cause difficulties in the purchasing of goat meat?

The respondents indicated that goat meat was not available in retail stores and therefore had a low level of accessibility. A lack of information about the availability of goat meat in the country was the most important obstacle to goat meat purchases, followed by a lack of availability in local supermarkets, and third, a lack of availability of fresh meat. See Table 20. Respondents further indicated that fresh goat meat sources were important because if the ruminant was not slaughtered properly, goat hair was found in the meat. Others cited that goat meat had a negative stigma associated with witchcraft.

- *Question D2:* How do you prefer your goat meat to be typically available in retail stores?

Over half the consumers (55 per cent, n = 11) preferred to buy prime cuts as opposed to buying a full carcass or slaughtering a goat themselves, as seen in Figure 25. The respondents mentioned that prime cuts were ready to cook and easy to cut, unlike the carcass.

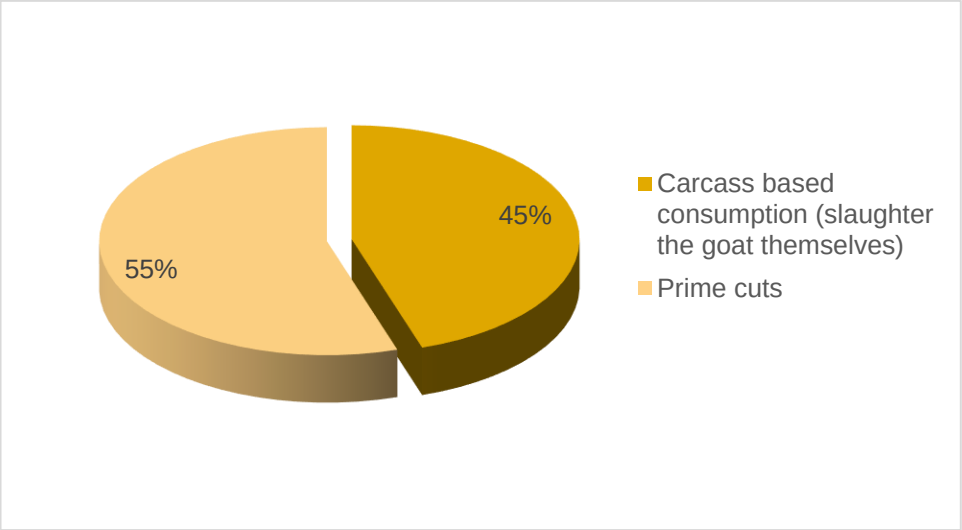


Figure 25: Preference for goat meat typically available in retail stores

Table 20 summarises the factors causing difficulties in purchasing goat meat. Consumers found it difficult to purchase goat meat due to limited availability at local supermarkets, along with limited availability of fresh meat and a lack in information.

Table 20: Factors causing difficulties in purchasing goat meat

Factor	Frequency		
	To a small extent	Indifferent	To a great extent
Availability in local supermarkets	5%	35%	60%
Availability of fresh meat	10%	35%	55%
Lack of information	20%	20%	60%
Comfort in buying directly from the farmer	30%	30%	40%

Note: To A Small Extent = 1, Indifferent = 2, To a great extent = 3

4.3.2.4 Theme 4: Competition

Section E of the research instrument asked two questions on consumer preferences for different types of meat protein. This was framed as competition or rivalry between different meat producers and substitutions for goat meat. These results are discussed below.

- *Question E1:* How do the following factors affect competition between goat meat and other types of meat?

Respondents were asked what factors affected preferences between different types of meats. Based on responses, pricing, taste and availability were the main factors. See Table 21. Pricing was important given affordability and staple food considerations.

Table 21: Factors affecting competition between goat meat and other types of meat

Factor	Frequency		
	To a low extent	Not sure	To a greater extent
Price	5%	20%	75%
Preference and taste	5%	20%	70%
Availability	10%	30%	60%
Customer care	15%	40%	45%
Packaging	10%	55%	35%

- *Question E2:* Choose the meat you would prefer to accompany your daily meals.

The respondents were allowed to select more than one option. Chicken was the most preferred type of meat, followed by beef and lamb. Goat meat was preferred over pork and game. See Table 22.

Table 22: Meat preferred as accompaniment to daily meals

Meat	Frequency (n)	Per cent
Chicken	19	95%
Beef	17	85%
Lamb	17	85%
Goat	14	70%
Pork	11	55%
Game	9	45%

4.3.2.5 Theme 5: Price

Price is the amount of money expected, required, or given in payment for something. Section F of the research instrument asked six questions related to price or the amount of money consumers expected to pay. The results are discussed below.

- *Question F1:* At what price do you purchase your meat per kg?

Figure 26 illustrates that goat meat was relatively highly priced compared to other meat options such as pork and chicken and, as a result, many consumers could not afford to consume it on a daily basis. Another reason for relatively high goat meat prices could also be explained in relation to price elasticity, which determines the price of goods based on demand. The supply of goat meat in Gauteng is not sufficient to meet the demand and therefore causes the price to increase as there are many people competing for small volumes of goat meat. The prices reflected in Figure 26 were obtained by telephoning meat suppliers and checking the internet for meat prices, including chevon.

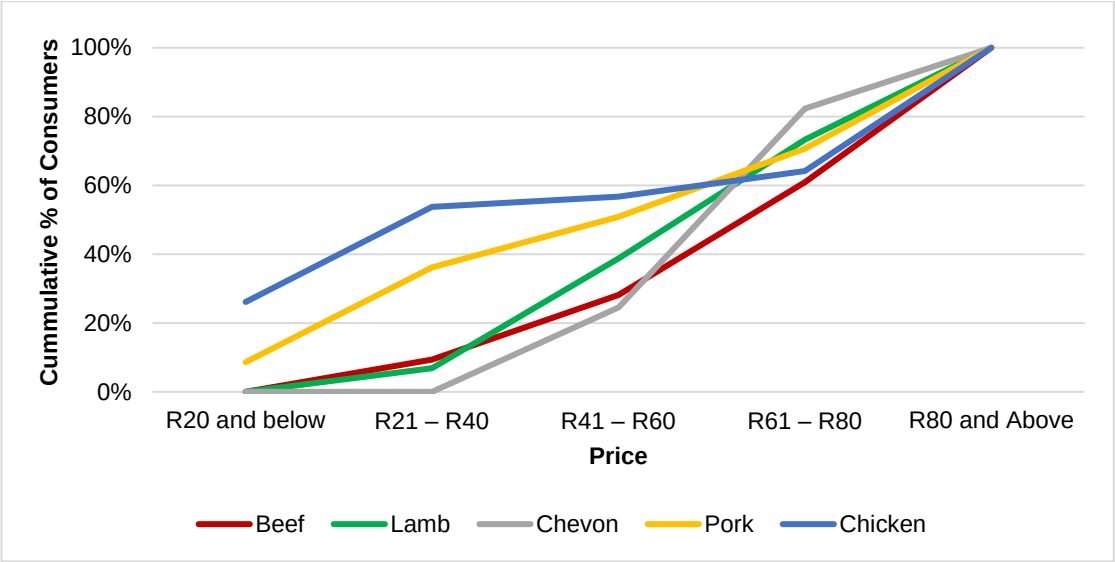


Figure 26: Price elasticity of demand

- *Question F2*: What is the level of pricing of goat meat in the Gauteng Province?

Three quarters of the respondents (n = 14) agreed that goat meat in Gauteng Province was highly priced. Their reason was that there were very few goat farmers in Gauteng mainly due to population density. "*We are paying for transportation*" said one respondent.

- *Question F3:* Do you agree that low pricing will increase demand on goat meat?

Many consumers (60 per cent, n = 12) believed that competitive pricing may increase demand for goat meat. However, 40 percent (n = 8) of respondents answered "*not sure*" and "*no*" meaning that pricing was not the only factor to increase consumption of goat meat.

- *Question F4:* Do you agree that high quality goat meat will increase demand irrespective of price?

Most respondents (75 per cent, n = 14) agreed that a superior quality of goat meat may increase demand, regardless of its higher price because improvements in quality may attract a sceptical consumer market.

The results of Questions F2, F3, and F4 are summarised in Table 23.

Table 23: Pricing of goat meat

Option	Rate	Per cent
• *Question F2*: What is the level of pricing of goat meat in the Gauteng Province?	Low	10%
	Fair	20%
	High	70%
• *Question F3*: Do you agree that low pricing will increase demand on goat meat?	Yes	60%
	Not sure	35%
	No	5%
• *Question F4*: Do you agree that high quality goat meat will increase demand irrespective of price	Yes	70%
	Not sure	25%
	No	5%

- *Question F5:* Do you agree that religious holidays cause an increase in goat meat pricing?

Two (10 per cent) respondents agreed that religious holidays caused an increase in the price of goat meat as a result of a demand-push. Some respondents believed that the price increase was due to increased margins applied by retailers during specific religious holidays such as Ramadan and Easter because demand was not elastic during these periods.

- *Question F6:* How often do you look for promotional prices on goat meat*?*

The results in Table 24 show that only six (30 per cent) respondents always looked for promotional prices on goat meat. However, consumers mentioned that because goat meat is not a common meat to find in the shops, they were accustomed to the unavailability of promotional prices.

Table 24: Promotional prices on goat meat

Option	Percentage
Never	15%
Once in a while	30%
Sometimes	25%
Always	30%

4.4 Results from Government Official Interviews

4.4.1 Demographic profile of government officials

Section A of the government officials questionnaire covered demographics. There were limited respondents from the agricultural and rural experts. As only five responses were received in this category, it was difficult to present detailed demographics. However, three males and two females participated in the research investigation.

4.4.2 Emergent themes from data collection

This section presents the results of the data collected from the interviews with government officials. The results are classified under three sections in the questionnaire, namely, 1) value chain, 2) seasonal variations, and 3) price and distribution, as discussed below.

4.4.2.1 Theme 1: Value chain

- *Questions B1 and B2:* Do you assist goat farmers through your office, if no, why not?

Government officials stated that they had assisted small-scale goat farmers. According to the respondents, support was provided to farmers at various stages of development, such as start-ups and established enterprises. Farmers accessed these

support services through community roadshows as well as through government offices.

- *Question B3:* What innovations are being championed by your organisation in the development of the goat industry in your province?

Government officials believed that local government in the Kuruman district had led programmes, which included:

- Vaccination programmes,
- Innovative breeding techniques,
- Agricultural technology (drones, tracking devices for livestock and so on),
- Monitoring and evaluating techniques,
- Learning and development,
- Business studies, and
- Financial planning.

- *Question B4:* What efforts are done to integrate the smallholder farmers with the market? What are the challenges and opportunities at their disposal?

Government officials argued that the opportunities available to smallholder farmers exceeded the challenges in the market. Opportunities that were highlighted included land redistribution, which aimed to provide previously disadvantaged farmers (black, Indian and coloured) with land for agricultural purposes, and support to develop them into commercial farmers. Respondents conceded that the greatest challenge was that chevon is not as popular as beef and lamb. One respondent said, "*What needs to happen is for the government to educate communities about goat farming and goat meat consumption in order to create a market*". Respondents also noted that export opportunities were available but with limited access for smallholder farmers because of the lack of education which created language and technical barriers.

4.4.2.2 Theme 2: Seasonal variations

Section C of the research instrument asked for levels of agreement on two sets of seasonal variation questions, the results of which are discussed below.

- *Question C1:* Do you agree with the following efficiencies and constraints linked to seasonal variations?

All the respondents agreed that goats were hardy and well-adapted to harsh environments, making them easy to rear. All respondents stated that the presence of goats in a mixed species grazing system could lead to more efficient use of the natural resources as they adapted easily to different grazing environments, unlike cows that needed large grazing areas and quality feed. Three (60 per cent) out of five respondents acknowledged that numerous factors affected goat meat production. One respondent said, "…*for example, the country has not enough goats to breed also some cultures regard goats as sacred*". See Table 25.

Table 25: Efficiencies and constraints linked to seasonal variations

Efficiency/Constraint	Agree	Disagree
Goats are hardy and well adapted to harsh climates making them easy to rear	100%	0%
The presence of goats in a mixed species grazing system can lead to more efficient use of the natural resources	100%	0%
Biological, economic and cultural hindrances are the main constraints that hinder goat meat production	60%	40%
Lack of demand on goat meat constrains goat production	80%	20%

- *Question C2:* Do you agree that management at farm level needs to counteract seasonal variations with the following solutions?

All five respondents agreed that farm management education was required to ensure the sustainability of farming activities throughout seasonal variations. Furthermore three (60 per cent) of the experts (as per Table 26) highly recommended formal learning and development through training on climate change as well as monitoring and evaluating tools or resources. Most respondents (80 per cent, n = 4) agreed that climate impacts such as droughts were a very serious challenge, not only in Kuruman, but in South Africa as a whole. One respondent explained: "*Sometimes we feel like God is not on our side when it comes to recent climate changes*". While

most respondents agreed that goat livestock were resilient in harsh weather conditions, most believed that it was advisable to keep a diversity of livestock and vegetation as a risk mitigation measure.

Table 26: Farm level management to counteract seasonal variations

Solutions	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
Educate on different seasonal patterns	0%	0%	0%	40%	60%
Introduce some alternative supplements during the drought periods	0%	0%	0%	80%	20%
Improve by adjusting animal numbers and species mix by improving the range conditions	0%	0%	20%	60%	20%

Note: Strongly Disagree = 1, Disagree = 2, Indifferent = 3, Agree = 4, Strongly Agree = 5

4.4.2.3 Theme 3: Price and distribution

Section D of the research instrument asked three questions related to price and distribution, the results of which now follow.

- *Question D1*: Do you think government intervention in the goat meat production market by establishing price control or subsiding of various products can help to keep goat meat prices low?

Government officials indicated that they did not have much control over pricing of various products; however, they believed that government interventions such as education, production support programmes, and marketing initiatives for goat meat products may influence goat meat pricing.

- *Question D2*: Which alternative distribution systems can lead to successful commercialisation of goat meat?

Currently goat meat is competing with other meats, which are doing well in the market with established distribution channels. One respondent explained, "*It is important that the goat farming industry to introduce the integrated system that will make sure that the support system works from beginning to the consumption*". The

respondents mentioned that this would ensure proper monitoring systems were in place.

- *Question D3*: Is there room for entrepreneurs to get involved and work with your organisation in upgrading the industry and form commercial markets for goat meat in your province?

All respondents agreed that entrepreneurs have a role to play in commercialisation and upgrading of the goat meat value chain. Respondents mentioned distribution channels such as '*buy-and-braai*', also known as '*chisanyama*', and abattoirs or processing facilities that required entrepreneurial innovation. Other entrepreneurial gaps noted included technology, vaccinations, processing, and transport or logistics.

4.5 Conclusion of Results

The objective of this primary research study was to respond to the five research questions.

(1) Is there a demand for goat meat in the Gauteng Province?
(2) Which innovation platforms assist in goat meat production in Kuruman, Northern Cape?
(3) Can a social enterprise business model driven by social entrepreneurs bring about success in the commercialisation of goat meat?
(4) Who are the key players in the value chain for commercial goat production in Kuruman, Northern Cape?
(5) How can an inclusive innovation platform be established and implemented for the integration of a sustainable goat value chain?

This was achieved by interviewing 30 small-scale goat farmers, 20 consumers, and five government officials involved in agricultural and rural development. Three different interview questionnaires were used. The data were presented in a summarised and graphic manner for comparison and from which conclusions were drawn. The outcomes of the data collection reported in this chapter forms the basis for the analysis of the potential of small-scale goat farming in Chapter 5.

CHAPTER 5:
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This section discusses the findings from the data presented in Chapter 4 and makes conclusions based on the data analysis. Policy recommendations and areas for further research are also discussed. The findings have a high potential for livestock production, which could be used as a policy tool to alleviate poverty. The research performed confirmed findings of previous researchers that the local government in Kuruman has indeed invested in goat farming for the benefit of smallholder farmers. Discussions with farmers and government officials in the area highlighted that there were still significant measures required to truly transform the goat meat value chain and leverage its potential. Specifically, additional interventions need to address the development of the goat meat value chain through vertical integration and initiatives to stimulate demand.

5.2 Demographic Profile of Small-scale Goat Farmers and Implications

Previous studies indicated that demographics such as age, gender, level of education and so on, significantly affected farmers' ability to scale from subsistence farming to commercial farming (Burgess, 2009; Yusoff, Man & Nawi, 2016). The demographics of the farmers' group and the impact of this on commercialisation in Kuruman are discussed in the sub-sections that follow.

5.2.1 Gender

Montshwe (2006) and Roets (2007) found that males dominated the agricultural sector of South Africa. Surprisingly, most respondents in this study (80 per cent, n = 24) were females. This finding is also not consistent with other studies performed by Burgess (2009), and Mahajana and Cronje (2000). While the results are unexpected, they are consistent with the specific historical context of South Africa in which males

left the rural areas in search of labour opportunities in the mines during the apartheid era. Later generations also left rural communities to seek economic opportunities in urban areas, leaving women to head rural households.

5.2.2 Age

A non-probability sampling method was used to select participants. Half (n – 15) of the respondents in this study were in their forties. However, this is not consistent with research conducted in Campbell, Eastern Cape by Burgess (2009), where the mean age of the respondents was 62 years old. Earlier research conducted by Mahanjana and Cronje (2000) in the Northern Cape also indicated that 66 per cent of the respondents, who were small-scale goat farmers, were older than 50 years showing a mean of 56 years. Bwire (2008) argued that older farmers may be more experienced in goat farming and less risk averse. However, it is also possible that they may be less likely to adopt new farming practices. Therefore, the younger mean age of farmers in Kuruman presents an opportunity for up-take of technology and improved farming practices.

The sample of participants' mean showed an average age of 43.6 years, participants therefore fell outside of youth category as defined in South Africa as persons between the age of 14-35 which constitute 37 per cent of the population (Statistics South Africa, 2020). The results of the study indicate that youth participation in goat farming is currently not attractive to young people, and here lies an opportunity to develop targeted programmes aimed at their participation. This is particularly important given that the majority of the unemployed are youth.

5.2.3 Education levels

Empirical research shows a strong, positive correlation between farmers' level of education and technology adoption as well as productivity (Bwire, 2008; Dube, 2015). Farmers with higher levels of education are better equipped to adopt innovative solutions. Bwire (2008) postulated that research in the area of innovation and goat production has indicated that this correlation is positive and strong.

The results from this study showed that over half (n = 18) of the farmers in the sample only had primary school education. Based on empirical research, this means that farmers in Kuruman are likely to be less efficient and innovative given their education levels (Roets, 2007; Bwire, 2008). The low levels of education will also make commercialisation interventions more challenging as farmers in Kuruman are less likely to understand value interventions than are their more educated counterparts. Innovation platforms for commercialisation in this case study may then require significant investment in training and development to ensure that farmers adopt new technologies and new farm management practices (Bwire, 2008).

5.3 Results from Thematic Analysis

The data analysis from interview responses revealed some overlapping themes in the three respondent categories, namely supply-side factors, demand-side factors as well as value-chain factors. This section discusses these themes and their practical implications.

5.3.1 Supply-side factors

5.3.1.1 Farmers

The age demographic of farmers in Kuruman is approximately 20 years younger than the demographic of previous studies. This finding is interesting because it shows that younger people either are increasingly choosing to enter into goat farming or are doing it as the most viable means of earning a living. As previously mentioned, a younger demographic has the potential to increase technology up-take. However, a younger demographic also reduces the experience level of goat farmers, which is also a significant constraint for farming management. This lack of experience could potentially be improved by increased education levels of younger farmers, which has been shown to also increase the level of understanding and ability to implement improved farming methods. Any innovation platform should not only consider the current demographics, but also be flexible enough to adapt to what might be an even younger age demographic in the future.

Most respondents indicated that their primary access to markets is through live auctions and out-of-hand sales. Neither channel offers pricing certainty, resulting in poor production planning and inconsistent revenue flow. This finding is consistent with findings in other African countries related to limited access to markets and industry value chains. Such weak marketing arrangements represent a major constraint to the transition from subsistence farming to commercial farming. An innovation platform in Kuruman would need to provide historical pricing information, pricing guidelines and clear links from producers to processors, retailers, and consumers.

5.3.1.2 Access to land

As mentioned in the literature review, land is the essence of all agricultural systems, therefore, it is crucial that farmers have access to or own the land they use for farming. In their research, Bassett and Crummey (1993) discussed the behaviour of people with respect to land and property as a source of income, and a place of residence and family life. This research also measured if farmers, who managed to run goat meat farms and commercialise, had access to land or if they owned the land on which they farmed. Nearly half (43 per cent, n = 13) inherited the land from their families, while a significant number (40 per cent, n = 12) rented their land.

In South Africa, women historically have suffered from cultural and legal restrictions in issues such as land ownership, land inheritance, and land use. Currently, women represent 60 to 80 per cent of small-scale farmers yet comprise only 15 to 20 per cent of landowners in sub-Saharan Africa (AGBIZ, 2018). The literature review noted that the Review of Agricultural Policies and Support Instruments stated that less than five per cent of commercial farmland had been transferred through land reform (Tregurtha et al., 2010). This indicated that South Africa is transforming very slowly in accommodating previously disadvantaged communities, and women are the most negatively affected.

Land also featured on issues affecting farmers or hindering their progress; the majority (67 per cent, n = 20) indicated a lack of land or no access to land as a major issue. These results are in line with South Africa’s history of racial domination, colonisation, and land dispossession, which resulted in the bulk of the agricultural

land being owned by the white minority. According to Clark, Feldman, Gertler, and Wojcik (2018), 20 years after the former homelands were incorporated into a unitary South Africa, apartheid's spatial geography is very much alive. Since the early 2000s, this continual discrimination has been fuelling rural to urban migration, the growth of informal settlements, and other informal occupations of land and has been linked to an increase in social unrest (Mbabu & Hall, 2011; Sauti & Lo Thiam, 2018). Although government took a resolution to amend the constitution to effect land redistribution without compensation, this has been slow, with the government reporting a nine per cent commercial land transfer through restitution and redistribution (Cousins, 2017). In addition, land tenure reform has been remarkably ineffective, with many poor people still living in insecure conditions.

Goat meat farmers could invest in machinery and bigger kraals that could accommodate more goats if they owned or had secure access to more land. The demographics of farmers in this research showed that the majority of the landowners were male. This is consistent with African culture, where females were not entitled to own land and neither could they inherit land from their parents.

5.3.1.3 Input suppliers

Responses from farmers and government officials indicated that farming methods were based mainly on experience, then to a lesser extent on training provided by the government. Interviews with government officials did not indicate an intentional focus on initiatives that promoted technology up-take for farmers in Kuruman. In the absence of a focus on technology and a general lack of policy investment into the development of production systems, it is clear that farmers in Kuruman might continue to be constrained by inefficiencies and legacy farming methods. Any innovation platform in this area would need to introduce the dissemination of production information and targeted technology, which would enable commercialisation.

Farmers also stated that poor access to consumers was a problem and they required insight into consumers' needs apart from the out-of-hand sales. Interviews with government officials also showed that local and national government had not invested in pricing, grading, weighing, and control systems for the goat meat

industry. No interventions provided have sought to improve communication between stakeholders such as traders, auctioneers, farmers, consumers, and exporters. The public-private partnership in the case study was limited to the Kalahari Kid Corporation, which, at the time of the study, did not seem to have gained significant momentum. Farmers had limited access to other actors in the goat meat value chain. Their primary access to consumers is through out-of-hand sales, which were limited, sporadic, and uncertain.

5.3.2 Demand-side factors

5.3.2.1 Processors and retailers

Farmers' primary access to livestock traders is through auctions and while auctions take place periodically, they do not provide significant certainty of demand. Conclusions with respect to the role of processors and retailers are limited in this study, as they did not form part of the respondent groups. However, it is safe to say that the current value chain structure in Kuruman was not collaborative. Respondents did not indicate whether they were in strong marketing associations or cooperatives. Musemwa et al. (2013) postulated that belonging to marketing associations or cooperatives could potentially lower transaction costs and increase economies of scale. An innovation platform in Kuruman should therefore leverage the potential benefit of cooperatives and marketing groups. This is particularly so for export markets which are an opportunity out of reach for individual farmers but might be viable when pursued through a representative organisation.

Farmer respondents also indicated that their distance from auction houses was a limitation to their income potential. This is unsurprising as distance from markets increases transaction costs and logistics complexities (Chipasha, Ariyawardana, & Mortlock, 2017). This finding was also consistent with findings in other countries such as Ethiopia. This further supported the argument for farmer groups and associations, which could reduce transaction costs on a scale basis.

5.3.2.2 Consumers

Both the consumer and farmer groups confirmed traditional socio-economic aspects of goats and goat meat. This finding was consistent with other research conducted in Limpopo Province in South Africa, by Roets (2007), and Van Rooyen and Homann (2007). This finding also confirmed the demand constraints highlighted in the literature review of goat farming on the continent. Any innovation platform would require demand stimulation activities, which educate consumers on the health benefits of goat meat, such as lower fat and higher fibre content than beef and chicken, in comparison to other meat products. The accessibility of goat meat in urban areas would need to be improved to overcome the social idea that goats are predominantly traditional animals relegated to rural and peri-urban areas.

The challenges that farmers faced included inadequate extension services, and poor research and development. Government did not actively support farmers with research and development or with engagement of the private sector to invest and support production. Skills and techniques of livestock breeding and management were poor and there was no effort to educate farmers on ways to improve their herds' ability to fight disease or provide meat according to market preference. An innovation platform would need to consider better access to veterinary services to control livestock diseases.

Low stock levels due to lack of resources and demand make the farmers' businesses non-viable; production was unorganised, supply was therefore sporadic, and there was no clear market source. In addition, there was overgrazing due to overcrowding of animals and poor land management practices; more land needs to be made available so that livestock densities are reduced. There was a general lack of agricultural policy understanding and legal issues were often overlooked. This tended to result in poor policy implementation.

5.3.3 Value-chain factors

5.3.3.1 Access to consumer insights and market information

Most of the farmers interviewed believed that the limited demand for goat meat or 'lack of market' was a severe constraint. Similar studies indicated that inefficiency of livestock marketing as well as poor marketing infrastructure and channels negatively affect commercialisation efforts (Kocho, Abebe, Tegegne & Gebremedhin, 2011). The lack of access to market information results in smallholder goat farmers being at a disadvantage when making decisions exposing them to opportunistic traders (Chipasha et al., 2017).

Goat markets are generally characterised by poorly managed and unrealistic carcass grading and pricing systems, inadequate promotion of goat meat, and an inadequate and inefficient transport system. Research by Musara et al. (2013) noted that the lack of an organised market system was a major constraint in goat meat production in Zimbabwe. They also found that the pricing systems, inadequate promotion of goat markets, and an inefficient transport system had negative effects on the commercialisation of goat production. This was consistent with the findings of this research, which found that the majority of the respondents named a lack of markets as a constraint to goat meat production. This has resulted in gross profiteering on the part of certain individuals, to the detriment of producers and consumers. Private butchers and middlemen bought live animals to sell in other areas, for example, towns, mines, hospitals, and schools, but this market was unorganised and unreliable (Gauthier, Gauthier & Christen, 1995).

It is interesting to note that over half of the farmers (53 per cent, n = 16) believed that goat meat pricing was a moderate constraint. This highlighted the lack of insight that farmers had about consumer preferences and willingness to pay. Interviews with consumers showed that they believed that goat meat was generally less affordable than other meat options such as chicken. The lack of integration in the goat meat market meant that farmers did not have a clear 'line of sight' on how the prices they charge to traders influenced the final retail price. Weak pricing considerations by farmers also pointed to the 'non-commercial' mindset. A profit-orientated producer would consider goat meat pricing and its influence on his/her ability to generate a

profit. However, based on the farmers' responses, this mindset was apparently lacking in Kuruman. Any innovation platform would need to train farmers to think in terms of profit and not simply income.

Prices of goats were set across all markets by farmers according to goat size, and buyers did not pay for better goat quality, even if purchasing at a farm gate. However, farmers tended to be in a better position to set prices at the farm gate, where buyers incur most of the transaction costs, unlike the other marketing options that limited the bargaining power of the farmers.

Lightfoot and Scheuermeier (2006) further suggested that production without access to market does not benefit the farmers and is a disincentive to production and participation. Although road infrastructure in some parts of South Africa is not well developed, it was assumed that most goat farmers in Kuruman were not restricted when taking their products to the cities or the main markets due to the close proximity to nearby towns.

Smallholder producers, and not commercial companies, dominate Goat marketing. The constraints for commercial company involvement are low quality, uneven supply, and lack of uniform carcasses. Policy is silent on goat meat marketing, focusing specifically on consumption patterns and profitability, quality of goats and goat meat supply, and goat meat that is unregulated. This research also highlighted that most small-scale farmers could not meet the bigger demand and better quality that retailers required. This setback caused large retailers to concentrate on all other types of meat, apart from goat, because they did not want to create customer expectations and then disappoint by failing to meet demand.

5.3.3.2 Transportation and proximity to purchasers

Results from the interviews indicated that most farmers had access to buyers in nearby towns and they used road transport to deliver to these markets. While this mode of transportation presented challenges related to fuel and margins, transport in Kuruman is more sophisticated than some other countries where, according to Homann et al. (2013), transportation and delivery take place through walking or scotch carts. The farmers in Kuruman were not questioned about transportation

challenges related to the health of their goats, such as, significant loss of body weight, considerable bruising, and mortality. However, it was assumed that the proximity to the nearby towns, such as Olifantshoek, limited the impact of these challenges.

5.3.3.3 Integration of stakeholders

There are many key players in the value chain for commercialisation of goat farming such as goat farmers, traders, input suppliers, government (Agri-sector), researchers, consumers etc. that are operating in isolation. The creation of a platform to facilitate integration and collaboration will improve commercialisation prospects by addressing the challenges faced by the industry.

5.4 Value Chain Solutions

5.4.1 Policy recommendations

5.4.1.1 Technical policies

This study revealed four main technical constraints that work against successful improvements and sustainability in small ruminant production and productivity:

(1) Deficient genetic potential of indigenous livestock,
(2) Widespread distribution of livestock diseases,
(3) Inadequate feed supplies and poor animal nutrition, and
(4) Poor marketing infrastructure and arrangements.

Commercialising goat farming has the potential to alleviate poverty, ensure food security and improve livelihoods among communities. Given the potential benefits, national government should consider increasing investment in the research of technologies to improve goat breeding, tracing through identification tags, and meat processing. As important is an increased investment in research, which should allocate funds for disseminating this research to farmers through cooperatives, local government channels, and cooperatives or farmer associations. Access to extension services and research data should be legally confined to cooperative structures or farmer associations. Organising farmers will promote cost efficiencies, dissemination

of information, and technology up-take. Investment in research and initiatives to disseminate this information is a starting point to address breeding quality constraints experienced by smallholder farmers. While extension services are important, quality breeds and well-informed breeding management serve as the foundation for farming goats.

5.4.1.2 Commercialisation policies

Commercialisation policies should address non-technical constraints such as:

- The balance of operations and management between central and local governments,
- An almost universal absence of clear livestock development policies and strategies,
- National standards for grading and pricing,
- National import substitution protocols,
- Commercialisation incentives; and
- The possibilities of cost recovery for goods and services.

Local government initiatives will always be limited by local government capacity and budget allocations. A commercialisation policy requires a state-led national mandate, which should include a comprehensive national livestock development policy, standards for grading and pricing of carcasses, and import substitution objectives. To incentivise commercialisation, this national policy should include wholesale funding packages and tax incentives to promote profitability and the recovery of costs.

Vanderhaeghen (2016) in the Farmers Weekly showed that a rural development project targeted at empowering female goat farmers in KwaZulu Natal is reaching new levels of success. "*The demand for goats in South Africa is insatiable, and production cannot keep up with demand"* stated the Rural Development Project director, Rauri Alcock. The growth is real and requires considerations for commercialisation of goat farming. However, new female entrants cite land ownership, access to markets and financing as barriers to entry. Additionally, female farmers find it difficult to obtain support from their male counterparts and thus may

benefit most from co-operatives that are female-led. The South African financial sector should be encouraged to follow the Grameen Bank small business micro-financing model which targets rural women and finds doing business with them more advantageous comparative to men.

5.4.1.3 Development policies

The study revealed the following disincentives to increased growth:

- A credit environment unsympathetic to smallholder borrowers,
- Weak financial services, and
- Unclear land tenure policies.

Land ownership can yield two significant results: first, it can improve farmer confidence and act as an incentive to increase investment and production volumes. Land ownership could also enable farmers to invest in feedstock crops as well as other crops to diversify revenue streams. Second, land ownership has a significant impact on profitability. Commercialisation requires control of farming costs and if farmers can operate on 'free' or minimal rental properties, this would improve their profitability prospects. The South African government's current objectives of land redistribution without compensation could assist with this. This could also be revolutionary for innovation platforms (designed to ensure strong working relationships between multiple stakeholders) such as the one designed as an outcome of this study (see Appendix A). Third, land assets can be used to obtain credit or working capital facilities. As this study and others have shown, access to credit or funding is also critical in commercialisation schemes. The redistribution of land to farmers should attach rights of ownership, which include turning the asset into collateral for loans even if they do not include the right to sell.

5.4.2 Praxis model

The research conducted has been designed to inspire and inform practical innovative models that will improve diversity and inclusion in the social-ecological system in South African goat meat farming. The Praxis is summarised in this section and a detailed report is attached in Appendix A. In summary:

- *Opportunity*: Historical, institutional, market, information, and research failures have resulted in a fragmented industry that has excluded small-scale farmers from the mainstream industry. Despite the structural weaknesses of the goat meat industry in South Africa, the goat meat market presents considerable growth potential due to the high demand for quality goat meat.
- *Inclusion*: Women in South Africa are most negatively affected regarding land ownership, as women historically and culturally were not allowed to inherit land. The Goat Meat Innovation (GMI) business model is designed to address the challenges in small-scale goat farming as well as the various stakeholders in the value chain included in commercialising goat farming.
- *Innovation*: The GMI model is an innovation required in the South African goat meat industry to safeguard traceability, quality, and consistency of supply. It will ensure that consumers can find the product they require through the regularity of stocks in food service industries, butcheries, and online platforms. The GMI process includes farm integrity, transport safety, processing reliability, and meat quality as key strategies.
- *Practicability*: The GMI model is practical as it is a vertically integrated model with three steps, incorporating role players and processes consisting of production, processing and route-to-market strategies as per Figure 27.

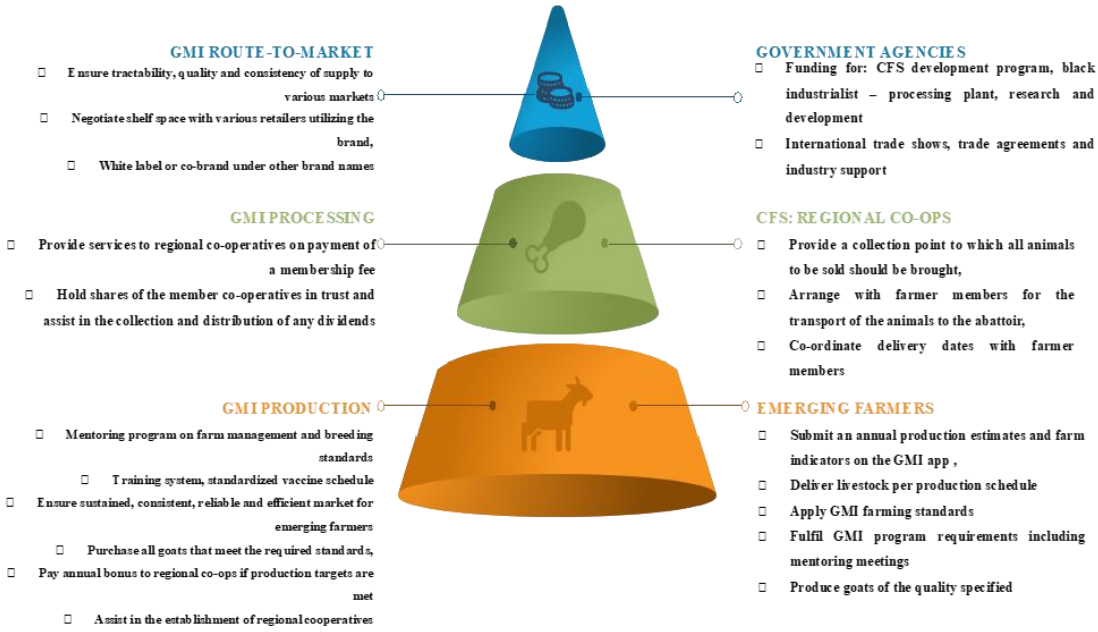


Figure 27: GMI structure and role players

Source: Researcher's own

- *Sustainability*: The term 'triple bottom line' (TBL) is a concept designed to understand sustainability, consisting of planet, people, and profit (Elkington, 1997). The TBL process articulates that there needs to be a balance within sustainability processes. The GMI process is about people, or the empowerment of farmers, planet, or the preservation of nature and understanding the climate, and profit, or the profitability of goat farming for the farmers.
- *Prototype*: The GMI model consists of three vertically integrated phases namely, GMI production, GMI processing, and GMI route-to-market (Figure 28). The processes are linked through the participation of various stakeholders in the value chain.

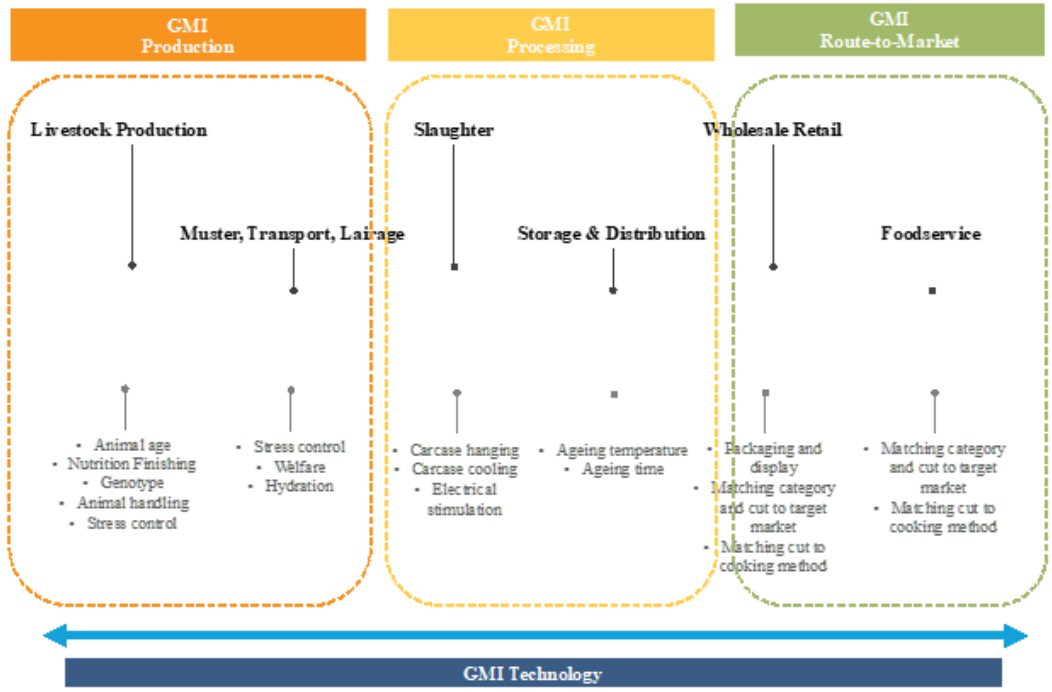


Figure 28: The GMI vertically integrated process

Source: Adapted from: MLA (2016)

5.5 Conclusion

Goat production has the potential to improve the livelihoods of poor, marginalised rural economies in the Northern Cape Province. In order to realise this potential, there is a need for deliberate intervention through innovation platforms designed to address challenges in the value chain and improve both productivity and market access. Goats have attributes that are significant to the successful transformation of rural economies. They require a low nutritive feed (Lebbie, 2004). They also have short generation intervals and high reproductive rates that lead to increased turnover, ensuring reduction in investment risk (Homann et al., 2007). The factors highlighted above are critical to the improvement of rural livelihoods through the inclusion of marginalised communities. Goats are, therefore, an ideal option in the alleviation of poverty as well as ensuring food security and improved livelihoods among small-scale goat farmers.

Communal goats are vital in the livelihoods of resource-limited communities in developing countries. They contribute significantly to household food security and assist in seasonal food variability and availability. Their ability to graze and browse a wider diversity of plants, withstand arid conditions, and reproduce quickly gives them a better chance than other ruminants of surviving in harsh environments. Despite the potential that goats possess in transforming the livelihoods of goat farmers, their utilisation remains low in most communities. There is a dire need to develop strategies that would ensure the sustainable development of this resource while improving rural livelihoods.

The purpose of this study was partly to plan activities that are aligned with the goal of designing a business model to increase the supply and demand for goat meat. It was also partly to create an organised, commercial goat meat market that would include communal goat farmers, and offer an affordable product for the meat-eating market. Currently, most goats marketed in South Africa are sold in the informal market through private transactions, usually for religious or traditional purposes. South African goat prices in the informal market are forcibly lowered due to neighbouring countries that infiltrate the market through cross-border transactions at lower prices, negatively affecting the South African goat market (Kalahari Kid Corporation, 2016).

This study looked at the potential of social enterprises to address basic market failures in goat meat commercialisation in South Africa. It reviewed the likely limitations that such enterprises would encounter in attempting to address the entrenched development problems of the most economically marginalised in the industry. The research questions and objectives that the research was seeking to address were as follows:

(1) Is there a demand for goat meat in the Gauteng Province?
(2) Which innovation platforms assist in goat meat production in Kuruman, Northern Cape?
(3) Can a social enterprise business model driven by social entrepreneurs bring about success in the commercialisation of goat meat?
(4) Who are the key players in the value chain for commercial goat production in Kuruman, Northern Cape?

(5) How can an inclusive innovation platform be established and implemented for the integration of a sustainable goat value chain?

The research has shown that there is a relatively high demand for goat meat in Gauteng. Consumers enjoy goat meat, though there is a lack of research and marketing to advertise its availability, its leanness, and its health properties. Coetzee (1998) noted that only about one per cent of goats in southern Africa are slaughtered in commercial slaughterhouses and sold in urban retailers. The lack of product availability and consumer awareness of goat products, due to limited field research, has pushed goat meat marketing to the periphery in South Africa, preventing producers, processors, and marketers, from acquiring sufficient knowledge about the commercial viability and sustainability of the business

Regarding commercialisation, the advertising of goat meat by-products, such as goat milk soap, goat milk paint, leather, goat horns, candles, beer, and mohair, can help to make inroads into the market, by not merely pushing for meat. Auctions were found to be the main interactive platform for buyers and sellers of goat meat. There is the need to broaden the distribution channel to reach as many people as possible in the target market. One such way would be through vertical integration, which involves owning the supply chain from inputs right up to the retail or distribution channel. A typical vertical integration model is illustrated in Figure 29.

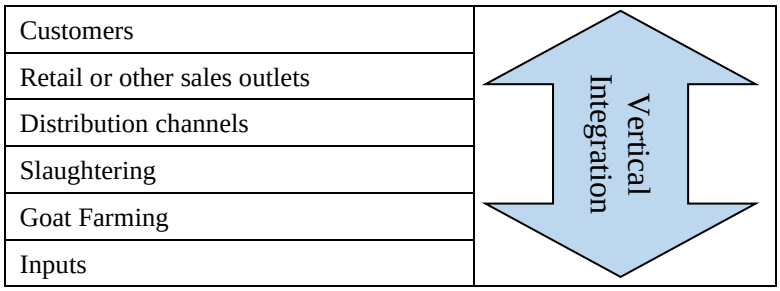


Figure 29: Vertical Integration Model

With cooperatives highlighted as the most important way to bring goat farmers' resources together to enable growth towards commercialisation, agricultural and rural development experts could assist by providing knowledge in this industry. There is however the need to improve on training and education to increase goat meat production. Small-scale goat farmers need government support and financial

injections in order to make the breakthrough into commercialisation. The main concern with small-scale farmers being able to commercialise is that farmers must comply with the standards for quality and safety, which are described in the inspection and classification of prescribed meat regulations (Sojl, Chikwanda, Jaja, Mushonga, & Muchenje, 2015).

Communal goat farmers market their livestock through informal channels because the classification system serves as a barrier to entry. The system serves as a hindrance by not taking into account the constraints that farmers face, such as a lack of infrastructure and facilities, limited access to veterinary health care, and shortage of feed (Sojl et al., 2015). The results have shown that although most farmers own their own land, they still lack the means to advertise their products and transport them to the mainstream retail outlets.

This research confirms that agriculture, and goat farming in particular, have great potential for poverty alleviation, import substitution, and the promotion of food security. The inclusion of small-scale goat farmers into a sustainable commercial market is therefore a problem worth solving.

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APPENDIX A:
PRAXIS MODEL

Innovative and inclusive commercialisation of goat meat in South Africa:

Goat Meat Innovation (GMI)
Business model and concept note

TABLE OF CONTENTS

1. THE PROBLEM WORTH SOLVING

It is widely accepted that the commercial sector is responsible for less than one per cent of the goats slaughtered in South Africa (DAFF, 2012). Surveys by the South African Meat Industry Company (SAMIC) have shown that goats slaughtered in the commercial sector are mainly Boer goats and surplus Angora goats, which make up approximately 0.55 per cent of the goats slaughtered commercially. However, some other observers put the commercial slaughter figure of goats at five per cent (Low, 2019). The market of goat meat is thus driven by the informal market. It has long been a hope that Boer goat farming and exporting will attract thousands of black, emerging, small-scale farmers; however, local herds and breeding material have been too small to meet overseas demands. The informal market, characterised by small-scale farmers, is constrained by inefficient farming systems, poor nutrition of livestock and lack of technical expertise in genetic identification of local goat populations (Gandhi, 2015). This is not unique to South Africa; in fact, Turkey, which has the largest goat population in Europe, has seen a decline in its goat production due to poor herd management and declining integrity in the genetic pool (Ogun, Koluman, & Daskiran, 2016). Goat production in the United States (US) also lacks a well-structured marketing system despite the growth the industry has experienced (Nyaupane, Gillespie, & McMillin, 2016).

Historical, institutional, market, information, and research failures have also resulted in a fragmented industry that has excluded small-scale farmers from the mainstream industry. Despite the structural weaknesses of the goat meat industry in South Africa, the goat meat market presents good growth potential due to the high demand for quality goat meat all over the world. There are real returns that can be gained by organisations that can improve the supply chain, apply technological knowledge, and increase the supply of quality meat.

2. THE SOLUTION

The development of a goat meat industry requires readily accessible infrastructure in the form of livestock marketing routes, facilities for slaughtering and processing

carcasses, and wholesale and retail distribution systems to an already receptive and sustainable market (Casey & Webb, 2010). Commercialising goat meat in South Africa will also require quality assurance (through certifications) and marketing systems.

The Goat Meat Innovation (GMI) model seeks to create institutional arrangements that will address the global challenges of quality, consistency, and high standards of goat meat. GMI is a holistic business and supply chain approach with consideration for best practice to ensure sustainability. The model will include three different businesses within the GMI group, namely, GMI Production, GMI Processing, and GMI Route-to-Market (RtM). GMI Production will pay attention to livestock sourcing, farming agreements, and emerging farmer development. It is essentially the farmer-facing part of the business. GMI Processing will focus on meat production and processing – delivering niche products for the local and international markets. And GMI RtM will focus on formal markets, distribution channels, go-to-market strategies and branding.

3. GOAT MEAT INNOVATION (GMI) MODEL

3.1 Overview

The GMI model is the innovation required in the South African goat meat industry to ensure traceability, quality, and consistency of supply. This model will ensure that consumers can find the product they require through regular stocks in food service industries, butcheries, and online platforms. It will build a quality brand that consumers, locally and internationally, can trust. This will be achieved through vertical integration, which will increase the efficiency and effectiveness of logistical operations to deliver healthy, safe, and desirable goat meat products to the consumer (Roets & Kirsten, 2005). Furthermore, strategic alliances will ensure possibilities of strong market position due to critical mass (Downey, 1996).

South Africa is in desperate need of a goat meat brand that will maintain a long-term commitment to food safety. GMI seeks to build a goat meat brand that is free of all

major livestock diseases, free from added hormones, with limited exposure to chemicals ensured by clean, low-risk, chemical residue production systems. The GMI model is more than just a business model, it is a national quality assurance program that implements integrity and traceability systems from farm to fork. The GMI model will use technology to identify and trace animals for biosecurity, food safety, product integrity, and market access. This will be a 'nation building' model for South Africa's goat meat industry as a whole and will require the partnership of government, industry, and other relevant organisations to promote a proudly South African goat meat brand.

3.2 The GMI Model Principles

3.2.1 Farm integrity

The GMI model will develop emerging farmers through the Contract Farmer Scheme (CFS). The CFS will develop qualifying small-scale farmers into commercial contract farmers through a mentoring and skills development program. The program will embed robust integrity systems to verify and assure the food safety status and other quality attributes of livestock. Commercial farmers supplying meat to the GMI will also be required to adhere to international quality assurance standards. All farmers will submit livestock details via the GMI cloud-based app, which will be verified by GMI mentors and inspectors to ensure adherence to GMI food safety standards.

Using the GMI application (app), livestock will be traced from farm to processing. The GMI app will contain information about the location of the property, contact details of the farmer, exposure of livestock to agricultural and veterinary chemicals, grazing history, supplementary feeding, and a Livestock Identification Code (LIC). The LIC is a 'whole of life' tag, which allows all livestock to be recorded and transmitted on the GMI app, which will be developed into a national database. All farmers, both commercial and emerging, who seek to participate in the international value chain through GMI, will be required to tag their livestock visually and electronically. The LIC and the GMI app provide a platform for traceability of all animals on an individual basis.

3.2.2 Transport safety

Research shows that the pre-slaughter transportation of goats has an impact on the quality of the meat (Mir, Ashutosh, Shergojry, Wani & Sheikh, 2019; Nikbin, Panandam & Sazili, 2016). The GMI model also includes a transportation quality assurance program, which will be applied to all GMI livestock transportation and will be centred on maximising animal welfare, meat quality, and meat safety. Cartons of goat meat and carcases destined for export will be loaded into refrigerated containers, where they are inspected and sealed under the approval of the Department of Agriculture. Container and seal numbers for all goat exports will be stored in the GMI app.

3.2.3 Processing reliability

The GMI model will build a processing plant licensed for export, operating under standards consistent with international ISO 9002:1994, EU certification, Halal certification, and local standards for the hygienic production and transportation of goat meat and goat meat products. The GMI Processing operations will also ensure that all goat carcases are correlated with their LIC stored on the GMI app. The GMI processing plant will have qualified veterinary personnel to ensure that export legislation is implemented accordingly.

3.2.4 Meat quality

GMI aims to build internationally competitive goat meat products for export demand. Major goat meat importing countries that have been identified include: Indonesia, Malaysia, China, Taiwan, Korea, United Arab Emirates (UAE), Saudi Arabia, Australia, and the US. A market survey conducted by Meat and Livestock Australia (MLA, 2016) indicated that these countries rank freshness, safety, and taste as the top three factors for their goat meat imports. As a result, the GMI goat meat brand must ensure a consistent eating quality. Research shows that eating quality is largely influenced by on-farm management specifically two weeks prior to slaughter and the first few hours post-slaughter. There are critical control points in the meat value chain, which need to be controlled to ensure quality meat. The GMI model is built on

vertically integrating the value chain to maximise improvement in goat meat quality. The goat meat industry supply chain sectors and control points are illustrated in Figure 1.

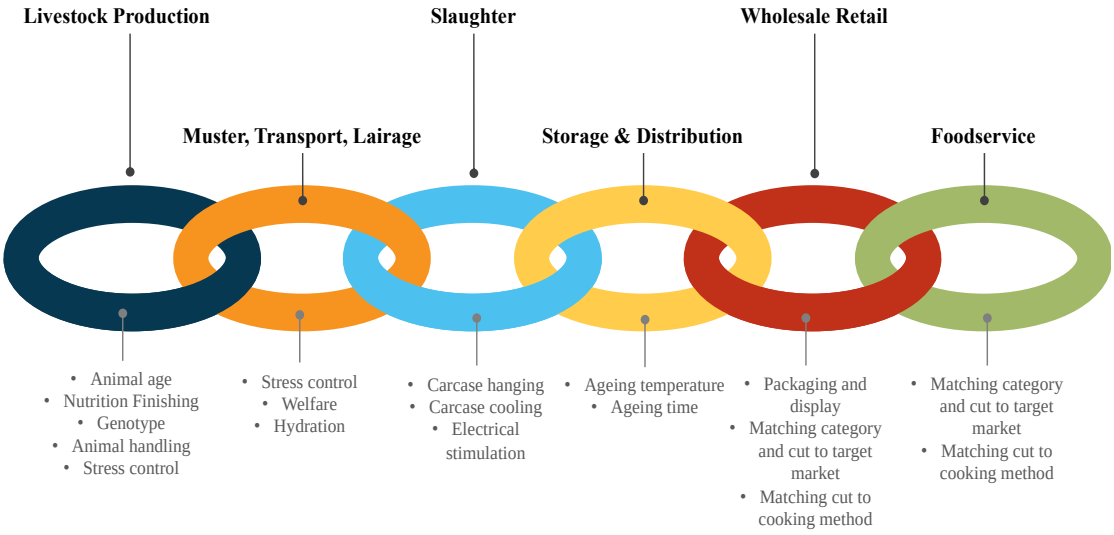

Figure 1: Goat meat industry supply chain and control points

Source: Adapted from: MLA (2016)

4. GMI PRODUCTION: CONTRACT FARMING SCHEME (CFS)

4.1 Overview

The GMI contract farming scheme (CFS) aims to develop a process of strong technology transfer to ensure that small-scale farmers are not excluded from participating fully in a growing goat meat industry. This new and necessary institutional model provides a way to link small-scale farmers to global markets without burdening them with the complexities involved in reaching these markets.

4.2 The GMI Model Difference

It is widely accepted that many small-scale goat farmers in South African rural areas are mainly goat keepers rather than farmers. The CFS will also assist farmers to overcome the general constraints of poor management that lead to high levels of goat mortality. The main marketing system for live goats in South Africa is sales to traders/speculators for indigenous goats. Farmers are able to achieve reasonable, albeit uncertain prices for live goats in the informal auction market. Live auctions reduce marketing effort and thus transaction costs, with the additional benefit of timely and reliable payment, but emerging farmers have no control over price and remain price-takers. Due to the shortage of supply in the country, a very small percentage of goats are marketed through registered abattoirs. GMI aims to increase the production of quality goats for goat meat, thus increasing goat product exports for South Africa. Furthermore, by building some certainty into the goat meat market, farmers will be able to plan their production and build sustainable farming enterprises (Bester, Ramsay, & Scholtz, 2009). Figure 2 illustrates the GMI principles and approach to vertical integration that will guarantee a proudly South African quality brand.

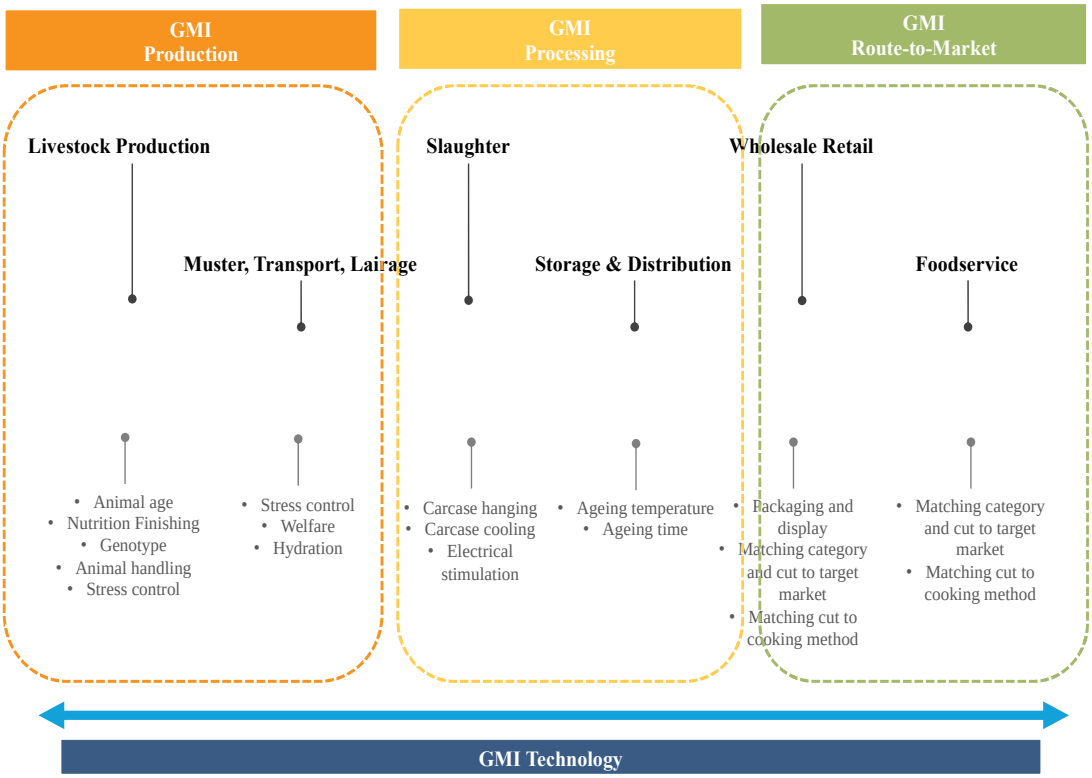

Figure 2: GMI model vertical integration

Source: Adapted from: MLA (2016)

Reasons for keeping goats result in differences in production systems, herd sizes, kidding percentages, inputs, labour, and cash income (Braker, Udo, & Webb, 2002; Mahanjana & Cronjé, 2000). The CFS aims to convert goat-keepers into farmers that participate in the goat meat value chain from South Africa.

4.3 Business Model Characteristics

4.3.1 Vertical integration

While GMI seeks to develop the entire industry value chain in South Africa, the non-customer facing and customer-facing parts of the goat meat production can be separated between producers and retailers/wholesalers. The CFS seeks to promote farmers, from small-scale to commercial, while guaranteeing their access to markets. GMI Production will guarantee the purchase and price for livestock that emerging farmers deliver. GMI Production will also facilitate best-practice sharing among the

farmers. The capital and operating expenses for farming quality livestock is considerably lower for an emerging farmer, compared with the costs for processing and delivering to market.

The spot market system, where buyers and sellers are free to enter into transactions based primarily on price, currently drives the goat industry. This spot market environment drives uncertainty, makes production planning impossible, creates price volatility, and limits the development of the industry as a whole because it often excludes smaller, less-informed farmers. Vertical integration through co-operatives and contract growing will overcome these and other supply challenges. Contract farming with emerging farmers will also improve informal livestock keepers, provide more reliable incomes, generate employment, and provide new skills in farming.

Figure 3 provides a summary of how GMI CFS will innovate through a vertical integration program that benefits emerging farmers in the program.

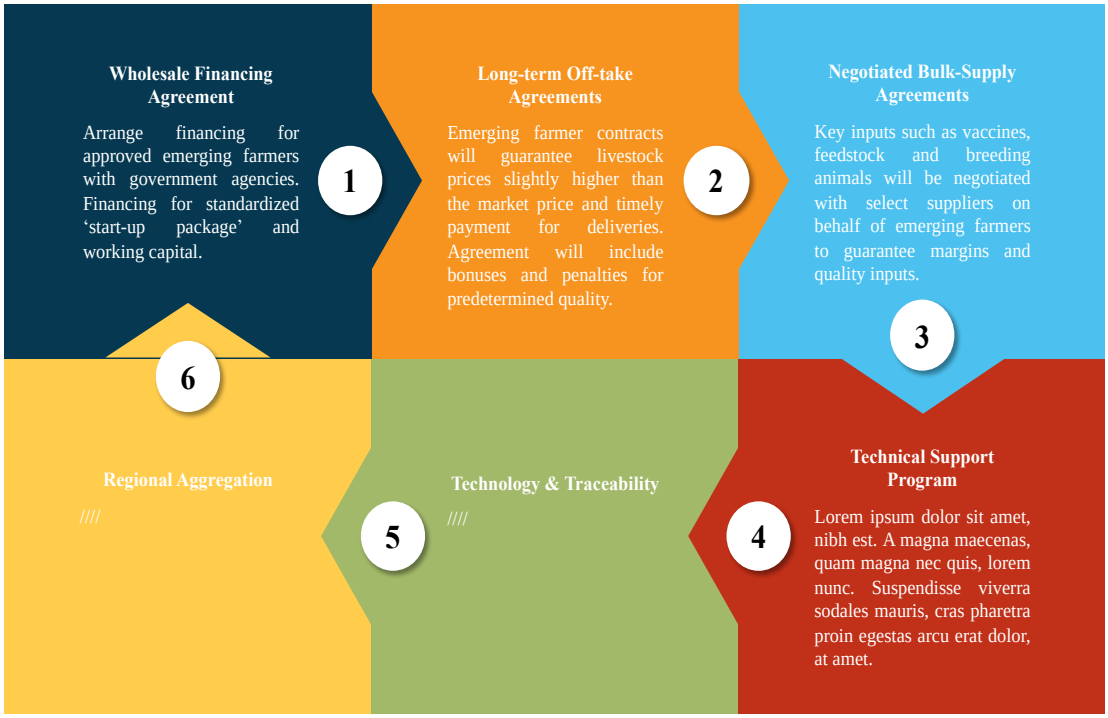

Figure 3: GMI CFS: Features and benefits

These contractual and institutional innovations will increase goat production and build trust between farmers and GMI, and will be seen by farmers as commercially attractive contracts with timely payments at a good price.

4.3.2 Suitable market environment

While there is a significant demand for goat meat in South Africa, a traditional branch model required to reach all areas in the country would not be profitable given the low population density in rural areas, low average income, or both. Live goats are typically purchased for occasions and events and therefore demand for a single farmer is periodic, increasing working capital requirements and stalling growth in between purchases.

Scale efficiency for goat meat production is reached when production is greater than 64 goats, or greater than 40 breeding does per operation (Qushim, Gillespie, Paudel, & McMillin, 2016). Goat meat farming for commercial scale in South Africa requires at least 100 does and three stud bucks to provide the necessary economy of scale. The program will develop emerging farmers to this scale with a focus on delivering “maximum meat at minimum weight” as soon as possible after weaning, which is generally at a weight of about 45 kilograms at the age of about eight months. Increasing scale in goat meat farming has been shown to increase returns (Qushim et al., 2016) and the program will therefore ensure that farmer growth is a key target of the program.

4.3.3 Suitable product

Small-scale farmers typically do not have higher education and would therefore struggle with understanding the concepts and activities required for marketing and distribution of goat meat in the mainstream industry. The CFS simplifies the goat farming process by guaranteeing off-take for quality livestock. Emerging farmers can therefore focus their efforts on farming livestock in accordance with the program developed for them. The farming program is highly standardised, and the pricing agreements are simplified. The CFS reduces complexity and variability in the farmer’s supply chain, given that all major inputs such as feedstock, vaccines, and breeding animals are sourced on behalf of the emerging farmer. The pricing scheme for livestock is transparent and based on weight and quality of livestock, which is easily observable for the farmer and GMI Production.

4.4 Infrastructure Characteristics

4.4.1 Education, training, and mentorship

Many small-scale farmers have not managed their farming as a business enterprise. Equally, emerging farmers that apply for the program will most likely have no business experience; therefore, education and training become a fundamental feature of the GMI CFS to ensure the success and sustainability of the business model. Training will be provided early in the program, with multi-day sessions completed by the farmers on-site. Given the simplicity of the program, the initial training will be delivered over a number of days while mentoring will continue for a minimum period of 18 months. The mentor will also schedule phased training, after the farmer has been in operation for a while. All training assessments and outcomes will be recorded on the GMI app for tracking, monitoring, and evaluation.

Besides the initial training on business and goat farming basics, on-going education of farmers is essential as the farming operations evolve over time and processes and payment structures may change. Mentorship will be a source of on-going monitoring for the farmers while best practice sharing among the farmers will be facilitated through the regional co-operatives.

4.4.2 Standardised equipment

Common meat quality output and process efficiency will be fostered by harmonising equipment and farming systems across all participating farmers. Given that small-scale farmers usually do not have a good understanding of the kind of production system best suited for goat farming to ensure meat quality, providing them with the right tools is essential for their success. Common equipment, coordination, support, and farming systems, ensure that GMI can maintain a common supply chain. The infrastructure (such as shelters), inputs, and equipment will be bundled along with other tools as a ‘start-up package’. Similar to a franchising model, this package will include all infrastructure required for initial set-up including breeding, kidding, and nutrition.

4.4.2.1 Goat selection

Using a quality buck is a non-negotiable in commercial goat farming and is the only way to enable genetic progress. Emerging farmers on the program will receive one buck and between 20 and 30 does as part of the 'start-up package'. Mentors will also be responsible for assisting farmers to select bucks based on correcting traits that studs may be lacking during operations. The GMI production system that farmers follow will ensure a kidding percentage of a minimum of 140 per cent and weaning percentage of a minimum of 120 per cent.

4.4.2.2 Feedstock

The CFS will require that farmers purchase feedstock from pre-selected suppliers to protect the quality of the meat and maximise the nutrition of the livestock. The feedstock provided as part of the 'start-up package' will include supplementary lick for the winter season to help the animals maintain good condition during winter. In addition, fodder radish will be provided for does to graze on after kidding to ensure good milk production.

4.4.3 Traceability

Emerging farmers on the program will be required to tag all their animals at birth, record their number, date of birth, and the name or number of the kids' sires and dams on the GMI app, thus aiding the tracing of goats from farm to processing to distribution. The GMI app will contain information about the location of the property, contact details of the farmer, exposure of livestock to agricultural and veterinary chemicals, grazing history, supplementary feeding, and a LIC. All farmers, both commercial and emerging, who participate in the international value chain through GMI, will be required to visually and electronically tag their livestock. The LIC and the GMI app provide a platform for traceability of all animals on an individual basis.

4.4.4 Vaccination programme

GMI will develop a strict and appropriate preventative vaccination programme to control common diseases, as well as internal and external parasites prevalent in the area of operation. As part of the CFS program, emerging farmers will be required to implement the vaccination record on the GMI app with verification performed by the mentor. The program will require recording of doses against tapeworm and other vaccinations deemed necessary based on the location of the farming operations. Emerging farmers in the program will be required to purchase and administer the vaccines from GMI approved suppliers. Bulk supply agreements will be negotiated with approved suppliers on behalf of emerging farmers. Mentors will monitor and evaluate this routinely and provide updates on the GMI app.

4.4.5 Financing

GMI will negotiate a finance warehousing scheme with development agencies and government institutions on behalf of emerging farmers.

4.5 Operational Characteristics

4.5.1 Aggregated farmers

The emerging farmers will be aggregated through regional co-operatives. The co-operatives will be responsible for the physical set-up and operation of emerging farmer networks. The regional co-operatives will also, through mentors, provide the required training, equipment, and supply chains and processes – monitoring all of this via the GMI app. Aggregated farmers can then apply for financing as co-operatives, creating an opportunity to access government funds more easily. Regional co-operatives will also be responsible for planning delivery dates, collection of animals for sale, transportation, and delivery to the GMI processing plant.

4.5.2 Sustainable margins

Price-point and margins are key factors for commercial farming. The pricing and margins offered to emerging farmers will be high enough not only to cover their expenses, but also to keep farmers motivated. The aim of the GMI pricing structure will be to provide emerging farmers with a market-related price that takes transportation and delivery into account.

GMI will enter into off-take agreements with regional co-operatives for the supply and delivery of quality livestock. The pricing determined by GMI will fulfil the following criteria:

- On average, revenue must be high enough to cover operating expenses and loan repayments, and leave some disposable income for the emerging farmer
- On average, revenue must be periodic and continuous. For this reason, emerging farmers must employ the farming systems designed in the GMI program to ensure that their goats produce kids at continuous intervals throughout the year.
- On average, revenue must increase quickly enough to minimise the time it takes for the farming operations to become profitable.

4.5.3 Simplicity and efficiency

To ensure meat quality delivered by emerging farmers, the program will include a performance testing system to select both male and female breeding stock as is applied by commercial producers. The program will also focus on pre-slaughter management practices, which can have an important economic impact on a goat meat enterprise. Studies have revealed that factors such as location, region, and farm structure dynamics can affect farming efficiency (Qushim et al., 2016).

4.5.4 Incentives and shared risks

The contract terms will be between GMI Production and the regional co-operatives each representing up to 10 farmers. GMI will ensure traceability, quality, and consistency of supply to various markets through the GMI RtM business. GMI will

also provide advisory services to the regional co-operatives through GMI mentors. Mentors will be assigned to farmers within regional co-operatives who will ensure that emerging farmers adhere to the GMI farming standards. GMI will also be partially owned by regional co-operatives for the benefit of member farmers and to assist in the distribution of any dividends from GMI operations. GMI will also undertake to purchase all goats that meet the required standards and required volumes within seven working days. Figure 4 illustrates the GMI structure and role-players.

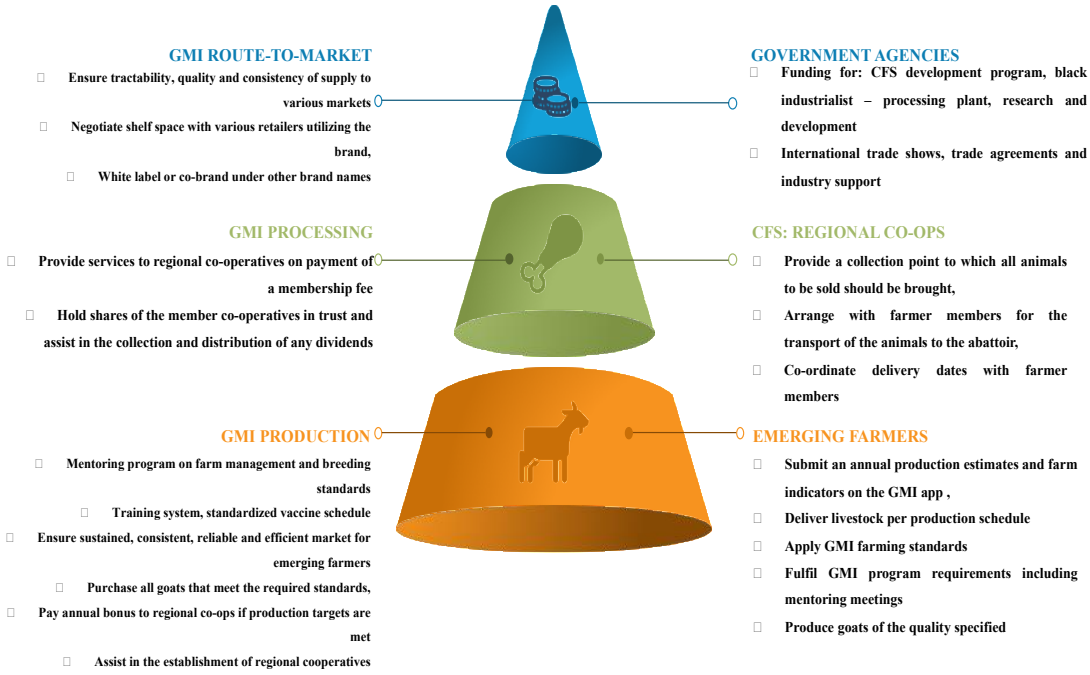

Figure 4: GMI structure and role-players

Source: Researcher's own

4.5.5 Monitoring and evaluation

Using the GMI app, emerging farmers will be responsible for providing annual production estimates. Farmers will also submit livestock delivery pledges through the GMI app, which will be monitored against their annual production estimates. The app will enable tracing of animals and tracking of the vaccinations of animals. Farmer deliveries, invoicing, and payments will also be recorded on the app.

4.6 GMI Production Technology

Figure 5 provides a summary of the GMI app features specifically for production. The app will be the primary platform for monitoring and evaluation of the CFS. It will also serve as a report-generating tool for production targets, volumes, forecasting, and planning. Farm compliance will allow emerging farmers to stay up to date with all farming compliance requirements including vaccinations, registration, taxes, among others. The livestock tracing feature allows farmers to stay up to date by using a livestock synchronisation button. When farmers buy or sell animals, they will simply do a livestock synchronisation and the app will automatically add or remove animals from their livestock, thus eliminating the need to maintain a manual livestock register.

Livestock information, such as age, last vaccination, days on the farm, will be available on the app offline for easy reference; all information in the app can easily be viewed in downloadable reports.

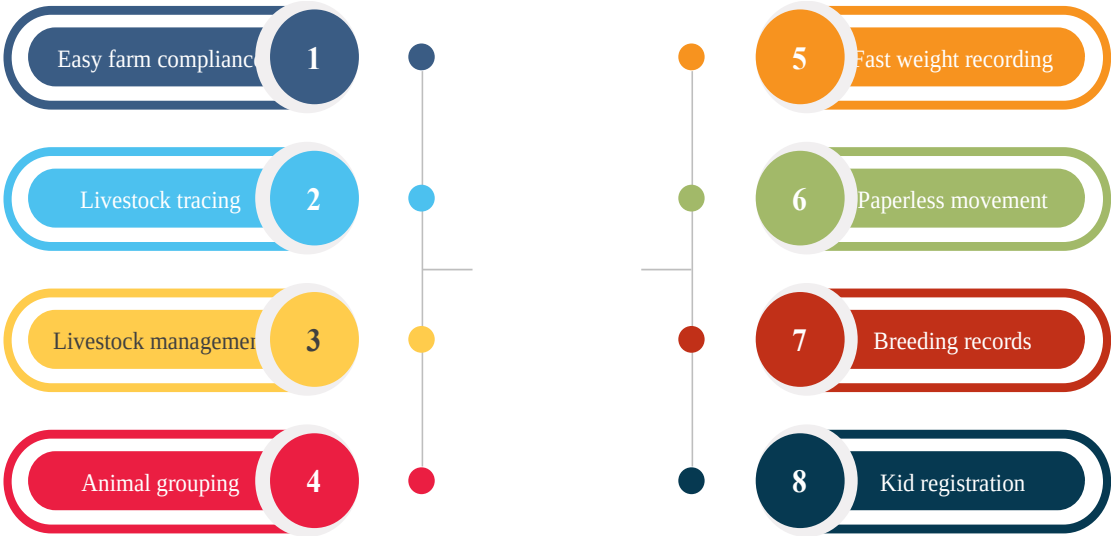

Figure 5: GMI app: Production features

Source: Researcher's own

4.7 Critical success factors

GMI Production will ensure the following key success factors:

- High-quality inputs;
- Lower transaction costs;
- Increased bargaining power with input suppliers;
- High organisation, governance, and infrastructure;
- Consideration of establishment costs, maintenance of member loyalty, quality assurance, and associated commissions when establishing regional cooperatives;
- Wholesale funding arrangement for emerging farmers; and
- 'Start-up package' that makes farm establishment easy, and reduces the time to 'operation' stage.

5. GMI PROCESSING

5.1 Overview

Previous attempts at vertical integration in the goat meat industry have failed, primarily due to inexperience, mismanagement, and a production-driven, rather than a market-driven, business approach by meat producers. The GMI model will separate the primary livestock business from the processing business to ensure that skilled industry personnel, who understand the capital demands of running a meat plant, can run and manage the processing business. The GMI model assumes the building of a new, efficient, EU and Halal certified meat processing plant, capable of harvesting sheep and goat livestock. The plant will provide these services internally to GMI as well as to other sheep and goat meat farmers who require slaughtering, deboning, grinding, and processing services for their animals.

5.2 The GMI Difference

The goat meat industry in South Africa remains fragmented and previous attempts at formalisation or consolidation of the industry have not been successful. While the international goat market is experiencing growth, emerging farmers are not in a position to take advantage of this boom. The majority of goats marketed in South

Africa are sold by private transactions in the informal market to be slaughtered for religious or traditional purposes. The result is that a very small percentage of goats are marketed through registered abattoirs. The informal market of goats through traders or speculators drives the South African goat industry.

Through the GMI CFS, emerging farmers will participate in the 'processing' value chain through a shareholding in GMI Processing via a broad-based trust. This shareholding aims not only to ensure their participation and inclusion in the mainstream industry, but also to align their interest with the processing business. Shareholding will incentivise their contribution to the success of the business by meeting their production targets and quality standards.

GMI has identified a lack of grading system for goat meat. A comprehensive national classification system would promote the selection of goat meat based on quality, allowing producers, such as GMI, to differentiate themselves based on graded quality in domestic and international markets. GMI Processing, in partnership with industry players and government agencies will facilitate the development of a classification system for goat meat. The classification system will also ensure a shift from benchmarking goat meat against lamb or mutton.

5.3 GMI Processing Plant

The processing plant's primary income will be selling processing services to the GMI RtM business. Secondary customers of the plant will be other goat or sheep farmers who require processing services. This is to ensure that the plant can operate at maximum capacity. Secondary customers of the meat plant will be customers that purchase meat and meat products directly from the plant.

GMI Processing will develop standardised regional processing plants comprising:

- Goat / sheep slaughter line;
- Meat processing line;
- Offal processing line;
- By-product processing line;
- Cold storage; and

- Waste treatment.

The general layout of the plant will comprise the following five sections: (i) live animal handling, (ii) primary processing, (iii) secondary processing, (iv) further processing, and (v) packing and dispatch. The processing plant capacity is expected to range between 50 and 150 head per hour. A modular plant design will facilitate plant capacity growth to meet demand. The general operational activities of the processing plant are depicted in Figure 6 and typical plant sections are depicted in Figure 7. To maintain high standards of hygiene, GMI Processing facilities will implement pneumatic and electric automation solutions built using a hygienic design, resistant to external influences and easy to clean.

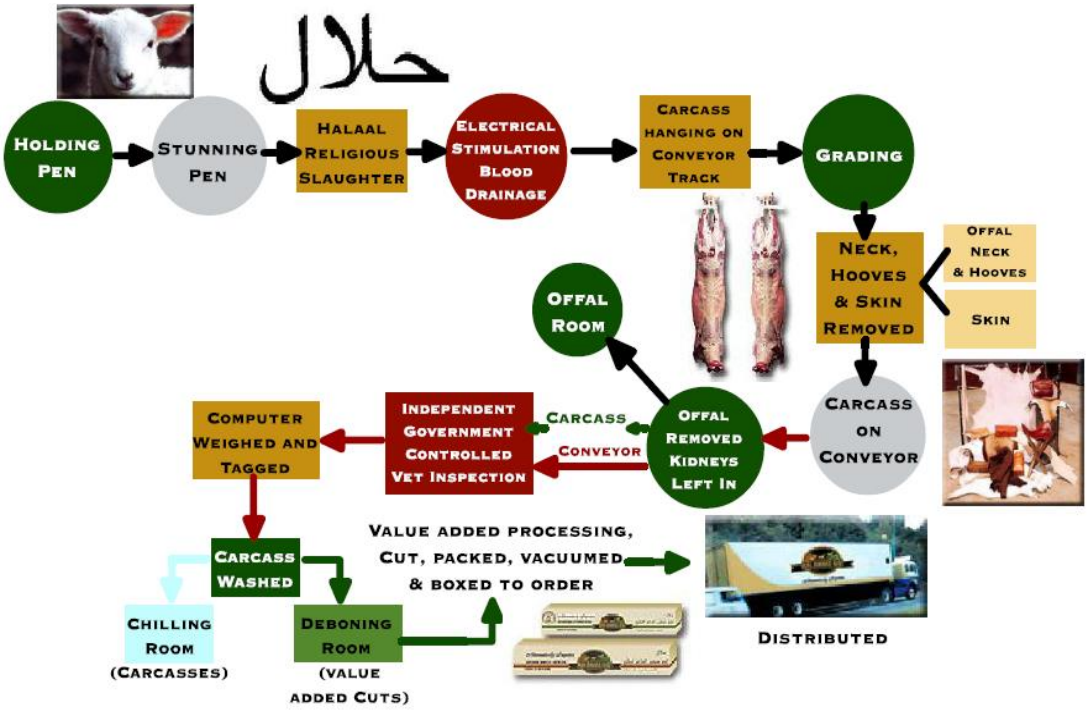

Figure 6: Overview of processing plant activities

Source: Kalahari Kid Corporation (n.d.)

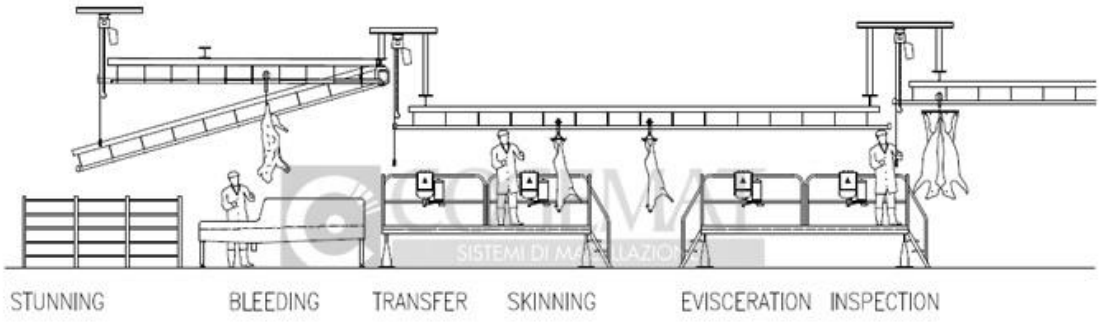

Figure 7: Typical sections of goat/sheep slaughter lines (50 heads per hour)

Source: Gogemat (n.d.)

5.4 GMI Processing Technology

Automation in meat processing leads to the development of non-destructive methods that can be effectively controlled and applied for quality monitoring of meat while carcasses are still on the line or live animals are waiting for slaughter. The GMI Processing technology features are summarised in Figure 8.

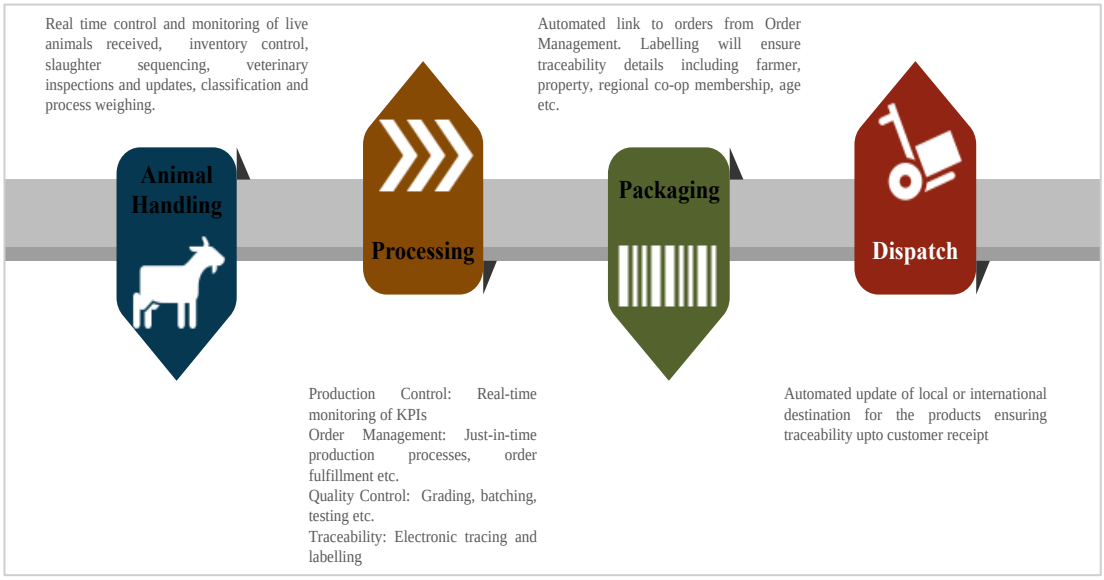

Figure 8: GMI Processing technology features

Source: Researcher's own

5.6 Location

The transporting phase is a highly stressful and exhausting period for live animals. The notion of transporting has many facets that affect the animal's physiology and consequently the carcass and meat quality. Studies have indicated that pre-slaughter transportation can cause significant loss due to carcass shrinkage, and other meat quality traits of transported goats. Furthermore, it has been observed that higher stocking density during transportation causes an increase in carcass shrinkage loss and a deterioration of meat quality, such as meat colour traits and drip loss (Mir et al., 2019; Nikbin, Panandam & Sazili, 2016).

Since profitability of animals is related to carcass and meat quality, choosing proper stocking density during transportation and limiting the transportation time is imperative. Emerging farmers in the program will be located within 50 kilometres from their mentors (commercial farmers) and within a 200-kilometre radius from the GMI Processing plant. For instance, as illustrated in Figure 9, if the GMI Processing plant was located in the central Johannesburg business district, livestock could be sourced from emerging farmers as far as Orkney in the Free State, Lichtenburg in the North West, Groblersdal in Limpopo, and Standerton in Mpumalanga.

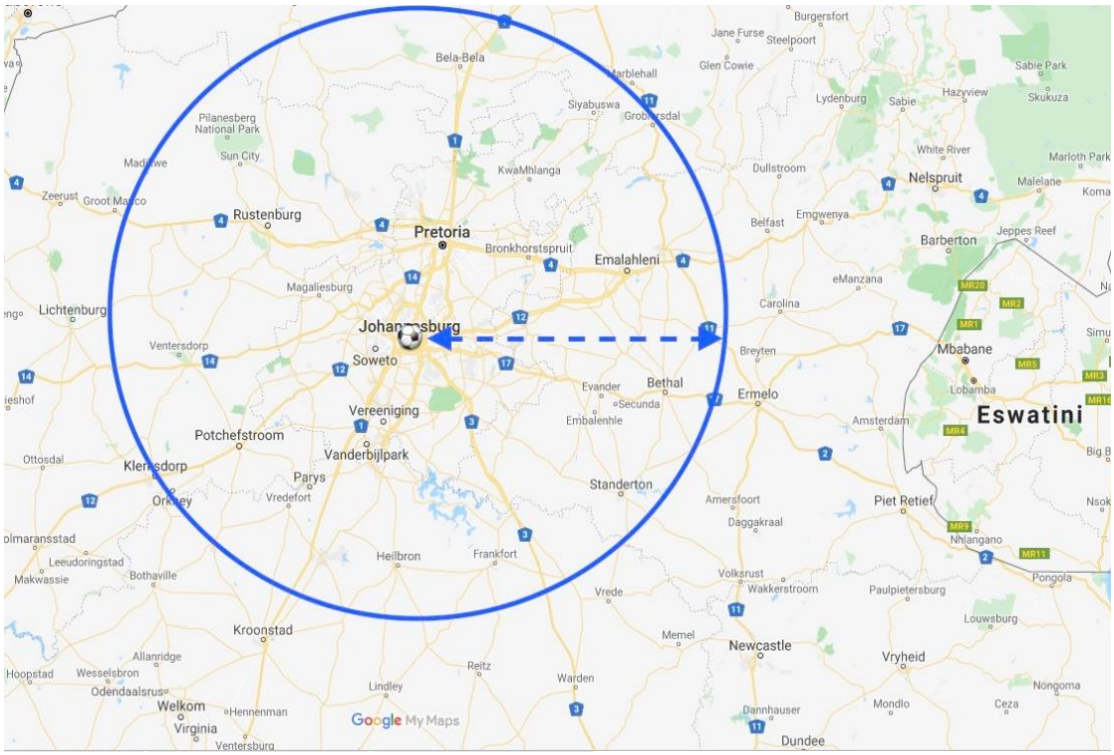

Figure 9: GMI Processing plant: Location and mapping

Source: maps.google.com (n.d)

5.7 Legal Environment

5.7.1 SA Legislation

The key in-country legislation that applies to GMI Processing is Section 14 of the Meat Safety Act 40 of 2000 (RSA, 2000), which requires export abattoir approval, inspections, samples, testing, and veterinarian certification. Other food safety laws such as the Health Act (RSA, 2003), Foodstuffs, Cosmetics and Disinfectants Act (RSA, 1972) are applicable. SABS standards and food safety systems certifications will determine the plant design, controls, and processing to ensure food safety.

5.7.2 EU requirements

A critical success factor for the GMI Processing plant is to meet the requirements for Grade A EU certification. The reason for this approach is that the EU applies stringent ‘non-tariff barriers’ to imported meat. Therefore, by implication, if GMI

Processing can satisfy the EU's regulations, the product will most likely satisfy other countries' 'non-tariff barriers' (DAFF, 2018). The EU official control regulations that will apply to GMI Processing are contained in Regulations (EC) No 852/2004, 853/2004 and 854/2004 (EUR-Lex, n.d.) and lay down specific rules and controls for foodstuffs, animal products, and animal products for human consumption.

5.7.3 Halal and kosher requirements

The marketing strategy (discussed in section 6) is also dependent on the Muslim and Jewish communities as target markets and the facility would therefore comply with Halal and Kosher certification requirements, in addition to the Department of Agriculture standards and requirements. Halal certification, much like the legal regulations, involves audits, evaluations, samples, testing, training, and compliance with mandatory declarations of production and sale of Halal products.

The market for Kosher goods includes Jewish people, Muslims, vegetarians, vegans, people with allergies, among others. In addition, products with the Kosher certification are perceived as healthy, natural, and of better quality. Kosher certification also requires slaughtering according to Jewish regulations, and certification involves audits and inspections.

5.8 Facilities and Equipment

Various sites have been identified that can be converted into a GMI processing plant relatively easily, which will save time and costs of building a new processing facility and quicken market entry. Identified OEM plant equipment suppliers are Marel, Festo and Gogemat. GMI Processing plant assumes a processing capacity of 60 to 80 lambs and goats per week, it is anticipated that the initial plant will be nearly 600 square metres, including chilled room sizes detailed in Figure 10, in order to accommodate the number of animals and carcass chilling times.

The GMI Processing plant will be designed to have adequate refrigerated and frozen storage capacity. Refrigerated boxed storage will be adequate for up to seven days

beyond processing, and frozen storage will be adequate for several weeks beyond processing. Local distribution will be outsourced to a logistics company.

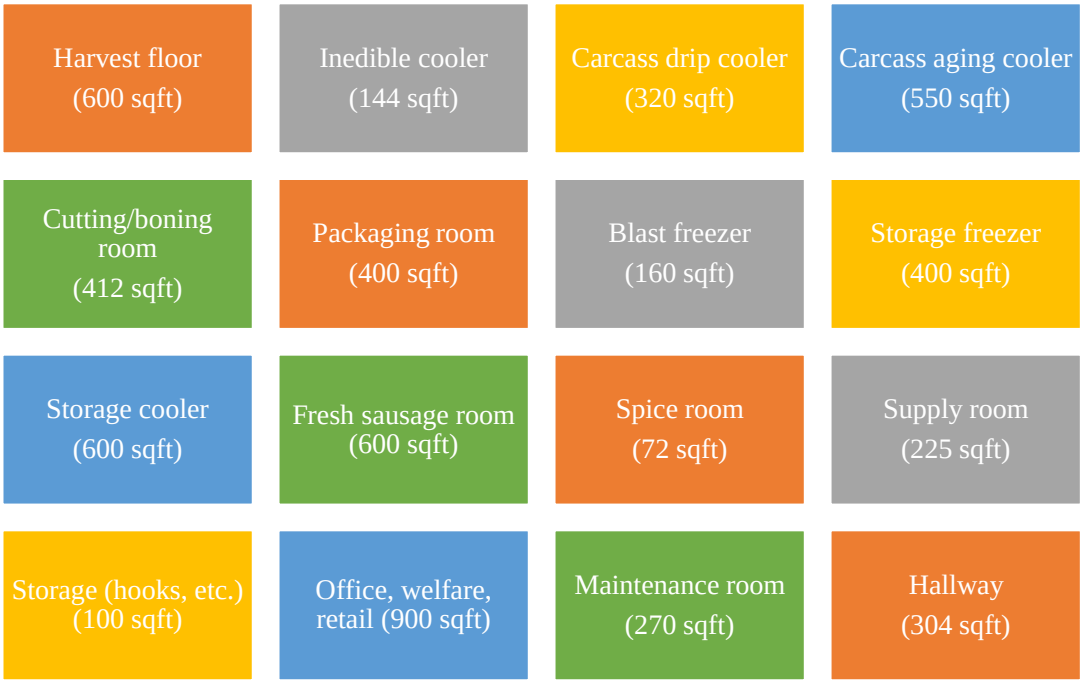

Figure 10: GMI Processing: Facility capacity requirements

Source: Adapted from Food & Livestock Planning Inc. (2011)

5.9 Critical Success Factors

The key success factors for GMI Processing business are outlined:

- Successful hiring, training, and supervision of a skilled workforce, including plant managers;
- Strict adherence to quality assurance policy and standard operating procedures;
- Compliance with all health and safety certifications, both domestic and international including EU Certification, state veterinarian approvals, Halal, Kosher, and other export requirements to underpin integrity of GMI products;

- Well-designed food and factory safety programs and strict adherence to the company's HACCP[1];
- Disciplined control of overhead costs;
- Record-keeping, cost-of-production analysis, and production analysis through technology, automation, and technical efficiencies;
- Security of supply of livestock meeting GMI quality standards from GMI Production;
- Security of demand from GMI RtM target market;
- Securing contract processing clients during ramp-up to maximise capacity utilisation;
- Funding for the capital investment and operating expenses;
- Implementation of farm biosecurity tools in GMI Production supported by appropriate communication back to GMI Processing to support value chain integrity; and
- Investigation of innovations in pathology prevalence and intervention technologies.

6. GMI ROUTE-TO-MARKET (RtM)

6.1 Overview

GMI RtM is essentially a marketing and business development company that exists to ensure the distribution of GMI's goat meat and goat meat products to consumers, both locally and internationally. This business within the GMI stable exists primarily to undertake branding, brand management, and marketing of goat meat and goat meat products.

[1] HACCP: Hazard Analysis and Critical Control Point (HACCP) is an internationally recognised system for reducing the risk of safety hazards in food.

6.2 Product Description

As previously mentioned, the GMI Processing business will entail the manufacture of fresh and further processed goat meat products such as various retail cuts (vacuum packed, spiced, and labelled), and other processed products. Figure 11 provides an illustration of the basic goat meat cuts that will be provided.

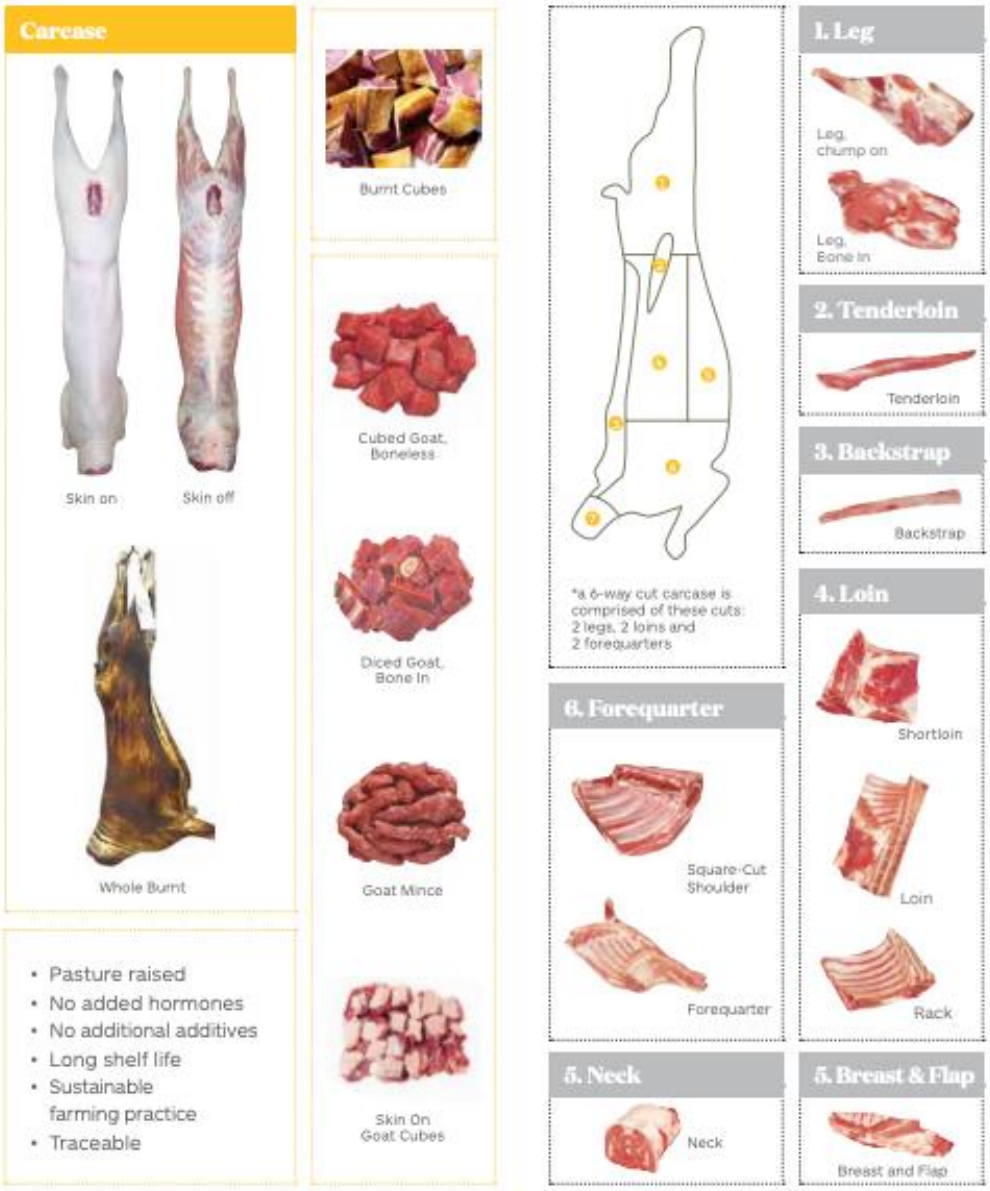

Figure 11: GMI Processing: Basic goat meat cuts

Source: Adapted from BGBM (n.d.)

As GMI expands, GMI RtM will launch new products and services that meet specific niche markets. New and follow-on products are highlighted in Figure 12 and are inspired by the research work of Madruga and Bressan (2011).

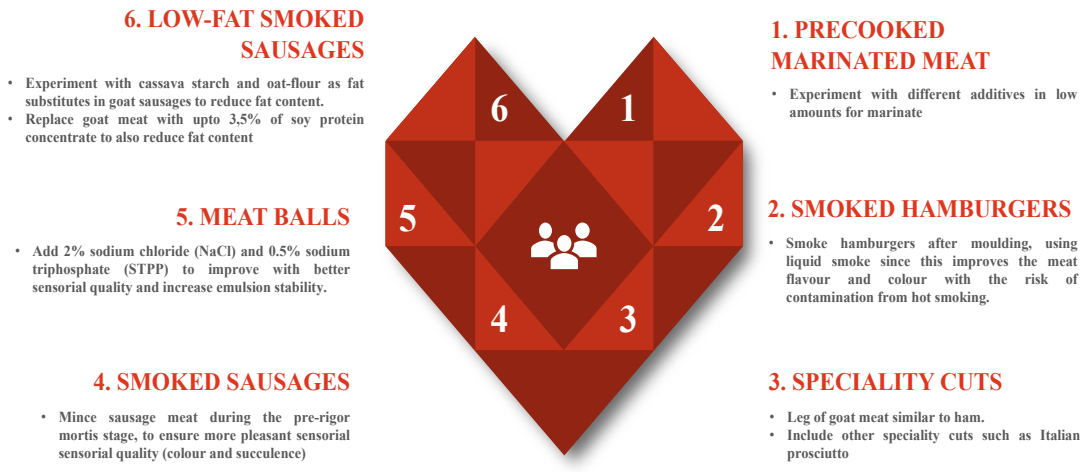

Figure 12: GMI RtM: New and follow-on products

Source: Adapted from Madruga and Bressan (2011)

For marketing purposes, goat meat has been divided into two distinct classes: capretto and chevon. Capretto is meat from milk-fed smaller kids with a carcass weight of six to 12 kilograms and pink flesh, while Chevon is from older goats with a carcass weight of 16 to 22 kilograms (Dhanda, Taylor, Murray, Pegg, & Shand, 2003). The export market product is generally live animals or frozen whole carcasses. While market research undertaken by the Kalahari Kid Corporation identified that the lower income consumer groups in South Africa often cannot afford to purchase a whole carcass and would therefore be better service by lower-priced cuts of meat, such as offal, neck, breast, and flap packed in a boxed format for selling into the informal sector. Research indicates that there might be some consumer markets interested in processed chevon snack foods, or other convenience products tailored for specific ethnic or cultural groups.

6.3 Market Segments

GMI's target market has been segmented into the following markets: export, food service industry, wholesalers, and distributors, and end-users or consumers.

6.3.1 Export market

The top five importers of goat meat, according to Food and Agriculture Organization (FAO) of the United Nations (FAO, 2018) are the US, UAE, China, Saudi Arabia and Europe. These will be key export targets for GMI. Other export markets include African countries with major goat meat production, but as a cheaper local product. It is anticipated that GMI's exports will mostly be exported as frozen whole carcasses. The export trade is typically seeking commodity goat meat and chevon, with the carcass size and goat age requirements varying between countries. The majority of the export market is carcass trade, but there is also significant demand for live goats.

There are Western countries whose populations are becoming increasingly culturally diverse. In these countries, there is high demand from ethnic groups for goat meat. The US is a prime example of this trend, where there is high demand for goat meat from the Hispanic and Asian communities. This includes the growth of ethnic restaurants, which will introduce goat meat to Western consumers. There are also countries that traditionally consume goat meat, but produce only small amounts, for example Taiwan and the Caribbean.

A survey of goat meat importers performed by Meat and Livestock Australia (MLA) revealed that goat meat importing countries value 'freshness' as the highest product attribute (MLA, 2016). The second and third attributes were 'guaranteed safe to eat' and 'taste'. The GMI positioning strategy will involve positioning the product in relation to the quality attributes of GMI goat meat products.

6.3.2 Food service industry, distributors and wholesalers

The food service sector is experiencing increased pressure to innovate and release new and interesting dishes. This pressure is driven mainly by the 'foodie' movement and kitchen media or television cooking shows. This sector is also under pressure to be more transparent about the source of their food, the ethical standards of their value chains and the authenticity of the food products they serve to consumers. This has led to global and local sourcing trends as well as 'small tasting plates' as a way of keeping menus fresh and interesting.

6.3.3 End users or consumers

The end-user or consumer segment of the target market can be further broken-down into retail consumers ('foodies'), health-conscious consumers, adventurous consumers, and religious or traditional consumers. GMI's consumer segments are outlined in Figure 13. Product positioning for these consumer markets requires product integrity, local convenience, or availability in retail stores, global expansion for rapid up-take, and brand equity developed through marketing campaigns.

Figure 13: GMI goat meat consumer profile

Source: Researcher's own

The product strategy for the consumer market includes a striking design for the meat products, to differentiate them from other competing products on retail store shelves. The focus will be on entering markets where there is strong growth, higher prices, higher margins, and less competition. In order to achieve this, GMI will promote distribution of niche goat meat cuts beyond goat meat carcasses. Market need research shows that consumers are looking for a protein alternative that has high quality taste, comes from a trusted source, and maintains consistency in quality and availability. The change in demographics globally mean that ethnic and religious communities will now be more prevalent in western countries and will drive the

consumption of goat meat for cultural, traditional, and religious purposes. Given the socio-economic trend of the declining size of the traditional family, the rise of the working professional and ‘millennials’, consumers are looking for healthy, easy to prepare options.

6.4 Pricing Strategy

GMI will use a cost-plus pricing strategy, which essentially involves determining production costs and adding a margin to the GMI products ready for market. Given the ‘informal’ nature of the goat meat market on the continent, goat meat products are considered ‘niche products’ as opposed to ‘commodity products’. As a result, GMI, in the first few years of development, can be a price-setter and not a price-taker. This competitive advantage is further solidified by the vertical integration of the GMI model, which enables significant control over the supply chain and input costs.

6.5 Promotion and Advertising Strategy

GMI RtM will make use of celebrity chefs in South Africa, on the continent, and in international markets to endorse GMI products. Televised food programs will also be selected for consumer education and marketing of goat meat as a product and GMI as a leading African goat meat producer. The ‘foodies’ marketing strategy will include the development of an online goat recipe book and competitions related to the recipes.

Marketing vehicles for GMI will include entering for awards for the goat meat products. This promotes the brand and builds credibility in the market. The retail target market requires sales volumes to reach scale efficiencies. As a result, marketing vehicles for the retail product will require a PR strategy that educates consumers and creates a demand within retail and online stores.

6.6 Critical Success Factors

GMI RtM will ensure the following key success factors:

- Develop a good rapport with local and international agents, processors or buyers, and keep in regular contact to ensure understanding of market requirements;
- Seek feedback from international and local agents, processors, and buyers about the product supplied, in terms of its suitability for the market and to find out how the product can be improved in order to achieve better prices;
- Effective, visionary industry leadership supporting cultural change;
- Stabilisation of the supply base;
- Development of strong, efficient supply chains;
- Continued collation of specific market intelligence to address data gaps;
- Delivery of a comprehensive marketing strategy based on objective market evaluations to identify high value growth opportunities for goat products in key markets;
- Implementation of targeted brand building activities through showcasing South African global positioning for goat meat; and
- Implementation of targeted business development partnerships with key influencers, which will boost consumption, improve product knowledge, and ensure menu penetration.

7. GOAT MEAT INDUSTRY OVERVIEW

South Africa is a relatively small goat producing country and possesses approximately three per cent of Africa's goats and less than one per cent of the world's goats; there are only 250 stud breeders in the country. The Boer goat, Savanna and Kalahari Red are recognised as commercial goat breeds for the production of meat, skins, and small quantities of cashmere. Goat meat is often called chevon when derived from adults and cabrito when from young animals (DAFF, 2018).

Currently the global goat population is much lower than cattle and sheep, which are at 1.5 billion and 1.2 billion, respectively (Mazhangara, Chivandi, Mupangwa, & Muchenje, 2019). Africa and Asia's goat populations constitute 38.7 per cent and 55.4 per cent respectively of the global goat population, thus these areas are

potentially major players in the goat industry's value chain. Between 2006 and 2016, the world's goat population increased by 19.3 per cent, while cattle and sheep increased by 6.7 per cent and 6.8 per cent respectively. African and Asian countries constitute part of the developing countries and are characterised by huge rural areas that are dependent on subsistence farming. Due to goats being hardy, they are one of the most favoured and widely farmed small ruminants; hence, their large numbers in African and Asian countries. The large numbers of goats in such resource poor communities present a tremendous opportunity for improved goat productivity and off-take (Mazhangara et al., 2019).

The goat production industry is still characterised by a lack of organised selection programs in most areas, particularly in the developing world. In developing countries goats are randomly bred with very limited, if any, dedicated selection programs. Due to the availability of a few well-characterised breeds for meat production, there is tremendous potential in the developing countries to select and exploit some of the untapped goat genetic potential. In addition to limited selection, an extensive production system and poor record keeping typifies goat production in these developing countries. Despite the lack of well-organised selection programs, the global outlook of the chevon industry shows evidence of its tremendous potential to grow (Mazhangara et al., 2019; Shrestha, 2011).

Indigenous goats represent approximately 65 per cent of the goats found in South Africa and in the past, they were not subject to any selection process. They are un-improved and usually a crossbreed of the improved goats such as the Boer goat, the Kalahari Red, and the Savanna goat (DAFF, 2018).

Commercially, goat meat is reportedly sold through some Muslim butcheries in Lenasia, Johannesburg, and certain Spars and butcheries throughout the country. From 2003 to 2008 the food retailer Shoprite Checkers was marketing goat meat, branded CHEVON. Kalahari Kid Corporation (KKC) succeeded in placing chevon on the shelves of a number of supermarkets in South Africa (Pick & Pay, Checkers Hypermarket, and Spar) and launched a campaign to make consumers aware of the excellent qualities of chevon (Low, 2019).

During 2018, a project was launched to test the marketing and commercial sale of Angora meat products in a group of retail stores in the Eastern Cape. The project was not commercially viable due to the seasonal availability of slaughter-age Angora goats. This seasonality causes inconsistent availability. In addition, it appeared that consumers still preferred the more expensive (between R10 and R20 more per kilogram) lamb or mutton to goat meat (Low, 2019).

The greatest portion of goat meat production is not traded like other meats, but is consumed locally in the communities of developing countries, where the market structure has not been developed for goat meat producers. For commercial scalability, the traditional forms of goat meat consumption (for example religious feasts) should be combined with modern habits of consumption (Skapetas & Bampidis, 2016).

Chevon, due to its healthy chemical nutrient profile is potentially the next major contributor of animal-derived protein for human consumption. Furthermore, the inadequacy of pertinent literature regarding the marketing of goats and chevon worsens the problems associated with a lack of formal goat and chevon marketing structures.

It is against this background that the development of the GMI model took place. It hopes to take advantage of this major opportunity to significantly increase the goat population in South Africa, market the merits of goat meat over other red meat products, and develop institutional capacity to produce chevon on a commercial scale and resuscitate South Africa’s exports.

Goats have inherent physiological adaptations that allow them to survive in marginal areas where crop and livestock production is not suited. Due to their adaptations, compared to other small livestock, goats are a low maintenance option and tend to be the preferred small ruminant by farmers, particularly those residing in areas that are semi-rural and rural. Thus, goats are characterised mostly by marginal farming potential.

Goats reared for chevon production constitute a major part of the global goat population. Several goat breeds are used for chevon production. In Southern Africa,

the major meat breed is the Boer goat of South Africa. The greatest portion of goat meat production is not traded like other meats, but is consumed locally in the communities of developing countries during religious feasts and traditional ceremonies (Skapetas & Bampidis, 2016). Goats are the most prolific domesticated ruminant; thus, both production and potential for genetic improvement can be attained in a relatively short period. The high prolificacy can be exploited to ensure adequate market supply of chevon, whose demand is on the increase (Aziz, 2010).

7.1 Size, Growth Rate, Trends, and Drivers of the Industry

The data for chevon production in South Africa is limited and difficult to trace due to informal transactions; it is produced and consumed in areas where farmers do not keep records. Goat slaughtering figures are normally included in the slaughter figures for sheep and it is difficult to obtain official statistics on goat slaughtering. Hence, it is estimated that between 0.55 per cent and five per cent of the goat population is slaughtered in the commercial sector and is mainly marketed in the informal sector (DAFF, 2018). This presents a tremendous opportunity for GMI to capture a significant share of goat livestock for commercial slaughter.

The recorded average gross value of chevon produced amounted to R363 million per annum over the period 2007/2008 to 2016/2017. Although rarely retailed, chevon is widely consumed in South Africa. Goats are mostly slaughtered for religious or traditional purposes, and on an informal basis. In other words, goats are slaughtered in a specific way for bridal ceremonies, and the eating of the meat tends to be restricted to certain persons according to the custom of the families (DAFF, 2018). This creates a false impression that South Africa is self-sufficient when it comes to Chevon supply and demand.

South Africa exported 43 tons of chevon to the value of R2.7 million during 2016, at an average of R62 per kilogram. This was an increase of 115 per cent in mass, and 87 per cent in income, from 2015 to 2016. The largest consumers of goat meat in South Africa are the lower income groups, who use it as a daily source of protein, and who consider it essential for bridal ceremonies and funerals. Table 1 depicts chevon

production in the world by 2016. It is easily observed that Africa and Asia produced approximately 95 per cent of the global goat meat (Mazhangara et al., 2019).

Table 1: Global chevon production in 2016

Region	Chevon Production (Tons)	Percentage of the Total
Africa	1,244,109	22
America	127,041	2
Asia	4,113,646	73
Europe	98,934	2
Oceania	37,603	1
World (Total)	**5,621,333**	**100**

Source: Mazhangara (2019)

Local cultural demand for the use of goats in South Africa is currently driving (and exceeding) the supply of live goats. Goats for meat are mainly marketed in the informal sector in the Eastern Cape and KwaZulu-Natal; this informal live market pays higher prices than the formal mutton and goat abattoirs and is driving the goat industry. Further development of the communal goat farming sector is needed and the GMI CFS model is an ideal strategy to achieve this in South Africa.

7.2 Performance of South African Chevon in International Market

Due to its health value and excellent taste, goat meat has become more popular among consumers over the past few years, and goat farmers simply cannot keep up with the demand. It is expected that this demand will continue to increase in future. The price of goat's meat, previously regarded as a relatively cheap meat aimed at the informal market, has therefore increased to levels 35 per cent above that of mutton. Almost 63 per cent of the world's population consumes goat meat, particularly in South Asia, the Middle East, and Latin America. Goat meat is increasingly featured on the menus of American restaurants (Helberg, 2019).

In 2017, South Africa's exports represented less than one per cent of chevon (fresh, chilled, or frozen). Table 2 shows that during 2017, South Africa exported approximately 12 tons of chevon at an average value of US$4 167 per ton. This is a steep decline from 43 tons exported in 2016. Namibia is the leading importer of chevon, accounting for 64 per cent of South Africa's export market of chevon in 2017. Hong Kong and China, and Lesotho accounted for 16 per cent and 20 per cent respectively during the same period. South African chevon exports to the world decreased by 25 per cent in value and by 40 per cent in quantity per annum between 2013 and 2017. Exports of South African chevon to the world have decreased by 73 per cent in value between 2016 and 2017 (DAFF, 2018).

Table 2: Importing markets for the Chevon (fresh, chilled or frozen) exported by South Africa in 2017

Importing Country	Value exported in 2017 (USD thousand)	Share in South Africa's exports (%)	Quantity exported in 2017 (Tons)	Unit value (USD/ton)	Share of partner countries in world imports (%)	Total imports growth in value of partner countries between 2013-2017 (%, p.a.)
Namibia	32	64	9	3556	0	-1
Lesotho	10	20	1	10000	0	-25
Hong Kong, China	8	16	1	8000	4.5	7
US					39.3	15
UAE					18.9	8
TOTAL	50	100	12	4167	100	3

Source: DAFF (2018)

The important observations from Table 2 are:

- US and UAE are the largest importers of goat meat, yet South Africa did not export to these counties in 2017. This presents both a challenge and an opportunity for GMI to export to these countries.

- The Namibia and Lesotho market to which most of South Africa's chevon was exported, are in decline in their imports, thus South African producers need to find new markets.
- South African producers earned the highest prices per ton in Lesotho followed by Hong Kong and China. Thus, GMI RtM will need to focus on developing the Hong Kong and China markets.

7.3 Trade of Goat Meat and Market Structure

Livestock production of sheep, pigs, and cattle have functionally efficient production and marketing support structures that allow farmers to realise proper value from both the sale of live animals and/or products derived from them. However, goat production lacks efficient and commercial value chains to facilitate commercial trading and value-adding activities. Figure 14 depicts the typical structure of the goat industry in South Africa. Live goats are realising good prices in the informal market and that is why most producers consider supplying local markets. Boer goats are marketed through out of hand sales to speculators, auctions, and sales to abattoirs. The biggest percentage of Boer goats is marketed through traders and/or speculators (DAFF, 2018).

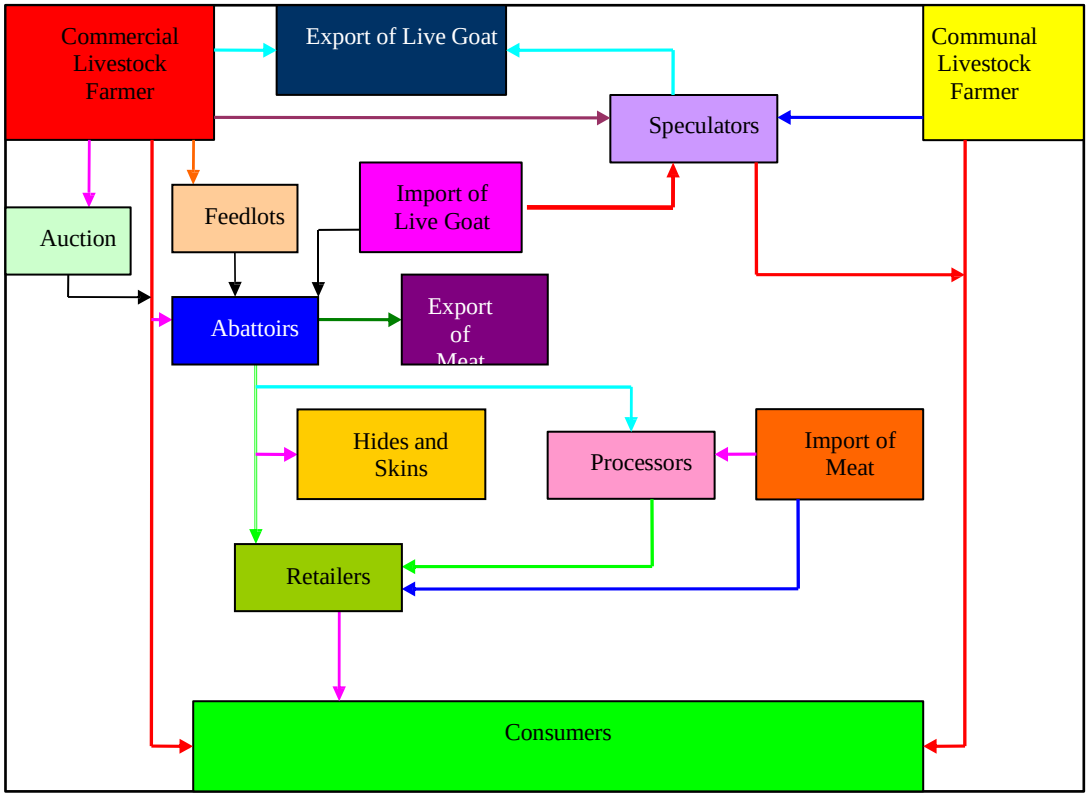

Figure 14: South African market structure of goats and chevon

In most areas, chevon is mainly consumed locally and most of it is sold at local 'markets' that cater for domestic consumption. This localisation of the trade and marketing of chevon is largely a result of the meat being excluded from the mainstream red meat industry in many regions of the world despite its potential and beneficial chemical nutrient composition. As a result, in both developed and developing countries, a major portion of chevon produced is not traded as other meats are traded; rather, it is produced, traded, and consumed locally in the communities where production takes place. In addition to the unavailability of formalised marketing for goats and chevon, the lack of a product grading system, poor quality product, seasonality of demand, inconsistent product supply, negative consumer attitudes, and insufficient research to identify new markets and expand existing markets compound the challenges faced by both goat producers and consumers of chevon (Maganga, Chigwa, & Mapemba, 2015).

In Africa and Asia, the demand for chevon is increasing despite the lack of a formalised marketing system. Besides being premised around social traditions and in some instance's ethnic necessity, the demand for chevon is also influenced by

religion as exemplified by the ‘Haji’, a religious festival, where Muslims slaughter approximately 34 million sheep and goats in about six hours (Mazhangara et al., 2019). Such religiously premised and other localised slaughters are performed outside of the abattoirs, and largely constitute traditional forms of chevon consumption.

The development of a nationally scaled, formalised marketing structure could exploit both the religious-social mediated and modern chevon consumption habits, which would stimulate the growth of the chevon industry. This is precisely what the GMI business model aims to capitalise on.

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APPENDIX B:

CONSENT LETTER

Agricultural commercialisation through innovation platforms - A case for goat production

INFORMATION SHEET AND CONSENT FORM

Hello, I am Mothupi Modiba. I am conducting research for the purpose of completing an MPhil in Inclusive Innovation at the University of Cape Town.

What I am doing

I am conducting research on the constraints and challenges in the commercialisation of goat production with the view of establishing an innovation platforms in for farmers and key value chain players.

Your participation

I hereby request that you complete a survey of about 25 questions which will take approximately 10 minutes to complete. Please understand that **your participation is voluntary and confidential** and you are not being forced to take part in this study.

Risks/discomforts

At the present time, I do not see any risks in your participation. The risks associated with participation in this study are no greater than those encountered in daily life.

Benefits

There are no immediate benefits to you from participating in this study. If you would like to receive feedback on the study, I can send you the results of the study when it is completed sometime after June 2017.

Who to contact if you have been harmed or have any concerns

This research has been approved by the University of Cape Town. If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please contact the Research Office Manager at the University of Cape Town **{Name and Email required}**

CONSENT

I hereby agree to participate in research on assessment of the value chain for goat production with the aim of creating innovation platforms for successful commercialisation.

I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term.

I understand that my participation will remain confidential.

……. ……..

Signature of participant Date

APPENDIX C:

RESEARCH INSTRUMENT: FARMERS

Interviewer's Name_____

Date of interview _____

SECTION A: DEMOGRAPHICS

A1. Sex

- ☐ Male
- ☐ Female

A2. Age Group

- ☐ 24 years and below
- ☐ 25 – 35 years
- ☐ 36 – 45 years
- ☐ 46 – 50 years
- ☐ 51 – 60 years
- ☐ 61 years and above

A3. Occupation

_____

A4. Years in the organisation

- ☐ 1 year and below
- ☐ 2 – 5 years
- ☐ 6 – 10 years
- ☐ 11 – 19 years
- ☐ 20 years and above

A5. Level of education

- ☐ High School
- ☐ Diploma
- ☐ Bachelor's Degree
- ☐ Masters
- ☐ Doctorate
- ☐ Others: - _____

DEPENDANT VARIABLES

SECTION B: COMMERCIALISATION

Commercialisation is the process of managing or running something for financial gain, in this context, managing or running the goat meat production for financial gain.

B1. How do small goat farmers commercialise?

☐ By breeding goat herds for their own consumption

☐ By managing and / or running their goat herds principally for financial gain

☐ By keeping their goat herds for their children's dowry

B2. How do commercialising small farms interact with large – scale businesses in the farming supply chain?

_____
_____
_____
_____

B3. Goat farmer make more money due to commercialisation.

☐ Agree

☐ Disagree

B4. Goat meat production brings about the following, agree or disagree

	Agree	**Disagree**
Employment		
Income		
Status		
Land utilisation		
Food security		
Animal nutrition enlightenment		

SECTION C: INNOVATION

Innovative platforms are defined as the space for learning and bringing about change for the better, where a group of people for example farmers, traders, researchers and government officials come together to diagnose problems, identify opportunities and find ways to achieve their goals.

C1. To what extent have these drivers led to the innovative platforms of goat meat production? Tick in the appropriate box

	To a low extent	**Indifferent**	**To a large extent**
Competitive marketing chain			
Access to working capital			
Technical advice			
Seasonal Variations			
Land			
Labour			
Access to the market			
Animal Nutrition			

C2. What innovative platforms are being implemented by the Agricultural and Rural Development experts' organisations in the development of the goat industry in your province?

_____
_____
_____
_____

C3. How do you rate the problems that are hindering innovative platforms on goat production?

Purpose	Very serious (1)	Moderate (2)	Not serious (3)	Not a problem at all (4)
Lack of market				
Land shortage				
Labour shortage				
Limited Breeds				
Meat prices				
Production Lack				

Others specify

_____
_____
_____

C4. Do you think the use of aromatic plants like sage, oregano and rosemary can increase the rate of convertibility, the taste, colour, texture and better shelf life of goat meat in the distribution chain?

- ☐ Yes
- ☐ No

INDEPENDENT VARIABLES

SECTION D SOCIO-ECONOMIC

This section is designed to gather information relating to the socio-economic factors

D1. In which ways is goat meat farming is helping on the socially and economically in your province?

- ☐ Job creation
- ☐ Income
- ☐ Status improvement

Others

_____
_____
_____

D2. Do you think farmers who commercialise achieve higher gross margins from the land and labour used for their commercialised enterprises?

- ☐ Yes
- ☐ No

D3. Are the goat farmers in this province landowners?

- ☐ Yes
- ☐ No

D4. If your answer to the above question is ‘No’, how did most farmers acquire the land they are farming on?

- ☐ renting
- ☐ Land sharing agreement
- ☐ Relatives / friends/neighbourhood (for free)

D5. What is the highest source of income in the goat farming of this province?

Tick where applicable

- ☐ Breeding of goats
- ☐ Sale of goats and their products
- ☐ Salary/wages from a goat farm
- ☐ other ……..

SECTION E VALUE CHAIN

Goat production value chain characteristics.

E1. Why do most people in this province keep goats?

- ☐ Status
- ☐ Selling
- ☐ Consumption
- ☐ Investment (savings)
- ☐ Dowry (offering)

E2. Do goat farmers get assistance from the Agricultural and Rural Development experts?

- ☐ Yes
- ☐ No

E3. If NO, what could be the reasons of not being rendered assistance?

_____
_____
_____

E4. What are your suggestions for improvement of value chain in the goat meat production?

_____
_____
_____
_____

SECTION F SEASONAL VARIATIONS

F1. Do you agree with the following efficiencies and constraints linked to seasonal variations? Rate at a scale of 1- 5

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
Goats are hardy and well adapted to harsh climates making them easy to rear					
The presence of goats in a mixed species grazing system can lead to more efficient use of the natural resources					
Biological, economic and cultural hindrances are the main constrains that hinder goat meat production					
Lack of demand on goat meat constrains goat production					

F2. Do you agree that management at farm level need to counteract seasonal variations with the following solutions? Rate at a scale of 1- 5

	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree
Improve by adjusting animal numbers and species mix by improving the range conditions					
Introduce some alternative supplements during the drought periods					
Educate on different seasonal patterns					

SECTION G: SOCIAL BUSINESS MODEL

G1. Are farmers in this province members of any local organisation or association?

☐ Yes

☐ No

G2. If answer for the above is 'yes', which associations do they belong to?

a) Farmer's Cooperative

☐ Yes

☐ No

b) Savings and Credit Institution

☐ Yes

☐ No

c) Women's Association

☐ Yes

☐ No

d) Other (please specify): _____

G3. Does the membership to affiliations benefit the goat farmers in the following respects?

	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree
Fast Input Delivery					
Affordable Input Price					
Fair Farm Gate Output Price					
Strong Bargaining Power					
Reliable Storage Facility					
Easy Access to Credit					
Low Cost Credit					
Increased Savings					

G4. Are the goat farmers members of the agricultural extension package in your District?

☐ Yes

☐ No

G5. If answer is 'yes', which of the following services have they received so far?

- ☐ Technical advice
- ☐ Market Information (input or/and output)
- ☐ Credit
- ☐ Farm equipment
- ☐ Improved seeds
- ☐ Fertilizer
- ☐ Capacity building training
- ☐ Weather related/Metrological

Other , Specify …….

SECTION H: SOCIO ENTREPRENEURSHIP

H1. Who are the major buyers of the goat meat in the district?

- ☐ rural consumers
- ☐ cooperatives
- ☐ middlemen from towns
- ☐ urban consumers
- ☐ others (please specify):_____.

H2. How do farmers acquire market information pertaining output prices?

- ☐ Radio
- ☐ Government
- ☐ Television
- ☐ Mobile
- ☐ Traders/Middlemen
- ☐ Neighbours
- ☐ Other (specify) _____

H3. Which areas should entrepreneurs invest in if they wish to uplift the lives of small-scale farmers and create commercial markets?

_____
_____
_____
_____

H4. In your opinion do you think the government is doing enough to improve conditions for small-scale farmers in the goat industry? Please provide reason/reasons for your answer.

_____
_____
_____
_____

H5. What efforts are done to integrate the smallholders with the market?

_____
_____
_____
_____

SECTION I DISTRIBUTION

I1. Do you have road access to the nearest town/city?

- ☐ Yes
- ☐ No

I2. If the answer is 'yes', what is the nearest town/city where you sell your products?
_____.

I3. How do goat farmers get to the nearest output markets?

- ☐ on foot
- ☐ by pack animals
- ☐ by road transport

I4. In your view why do you think there are just a few small scale farmers producing meat that can be sold by retailers, e.g. Pick and pay?

_____
_____
_____
_____

I5. Do you think business people could assist in solving some of the distribution problems being experiencing by goat farmers?

- ☐ Yes
- ☐ No

I6. Which alternative distribution systems can lead to successful commercialisation of goat meat?

_____
_____
_____
_____
_____
_____

Thank you very much for your cooperation

APPENDIX D:

RESEARCH INSTRUMENT: CONSUMER

SECTION A: DEMOGRAPHIC

A1. Sex

- ☐ Male
- ☐ Female

A2. Age Group

- ☐ 24 years and below
- ☐ 25 – 35 years
- ☐ 36 – 45 years
- ☐ 46 – 50 years
- ☐ 51 – 60 years
- ☐ 61 years and above

A3. Occupation

_____

A4. Religion

☐ Christianity

☐ Islam

☐ Hinduism

☐ African traditional and Diasporic

☐ Buddhism

☐ Other:

_____

A5. Level of education

- ☐ High School
- ☐ Diploma
- ☐ Bachelor's Degree
- ☐ Masters
- ☐ Doctorate
- ☐ Others:

_____

SECTION B: HABIT

Habit refers to a settled or regular tendency or practice, especially one that is hard to give up.

B1. When you think of goat meat. Do you think that it is something that you need or do not need?

☐ Need

☐ Do not need

B2. If goat meat were available today in your local supermarket, how likely would you buy it?

□ Very likely

□ Not sure

□ Not likely

B3. Would you replace your meat consumption with goat meat?

□ Yes

□ No

SECTION C: CONSUMER PREFERENCE

Consumer preference is defined as the subjective tastes of individual consumers, measured by their satisfaction with those after they have purchased.

In the following table, tick the features which affect your purchasing decisions of goat meat according to importance

	Most important	**Average importance**	**Not important**
Halaal Certification			
Fresh (not frozen)			
Ability to secure live animal			
Leanness			
Fat content			
Quality			

SECTION D: ACCESSIBILITY

Accessibility refers to the quality of being able to be reached, obtained or understood.

D1. To what extent to the following factors cause difficulties in the purchasing of goat meat? Tick in the appropriate column

	To a great extent	**Indifferent**	**To a small extent**
Availability of fresh meat			
Lack of information			
Availability in local supermarkets			
Comfortability in buying directly from the farmer			
Others _____			
Others _____			

D2. What do you prefer your goat meat typically available in retail stores?

□ Carcass based consumption (self-slaughter)

□ Prime cuts

SECTION E: COMPETITION

Competition refers to the rivalry between companies selling similar products and services with the goal of achieving revenue, profit and market share.

E1. How do the following factors affect competition between goat meat and other types of meat?

	To a greater extent	Not sure	To a low extent
Price			
Preference and taste			
Availability			
Packaging			
Customer care			

E2. From the following table, choose the meat you would prefer to accompany your daily meals?

	YES	NO
Goat		
Lamb		
Beef		
Pork		
Chicken		
Game		

SECTION F: PRICE

Price is the amount of money expected, required, or given in payment for something.

F1. At what price do you purchase your meat per kg?

Price /Kg	Beef	Lamb	Chevon (Goat)	Pork	Chicken
R20 and below					
R21 – R40					
R41 – R60					
R61 – R80					
R80 and Above					

F2. What is the level of pricing of goat meat in the Gauteng province?

☐ High

☐ Fair

☐ Low

F3. Do you agree that low pricing will increase demand on goat meat?

☐ Yes

☐ Not sure

☐ No

F4. Do you agree that high quality goat meat will increase demand irrespective of price

☐ Yes

☐ Not sure

☐ No

F5. Religious holidays cause an increase in goat meat pricing. Tick in the appropriate box

	Strongly agree	**Agree**	**Indifferent**	**Disagree**	**Strongly disagree**
Christmas					
Easter					
Ramadan					

F6. How often do you look for promotional prices on goat meat?

- Always
- Sometimes
- Once in a while
- Never

Thank you very much for your cooperation

APPENDIX E:

RESEARCH INSTRUMENT: EXPERT GROUP

SECTION A DEMOGRAPHICS

(Tick appropriate answer where applicable)

A1. Sex

- ☐ Male
- ☐ Female

A2. Age Group

- ☐ 24 years and below
- ☐ 25 – 35 years
- ☐ 36 – 45 years
- ☐ 46 – 50 years
- ☐ 51 – 60 years
- ☐ 61 years and above

A3. Name of the Organisation and District

_____

A4. Years in the organisation

- ☐ 1 year and below
- ☐ 2 – 5 years
- ☐ 6 – 10 years
- ☐ 11 – 19 years
- ☐ 20 years and above

A5. Position occupied in the organisation

- ☐ Team member
- ☐ Junior Manager
- ☐ Middle Manager
- ☐ Senior Manager
- ☐ Director / C.E.O
- ☐ Other: - _____

A6. Level of education

- ☐ High School
- ☐ Diploma
- ☐ Bachelor's Degree
- ☐ Masters
- ☐ Doctorate
- ☐ Others: - _____

SECTION B: VALUE CHAIN

B1. Do you assist goat farmers through your office?

- ☐ Yes
- ☐ No

B2. If NO, Give reasons why not

_____
_____
_____

B3. What innovative ways are being championed by your organisation in the development of the goat industry in your province?

_____
_____
_____
_____

B4. What efforts are done to integrate the smallholders with the market? What are the challenges and opportunities at their disposal?

_____
_____
_____
_____
_____

SECTION C SEASONAL VARIATIONS

C1. Do you agree with the following efficiencies and constraints linked to seasonal variations?

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
Goat are hardy and well adapted to harsh climates making them easy to rear					
The presence of goats in a mixed species grazing system can lead to more efficient use of the natural resources					
Biological, economic, and cultural hindrances are the main constrains that hinder goat meat production					
Lack of demand of goat meat constrains goat production					

C2. Management at farm level need to counteract seasonal variations.

	Strongly Agree	**Agree**	**Indifferent**	**Disagree**	**Strongly Disagree**
Improve by adjusting animal numbers and species mix by improving the range conditions					
Introduce some alternative supplements during the drought periods					

SECTION D: PRICE AND DISTRIBUTION

D1. Do you think Government intervention in the goat meat production market by establishing price control or subsiding of various products can help to keep goat meat prices low?

- ☐ Yes
- ☐ No

D2. Which alternative distribution systems can lead to successful commercialisation of goat meat?

_____
_____
_____
_____

D3. Is there room for entrepreneurs to get involved and work with your Organisation in upgrading the industry and form commercial markets for goat meat in your province?

_____
_____
_____
_____

Thank you very much for your cooperation