An assessment of entrepreneurial attributes determining the potential of smallholder dairy farmers progressing to commercial farming

Faith Kudzai Tanyanyiwa

Submitted in fulfilment of the requirements for the degree

Master of Agriculture (Food Security)

African Centre for Food Security

School of Agricultural, Earth and Environmental Sciences

College of Agriculture, Engineering and Science

University of KwaZulu-Natal

Pietermaritzburg

January 2016

Declaration

I, Faith Kudzai Tanyanyiwa, declare that

1. The research reported in this dissertation, except where otherwise indicated, is my original research.
2. This dissertation has not been submitted for any degree or examination at any other university.
3. This dissertation does not contain other person,,s data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other sources.
4. This dissertation does not contain other persons ,,writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted then:
5. Their words have been re-written but the general information attributed to them has been referenced.
6. Where their exact words have been used, then their writing has been placed in quotation marks, and referenced.
7. This dissertation does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the dissertation and in the References sections.

……

Faith Kudzai Tanyanyiwa (Candidate)

As supervisors we agree to submission of the dissertation

…….....

Dr Unathi Kolanisi

…….....

Professor Michael Chimonyo

Abstract

Dairy production plays an important role in the economies of developing countries where it contributes to national gross production, provides milk for nutrition and is used for income generation. Dairy farming is critical in rural development, poverty alleviation and food and nutrition security in sub-Sahara Africa due to the large number of cattle owned by smallholder rural communities. Entrepreneurial skills among communal and emerging farmers have not been widely assessed and profiled to determine their importance among smallholder farmers. Successful entrepreneurship requires the farmer to possess a vision for growth, good interpersonal skills, strong marketing strategies, sound management skills and sharp cost-benefit consciousness. Many smallholder farmers are not able to realize meaningful economic returns from the dairy enterprise because of lack of entrepreneurial skills. The objective of the study was to determine whether emerging and communal dairy farmers have the entrepreneurial attributes required to progress to commercial dairy cattle farming. Demographic data, production and management practices and financial data were collected using face to face interviews, focus group discussions, Likert scale and transect walks. The study drew participants from Groblersdal and Matatiele areas of Mpumalanga and Eastern Cape, respectively. Males aged over 60 years dominated smallholder dairy farming. However, women participation was enhanced by the Heifer project which greatly improved their involvement in dairy farming. Youth participation was very low. Most of the farmers were making losses and the viability of their dairy enterprises was low due to lack of entrepreneurial skills coupled with other production constraints. Young farmers, female farmers and farmers who were employed elsewhere other than their dairy enterprise were less likely to possess the essential entrepreneurial attributes for profitable and viable dairy enterprises. Emerging farmers could be assisted to progress to commercial dairy

farming since they have already progressed past subsistence farming, incorporating their IKS and are showing some entrepreneurial attributes. However, communal farmers may be a difficult group to progress to commercial farming given the current levels of production which are failing to meet household consumption, are not exploiting IKS opportunities available and have poor entrepreneurial attributes.

Keywords: Communal farmers; Dairy cattle; Emerging farmers; Entrepreneurial attributes; Food security

Acknowledgements

Firstly, I would like to thank God for granting me the opportunity and strength to carry out this study. I would like to acknowledge my supervisors Dr U Kolanisi and Prof M Chimonyo for their support and encouragement. I also extend gratitude to Dr. C Banga of ARC and Eastern Cape Department of agriculture for data collection logistics. A lot of gratuity to the Centre for Indigenous Knowledge Systems, UKZN, for the bursary. Thank you Ntate Makhakheng for acting as a key informant. A big thank you to the farmers for their time and commitment. To my colleagues Atlehang and Siya thank you guys for interpretation of results from focus groups. To Isack Mathew I am forever grateful for moral support throughout my work. Special mention goes to my family; this is for you, thank you for love, encouragement and financial support.

Dedication

To God who saw it first

My Father who taught me the culture of reading

My Mother for her endless prayers

Wellington, Jesca, Fadzai, Sylvester and Tapiwa for your love and support

List of Abbreviations

AI	Artificial insemination
DAFF	Department of Agriculture, Forestry and Fisheries
DTI	Department of Trade and Industry
IFAD	International Fund for Agricultural Development
NGO	Non-Governmental Organization
SSA	Sub-Saharan Africa
WDS	World Dairy Summit

Table of Contents

List of Tables

List of Figures

List of Appendices

Chapter 1 : Introduction

1.1. Background

Dairy farming is the production of milk from cows. Dairy farming is the fifth largest agricultural industry in South Africa (Thindisa, 2014). It produces milk on a daily basis, thereby providing a source of food and income to dairy producers and the community at large. This makes dairy cattle production a substantial source of employment opportunities and a poverty reduction agent. Raw milk is an intermediate product which can easily be produced under smallholder farming and helps smallholder farmers to become self-sufficient and sell surplus milk (Grobler *et al*., 2008). Dairy enterprises are expanding rapidly in countries such as New Zealand, Australia, United States and the European Union compared to Sub-Saharan Africa (SSA) (Department of Agriculture, Forestry and Fisheries (DAFF, 2012a). The dominance by developed countries in global milk production shows lack of advances in dairy sectors of developing countries where production and marketing of dairy products is mainly at subsistence level.

Entrepreneurship is difficult to define, complex and multi-dimensional. For the purpose of this study, an entrepreneur is defined as a dairy farmer who is engaged in production and marketing milk and milk products for income. Entrepreneurship assists in generating employment (Sidhu and Kaur, 2006). For smallholder farmers who lack capital resources, small-scale entrepreneurship can be regarded as a breakthrough to the predicament of unemployment through proper utilization of both human and non-human resources (Sidhu and Kaur, 2006). Levels of entrepreneurship are, however, low among emerging and communal farmers. There is need to investigate entrepreneurial attributes which are required for successful commercialization

of smallholder dairy production. This will help to determine whether they can be competitive at both production and marketing levels.

1.2. Problem Statement

The entrepreneurial skills of emerging and communal farmers have not been identified so as to develop appropriate intervention programmes to develop the entrepreneurial attributes. There is, therefore, need to assess the entrepreneurial attributes of smallholder dairy farmers and viability of the smallholder dairy farms in order to determine the entrepreneurship potential of smallholder dairy farmers to progress to commercial dairy farming.

1.3. Justification

There is a need to differentiate between survival-oriented poverty alleviation micro-enterprises and business growth. The study seeks to assess attributes and the potential of farmers as a guide to future interventions. This sets the groundwork for proper dairy development schemes based on farmers‟ attributes, challenges and opportunities. This study will benefit all emerging and communal farmers through identification of their entrepreneurial attributes. Assessment of these entrepreneurial attributes will assist emerging farmers in generating profit. Communal farmers will improve their production to meet household food demand.

1.4.Objectives

The broad objective of the study was to determine whether emerging and communal dairy farmers have the entrepreneurial attributes required to progress to commercial dairy cattle farming. The specific objectives were to:

1. Examine the entrepreneurial characteristics of emerging dairy farmers; and
2. Assess the entrepreneurial attributes of communal dairy farmers.

1.5. Limitations of the study

It was not possible to interview all the farmers on the list given by the government department due to time and logistical constraints. The study was limited to Eastern Cape Province due to high number of smallholder farmers and dependence on livestock, Mpumalanga Province was selected to represent an intermediate province where there were both cattle and crop production and there were also emerging farmers who were engaging for economic gain.

1.6. Definition of terms

Economic factors

The intra-household distribution of assets, income, work and decision-making and responsibility with regard to livestock production (Upton, 2004).

Entrepreneur

The dynamic process of creating incremental wealth. This wealth is created by individuals who take the major risks in terms of equity, time and career commitment by securing and allocating the necessary skill and resources (Kuratko *et al*., 2005).

Livelihoods

A livelihood is a means of making a living. It encompasses people‟s capabilities, assets, income and activities required to secure the necessities of life (Krantz, 2001).

Emerging

Emerging farmers are farmers who own more than five hectares of land, with an average herd size of 10 cows and engaging in income generating dairy enterprise (Mabaya *et al*., 2011).

Commercial farmer

Commercial farmers are farmers with well-developed and capital intensive dairy farms with hundreds of cattle, access to formal markets and contribute significantly to national food security (Thamaga-Chitja and Morojele, 2014).

Communal farmers

Communal farmers are farmers who practice agriculture for subsistence on land that is communally owned and administered by a traditional authority (Thamaga-Chitja and Morojele, 2014).

Smallholder farmers

Smallholder farmers farm on less developed and poorly resourced farms with fewer dairy cattle. This is a broad term that includes communal and emerging farmers (Baloyi, 2010).

Subsistence farmer

Subsistence farmers are defined as similar to communal farmers. This term also defines the level of production carried out by the farmer (Morton, 2007).

1.7. Structure of dissertation

This dissertation is structured as follows:

Chapter 1

The chapter introduced dairy farming among smallholder farmers in South Africa. It provides the main objective, research objectives, problem statement, and importance of the study. It concludes by outlining the limitations of the study and definition of terms used in this study.

Chapter 2

This chapter reviewed literature on studies carried out by other researchers. The purpose of this chapter was to put the study into context and identify knowledge gaps. The literature review focused on South African smallholder dairy farmers while comparing it to the regional and global perspectives. It concludes by summarizing the knowledge gaps that the objectives of the study attempted to fill.

Chapter 3

This chapter presents descriptive narratives obtained from the case studies of emerging dairy farmers.

Chapter 4

An assessment of entrepreneurial attributes of the smallholder dairy farmers in Matatiele local Municipality is presented in this chapter. The results were presented as tables and figures followed by a brief description. The results are also discussed in this chapter.

Chapter 5

This chapter presents discussion on the conclusions drawn from the previous chapters. It outlines the overall conclusions from this study and presents recommendations to address objectives presented in chapter 1.

1.8. References

Baloyi, J.K., (2010). An analysis of constraints facing smallholder farmers in the Agribusiness value chain: A case study of farmers in the Limpopo Province. Doctoral dissertation. University of Pretoria, Pretoria, South Africa.

Department of Agriculture, Forestry and Fisheries., (2012a). A profile of the South African dairy market value chain. Directorate of marketing, Pretoria, South Africa.

Grobler, S.M., Scholtz, M.M., Bester, J., Mamabolo, J.M., Ramsay, K.A., (2008). Dairy production systems in the emerging and communal sectors of South Africa: Results from a structured survey. *Applied Animal Husbandry and Rural Development*, **1:** 25-30.

Krantz, L., (2001). The sustainable livelihood approach to poverty reduction: An introduction. Division for policy and socio-economic analysis: Swedish International Development Co-operation Agency.

Kuratko, D.F., Ireland, R.D., Covin, J.G and Hornsby, J.S., (2005). A model of middle-level managers‟ entrepreneurial behavior. *Entrepreneurship theory and practice*, ***29*****(6):** 699-716.

Mabaya E., Tihanyi K., Karaan M. and van Rooyen, J. (2011). Case Studies of Emerging Farmers and Agribusinesses in South Africa. SunMedia: Bloemfontein.

Morton, J.F. (2007). The impact of climate change on smallholder and subsistence agriculture. *Proceedings of the national academy of sciences*,**104(50)**: 19680-19685.

Sidhu, K and Kaur, S., (2006). Development of entrepreneurship among rural women. *Journal of Social Sciences*, ***13*(2):** 147-149.

Thamaga-Chitja, J.M., and Morojele, P. (2014). The context of smallholder farming in South Africa: towards a livelihood asset building framework. *Journal of Human Ecology* **45(2):** 147-155.

Thindisa, L. M. V., (2014). Participation by smallholder farming entrepreneurs in agro-processing activities in South Africa. (Doctoral dissertation). University of the Witwatersrand, South Africa.

Upton M., (2004). The role of livestock in economic development and poverty reduction: Pro-poor livestock Policy initiative. Food and Agriculture Organization. Rome, Italy: Pp. 57.

Chapter 2 : Literature Review

2.1. Introduction

Entrepreneurship can assist in employment creation, poverty alleviation, economic growth for smallholder farmers (Agupusi, 2007; Musemwa et al., 2008; Wankel, 2008). Entrepreneurship in dairy farming has potential to generate income, combat unemployment and alleviate hunger and poverty but may be hampered by gender roles in cattle ownership. Good entrepreneurship skills are necessary for economic development that can transform emerging smallholder dairy farmers from subsistence farming to become entrepreneurs who actively participate in the economy, improve household livelihoods, enhance food security and break the cycle of poverty.

Entrepreneurial attributes are grouped into cost-benefit consciousness, good marketing strategies, basic management skills, interpersonal skills and ability to develop a vision (Pyysiäinen *et al.*, 2005). There are, however, smallholder farmers who possess these attributes but continue to practice subsistence farming due to several factors which they may fail to overcome. Such farmers need to be identified and assisted. This chapter reviews milk production patterns, smallholder dairy production systems, constraints to smallholder dairy systems, the role of entrepreneurial skills for smallholder dairy farmers and also discusses the major entrepreneurial attributes that enhance the viability of smallholder dairy enterprises.

2.2. Milk production patterns

Department of Agriculture Forestry and Fisheries (DAFF) (2012a) reported that the United States of America accounts for 14.4 % of global milk production. India is the second largest cow

milk producer (Table 2.1). When milk from buffalo is included in the production, India currently stands at 16 % of global production followed by the United States of America, China, Pakistan and Brazil. In India, smallholders own the majority of livestock and dominate the dairy sector (Otte *et al.,* 2012).

Department of Agriculture Forestry and Fisheries (2012a) purports that despite the South African dairy industry being relatively small on the global market; it is the fifth largest agricultural industry in terms of the value of agricultural production in South Africa. In South Africa, milk production increased by about 20 % to 2.6 billion litres in 2011, despite a reduction in the number of producers (Lassen, 2012). Scholtz and Grobler (2009) confirmed a 30 % decrease in the number of producers. However, high milk production levels were maintained by increases in the herd size. Lassen (2012) reported that the average herd size in South Africa is 300 cows per farm among commercial farmers. The herd sizes per household among smallholder farmers are, however, unknown.

A large proportion (98 %) of the South African dairy market is formalised (Lassen, 2012). In Ethiopia, for example, 98 % of the milk sold is supplied and produced by smallholder farmers (Bereda *et al*., 2013). In South Africa, a large proportion of the milk is produced by large scale commercial farmers (Lassen, 2012). The bulk of the milk is processed into pasteurized liquid milk, ultra-high temperature (UHT) milk and cheese (Lassen, 2012). Despite having a developed dairy sector, South Africa is still a net importer of concentrated dairy products (DAFF 2012a; Lassen 2012). South Africa imports milk, whey, butter, cheese and curd while she exports yoghurt, buttermilk, milk and cream (Lassen, 2012).

Table 2.1: World's top 10 cow-milk producing countries in 2011-13 (million tonnes)

Country	2011	2012	2013
United States of America	89	91	91
India	58	60	61
China	37	38	36
Brazil	32	32	34
Germany	30	31	31
Russian Federation	31	32	30
France	24	24	24
New Zealand	17	19	19
Turkey	14	16	17
United Kingdom	14	14	14

Source: Adapted from DAFF, 2012a.

Gertenbach (2007) and Lassen (2012) reported that, in South Africa, dairy farming is prevalent in regions where water is in adequate supply. Dairy farming does not thrive in drought prone areas. Table 2.2 shows the milk production patterns by province in South Africa. The contribution of smallholder farmers is not known, but is marginal. Most smallholder farmers market their milk informally and so their contribution to national statistics is unknown.

2.3. Smallholder dairy farming

There are about two million smallholder farms in South Africa (Mapekula *et al*., 2011). The small holder farms include communal and resettled farmers who share pastures and communal facilities obtained under the government land redistribution program. Smallholder farmers continue to be affected by high rates of poverty, unemployment and inequality (Thindisa, 2014; Ntshephe, 2011). The continued lack of improvement in their livelihoods is caused by the fact that most of the farmers do not engage in entrepreneurship to realize meaningful economic returns. Small holder dairy farmers do not produce enough milk to constitute the definition of dairy cows so their cows are typically beef cows milked for subsistence (Meissner *et al*., 2013). This could explain the low milk yields (Mapiye *et al*., 2007; Chinogaramombe *et al*., 2008; Mapekula *et al*., 2011).

Information regarding levels of production and utilization of milk in smallholder farms is scant. Some smallholder farmers possess dairy breeds with potential to produce high milk yield. They face several challenges that hinder their progress to commercialization. According to Grobler *et al*. (2008) and Cousins (2010), the smallholder sector can be divided into communal and emerging farmers.

Table 2.2: Milk production per province in South Africa in 2011

Province	Contribution to national milk supply (%)
Western Cape	27
Eastern Cape	24
KwaZulu-Natal	24
Free State	13
North West	5
Mpumalanga	4
Others	3

Source: MPO (2012).

There are some constraints which are common to both groups of farmers while some challenges are specific to a particular group. Communal farmers face production challenges related to herd size, availability of feed, technical and water resources and land disputes (Chinogaramombe *et al*., 2008). They are not much affected by market related challenges since they only sell their products occasionally such as when need for cash arises in the household.

Emerging farmers consider their dairy farms as business enterprises and invest more in technical, feed and water resources (Moloi, 2010). In some cases they overcome these challenges unlike communal farmers. Although government makes provision for extension services, they may be inadequate for emerging farmers who end up sourcing from private service providers. Land disputes are not common among emerging farmers since they are beneficiaries of government land redistribution program. However, emerging farmers are more affected by market related challenges since their main focus is producing and selling (Senyolo, 2009). Therefore, it may be appropriate that these two groups of farmers be studied separately.

2.4. Constraints to smallholder dairy farming

The structure of the dairy industry in South Africa (98 % commercial and 2 % informal) highlights the challenges that smallholder farmers face in breaking into formal production and marketing of dairy products (Milk producers organization (MPO), 2012). Among the constraints are a lack of appropriate and suitable dairy breeds, limited market access, poor infrastructure, lack of capital, high transaction costs, lack of appropriate facilities, inadequate technical skills and inadequate entrepreneurial attributes.

2.4.1. Lack of appropriate dairy breeds

Holstein, Jersey, Ayrshires and Guernseys are the major dairy breeds in South Africa (Lassen, 2012). Most of the smallholder farmers own crossbreds between indigenous and exotic breeds (Mapekula *et al*., 2011) which may not have been bred for milk production. As a result their milk productivity is low. Beyene (2015) stated that the situation is similar in Ethiopia. Although indigenous breeds are well adapted to the local conditions, there is need to select important traits in the local breeds in an effort to increase productivity (Garwe *et al*., 2001). Dairy breeds have higher conversion rate of feed to milk than beef breeds. This is important to meet demand and penetrate established markets.

There is a marked difference between the type of breeds kept by communal and emerging farmers. Communal farmers mainly keep Nguni, Brahman and Afrikaner breeds while Friesian and Jersey cows constitute a small number. Emerging farmers keep a significant number of Friesian and Jersey cows in addition to Brahman and Bonsmara (Grobler *et al*., 2008). The difference in the choice of breed is based on the objective of production. Lack of suitable and high yielding breeds is compounded by limited access to artificial insemination (AI) services. Almost all communal farmers do not utilize this technology while some emerging farmers have limited access to AI services (Burki *et al*., 2004; Zia *et al*., 2011).

2.4.2. Poor access to markets

Sikwela (2013) noted that there are two types of markets which are formal and informal. Formal markets are highly organized and more lucrative than informal markets. Market access plays a pivotal role in the livelihoods of emerging and communal smallholder dairy farmers as these

farmers rely on market participation whether formal or informal. Kapungu (2013) forwarded that formal market access affords smallholder dairy farmers opportunities to become consistent and reliable producers. Income generation has the potential to increase smallholder farmer‟s access to inputs, credit, improve their marketing strategy and acquire new technologies. Although market access has potential to improve livelihoods, smallholder farmers remain poor and disadvantaged because their participation is mainly in the informal market as they find it difficult to penetrate into the more profitable formal market.

Informal markets are encouraged by the fact that most transactions in the informal market do not require strict documentation such as receipts and invoices, the infrastructure at points of sale is not complex and prices are flexible or negotiable. In contrast, formal markets operate on stringent systems on quality and quantity standard making it difficult for the smallholder farmer who has no access to financial resources to penetrate (Sikwela, 2013). Smallholder farmer‟s milk production has to meet the market standards in order to penetrate into the formal dairy market. Hemme and Otte (2010) reiterated that gaining access into formal markets depends on the smallholder farmer‟s competitiveness in milk production and is largely influenced by production costs and the capacity of the dairy value chain targeted by the farmer. Poor road infrastructure has been implicated in many instances as the cause of limited market participation. Chinogaramombe *et al*. (2008) indicated that smallholder farmers in Zimbabwe cited poor transport network as a constraint to their dairy enterprises.

Lack of market information can limit participation in the formal marketing of products (Ntshephe, 2011). Smallholder farmers often have inadequate information on quality and

quantity requirements of the target market and this hampers their efforts to penetrate the markets. In addition, it hampers the potential of smallholder farmers to generate income or expand into the commercial sector as they receive low prices (DAFF, 2012b) for their products through informal sales. Sikwela (2013) argued that smallholder farmers do not have reliable and efficient means of acquiring information and this could be due to limited access to mass media (Kapungu, 2013) thereby limiting their knowledge on the type of products required by the market. Baloyi (2010) reiterated that even though the smallholder farmers may acquire information from other actors in the commodity chain, the information may be unreliable or inaccurate.

Market constraints affect emerging farmers more compared to communal farmers who do not regularly sell. However, despite the market challenges, emerging farmers strive to penetrate both formal and informal markets outside of their immediate communities. This proactiveness distinguishes the emerging farmers from communal farmers and attracts special attention such as case study.

2.4.3. Lack of capital and high transaction costs

Dairy enterprises require large capital investment which is beyond the reach of smallholder farmers. Capital is necessary for employment of labour, procurement of feed and equipment (Chinogaramombe *et al*., 2008). Other costs which may arise in setting up a dairy enterprise include costs associated with access to information, fulfillment of contractual obligations, project monitoring, and coordination of duties and soliciting business opportunities; these increase business costs (Baloyi, 2010).

Farmers who have access to higher social capital become dominant in capital-intensive marketing activities because they are able to sustain the transaction costs. Social capital includes all business relationships that one may have that helps in facilitating access to resources and markets for economic returns (Baloyi, 2010). Business relationships promote wholesaling, commodity broking and help the farmers to benefit from economies through pooling of resources (Baloyi, 2010). In many cases, smallholder farmers operate in isolation with limited networks outside of their immediate circles. This limits their opportunities and constricts their potential markets. Sikwela (2013) envisaged that participation of a household in lucrative markets is, therefore, determined by their ability to meet transaction costs.

The lack of capital affects both groups of farmers. However, many communal farmers rely on cattle inherited from their families and may not incur large sums of capital costs. On the other hand, emerging farmers may be farmers who were not previously practicing dairy farming and may have to acquire all their starting herd of cows from their own financial resources accumulated from other previous professions (Grobler *et al*., 2008).

2.4.4. Lack of facilities and technical skills

Milk is a highly perishable commodity and requires refrigeration especially in tropical sub-Saharan Africa. Smallholder farmers operating in the rural areas have no access to facilities such as mobile refrigerators or on-farm cold rooms. Lack of these facilities increases loss of product, lack of bargaining power as most farmers will sell products even at less than producing price in order to recoup costs before their products spoil (Chinogaramombe *et al*., 2008; Baloyi, 2010;

Bereda *et al*., 2013). Provision of proper holding facilities would improve quality, flexibility and breaking of barriers into commercialization of smallholder dairy enterprises.

Sikwela (2013) purported that lack of infrastructure hinders the participation of smallholder farmers in the formal market because they are located in rural areas where they depend on public transport to bring their products to the market. However, this mode of transport is not guaranteed due to the poor roads. Sikwela (2013) further noted that South African smallholder farmers have not received enough infrastructural support from former governments. However, the government initiated several projects to address the issue. Different projects achieved different levels of success although several were aimed at relief rather than entrepreneurship.

Technology plays a crucial role to smallholder dairy farmer‟s access to market information and equipment. Despite the advent of mobile phones and telecommunication, smallholder farmers still face challenges in accessing up to date market information. Dairy farming is labour intensive and smallholder farmers have limited access to machinery and equipment. As a result, labour costs have remained high among smallholder dairy farmers (Sikwela, 2013).

Both communal and emerging farmers face technical challenges which are confounded by low levels of literacy, lack of financial resources to acquire equipment or services and poor extension services. However, there is a marked difference in use of machinery and equipment such as milking machines and cooling facilities but not much in training between the two groups of farmers (Garza *et al*., 2014). The use of Indigenous Knowledge System is more dominant in emerging farmers as a cost cutting measure compared to communal farmers (Saha, 2014).

Incorporation of residues in supplementary feed and herbs for disease control is more prevalent among emerging farmers compared to communal farmers.

2.4.5. Lack of subsidies and entrepreneurial skills

The South African dairy industry may be less competitive against dairy industries in developed countries such as European Union, United States of America or New Zealand. Dairy farmers in these countries receive subsidies from their governments. However, the system in South Africa promotes free market and entrepreneurship among the farmers. The open system in South Africa encourages entrepreneurs to control their production costs and affect their profit margins accordingly. The free market system thrives on competition to sustain a marketable and profitable dairy industry (DAFF, 2012a; Lassen 2012).

Due to lack of subsidies in South African dairy farming, production costs are higher. Dairy farmers need to possess certain levels of entrepreneurial abilities to run viable dairy enterprises. Only farmers who possess these attributes will be able to economically participate in this sector. Hence, the need to evaluate/assess these attributes in the smallholder farmers.

2.5. Entrepreneurship ecosystem

Entrepreneurship operates in an environment influenced by culture, policy, markets, human capital, finances and supports among other factors (Figure 2.1). The entrepreneurs must develop a culture of supporting each other and boost their social capital. Public policy determines the level of entrepreneurial development through business regulations and legal framework.

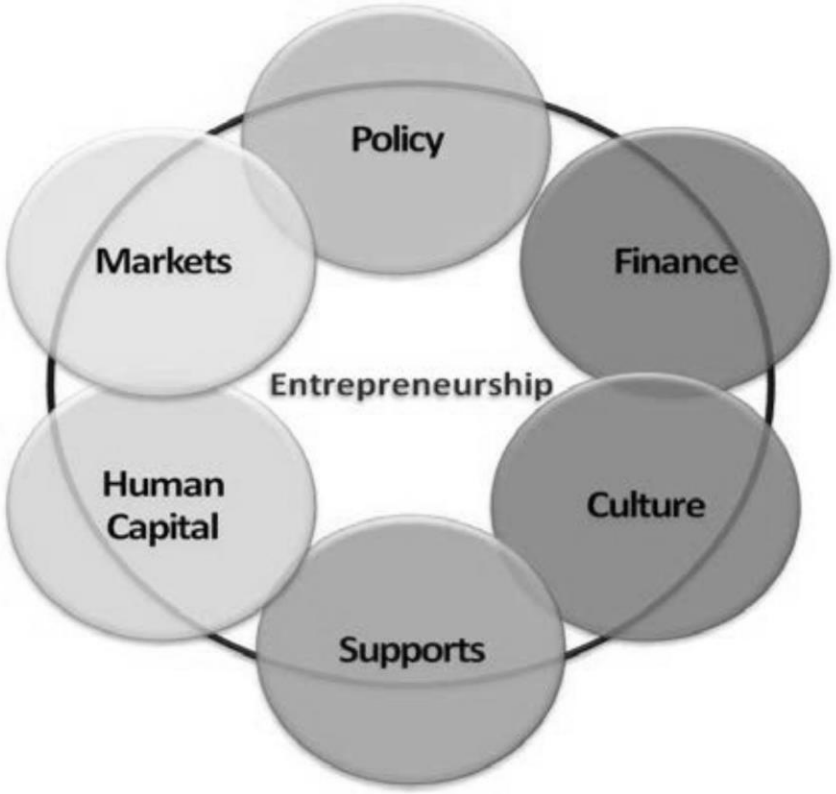


Figure 2.1: The entrepreneurship ecosystem
Source: Cooney (2012).

Entrepreneurship is sustained by access to markets as this determines the income and profitability of an enterprise. Human capital includes all the skills that employees have that help the entrepreneur to drive the organizational goals. Financial resources are very critical to successful entrepreneurship. These are the backbone of operations. Support in the form of tangible and intangible material is also integral especially among start up enterprises.

2.5.1. The concept of commercializing smallholder enterprises

Commercialisation entails a process by which smallholder farmers experience a transformation process from subsistence farming where their production is based on self-sustenance to

commercialisation where their production goes beyond self-sustenance (Jaleta *et al*., 2009; Jayne *et al*., 2011). The process of commercialization is a continuum with intermediary stages such as emerging farmers or semi-commercial farmers (Jaleta *et al*., 2009). Subsistence farmers rely solely on household generated inputs to produce mostly one product while at the semi commercial stage the inputs are both household generated and outsourced to produce a few types of products such as cream and butter.

Entrepreneurship development is a global phenomenon especially in developing countries where it has been identified as key to economic growth, employment creation and poverty alleviation (Wankel, 2008). It is regarded as a tool to promote livelihood opportunities among rural communities where unemployment is very high. Sidhu and Kaur (2006) stated that entrepreneurship assists in generating employment for various individuals within their social systems.

While entrepreneurship is regarded as a means to breaking poverty, it is widely debated whether it is inborn, learnt or developed. Cooney (2012) noted that some researchers believe that entrepreneurship is a natural inborn skill while others have acknowledged that it is a skill that can be acquired. Entrepreneurship is critical, especially in start-up enterprise ventures (Cooney, 2012) in which many emerging and communal farmers are categorised.

2.5.2. Entrepreneurship for dairy smallholder farmers

Smallholder dairy enterprises can be developed into commercial units if smallholder farmers are capacitated and their entrepreneurial potential is exploited. In order to help the smallholder

farmers to commercialize their enterprises they need to view their dairy farms from a business perspective and improve their entrepreneurial attributes rather than running their dairy farms only at subsistence level. An entrepreneur with entrepreneurship capabilities can substantially contribute to the development of a country through employment and income generation, improving rural welfare reducing poverty (Ali and Ali, 2013). Although smallholder farming activities are mainly informal they are responsible for providing many job opportunities especially in poverty stricken communities, where otherwise the situation would have been worse (Mills, 2010).

Farmers can either be „pushed" or „pulled" into establishing dairy farming enterprises. Pull factors are attractive positive factors that motivate a farmer to engage in the business while push factors are negative situational occurrences that force a farmer to enter into a business activity (Mulu-Mulu-Mutuku *et al*., 2015). Some of the attractive factors in dairy farming include income and financial independence, employment and high conversion rate of fodder into edible products. Push factors include harsh environmental conditions, economic pressure and socio-cultural norms. Poor rains and low agricultural commodity prices have forced some farmers to diversify from sole crop production to include dairy farming.

In many cases, smallholder farmers earn their livelihoods through selling milk and milk products through informal structures and also acquire some of their inputs such as feed on the informal market (International Fund for Agricultural Development (IFAD),(2014). Their entrepreneurship potential might, however, not be fully realized because of the inadequacies encountered in informal markets and marketing. This incapacitation negatively impacts on many SSA countries

where smallholder farmers form the backbone of agro-based economies (DAFF, 2012b). This is in contrast to Europe where smallholder farmers have developed skills and ways of operating smallholder farming enterprises to compete in the formal markets (Mcelwee, 2005).

2.6. Entrepreneurial attributes

Cooney (2012) asserts that development and personal competence are critical elements to successfully operate a business. Entrepreneurial attributes form part of important personal traits of the farmer which determine the success of their enterprises.

2.6.1. Management skills

A farmer is expected to make management decisions during the course of running the business. Management skills are a collection of all skills and capabilities that a farmer employs (McElwee, 2005) in arriving at decisions that are deemed necessary and economic for the flow of business to realise profits. The skills entail activities that include planning, leading, controlling and coordinating farm operations and the famers improve in efficiency of executing these duties if they are actively involved. Farming enterprises need to be sustainable to generate income for the farmer and enable recapitalisation and restocking especially in dairy farming where the productive cycle of the cow is short. The ability to efficiently and effectively allocate resources can determine success of a dairy farm enterprise. The need for adequate management skills is now critical where markets is more product-oriented and farming enterprises have become market oriented. These skills rely heavily on the ability to keep accurate on farm records. Records help the farmer to make informed decisions and keep track of expenditure and income.

2.6.2. Interpersonal skills

Dairy farming encounters problems like any other business venture. The problems may require the application of basic interpersonal skills which include effective communication, ability to relate well with different stakeholders, negotiating capability, being influential through good leadership demonstration (Pyysiäinen *et al*., 2005). The ability of farmers to become members of a farmer support group or co-operatives can be a sign of good interpersonal skills. The famers have to be able to identify the problems that the enterprise may encounter in order to come up with a sound decision encouraging the progress of the entity (McElwee, 2005). Lack of interpersonal skills can limit social capital and thereby restricting the interaction of farmers with those within their immediate circles. Farmers must also be able to motivate their employees and command respect and trust. These are important especially in conflict resolution to ensure smooth flow of operations.

2.6.3. Marketing strategies

Marketing is the proactive identification and exploitation of opportunities that result in the sale of products at a profitable price (Morris *et al*., 2002). It can be achieved through risk management, value addition and product placement in order to beat competition by meeting or exceeding customer expectations. Marketing skills are critical in a free and open market system (Bjerke and Hultman, 2002). Due to the stiff competition the farmer must have long term, innovative and sustainable strategies for marketing to be successful (Hills *et al*., 2008). Mujuru (2014) identified the ability to successfully market products, adapting to fluctuations in the market, commitment and perseverance as important indicators of entrepreneurial capabilities.

The farmer must be vigilant and constantly engage the consumers in order to be able to respond to changes in market orientation.

2.6.4. Vision

A business venture needs a vision by which it is operated. The vision should be encouraging, understandable easily articulated by the followers. The vision must be specific and attainable (Kutzhanova, 2008). It can be for the short term or long term business operation. Determined entrepreneurs have vision of growth for their business and this is evidenced by undertaking of difficult opportunities (Baum and Locke, 2004). Setting of targets or role models can be regarded as a vision.

A clear vision is evidenced by having a goal which is backed by a plan to achieve it. It also comprises of the entrepreneur‟s willingness to take risk, allocate time and meet all the costs to achieve the goal. This model is common among formal business. Informal entrepreneurs such as smallholder farmers may not have their vision clearly spelt out. They may rely on other ways to express their vision.

2.6.5. Cost and benefit consciousness

Commercial dairy farming ventures are set up to generate profits for the farmers. Profit is realized when income exceeds costs of running the business. Therefore farmers must be conscious of their expenditure in relation to their returns. The performance of commercial entities is measured by financial returns (Zahra *et al*., 2009). A farming enterprise involves the input of funding and other resources by the farmer in order to generate income for the farmer and

recapitalization through procurement of inputs for the next cycle of business. In dairy farming the farmer needs to procure services, feed and heifers to generate more income or expand the business. The farmer must make calculations whether consciously or sub-consciously and undertake decisions which are likely to result in the highest returns per cost. The scenario is not prevalent among smallholder farmers where decisions are not based on consciousness.

2.7. Gender issues and entrepreneurship

The domination of dairy farming by adult males (usually over 60 years) marginalizes women. Cattle ownership, decision making, control of income and operating environment of dairy entrepreneurship is skewed against women making it very difficult for women to establish their own dairy farms (Mulu-Mulu-Mutuku *et al*., 2015).

2.7.1. Women and youth participation in dairy entrepreneurial activities

Entrepreneurship among women should be promoted as women contribute to the socioeconomic statuses of most households (Mulu-Mutuku *et al*., 2015; Manimekalai and Balaji, 2015). In India there are more women involved in dairy entrepreneurship than men as opposed to SA and other countries (Manimekalai and Balaji, 2015). Women contribute to constructing of sheds for the cattle, washing and grooming of cattle, cleaning the sheds, weaning the calves and farm maintenance and record keeping by the following proportions 78, 84, 97, 86 and 90 %, respectively, compared to men. In addition, Lazar (2014) asserts that women are involved in milk processing and animal welfare.

Constant support from family members was identified as the most important factor that pushes women into dairy farming. This was augmented by assistance from financial institutions and the desire to do something independently (Table 2.3). In contrast to India, men dominate dairy farming enterprises in Kenya (Mulu-Mulu-Mutuku *et al*., 2015). This has been attributed partly to low level of formal education among women (Stevenson and St-Onge, 2005). As a result dairy enterprises owned by women in Kenya are generally smaller, are less profitable and have less access to acquisition of capital compared to those owned by men. Women have to overcome these challenges to establish their enterprises and some women have succeeded thereby contributing meaningfully to employment and poverty reduction (Mulu-Mulu-Mutuku *et al*., 2015).

The continued marginalization of women entrepreneurs in South Africa involved in informal dairy sector is exacerbated by cultural, societal and institutional constraints such as lack of information, training and access to finance and markets (Department of Trade and Industry South Africa (DTI), (2005). Urban and rural youth both face challenges of poverty and unemployment (Sulo *et al*., 2012). However their participation in dairy farming is not well documented. From the available information dairy farming ownership is dominated by adults (IFAD, 2014).

Table 2.3: Factors which influence women participation in dairying

	Motivational factors		
	Desire to do something independently as a dairy entrepreneur	Assistance from financial institution	Constant support from family members
Satisfied	150	116	159
Neutral	20	35	20
Dissatisfied	30	49	21
Weighted average	835	714	844
Weighted score	4.175	3.57	4.22
Rank	2	3	1

Source: Manimekalai and Balaji (2015).

2.7.2. Gender dynamics in cattle ownership

Figure 2.2 shows the differences between males and females in dairy production. The differences are evident in their access to resources, labour and roles in cattle management. Dairy cattle have different functions for women and men which are influenced by socio-cultural and socio-economic perceptions. These differences vary from one community to the other. Women play a major role in dairy farming through provision of labour inputs. However, women do not have control over income and decision making with regards to the selling and purchasing of a dairy cow (Manimekalai and Balaji 2015; Lazar, 2014; Rathod *et al*., 2011). Despite women not having control over income made from dairy cattle and their limited participation in decision making with regards to the selling and purchase of dairy cattle, Moran (2005) depicts that women often involve themselves with labour input in dairying because cattle live near the home.

Beyene (2015) argued that gender roles in farming are changing as dairying is now providing women with daily income thereby contributing to food security and the household‟s well-being. The author notes that previously gender roles were not taken into consideration and as a result women remained marginalized in development activities but that has since changed. Beyene (2015) does however, agree with (Moran, (2005); Rathod *et al*., (2011); Lazar, (2014); Manimekalai and Balaji (2015) by concluding that although gender roles have changed in dairying, women still do not have control over dairy income and their decision making is limited. A disparity between rural women and urban women has been noted. Beyene (2015) reported that women in rural areas in Ethiopia have control over the income they make from selling butter, while women in urban areas sell and control income from milk.

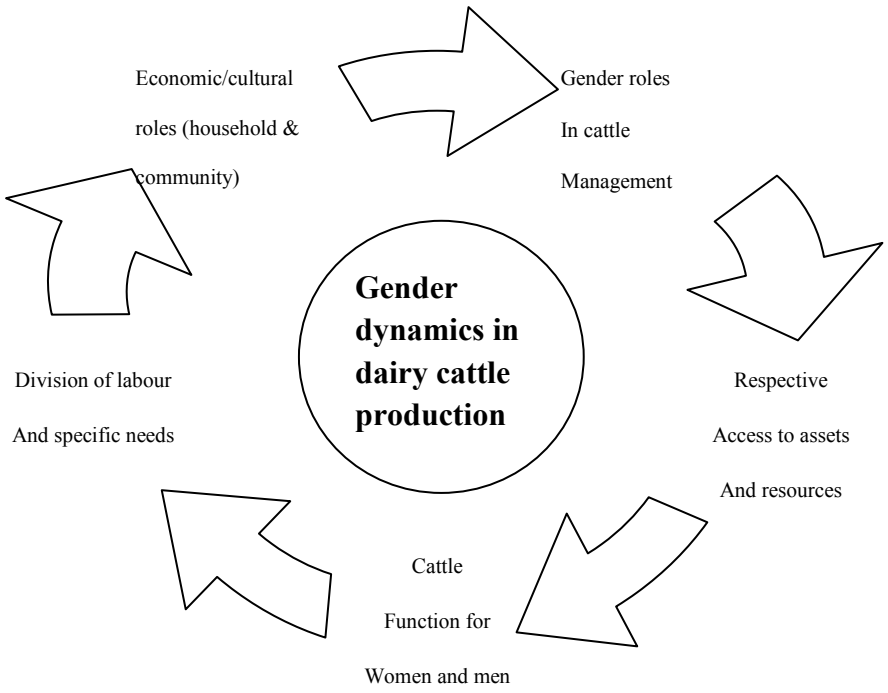


Figure 2.2: Key issues associated with gender and livestock
Adapted from Rota *et al*., 2003

2.8. Summary

The dairy sector provides opportunities for smallholder farmers. Dairy farming is capital and labour intensive; therefore the smallholder and emerging farmers require technical and financial support. Access to profitable markets is important for the farmers to realize meaningful returns. Entrepreneurial skills are necessary in order to progress from subsistence to commercial. There is gender disparity in the dairy industry as women are mostly involved in dairy cattle husbandry with limited access to economically important decisions and functions which remain limited to males. It is important to understand necessary entrepreneurial attributes for emerging and communal farmers.

2.9. References

Agupusi P., (2007). Small Business Development and Poverty Alleviation in Alexandra, South Africa. In: Second meeting of the Society for the Study of Economic Inequality ECINEQ Society, July 12–14, Berlin, Germany.

Ali, D.A.H. and Ali, A.Y.S., (2013). Entrepreneurship development and poverty reduction: Empirical survey from Somalia. *American International Journal of Social Science*, ***2*(3):** 108-113.

Baloyi, J.K., (2010). An analysis of constraints facing smallholder farmers in the Agribusiness value chain: A case study of farmers in the Limpopo Province. Doctoral dissertation. University of Pretoria, Pretoria, South Africa.

Baum, J.R and Locke, E.A., (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*, **89(4):** 587.

Bereda, A., Yilma, Z and Nurfeta, A., (2013). Handling, processing and utilization of milk and milk products in Ezha district of the Gurage zone, Southern Ethiopia. *Journal of Agricultural Biotechnology and Sustainable Development*, **5(6):** 91-98.

Beyene, B., (2015). Review on value chain analysis of dairy products in Ethiopia. *Journal of Economics and Sustainable Development,* **6(1):** 26-36.

Bjerke, B and Hultman, C.M., (2002). Entrepreneurial marketing. Edward Elgar publishing Inc. UK.

Burki, A.A., Khan, M.A., and Bari, F., (2004). The state of Pakistan‟s dairy sector: an assessment. *The Pakistan Development Review,* **43 (2):** 149-174.

Chinogaramombe, G.N.C., Muchenje, V., Mapiye, C., Ndlovu, T., Chimonyo, M and Musemwa, L., (2008). Challenges for improving smallholder dairy production in the semi-arid areas of Zimbabwe. *Livestock Research for Rural Development*. *Crops*, **7:** 0-3.

Cooney, T.M., (2012). Entrepreneurship skills for growth-orientated businesses. Report for the Workshop on „Skills Development for SMEs and Entrepreneurship. Copenhagen, Denmark.

Cousins, B., (2010). What is a „Smallholder?" Class-analytic perspectives on small-scale farming and agrarian reform in South Africa. Working Paper 16. University of Western Cape, South Africa.

Department of Agriculture, Forestry and Fisheries., (2012a). A profile of the South African dairy market value chain. Directorate of marketing, Pretoria, South Africa.

Department of Agriculture, Forestry and Fisheries., (2012b). A framework for the development of smallholder farmers through cooperative development. Directorate co-operative and enterprise development, Pretoria, South Africa

Department of Trade and Industry South Africa (DTI), (2005). South African Women Entrepreneurs. A burgeoning force in our economy. A special report. Pretoria, South Africa

Garwe E, Ball, P.J.H, Hamudikuwanda, H and Mutisi, C., (2001) Reproductive performance of indigenous and cross-bred cows developed for milk production in semi-arid regions and the effect of feed supplementation. In: Sustaining livestock in challenging dry season environments: strategies for small scale livestock keepers. *Natural Resources International Ltd*., Kent, UK. 63-71.

Garza, M., Anis, A and Bokhari, S., (2014). Women empowerment through the dairy sector in Pakistan. Master in Public Policy, Lee Kuan Yew School of Public Policy, National University of Singapore, Singapore.

Gertenbach, W., (2007). Dairy farming in South Africa. Where to now? Institute for Animal Production, Western Cape Department of Agriculture, Cape Town, South Africa

Grobler, S.M., Scholtz, M.M., Bester, J., Mamabolo, J.M and Ramsay, K.A., (2008). Dairy production systems in the emerging and communal sectors of South Africa: results from a structured survey. *Applied Animal Husbandry and. Rural Development*, **(1):** 25-30.

Hemme, T and Otte, J., (2010). Status and Prospects for Smallholder Milk Production A Global Perspective. FAO, Rome, Italy.

Hills, G.E., Hultman, C.M and Miles, M.P., (2008). The Evolution and Development of Entrepreneurial Marketing. *Journal of Small Business Management* **(46)1:** 99–112

International Fund for Agricultural Development (IFAD). (2010). Youth and Agriculture: Key challenges and concrete solutions. FAO, Rome, Italy.

Jaleta, M., Gebremedhin, B and Hoekstra, D. 2009. Smallholder commercialization: Processes, determinants and impact. Discussion Paper No. 18. Improving Productivity and Market Success (IPMS) of Ethiopian Farmers Project, International Livestock Research Institute, Nairobi, Kenya. pp55.

Jayne, T.S., Haggblade, S., Minot, N and Rashid, S., (2011). Agricultural Commercialization, Rural Transformation and Poverty Reduction: What have We Learned about How to Achieve This? In Synthesis report prepared for the African Agricultural Markets Programme Policy Symposium, Alliance for Commodity Trade in Eastern and Southern Africa April, 2011, Kigali, Rwanda. Pp 20-22.

Kapungu, S., (2013). A study of rural women farmers‟ access to markets in Chirumanzu. Doctoral dissertation, Stellenbosch University, Stellenbosch, South Africa

Kutzhanova, N., (2008). Entrepreneurial Skill Development and how best to assist entrepreneurs: Policy implications for enterprise development practice. ProQuest, Michigan. United States of America.

Lassen, B., (2012). Dairy production in South Africa; Dairy farming in a free market: Impressions from South Africa. http://www.agribenchmark.org/fileadmin/Dateiablage/B-Dairy/Country_Report/12_country_information_SA.pdf (Accessed 2015, June 30).

Lazar, N., (2014). Role of women entrepreneurs in dairy sector with special reference to Thrissur District of Kerala. *Indian Journal of Applied Research*, **4(11):** 296-298.

Manimekalai, P and Balaji, K., (2015). Participation of women entrepreneurs in dairy sector in Salem district of Tamilnadu. *International Multidisciplinary Research Journal*, **4 (10):** 1-5.

Mapekula, M., Mapiye, C and Chimonyo, M. (2011). Changes in metabolites concentration in Nguni and crossbred calves on natural pasture. *Asian-Australian Journal of Animal Science*, ***24*(11):** 1569-1576.

Mapiye, C., Chimonyo, M., Muchenje, V., Dzama, K., Marufu, M.C. and Raats J.G., 2007. Potential for value-addition of Nguni cattle products in the communal areas of South Africa: a review. *African Journal of Agricultural Research*, **2(10):** 488-495.

McElwee, G., (2005). Developing entrepreneurial skills of farmers. D2: A literature review of entrepreneurship in agriculture. European Commission, United Kingdom.

Meissner, H.H., Scholtz, M.M and Palmer, A.R., (2013). Sustainability of the South African Livestock Sector towards 2050 Part 1: Worth and impact of the sector. *South African Journal of Animal Science,* **43(3):** 282-297.

Milk Producers Organization (MPO). (2012). Milk South Africa is the instrument through which its members, the MPO and South African Milk Processors‟ Organization **(**SAMPRO), deal with common challenges. *Lacto Data Statistics*, **15(2):** 4-15.

Mills, G (2010) Poverty is now optimal: Why Africa is poor and what Africans can do about it. Penguin Books Rose bank, Johannesburg, South Africa.

Moloi, M. J. (2010). A comparison of socioeconomic characteristics that determine the farm income of emerging lifestock and horticultural farmers in South Africa. Doctoral dissertation. University of Limpopo. Limpopo, South Africa.

Moran, J., (2005). Tropical dairy farming: feeding management for smallholder dairy farmers in the humid tropics. CSIRO Publishing. Collingwood, Australia.

Morris, M.H., Schindehutte, M and LaForge, R.W., (2002). Entrepreneurial marketing: A construct for integrating entrepreneurship and marketing perspectives. *Journal of Marketing Theory and Practice,* **10(4):** 1-19.

Milk producers organization (MPO)., (2012). Statistics. *Journal of LactoData*, **15(2):** 4-15.

Mujuru, J.T.R., (2014). Assessing the impact of strategic entrepreneurship skills training workshops on small-holder farmers‟ entrepreneurial competence and capabilities: Case studies of Dotito irrigation scheme in Mashonaland Central province and Mitchell in Mashonaland East province, Zimbabwe. *International Review of Basic and Applied Sciences,* **2(1):** 18-28.

Musemwa L, Mushunje, A., Chimonyo, M., Fraser, G., Mapiye C and Muchenje V., (2008). Nguni cattle marketing constraints and opportunities in the communal areas of South Africa: Review. *African Journal of Agricultural Research,* **3 (4):** 239-245

Mulu-Mutuku, M., Wanga, D., Olubandwa, A., (2015). Female Entrepreneurship in Kenya: How do female micro-entrepreneurs learn to be entrepreneurial? Case Studies in Business and Management, **2(1**): 1

Ntshephe, L., (2011). Marketing information needs of smallholder livestock farmers in the Morele area. Masters Thesis, University of South Africa, Pretoria, South Africa

Otte, J.A., Costales, J., Dijkman, U., Pica-Ciamarra, T., Robinson, V., Ahuja, C., and Roland-Holst, D., (2012). Livestock sector development for poverty reduction: an economic and policy perspective. Livestock's many virtues. FAO, Rome, Italy.

Pyysiainen, J., Anderson, A.R., McElwee, G and Vesala, K., (2005). Developing the entrepreneurial skills of farmers: some myths explored. *International Journal of Entrepreneurial Behavioral Research,* **12(1):** 21-39

Rota, A., Sperandini, S., Hartl, M., (2003). Gender and livestock: Tools for design. International Fund for Agricultural Development (IFAD). Rome, Italy.

Rathod, P. K., T.R.Nikam, T R., Landge, S., Vajreshwari, S. and Hatey, A. (2011). Participation of rural women in dairy farming in Karnataka. *Indian Research Journal of Extension Education,* **11 (2):** 31-36.

Saha, A., (2014). Indigenous breeding and management practices of dairy animals–a study on documentation. *Scholars Journal of Agriculture and Veterinary Sciences* **1(4A):** 216-221.

Scholtz, M.M and Grobler, S.M., (2009). A systems approach to the South African dairy industry. *South African Journal of Animal Science,* **39(5):** 121-125.

Senyolo, G. M., Chaminuka, P., Makhura, M. N., & Belete, A. (2009). Patterns of access and utilization of output markets by emerging farmers in South Africa: Factor analysis approach. *African Journal of Agricultural Research*, **4(3):** 208-214.

Sidhu, K and Kaur, S., (2006). Development of entrepreneurship among rural women. *Journal of Social Sciences,* **13(2):** 147-149.

Sikwela, M.M., (2013). The impact of farmer support programmes on market access of smallholder farmers in the Eastern Cape and KwaZulu Natal Provinces, South Africa. *African Journal of Agricultural Research*, **8(21):** 2502-2511.

Stevenson, L and St-Onge, A., (2005). Support for growth-oriented women entrepreneurs in Kenya. International labour organization, Geneva, Switzerland.

Sulo, T., Chepng"eno, W., Chumo, C., Tuitoek, D and Agat J., (2012). Assessment of youth opportunities in the dairy sector in Uasin Gishu County, Kenya. *Journal of Emerging Trends in Economics and Management Sciences*, **3(4):** 332-338.

Thindisa, L., (2014). Participation by smallholder farming entrepreneurs in agro- processing activities in South Africa. Doctoral dissertation. University of Witwatersrand, Johannesburg, South Africa.

Wankel, C., (2008). Alleviating poverty through business strategy, 1st ed. Macmillan, New York, United States of America

Zahra, S.A., Gedajlovic, E., Neubaum, D.O and Shulman, J.M., (2009). A typology of social entrepreneurs: Motives, search processes and ethical challenges. *Journal of Business Venturing,* **24 (5)**: 519-532.

Zia, U.E., Mahmood, T., and Ali, M., (2011). Dairy Development in Pakistan. FAO, Rome, Italy.

Chapter 3 : Entrepreneurship skills and viability of emerging dairy enterprises

Abstract

A case study approach was undertaken in Groblersdal and Matatiele local municipalities in Mpumalanga and Eastern Cape provinces of South Arica respectively, to obtain an in-depth understanding of the entrepreneurial characteristics of smallholder dairy farmers. A total of twenty five emerging smallholder dairy farmers from Matatiele and Groblersdal municipalities were interviewed. Transact walks, face-face interviews, focus group discussions and a Likert scale to assess the entrepreneurial characteristics of the emerging dairy farmers. All data was subjected to content analysis. Profit and loss of the dairy enterprise was calculated using basic accounting in Microsoft Excel 2010. Eighteen famers possessed interpersonal skills, 14 had vision to expand and 11 exhibited good marketing strategies. The study found lack of management and cost benefit consciousness among the farmers. Only six farmers had these two important attributes. There were a myriad of operational challenges that limited their ability to access and participate in the market. These challenges, subsequently, reduced the viability of their small-scale emerging dairy enterprise. The findings also showed that the smallholder farmers still relied on their indigenous knowledge to manage the dairy operation. The indigenous knowledge concentrated within the communal sector offers a starting point in progression as it can be integrated with modern techniques in enhancing cattle production and management.

Keywords: cattle, dairy, emerging farmers, entrepreneurship, food security, indigenous knowledge systems.

3.1. Introduction

The South African dairy sector is broadly divided into two groups; commercial and communal farmers (Thamaga-Chitja and Morojele, 2014). There is however, an intermediate group known as the emerging farmers which has since emerged. This group exhibits a mixture of characteristics from the broad groups which makes it difficult to place emerging farmers into a definite category. There is little information on entrepreneurship among emerging farmers. This transitional group has potential to progress to full-fledged commercial farming with necessary support hence the need to evaluate their attributes. Emerging farmers were previously disadvantaged farmers who are now owners of more than five hectares of land through the South African‟s land restitution programme with an average herd size of 10 cows (Mabaya *et al*., 2011).

Emerging dairy farming is a dairy enterprise that is producing at an intermediary level past the communal farmer but below commercial farmer. Their dairy operations are influenced by fluctuations in climatic conditions, production constraints and technical shortcomings (Zvinorova *et al*., 2013). These constraints negatively affect viability of their dairy enterprises and reduce the contribution of dairy farming to household and local economies. For optimum economic contribution, farmers should operate their dairy farming as profitable enterprises (Hahlani and Garwi, 2014). The profit contributes to the viability of the enterprise by helping the farmer to cover all production costs.

The constraints that these emerging farmers face may be overcome by using multi-faceted approaches such as integrating Indigenous Knowledge Systems (IKS) in animal health care and

feeding and modern techniques. Vast amounts of IKS which are not documented may be integrated to reduce production costs and increase profit margins for emerging farmers. Indigenous Knowledge Systems may be cost effective and enable the farmers to deal with local challenges in their own ways. Indigenous Knowledge Systems are still deeply engraved within emerging farmers (Saha, 2014) such as the treatment of cattle through the use of herbs. Therefore, methods which are foreign to a community but relevant should be used in tandem with such indigenous knowledge systems.

Emerging farmers face constraints such as lack of appropriate and suitable dairy breeds, poor market access, poor infrastructure, lack of capital, lack of appropriate facilities, inadequate technical skills and poor entrepreneurial attributes (Mabaya *et al*., 2011). Entrepreneurship requires a certain level of competence by the farmer to be able to exploit available resources and opportunities to realise maximum possible profit. The profits enable the farmers to participate in the mainstream economy (Wankel, 2008). The government of South Africa, through the National Development Plan, aims to foster entrepreneurship among smallholder and communal farmers by the year 2030 (NPC, 2012). Several intervention programmes aimed at promoting entrepreneurship among emerging farmers resulted in relative low success. Among some of the reasons which contributed to the low success rates include overlooking the entrepreneurial attributes of the farmers and their technical capacity. Farmers are more reactive in nature rather than proactive which greatly compromises their entrepreneurial ability.

Emerging farmers have the potential to support their households and sell surplus milk to earn income. Dairy production among emerging farmers is, however, largely hindered by include lack

of entrepreneurial attributes. Entrepreneurial attributes determine whether a farmer can be competitive in the dairy sector at both production and marketing levels. Emerging farmers represent an intermediate group and, therefore, cannot be included in the study of communal or commercial farmers. They should rather be studied on their own in order to gain an in-depth understanding of their circumstances. Much information is known about commercial or communal compared to emerging farmers. The objective of the current study was to assess whether emerging farmers possess the necessary entrepreneurial attributes to operate profitable smallholder dairy enterprises. It was hypothesized that the emerging farmers lacked entrepreneurial attributes and the lack of these attributes limit the profitability and viability of emerging dairy enterprises. Thamaga-Chitja and Morojele (2014)

3.2. Materials and Methods

3.2.1. Population of farmers

Farmers who benefitted from developmental projects were identified with the assistance of the Eastern Cape Department of Agriculture. All the farmers who were identified were selected for the study. The farmers had graduated from small scale (subsistence) farming and they were individual emerging farmers who owned more than 10 dairy cows. The cattle breeds used were mainly Nguni, Jersey and crosses between Jersey and Nguni breeds. Eight farmers were identified in Groblersdal, Mpumalanga Province and 17 were identified in Matatiele, Eastern Cape Province, both provinces are in South Africa. The two sites were selected due to differences in agricultural potential. Groblersdal has higher potential than Matatiele based on favorable climatic conditions. They were also selected Due to similarities in the challenges faced

by the farmers in their dairy enterprises. Both areas consisted of farmers who engaged in income generating dairy farming and those who produced for household consumption only.

The weather conditions for Groblersdal and Matatiele are depicted in Figure 3.1 and 3.2, respectively.

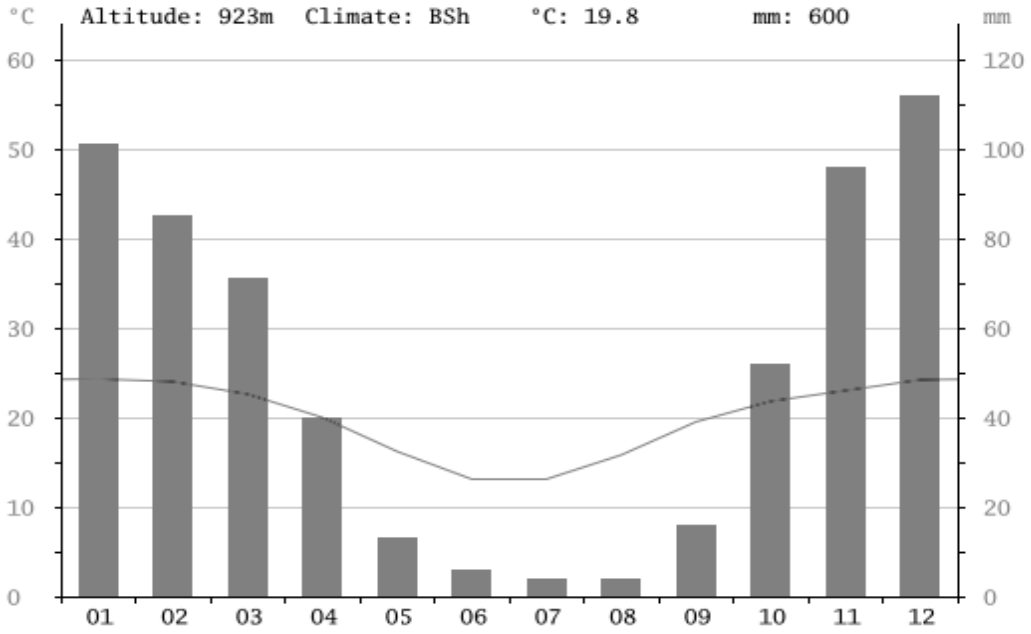
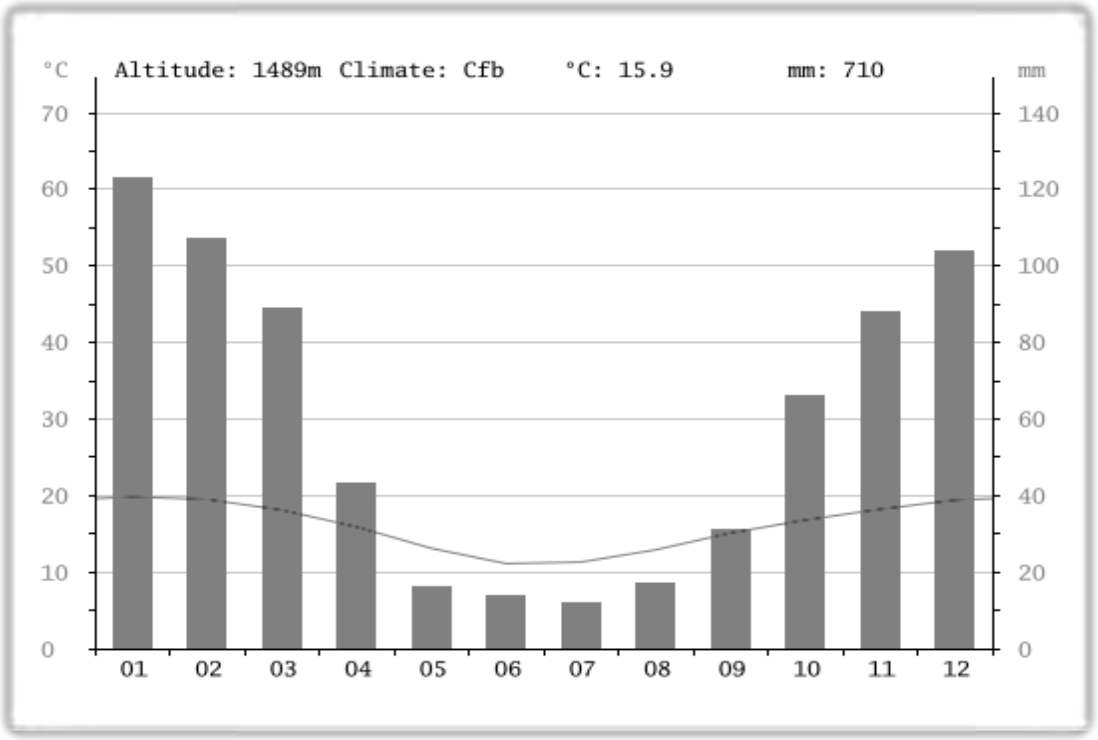


Figure 3.1: Average monthly weather conditions in Groblersdal for period January 2000 to December 2015

Source: http://images.climate-data.org/location/26813/climate-graph.png



Month of the year

Figure 3.2: Average monthly weather condition in Matatiele for period January 2000 to December 2015

Source: http://images.climate-data.org/location/27178/climate-graph.png

3.2.2. Presentation of farmers

Representative farmers were presented from the population based on age, gender, level of education, as shown in Table 3.1. Farmer making highest profit and loss in each category was selected to represent that category. Six farmers making the highest loss and five farmers making the highest profit were selected to represent their respective categories. Farmer M3 and Farmer M10 were presented more than once as they represented three categories each.

Table 3.1: Selection criteria used to select representative farmers

Selection criteria	Category	Profit /Loss
Age	Oldest	Profit
	Oldest	Loss
	Youngest	Profit
	Youngest	Loss
Gender	Male	Profit
	Male	Loss
	Female	Profit
	Female	Loss
Level of education	Basic education	Profit
	Basic education	Loss
	Higher education	Profit
	Higher education	Loss
Employment status	Unemployed	Profit
	Unemployed	Loss
	Employed	Profit
	Employed	Loss

Farmers were identified by a combination of initial of the study area and their number in the group. For instance M4 means farmer number four from Matatiele while G4 means farmer number four from Groblersdal.

3.2.3. Data collection and analyses

A case study approach was used to assess the entrepreneurial attributes of the emerging farmers. Data were collected using face to face interviews; focus group discussions, Likert scale and transect walks were used. The interview was used to collect demographic data, production and management practices and financial information of the farmers‟ enterprises. Two focus group discussions of eight farmers per group were conducted. The focus group discussions were used collect information on challenges and constraints that the farmers faced. The Likert scale was used to collect information on the dairy farmers‟ entrepreneurial characteristics. The data collected included the farmers‟ vision, interpersonal skills, marketing strategies, management skills and cost-benefit consciousness. Three transect walks were conducted in Matatiele and three in Groblersdal to appraise available dairy assets. Data collected included type and number of assets available, availability of water, the source of water and infrastructure.

Three enumerators from each study site were trained to conduct the interviews and record assets that the farmers owned. All data were subjected to content analysis. The financial information collected was used to calculate gross profit of the enterprises using basic accounting principles. Gross profit was estimated as the difference between revenue (income) and the total variable costs. Profit and loss for each farm were calculated from costs and revenue estimates given by the farmers as they did not keep relevant and proper financial records. Where receipts were kept

they were used too, some price estimates were verified at the agricultural dealers. Where prices could not be established, the study relied on information provided by the farmers.

3.3. Results

3.3.1. Household demographic information for dairy farmers in Groblersdal

In Groblersdal the youngest farmer was 40 years old while the oldest was 78 years old. Only one out of the eight farmers was single, the rest were either married or widowed. The level of education was evenly distributed among no formal, primary and secondary education among the farmers. Only two farmers were unemployed while the rest were employed part time elsewhere. Household size ranged between two and 10 people per household. Five farmers each owned farms which were five hectares in size while the largest and smallest farms measured seven and three hectares respectively. Female ownership of dairy cattle dominated in Groblersdal. Table 3.2 summarizes the demographic information of the farmers in Groblersdal.

3.3.2. Household demographic information for dairy farmers in Matatiele

In Matatiele, 14 male and three female farmers who were mostly either married or widowed participated. Only two farmers were single. The farmers were spread across different age groups. There were three youths aged between 18 and 35 years. Ten of the farmers were in the middle age (between 36 and 60 years old) and the remainder (4) were aged above 60. Primary level education dominated with eight farmers having attained this level. Two farmers attained tertiary education, while there were three who did not have any formal education. The other four farmers

attained secondary level education. Cattle ownership was dominated by males, although joint ownership was also reported. Fifteen out of the 17 farmers had no formal employment and depended solely on dairy farming for income. Farmers in Matatiele owned less than 0.5 ha of land, with only two farmers having seven and eight hectares (Table 3.3).

3.3.3. Profiles of selected representative farmers

Summary profile of representative farmers is presented in Table 3.4. One farmer from each category making profit or loss was selected to represent farmers for that category. Different demographic groups showed differences in profit or loss making. The different demographic groups were divided into two categories each such as youths and old age for age group, male and female for gender. There was one farmer who depended entirely on dairy farming for livelihood. There were seven farmers who diversified dairy production with other livelihood options. The different livelihoods options were crop production, beef production, employment and some non-agricultural businesses. The importance of each livelihood option differed between farmers. The reasons for engaging in dairy farming included the need to generate income and household consumption.

Table 3.2: Demographic information of emerging dairy farmers in Groblersdal

Farmer identity	Age	Gender	Marital status	Education level	Employment status	Household size	Land size (ha)
1	65	Female	Widowed	Primary	Unemployed	10	7
2	78	Male	Widowed	No formal	Unemployed	4	5
3	56	Female	Married	Secondary	Part-time	9	5
4	76	Male	Widowed	Primary	Full time	10	5
5	50	Female	Married	Secondary	Part-time	2	7
6	73	Male	Married	No formal	Part-time	3	3
7	48	Female	Married	No formal	Part-time	5	5
8	40	Male	Single	Primary	Part-time	5	5

Gender: gender of head of household. Listed in order of farmer identity

Table 3.3: Demographic information of emerging dairy farmers in Matatiele

Farmer identity	Age	Gender	Marital status	Education level	Employment status	Household size	Land size
1	69	Male	Married	Primary	unemployed	4	0.36
2	69	Male	Married	Tertiary	unemployed	6	7
3	47	Male	Married	Tertiary	unemployed	8	8
4	71	Male	Married	No formal	unemployed	5	0.36
5	39	Male	Married	Secondary	part-time	4	0.3
6	60	Male	Married	Primary	full time	9	0.36
7	20	Male	Single	Primary	unemployed	6	ND
8	57	Male	Single	Primary	unemployed	3	0.36
9	59	Female	Widowed	Tertiary	unemployed	4	ND
10	70	Male	Widowed	Primary	unemployed	8	0.49
11	24	Male	Married	Secondary	unemployed	6	0.36
12	60	Male	Married	No formal	unemployed	8	0.36
13	56	Female	Widowed	No formal	unemployed	4	0.36
14	57	Male	Married	Primary	unemployed	14	0.56
15	59	Male	Married	Primary	unemployed	5	ND
16	34	Female	Married	Primary	unemployed	4	0.16
17	52	Male	Married	No formal	unemployed	7	0.36

ND: land size unknown due to communal land ownership; Gender: Gender of head of household Listed in order of farmer identity

3.3.4. Profitability of dairy enterprises of selected representative farmers

Profit and loss calculations showed that the farmers had different potential to generate income (Table 3.5). Six farmers were incurring losses whilst five farmers were making profit from their dairy enterprises. Farmer M3 was making the highest profit while farmer M10 had the highest loss and cost of feed. Farmer M5 had the lowest cost of production. Farmer G6 did not spend any money on animal health. Seven farmers had less than 10 cows in lactation while four farmers had 10 or more cows in lactation. Feed costs were the major production costs. Farmers M9, M10 and M11 were making and selling fermented milk to increase diversity in their product range.

Table 3.4: Farmers selected to represent different categories

Selection criteria	Category	Profit /Loss	Selected farmer	Livelihood option
Age	Old aged (above 55 years)	Profit	G4	Crop, dairy and employment
	Old aged (above 55 years)	Loss	G2	Crop, beef and dairy
	Youth (18-35 years)	Profit	M11	Dairy only
	Youth (18-35 years)	Loss	M7	Beef only
Gender	Male	Profit	M3	Dairy and beef
	Male	Loss	M10	Crop only
	Female	Profit	G5	Crop, dairy and business
	Female	Loss	M9	Dairy only
Level of education	Basic education	Profit	G8	Dairy and business
	Basic education	Loss	M10	Crop only
	Higher education	Profit	M3	Dairy and beef
	Higher education	Loss	M5	Beef and employment
Employment status	Unemployed	Profit	M3	Dairy and beef
	Unemployed	Loss	M10	Crop only
	Employed	Profit	G5	Crop, dairy and business
	Employed	Loss	G6	Dairy, beef and employment

G1, G2…G8=Famer 1, Farmer 2 …Farmer 8 from Groblersdal; M1, M2…M17=Farmer 1, Farmer 2…Farmer 17 from Matatiele; Crop, beef=dependence on crop or beef production. Employment=Farmer employed elsewhere; Business=Farmer engaged in non-dairy business

Table 3.5: Profit and loss accounts for representative farmers

	Farmer										
	G2	G4	G5	G6	G8	M3	M5	M7	M9	M10	M11
Raw milk											
Price of milk/litre	R5.00	R7.00	R10.00	R5.00	R7.00	R10.00	R5.00	R5.00	R5.00	R5.00	R10.00
Cows in lactation	5	5	5	3	3	13	6	7	10	16	12
Yield per cow (litres)	3	7	5	3	8	3	2	3	3	2	3
Milking frequency	1	1	2	1	2	2	1	1	1	1	1
Milk sold per day (litres)	13	32	49	7	46	75	9	17	26	25	30
Income per day	R65	R224	R490	R35	R322	R750	R45	R85	R130	R125	R300
Total per month	R1300	R4480	R9800	R700	R6440	R15000	R900	R1700	R2600	R2500	R6000
Fermented milk											
Price/litre	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	R3.00	R3.00	R5.00
Sales per month (litres)	0	0	0	0	0	0	0	0	60	100	80
Total per month	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	R0.00	180	300	400
Gross income	R1300	R4480	R9800	R700	R6440	R15000	R900	R1700	R2780	R2800	R6400
Costs											
Labour	R1500	R1000	R1450	R900	R800	R1300	R800	R0	R1400	R800	R1200
Animal health	R330	R600	R300	R0	R200	R2000	R220	R0	R920	R250	R150
Feed	R2680	R1500	R1300	R2500	R1350	R3500	R1075	R3600	R3940	R5750	R1500
Transport	R0.00	R.000	R250	R0.00	R100	R420	R0.00	R0.00	R0.00	R0.00	R100
Total costs	R4510	R3100	R3300	R3400	R2450	R7220	R2095	R3600	R6260	R6800	R2950
Profit/Loss	-R3210	R1380	R6500	-R2700	R3990	R7780	-R1195	-R1900	-R3480	-R4000	R3450

3.3.5. Viability of dairy enterprises of representative farmers

There are negative and positive factors which affect viability of emerging dairy enterprises (Table 3.6). The negative factors included production constraints such as small numbers of lactating cows, limited financial resources and market constraints. Farmers‟ experience in dairy farming, cattle ownership among many communal farmers and useful IKS were identified among the positive factors which improve viability. Good interpersonal skills were also found prevalent among the famers.

3.3.6. Entrepreneurial attributes of representative farmers

The entrepreneurial attributes of the selected farmers are presented in Table 3.7. Four farmers showed a lack of vision required to expand their dairy enterprises. Farmer 2 in Matatiele stated that his vision was diversifying into beef production. All famers in Matatiele, except farmer 15, exhibited good interpersonal skills. Loss making farmers were shown to have weak marketing strategies. Management skills and cost-benefit consciousness were exhibited by the profit making farmers only.

Table 3.6: Contributions to viability of emerging dairy enterprises

Negative	Positive
• Low number of milking cows and low frequency of milking	• Ownership of dairy cattle provides a starting point for intervention strategies
• Limited financial resources which hinder procurement of equipment and services	• Experience in dairy farming which can be improved by training
• Limited training in basic management skills which negatively affects keeping of enterprise related records	• They possess IKS which can be integrated into commercialization
• Prevalence of cattle illnesses, deaths and stock theft which reduce size of dairy herds	• The good relations among the farmers can be used to build farmer support groups
• Lacked most entrepreneurial attributes which are necessary for progression into commercial farming	
• The farmers lacked value addition in their value chain. They were limited to selling raw milk and fermented milk	

Table 3.7: Entrepreneurial attributes exhibited by the representative farmers

	Farmer										
Attribute	G2	G4	G5	G6	G8	M3	M5	M7	M9	M10	M11
Vision	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Interpersonal skills	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes
Market strategies	No	Yes	Yes	No	Yes	Yes	No	No	No	No	Yes
Management skills	No	No	Yes	No	No	Yes	Yes	No	No	No	No
Cost-benefit consciousness	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes

3.4. Discussion

Youth participation in dairy farming in South Africa was different from Nigeria (Arowolo *et al*., 2013). There was a contrast in youth involvement between Matatiele and Groblersdal. The Heifer International project which benefitted married women may have marginalized youths who were deemed to be part of the beneficiary household. Urban migration may also be responsible for the decrease in the number of youths who participate in dairy farming. The youths who were involved inherited the dairy cattle from their families. Unlike Matatiele, Groblersdal is a re-settlement area therefore there was lack of the element of inheritance. The low level of youth participation in dairy farming has a negative impact on sustainability and impact of projects. The impact of intervention or livelihoods projects would be higher if they target youths who make up a large proportion of the population. Due to high levels of unemployment in South Africa, promotion of youth entrepreneurship in dairy farming would contribute to the reduction of unemployment while also contributing to food security.

Farmer M11 was a young dairy farmer who was making profit from dairy farming. M11 had a good market of supplying to schools and nurseries. Yield per cow was not high which means increasing productivity per cow can improve M11‟s profit. M11 managed to sell about 30 litres per day after meeting household consumption. M11 diversified products by fermenting left over milk. M11 had high labour and feed costs which reduced profitability. M11 used pasture and commercial feed sourced from a local dealer “Nkosi Ndicede”. M11‟s herd size was 16 cows comprising of Jersey and Crossbreeds, of these, 12 cows were in lactation. In contrast, M7 was a young farmer who was running loss from his dairy enterprise. Reasons for making loss included poor market, low yield per cow, lack of diversified products and huge feed costs. M7 was not

spending on animal health which might have compromised productivity. His primary source of livelihood was beef production which might also have contributed to him running losses in dairy farming. Farmer M7 used pasture and commercial feed sourced from a commercial supplier. Commercial suppliers were more expensive compared to local dealers. M7 mentioned that he had no access to adequate feed for his 15 cows. M7 had seven cows in lactation. His herd consisted of crossbreeds and jerseys which were selected on availability and milk yield.

Traditionally, men dominate cattle ownership in rural and communal areas. Female domination in Groblersdal was increased by the Heifer project which targeted women. Potential female entrepreneurs do not get as many opportunities as their male counterparts. In cases where women manage to establish dairy enterprises their enterprises are usually smaller with limited access to financial resources or markets (Mulu-Mulu-Mutuku *et al*., 2015). Women have difficulties in accessing credit facilities due to lack of ownership of cattle which are considered collateral. Musemwa *et al*. (2008) purported that cattle can be used as a way of banking. Therefore, women have more challenges than men in establishing a dairy farm. These challenges in gender dynamics and cattle ownership need to be addressed in order to promote dairy entrepreneurship among women.

Profit and loss accounts of the whole population show that only three females and five males were making profit. These were represented by farmers G5 and M3, respectively. A comparison of a male and a female farmer to show if there were any differences in profit making was carried out between Farmer G5 (female) and Farmer M3 (male). Both farmers were making profit because they possessed all the essential entrepreneurial attributes. Differences in their profit

making may have emanated from differences in herd size, diversity of products sold, sources where inputs were purchased and differences in the use of modern techniques and IKS. Farmer M3 relied on modern technology such as milking machines, well-built milking sheds and AI while farmer G5 relied entirely on IKS without access to modern techniques and her cows relied on random mating. The farmers who were running at a loss may have been affected by lack of essential entrepreneurial attributes which assist in managing production costs.

Farmers M10 and M9 represented male and female farmers respectively who were making loss. These two farmers were selling from home which attracted a less lucrative market. The farmers had high production costs. Buying inputs such as commercial feed supplements from a commercial dealer may have contributed to the high costs of production. The farmers also mentioned that they had no access to adequate feed due to the high costs. Farmer M10 mentioned that he had access to adequate drinking water for the cows. Milk yield per cow for both these farmers was low although they had jersey cows among their herds. Nguni and crossbreeds were also part of the herd for both farmers. The primary source of livelihood for farmer M10 was crop production while farmer M9 depended entirely on dairy production. The loss incurred by farmer M9 puts the farmer at high risk due to dependence on dairy farming only which was running at a loss. M10 was using IKS while farmer M9 incorporated both IKS and modern techniques. They used wild herbs for treating diseases and artificial insemination for controlled calving.

Profit between different genders was determined by market access, production costs and milk yield per cow. This shows that any farmer despite their gender has the potential to realize profit if they take these factors into account. Number of lactating cows was not important in

determining profitability between the genders. Possession of jersey cows should be complemented with adequate water and feed supply to achieve high milk productivity and profit generation**.**

Farmers G8 and M3 had basic (primary level) and higher (tertiary level) education respectively. They were selected to represent farmers who were making profit in their respective education level. There were a total of 18 farmers with primary or no formal education and seven had attained at least secondary level education. Farmer G8 was making profit from three cows in lactation. The farmer achieved high milk yield per cow and was milking the cows twice a day which helped boost profit making for his dairy enterprise. The farmer achieved high milk yield because the herd was composed of Jersey breeds only which were specifically selected based on yield potential. Farmer G8 had access to adequate amounts of feed (pasture, crop residues and commercial supplements) and drinking water for the cows which enabled the cows to produce high yields. Framer G8 had access to a less lucrative market compared to farmer M3. Farmer M3 had higher production costs compared to G8. This was influenced by the difference in the farmers‟ herd size and source of their inputs rather than differences in level of education. Farmer G8 purchased supplementary feed from a neighboring commercial farmer at reduced and negotiated prices. Farmer G8 had low level of formal education but had a lot of experience in dairy farming spanning nearly 10 years. Farmer G8‟s source of livelihood was dependent on dairy farming and a non-agricultural business. Farmer G8 used IKS unlike farmer M3 who used modern techniques.

Farmers M5 and M10 represented educated (higher) and uneducated (basic) farmers who were running losses in their dairy farming. Farmer M5 had six cows in lactation which were giving a low milk of two litres per cow. Farmer M5‟s herd consisted of Nguni, crossbreeds and Jerseys. The low milk yield was confounded by a poor marketing strategy by farmer M5 resulting in loss from the dairy enterprise. Lack of access to adequate water and feed contributed to the low productivity. Farmer M5 attempted to reduce production costs by procuring feed and other inputs from neighboring farmers which is cheaper than buying from commercial suppliers. Farmer M5‟s source of livelihood was dependent on beef and employment. Farmers M5 and M10 used IKS in running their dairy enterprises. Although education plays a role in dairy management, farmers with basic or no formal education showed that they are also capable of making profit. Farmers with higher education can also run at a loss if the factors of production such as feed, labour, breeds and milk yield per cow are not well managed.

The total number of farmers who were unemployed was 17 and eight were employed. Farmers M3 and M10 represented farmers who were making profit and loss respectively in the unemployed category. Farmers G5 and G6 represented employed farmers who were making profit and loss respectively. Farmers M3 and G5 were both making profit although farmer G5 was employed elsewhere. Farmer M3 was making more profit than G5 because he committed all his time to dairy and beef farming. Farmers M10 and G6 were running loss. Farmer M10 was unemployed while G6 was employed. Although M10 was unemployed his dairy enterprise was running at a loss because he committed most of his time to crop production. Farmer G6 may have committed less time to dairy farming resulting in loss. In addition, G6 had higher production costs, low milk yield per cow and a poor market which contributed to loss. Farmer

G6 had no access to adequate water or feed for his herd which comprised of Jersey only. Feed was acquired from a commercial supplier which was more expensive than local dealers. Farmer G6 incorporated IKS in managing the dairy enterprise which was a source of livelihood in addition to beef production and employment. Although most of the dairy farmers were unemployed, it was shown that even farmers who were employed elsewhere other than their dairy farms were also capable of generating profit. Profit was affected by their ability to procure inputs at lower prices, selling their milk at a higher price and producing higher milk yield per cow.

Only nine farmers had poor interpersonal skills and preferred to work independently. Farmers exhibited their Interpersonal skills by forming a farmer support group with intention to share information and resources. The farmer support group was guided by the principle of Ubuntu such as dispute resolution at the Chief‟s kraals. Grazing lands and open fields were determined by the Chiefs and communicated at farmers‟ meetings. Farmer M9 emphasized the importance of interpersonal skills since she relied on communal resources such as water. She also mentioned that only small pieces of land could be owned privately in communal areas. These small lands cannot support herd sizes of cattle in communal areas, therefore much of the land on which the cattle graze are owned communally. This requires good interpersonal skills to interact with other farmers in sharing the resources. Hahlani and Garwi (2014) highlighted a high prevalence of conflicts among farmers in Zimbabwe. This may be a sign of lack of interpersonal skills which hinder progress.

Farmers M7, M10, M9, M5, G2 and G6 represented farmers with passive marketing strategies. These farmers relied on word of mouth and sold at community prevailing prices. Farmer M7, M10, M9, M5 and G2 and farmer G6 marketed from home. Luoga *et al*., (2014) found that in Tanzania, although the majority of the farmers had market access, but they lacked marketing strategies and ended up selling from their homes. Farmers M3 and farmers and G1 integrated IKS with modern technology. They relied on word of mouth and mobile phones for market price information and soliciting customers. Despite the advent of mobile phone communication farmers still rely heavily on word of mouth as a means of communication (Dhewa, 2015). Farmer G8 was not abreast with technology and also mentioned that he prefers face to face interaction with a customer or fellow milk selling farmers. farmer G8 mentioned that besides making profit he is also interested in building trust with the customer as a result this farmer sold at home as it provided an opportunity to interact with the customer more. His selling price of milk was not fixed but flexible according to the level of interaction with the customer. Face to face interaction between seller and buyer improves trust relationship (Dhewa, 2015).

Only six farmers had good management skills. Management skills were important in feeding, treating, milking a dairy cow, herd management and decision making which affected the enterprise. The lack of management skills is detrimental to production (Hahlani and Garwi, 2014). The use of IKS was prevalent in feeding where farmer G1 incorporated wild leguminous plants such as *Acacia* and wild fruits which were believed to increase milk production. In Matatiele, cattle were allowed to graze on crop residues in fields opened by the chief.

The use of veterinary services was limited as farmers relied on IKS in treating their cattle for diseases. Herbs such as *Aloe vera* which were believed to possess medicinal properties were used. Farmer M3 in Matatiele boiled the *Aloe vera* in water and administered to the sick dairy cow. This practice is dominant among the Sothos who make up a substantive proportion of the population in Matatiele. It was also reported in Nigeria (Adekunle et al., 2002). The farmer determined the health status of a cow by merely looking at its coat. He mentioned that a healthy cow has a shiny or glossy coat. If the cow is sick, its coat looks rough and the coat starts shedding off. Farmer G5 used *Umuhlwa* (common name for a cactus) to treat joint problems in dairy cows. Incisions were made on the joints and the medicine was applied topically. The wound would then be bandaged for healing. The *Umuhlwa* could also be boiled to make a broth which was given to cows which gave birth to still born calves. This was believed to stop recurrence of still births and miscarriages.

Farmer G4 administered a salt and water solution to make the cow thirsty and force it to drink more water. Drinking a lot of water has benefits such as detoxification and curing of ailments. It also increased milk production. IKS was also used in herd management. Farmer G8 mentioned that she practiced bull lending and barter trading of bulls for heifers or vice-versa. Farmer three in Matatiele practiced cross-breeding. Cows and bulls exhibiting favorable traits were placed in the same shed to encourage mating. The farmer mentioned that he recognized the cow which was on heat through behavioral changes such as restlessness, mounting other cows or by making a certain bellowing sound. Physiological and behavioral changes are used extensively to determine when a cow is ready for mating (Saha, 2014). Decisions which affected the dairy enterprise were based on IKS. Dairy cattle entries and exits were summoned to the ancestors for approval.

Farmer M3 mentioned that „*when I purchase a new dairy cow or when a cow gives birth, I introduce it to the ancestors. The ancestors have to approve before trading a bull or a cow if that cow can leave'.*

Farmers G4, G5, M3 and M11 were cost benefit conscious and kept proper records for lactation period, calving times, milk yield and financial records. This enabled them to keep track of their costs and income. The farmers who were not cost-benefit conscious mentioned that they relied on their memory to keep track of costs and income. This proved to be inefficient as they could not recall their cost and income when they were asked. Appropriate records improve efficiency in monitoring and evaluating the performance of a business enterprise (Hahlani and Garwi, 2014).

The majority of the farmers were making financial losses. This negatively impacts the progression of these emerging farmers into commercialization because it is difficult to sustain a loss making enterprise. Further losses are likely to be realized due to lack of systematic way of tracking costs and benefits. Dairy feed was the major part of the production costs which negatively affected the profit margin. Poor record keeping may have caused the farmers to overlook other costs. This indicates a lack of good management skills which are essential for the progression of emerging dairy farmers into commercial farming.

There were some farmers who were doing well. Their estimated income and expenditure showed that they were making profit. Their income could allow them to cover all the production costs while also meeting part of the household expenses. These farmers also did not keep proper

records which might have contributed to over or under estimation of their profitability. This presents a group of farmers who have a potential to sustain their dairy enterprises since they consider their enterprises as profitable and would want to continue running their enterprises. Entrepreneurship is easier to promote among farmers who are already making profit. This group of farmers is probably convinced that dairy enterprises can be profitable. They may also be willing to expand in order to realize higher profit margins. It also shows that they may have some essential entrepreneurial attributes since they have demonstrated that they can make profit from their enterprises. They may require assistance in some particular areas. However, entrepreneurship may not be easy to promote among loss making farmers. Farmers who are currently making loss may be difficult to convince that dairy farming can be a profitable enterprise.

The viability of emerging dairy enterprises may be limited by lack of entrepreneurial attributes by emerging farmers. Entrepreneurial attributes have been shown to be critical in profit making. Profit plays a major role in the viability of any enterprise. The emerging farmers face an array of production and marketing constraints which impact negatively on viability. The production constraints restrict expansion and reduce herd size. This reduces productivity and potential to make profit. Lack of value addition among the farmers also reduces potential income. Value addition requires dairy equipment which the farmers may not be able to acquire due to financial constraints. Since most of these farmers‟ dairy enterprises are in their infant stages it is very difficult for the farmers to access credit from financial institutions. The financial institutions regard this sector as a high risk.

Emerging farmers possess experience, IKS and good interpersonal skills which can improve viability. Most of these farmers are experienced in dairy farming as they have been practicing dairy farming for a long time. The experience provides a basis for training to improve their skills in dealing with production constraints. The IKS which these farmers possess can be integrated with modern techniques. Some of the IKS used by these farmers have been shown to significantly reduce production costs with a positive impact on viability. Interpersonal skills which encourage farmer interactions are vital in resource mobilization and information acquisition. Pooling of resources improves the chances of a farmer to make profit and improve viability. Information is important in decision making which may determine profitability of an enterprise.

Transect walks revealed that most of the water in Matatiele was coming from the river and communal taps which did not provide adequate water. In Groblersdal they had farm piped water which was mostly adequate since it was coming from a nearby irrigation dam. Water was made accessible to lactating cows by fetching from the river by carts or driving the cattle to drinking points. The farmers owned cattle sheds and collecting urns for their milk. They owned basic items such as troughs for feeding, yokes for reining their cattle. Only two farmers had milking machines. The healthy statuses of the cows were not good due to the time of season characterized by shortage of feeds. The cows were sickly although most of the farmers reported no sickness in the six months leading to the study visit. Focus group discussions revealed that calving was mainly done in the summer when there is plenty of feed. Calving was controlled by controlled mating of cows with bulls. Although most did not have access to AI, they controlled mating by separation of bulls and cows.

3.5. Conclusions

An analysis of effects of demographic factors on profitability of emerging dairy enterprises showed that profit was mainly dependent on milk yield, production costs such as feed, labour and animal health, number of cows in lactation, source of inputs and market access. Management practices such as incorporating IKS and modern techniques aimed at reducing production costs may help to increase profit. Age, gender, education level and employment status of the farmer had less influence on profitability. Most farmers were making loss although there is potential for viability shown by the farmers who were making profit. Successful farmers who were making profit were represented by farmers G4, G5, G8, M3, and M11. These farmers possessed vision, good interpersonal skills, good management skills, had good marketing strategies and were cost benefit conscious.

There is lack of youth participation and male domination in emerging dairy agriculture. Most farmers were diversifying their production to cushion against risk. Vision and interpersonal skills were common among the farmers and these were expressed in IKS. Marketing strategies, management skills and cost-benefit consciousness were lacking. IKS was also integrated in management systems by the few farmers who possessed management skills. There is need to investigate whether these findings apply to communal farmers.

3.6. References

Adekunle, O.A., Oladele, O.I and Olukaiyeja, T.D., (2002). Indigenous control methods for pests and diseases of cattle in Northern Nigeria. *Livestock Research for Rural Development* **14(2):** 66-75.

Arowolo, O.O., Lawal, A.M and Ogundijo, J.I., (2013). Grass-root youth involvement in cattle rearing activities Oyo State, South western Nigeria. *Journal of Agricultural Extension and Rural Development* **5(5):** 100-106.

Dhewa, C., (2015) Farmers trust word of mouth more than other forms of communication https://emkambo.wordpress.com/2015/11/16/farmers-trust-word-of-mouth-more-than-other-forms-of-communication (Accessed December 16, 2015).

Hahlani, C.D., Garwi, J., (2014). Operational Challenges to Smallholder Dairy Farming: The Case of Mayfield Dairy Settlement Scheme in Chipinge District of Zimbabwe. *IOSR Journal of Humanities and Social Science* **19: (1)** 87-94.

Luoga, W., Kurwijila, L.R., Nyange, D and Ryoba, R., (2014). Determinants of Access and Participation of Smallholder Farmers in Dairy Input and Output Markets in Tanzania Case study of Rungwe District. *Tanzania Journal of Agricultural Sciences* **8 (1):** 57-66.

Mabaya E., Tihanyi K., Karaan M. and van Rooyen, J. (2011). Case Studies of Emerging Farmers and Agribusinesses in South Africa. SunMedia: Bloemfontein.

Mulu-Mulu-Mutuku, M.W., Odero-Wanga, D and Ali-Olubandwa, A., (2015). Female Entrepreneurship in Kenya: How do Female Micro-Entrepreneurs Learn to be Entrepreneurial? *Case Studies in Business and Management* ***2*****(1):** 1.

Musemwa L, Mushunje, A., Chimonyo, M., Fraser, G., Mapiye C., and Muchenje V., (2008). Nguni cattle marketing constraints and opportunities in the communal areas of South Africa: Review. *African Journal of Agricultural Research* **3 (4)**: 239-245.

Saha, A., (2014). Indigenous breeding and management practices of dairy animals–a study on documentation. *Scholars Journal of Agriculture and Veterinary Sciences* **1(4A):** 216-221.

Thamaga-Chitja, J.M., and Morojele, P. (2014). The context of smallholder farming in South Africa: towards a livelihood asset building framework. *Journal of Human Ecology* **45(2):** 147-155.

Wankel, C. (2008). Alleviating poverty through business strategy. 1st ed. Palgrave Macmillan. New York.

Zvinorova, P.I., Halimani, T.E., Mano, R.T., & Ngongoni, N.T. (2013). Viability of smallholder dairying in Wedza, Zimbabwe. *Tropical animal health and production*, **45(4):** 1007-1015.

Chapter 4 : Entrepreneurial attributes of communal dairy farmers

Abstract

A total of 140 communal dairy farmers in Matatiele local municipality, Eastern Cape, South Africa were interviewed to assess their entrepreneurial attributes. Dairy farming was dominated by males who were above 55 years of age (64 %). The farmers possessed vision which was expressed in their indigenous knowledge systems. They also possessed interpersonal skills which were evident in their sharing of resources. The marketing strategies employed by the communal farmers were weak and passive; they sold from their home-steads. Although youth participation in dairy farming was low, they were found to have higher odds to possess better marketing strategies than their adult counterparts. Management skills of the farmers were compromised by lack of record keeping, which also compromised their cost-benefit consciousness. Level of education was an important determinant of management skills and cost-benefit consciousness. Only 11 % of the farmers possessed all the attributes, 24 % possessed four of the attributes and 92 % had either one or two attributes. Eleven farmers exhibited none of the attributes. The lack of the essential entrepreneurial attributes contributed to the majority of the farmers realizing losses from their enterprises. Only 15 % of the farmers were making profit. However, the profits realized by the farmers were low. The viability of communal dairy enterprises is challenged by a myriad of constraints. Feed and labour costs were significant determinants of profitability. The probability for a youth to have a vision for dairy farming was low (odds ratio 0.62) while the odds for an educated farmer to have management skills and cost-benefit consciousness were high (10.29 and 13.33, respectively). It was concluded that demographic characteristics had an influence on entrepreneurial attributes of the farmer.

Key words: Cost-benefit consciousness, Interpersonal skills, Management skills, Marketing strategies, Vision

4.1. Introduction

Cattle are a major part of livelihoods of communal farmers in Sub-Saharan Africa. The cows are milked regularly. This makes dairy production a suitable enterprise for rural development, poverty alleviation and employment creation (Musemwa *et al*., 2008). Communal farmers, however, largely practice subsistence farming with a primary objective to feed their households. However, most communal farmers fail to sustain their households due to a myriad of constraints which include lack of entrepreneurial attributes.

Income generation and expansion of their dairy enterprises is addressed from sales of the surplus milk. Subsistence dairy farming is important as it ensures food and nutrition security of the farmers‟ household. Entrepreneurship is, however, likely to reduce unemployment and high poverty levels. Successful entrepreneurship is determined by possession of essential attributes such as vision, interpersonal skills, marketing strategies, management skills and cost-benefit consciousness (Pyysiäinen *et al.*, 2005). Some emerging farmers were found to possess vision, interpersonal skills and marketing strategies although their management skills and cost-benefit consciousness were not very strong.

Non-governmental organizations (NGOs) such as the Heifer International have been at the forefront of promoting dairy entrepreneurship among communal farmers. Communal farmers are farmers who practice agriculture for subsistence and sell surplus for income (Thamaga-Chitja

and Morojele, 2014). Entrepreneurship is important in economic development programmes aimed at transforming dairy production from subsistence to small-scale and financially-efficient commercial farming systems. It is expected to transform communal farmers from being cattle rearers to participate in economic development opportunities. Although the concept of entrepreneurship is well understood, its practice in improving communal dairy productions is not clear. It could be limited by lack of effective marketing strategies, management skills and cost-benefit consciousness. These attributes need to be investigated and evaluated. In the study involving emerging farmers, the effect of age, gender, education level and employment status on profit making and possession of entrepreneurial attributes was not conclusive because of the small sample size of emerging farmers. There is a need to investigate this phenomenon on communal farmers with a larger population size.

The objective of the current study was to assess the entrepreneurial attributes of communal dairy farmers. It was hypothesized that the communal farmers lacked entrepreneurial attributes and the lack of these attributes limit the profitability and viability of communal dairy enterprises.

4.2. Materials and Methods

4.2.1. Description of study site

The study was conducted in Matatiele local municipality, Eastern Cape Province, South Africa. Matatiele is located on the northern parts of the Eastern Cape Province 30°20'S 28°49'E. Matatiele is populated with Xhosa and Sotho-speaking people (IDP, 2014/2015). Farmers in Matatiele benefitted from Heifer international project in 2014 in an effort to alleviate poverty and

enhance food security through increased milk production. The project targeted women who were believed to be integral to household economic stability.

4.2.2. Sampling of farmers

Farmers were randomly selected from the list of households that owned dairy cattle. The list was provided by the Department of Rural Development and Agrarian Reform. A retired senior extension officer who had in-depth knowledge of the area assisted in identifying possible sampling areas. Household heads owning dairy cattle and willing to participate in the study were randomly selected from the list. Willingness to participate was sought by signing of a consent form by the farmer. A total of 140 farmers participated in the study.

4.2.3. Data collection

Data were collected using structured questionnaires and focus group discussions from 140 farmers. Five focus group discussions of seven to eight farmers per group were conducted. The focus group discussions collected data on challenges and constraints affecting farmers‟ enterprises and their reasons for engaging in dairy farming. The questionnaire captured demographic data, production and management practices and financial information of the farmers‟ enterprises. The Likert scale was used to collect information on the dairy farmers‟ entrepreneurial characteristics. The data collected was used to evaluate farmers‟ vision, interpersonal skills, marketing strategies, management skills and cost-benefit consciousness. These data were collected using a five point Likert scale. Vision was evaluated on the basis of the strength of the farmers‟ goals, plans, risk-taking, time consciousness and cost to achieve the goals. Interpersonal skills were evaluated against networking with other dairy farmers, conflict

resolution, organizational skills, customer relations and level of involvement in farm operations. Marketing strategies were evaluated on the backdrop of customer orientation, accessibility of the farmer by customers, pricing strategy and negotiating ability of the farmer. Basic management skills and cost-benefit consciousness were measured by the ability of the farmer to read, write, calculate costs and keeping of proper income and expenditure records. For the purposes of determining odds ratios, education was categorized into higher and basic levels. Higher education level is defined as having attained secondary or tertiary level education. Basic education is defined as having attained at most primary (Grade 7) level education.

An employed farmer was defined as a farmer who earned income through provision of labour to other enterprises other than the farmer‟s own dairy farm. An unemployed farmer was defined as a farmer who had no employment elsewhere but committed all the time to one‟s own dairy farm. Gender referred to the sex of the head of household and defined as either male or female. Age group was defined as the age of the dairy farmers and categorised into youths (18-35 years), middle aged (36-55 years) and old aged (over 55 years). Data were collected in vernacular, Sotho and Xhosa. Three enumerators from Matatiele were trained and employed to conduct the interviews and completing the questionnaires.

4.2.4. Statistical analyses

Data were analysed using Statistical Package for Social Sciences (SPSS) Version 23. Basic profit and loss calculations were carried out in Excel 2010. Analysis of variance was used to compare means of factors affecting profit. The chi-square was used to test association between demographic data and entrepreneurial attributes. Profit and loss was used to determine the

financial viability of farmers‟ dairy enterprises. Profit and loss was calculated using the following formula:

Gross profit = income – total variable costs.

Logistic regression was used to determine the odds of a farmer to possess entrepreneurial attributes using the following model;

$\ln[P/1-P] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \ldots \beta_5 X_{5+} e$

Where:

P=probability of an individual to possess an entrepreneurial attribute

[P/1-P]=odds ratio, which refer to the odds of an individual to possess an entrepreneurial attribute.

β_0= intercept

$\beta_1 X_1 + \beta_2 X_2 \ldots \beta_5 X_5$= regression co-efficient of demographic characteristics

e=random residual error

When computed for each estimator ($\beta_1 \ldots \beta_5$), the odds ratio was interpreted as the probability of an individual to possess an entrepreneurial attribute.

Data from Likert scale and focus group discussion was subjected to content analysis.

4.3. Results

4.3.1. Farmers' socio-economic profiles

The majority of the farmers were males Table 4.1. There was low youth participation compared to middle aged and old age. Secondary education dominated followed by primary education and very few had either tertiary or no formal education. Unemployment was high and these farmers were engaging in farming including dairy farming.

4.3.2. Factors affecting profitability

Profit making was different among the farmers. Feed and labour costs significantly reduced the amount of profit made by a farmer. Table 4.2 shows that feed and labour costs are significantly related to potential profit by a farmer. Milk yield per cow, employment status of the farmer, education level of the farmer and number of lactating cows did not influence the amount of profit made by the framer.

4.3.3. Potential of a communal dairy enterprise to generate profit

Dairy farmers showed different levels of profitability (Table 4.3). The farmers exhibited different amounts of costs related to production. Farmers who were earning profit had lower costs compared to loss making farmers. Feed costs accounted for the major costs incurred by the farmers followed by labour and animal costs. The average milk price was R4.50 and none of the farmers owned more than five lactating cows. The farmers milked once a day on average and the highest milk yield obtained by a farmer from one cow per day was 6 litres. Analysis of profit and loss account of the farmers showed no relationship between potential to make profit and demographics such as age, gender and education level (Table 4.3).

Table 4.1: Farmers' socio-economic profiles (n=140)

Demographic trait	Category	Proportion (%)
Gender	Male	64
	Female	36
Marital status	Married	69
	Widowed	20
	Single	11
Education level	Tertiary	8
	Secondary	46
	Primary	39
	No formal education	7
Employment status	Unemployed	84
	Employed	16
Age group	Youth (18-35 years)	5
	Middle aged (36-55 years)	31
	Old age (over 55 years)	64

Table 4.2: Level of significance of factors affecting profit

Source of variation	Significance level
Milk yield	0.545
Employment status	0.477
Education	0.904
Number of lactating cows	0.982
Feed costs	0.002
Labour costs	0.03

χ^2 test separation

Table 4.3: Monthly profit and loss account for selected farmers (n=140)

Farmer	**1**	**12**	**22**	**110**	**117**	**128**
Age group	18-35	over 55	over 55	36-55	36-55	over 55
Gender	Male	Male	Male	Female	Male	Male
Education	Secondary	Tertiary	Secondary	Secondary	Secondary	Primary
Gross income						
Price of milk/L	R4.50	R4.50	R4.50	R4.50	R4.50	R4.50
Number of cows	2	3	3	2	1	2
Yield	2	3	4	4	4	3
Times milked	1	1	1	1	1	1
Litres sold/day	1	2	3	3	3	2
Income/day	R4.50	R9.00	R13.50	R13.50	R13.50	R9.00
Income/month	R90.00	R180.00	R270.00	R270.00	R270.00	R180.00
Costs						
Labour cost	0	0	0	0	R250.00	0
Total feed cost	0	R100.00	R250.00	R390.00	R150.00	R420.00
Total animal health	0	0	R300.00	R100.00	R115.00	R95.00
Total cost	0	R100.00	R550.00	R490.00	R515.00	R515.00
Profit or loss	**R90.00**	**R80.00**	**-R280.00**	**-R220.00**	**-R245.00**	**-R335.00**

4.3.4. Relationship between household demographics and entrepreneurial attributes

Table 4.4 shows the frequency of farmers showing different entrepreneurial attributes. Most farmers showed possession of interpersonal skills followed by vision. Cost-benefit consciousness was the least common attributes among the farmers. There was a highly significant difference in vision of the farmers to expand their dairy enterprises between different age groups (Table 4.5). The age groups also showed differences in interpersonal (interactions among the farmers) and management skills (cattle production and management of farm activities). Gender and education level differences showed significant influence on cost benefit consciousness (knowledge of expenditure and returns). Employment status had a significant relationship with the ability to develop a vision and having interpersonal skills.

The probability for a youth to have a vision for dairy farming was low (odds ratio 0.62) (Table 4.6). The odds of 10.29 and 13.33 for management skills and cost benefit consciousness, respectively, show that it was highly likely for a more educated farmer to possess these attributes. The youths had higher probability of engaging in marketing strategies than adults although the youths showed poor interpersonal skills. Farmers who had employment elsewhere showed very low odds for all attributes. Regression of age on ability to develop a vision in dairy farming was highly significant ($p<0.01$) (Table 4.7). Gender also showed a significant effect on the clarity of the vision the farmers showed ($p<0.05$). All the demographic traits did not have any significant regression on interpersonal skills and marketing strategies. Age and level of education had a significant relationship on basic management skills. Only education and gender had a significant regression on cost benefit consciousness.

Table 4.4: Frequencies of farmers showing entrepreneurial attributes (n=140)

Attribute	Frequency (%)
Vision	57
Interpersonal skills	67
Marketing strategies	48
Management skills	35
Cost-benefit consciousness	11

Table 4.5: Association of demographic characteristics of farmers with entrepreneurial attributes

	Entrepreneurial attributes				
Demographic traits	Vision	Interpersonal skills	Marketing strategies	Management skills	Cost benefit consciousness
Age	15.62**	9.92**	0.93	14.76**	2.82
Gender	1.66	14.44**	0.07	4.51*	7.71**
Marital status	0.35	1.19	4.18	1.25	3.41
Education level	0.53	10.84*	11.94**	12.94**	10.89**
Employment status	6.49*	8.93**	3.48	5.15	3.41

** $p<0.01$; * $p<0.05$

Numbers shown are Chi-square values.

.

Table 4.6: Odds ratio estimates of a farmer to possess entrepreneurial characteristics (n=140)

	Vision			Interpersonal Skills			Marketing Strategies			Basic Management Skills			Cost Benefit Consciousness		
	OR	**LCI**	**UCI**	**OR**	**LCI**	**UCI**	**OR**	**LCI**	**UCI**	**OR**	**LCI**	**UCI**	**OR**	**LCI**	**UCI**
Age (Youth vs adult)	0.62	0.01	0.34	0.24	0.05	1.13	2.83	0.03	0.44	0.11	0.03	0.44	0.44	0.11	1.70
Gender (Male vs female)	2.40	0.62	9.27	29.00	3.15	267.37	1.29	0.04	0.97	0.19	0.04	0.97	#	#	#
Marital status (Married vs not married)	0.67	0.16	3.10	2.16	0.48	9.70	1.61	0.11	1.96	0.46	0.11	1.96	0.17	0.02	1.48
Education level (higher vs basic)	1.24	0.33	4.71	0.17	0.03	0.96	1.30	1.97	53.85	10.29	1.97	53.85	13.33	1.54	115.83
Employment status (employed vs unemployed)	0.31	0.04	2.51	0.20	0.24	1.67	0.32	0.06	3.54	0.45	0.06	3.54	0.94	0.09	10.05

#Statistic could not be computed. LCI=lower confidence interval, UCI=upper confidence interval, OR=Odds ratio

Table 4.7: Logistic regression of demographic traits on entrepreneurial attributes

Attribute	Demographic	Reg.	SE	Sig.	Attribute	Demographic	Reg.	SE	Sig.
Vision	Age	3.51	1.20	0.00	Management skills	Age	2.31	0.88	0.00
	Gender	-2.73	1.41	0.05		Gender	1.33	1.21	0.27
	Marital status	1.053	1.17	0.37		Marital status	0.41	1.13	0.72
	Education	-0.60	1.08	0.58		Education	-2.33	1.02	0.02
	Employment	0.72	1.40	0.61		Employment	1.82	1.45	0.21
Inter personal skills	Age	37.40	8112.16	1.00	Cost benefit consciousness	Age	0.00	0.90	1.00
	Gender	-37.40	8112.16	1.00		Gender	20.13	9057.4	1.00
	Marital status	-1.10	1.77	0.54		Marital status	0.95	1.31	0.47
	Education	19.17	4937.28	1.00		Education	-2.60	1.25	0.04
	Employment	20.27	4937.28	1.00		Employment	1.10	1.84	0.55
Marketing strategies	Age	-1.27	1.24	0.31					
	Gender	0.30	1.28	0.82					
	Marital status	-0.67	1.28	0.61					
	Education	-0.47	1.01	0.64					
	Employment	1.55	1.41	0.27					

SE= Standard error Sig. =Significance level; Reg: regression coefficient.

4.4. Discussion

The odds for a female farmer to have a vision for a dairy enterprise were very low. Gender was shown to have a significant regression on vision. This may be due to the suppression of females by socio-cultural and socio-economic values existing in many African societies. Females may not be able to develop their own vision on dairy enterprises since they are generally owners of small livestock while men own the larger livestock (Njuki and Sanginga 2013). In most cases, women operate as stewards or custodians providing labour for cattle husbandry of male owned enterprises. Youths were also found to lack vision in dairy enterprises. This may be as a result of lack of participation by youths in dairy farming as they seek employment in other areas such as „white collar jobs". This may imply that they regard dairy farming as unattractive for a young person. This low level of youth participation in dairy farming in South Africa was in contrast to youth participation in Nigeria where the majority of dairy farmers were youths (Arowolo, 2013).

The focus group discussions revealed that the farmers had a vision for expansion of their dairy enterprises as they realized the economic value of a dairy cow. While the beef cattle were reserved for socio-cultural purposes such as rituals and traditional ceremonies, the dairy cows were not used for any rituals or traditional ceremonies. The farmers were mainly concerned with milking for household consumption and selling. Lack of vision affects viability of an enterprise. These Farmers possessed vision in their own way which is different from the business model. Their vision was evident in emulation of successful farmers or ambition to fulfill an inherited father"s legacy.

The Chi-square test showed significant relationship between most demographic traits with at least one entrepreneurial attribute. Only marital status did not show significant relationship with any entrepreneurial attribute. This shows that marital status does not affect interpersonal skills as these skills are developed even before a farmer is married. The odds for a youth to have interpersonal skills were lower compared to adults. Youths in Matatiele were found not to be part of co-operatives or members of any farmer support group which greatly reduced their involvement in dairy farming. Interpersonal skills are more evident where farmers interact and share ideas and resources and therefore, a farmer who does not belong to any group may be considered to have low interpersonal skills. The odds for a male farmer to possess interpersonal skills were higher compared to female farmers. Female farmers are at a disadvantage to participate in farmer support groups due to marginalization in the male dominated sector. Socio-cultural values regard women as care-givers (Rota *et al*., 2003) rather than dairy farmers who can actively participate in dairy farming. This restricts their involvement in sharing of resources and ideas which are the main objective of farmer groupings. Farmers who were employed elsewhere had very low odds of engaging in activities that demonstrated their interpersonal skills. This may be due to time constraints or other commitments which limited their participation in the farmer groups. Farmers who were unemployed had ample time to commit to their enterprises and farmer support groups where they exhibited their interpersonal skills when interacting with fellow dairy farmers.

Dairy farming is capital intensive. Entrepreneurship especially among resource poor communal farmers would require them to pool resources. The pooling of resources may only be successful where the farmers have good interpersonal skills. This makes interpersonal skills crucial in entrepreneurship of communal farmers. Resource sharing in Matatiele among farmers who

belonged to a farmer support group included bull lending and trading and input procurement as a group. This increased the farmers‟ access to resources which are necessary in dairy farming. Similarly, smallholder dairy farmers in Swaziland joined farmer support groups to share information and skills in order to improve their entrepreneurship (Masuku, 2014).

The significant difference in marketing strategies between farmers who had higher education level and those who had lower education level showed that education is important in marketing strategies. Education may determine how the farmers access information, how the information is synthesized and how it is evaluated for use in marketing. The odds for a youth farmer to have better marketing strategies compared to adult farmers were higher. This may be due to the fact that youth may be more educated, active and innovative. The higher level of education enhances their access to relevant information while their pro-activeness assists them in market penetration. However, despite their higher odds, youth involvement in dairy farming is very low. Farmers who were employed had lower probability of engaging in marketing activities compared to unemployed farmers. This may be due to time limitation and because they may not consider dairy farming as their main source of livelihood as they earn income from their employment.

Most farmers in Matatiele were not pro-active in marketing their milk. The farmers relied on people to come to the house and buy. The milk was sold at a negotiated price or sometimes a community prevailing price. Information regarding marketing and pricing of the milk was obtained through word of mouth especially at farmers‟ meetings. A more pro-active marketing strategy would be required under entrepreneurship in order to reach lucrative markets and sell adequate volumes of milk to earn substantial income. Marketing skills are critical in modern day where the market is open and free (Bjerke and Hultman, 2002).

Level of education was strongly related to basic management skills and cost benefit consciousness. The odds were very low for less educated farmers to possess cost benefit consciousness and basic management skills. Writing, reading and calculating formed an integral part of management skills and cost benefit consciousness. Farmers with less education found this to be more challenging compared to farmers who had higher education. Higher education improves the farmer‟s ability to manage risk and solve problems encountered in their dairy farming (Masuku 2014). The farmers in Matatiele were more focused on production without paying attention to keeping of records such as calving times, milk yield, cattle health, milk quality reports and financial information. Lack of record keeping compromises the farmers‟ ability to realize linkages between their decision making and profitability. There were differences in basic management skills between different age groups and gender. The odds were lower for a youth farmer to possess basic management skills compared to an adult farmer. Youths have higher regard for „white collar jobs‟ compared to dairy farming and this reduces their probability of acquiring or developing basic management skills. Female farmers were shown to have higher odds of possessing basic management skills compared to male farmers. Although women are marginalized in economic activities, their role in management especially cattle husbandry is prominent. Their prominence in cattle husbandry may allow them to acquire or develop these skills over time more than men. Nearly half of the female farmers were keeping some sort of records compared to less than 40 % of the male farmers. However, the records were not adequate.

The focus group discussions revealed that although most of the farmers showed that they were making loss in monetary terms, they were getting other non-monetary benefits from their dairy

cows. Dairy cows provided milk for household consumption, provided collateral and served as a symbol of wealth (Musemwa *et al*., 2008). These benefits are not captured when profits and losses are calculated. For viability or sustainability of an enterprise, the enterprise should be able to generate a certain minimum income in order to cover the necessary costs. If these costs are not met the enterprise may fail to sustain itself to generate even the non-monetary benefits.

Farmers were obtaining low milk yield and had very low numbers of lactating cows. The lack of relationship between milk yield and number of lactating cows with profitability may be a result of lack of proper dairy breeds, poor market access and poor quality feed. In contrast to Gertenbach‟s (2007) outcomes, profitability of a farm is dependent on increasing milk production by increasing milk yield per cow or herd size. However, increasing herd size will require more resources such as water, high quality feed, veterinary services and production management skills which are not readily available among communal farmers. The majority of the farmers in Matatiele had Nguni breeds and a few farmers had an average of one jersey breed. Nguni breeds have low milk yield but highly adaptable to the harsh conditions of semi-arid zones (Muchenje *et al*., 2008).

The amount spent by a farmer on feed or labour determined profitability of their enterprise. Feed constituted a major part of the production costs and was affected by seasonal prices characterized by high prices in winter. Matatiele is located in a semi-arid ecological zone with very low forage and sour veld. This type of vegetation provides low quality feed especially in winter and the dry season. As a result, farmers have to procure feed for their dairy cows. However, the production is often not enough to re-coup the costs. Labour was mostly provided by family members and this labour was not accounted for in the production costs. Some farmers hired community members

whom they paid either in cash or in kind. The labour costs were lower relative to feed costs. Labour should be proportional to a farmer‟s enterprise in order to reduce costs and improve economic efficiency (Masuku, 2014).

Milk price was not determined by market forces. Most farmers sold their milk at negotiated prices or prices that were just prevailing in the community usually gathered by word of mouth. However, prices must be governed by supply, demand and market policies (Mburu *et al*, 2007). The farmers accessed the same market provided by the immediate community as a result the price was similar and average was R4 per litre. Sometimes the farmers had to reduce their prices below the community price in order to attract customers. This reduced their potential income. Household consumption of milk in Matatiele was high on average. Household consumption for farmers who have access to markets was lower compared households of farmers who lacked market access (Mburu *et al*, 2007).

Profit was inversely related to cost of production. The major cost of production was feed. Low supply and high cost of feed restrict the use of commercial feed among communal farmers. The majority of the farmers were relying on sour veld under free range grazing and the farmers revealed that they only bought minimal feed from commercial farmers. The farmers would come together as a group in order to purchase feed. Animal health costs were also minimal and the farmers depended on government for veterinary services. In most cases, the farmers treated their own cattle using IKS. Labour was mostly provided by family members (Ngongoni et al., 2006) who were not paid. In cases where labour was sourced from community members the workers were paid in cash or in kind. On average, farmers were paying R400 per month for labour. The responsibilities of the employees were mainly cattle husbandry - to feed, milk, clean the sheds, to

manage the calves regarding their weaning and suckling times and herding the cattle. Employment was seasonal especially during cropping season when cattle needed tending to prevent them from destroying crops in the field. In winter they were allowed to roam freely. Low feed and health care may reduce productivity per cow and thereby reducing potential to make profit from milk.

Income was generated from the sale of raw milk. The low milk price and low milk yield resulted in low profits or high losses among the farmers. The average farmer was making a profit of R64 or loss of R304 per month. However, the income did not account for household milk consumption or milk used to pay for labour or other costs. These farmers were not economically efficient as their income could not cover their costs. The farmers" inefficiencies may stem from the fact that most of the farmers were not trained in profit oriented dairy farming. This is in line with Masuku (2014) who found that dairy farmers in Swaziland were not running their dairy farming on entrepreneurial basis.

Diseases and animal death, shortage of feed, lack of finances, and lack of production skills and cattle theft were raised as the major challenges encountered in communal dairy farming. Deaths and diseases were prevalent due to uncontrolled movement of cattle (Mapiye *et al*., 2009) poor adaptability, poor diet and lack of veterinary services. Farmers shared communal grazing lands where their cattle mixed with cattle owned by other farmers during grazing. Transmission of communicable diseases was rampant. The few farmers who owned exotic breeds experienced high mortality rates among their herds. This could be a result of poor diet and adaptability to the harsh conditions in the semi-arid zones. The farmers could not afford veterinary services and relied on limited government extension services. Lactating cows have higher dietary needs and

require supplements such as proteins and vitamins to replenish nutrients lost during lactation (Moran, 2005). Low quality grazing veld does not supply the required nutrients. Communal farmers cannot afford the commercial feed to meet the dietary needs of the lactating cow. As a result milk productivity is reduced drastically. Dairy farming is capital intensive and the majority of the farmers cannot afford the start-up costs. The lack of financial availability to the communal farmers limits their ability to procure resources required to increase their production from current levels. Dairy farming requires some basic production skills which are often not available among communal farmers. The basic skills enable the farmer to run their enterprise efficiently and productively. Therefore the lack of these skills among communal farmers presents a major concern for entrepreneurship.

Farmers in Matatiele belonged to a dairy farmer support group and they met frequently to discuss challenges, share ideas and resources. By sharing their experiences in dairy farming, farmers may be able to formulate solutions to their challenges. Government and non-governmental organizations usually prefer to assist organized farmer groups compared to individual farmers. Farmer support groups can easily be transformed into a co-operative as the members already know each other‟s strengths and abilities.

The farmers in Matatiele have owned dairy cows for a very long time. This experience presents a foundation upon which training in technical skills can be built. Their experience is largely based on indigenous knowledge system which can be integrated with modern techniques. Dairy production systems based on effective exploitation of indigenous knowledge systems may accrue more profits and improve self-sustenance (Devendra, 2001). Dairy cattle form part of the sustainable livelihoods assets. This presents an opportunity for intervention in rural development

based on dairy production. The farmers‟ local breeds of cattle should be preserved and used to breed for resistance to local diseases and adaptation to local conditions.

4.5. Conclusions

Farmers exhibit vision and interpersonal skills in ways that are different from the formal business models. The farmers lacked effective marketing strategies, basic management skills and cost benefit consciousness. Lack of these attributes resulted in most of the farmers running loss making dairy enterprises. Communal dairy enterprises can be viable if the challenges highlighted are addressed and opportunities are exploited.

4.6. References

Arowolo, O.O., Lawal, A.M and Ogundijo, J.I., (2013). Grass-root youth involvement in cattle rearing activities Oyo State, South western Nigeria. *Journal of Agricultural Extension and Rural Development* **5(5):** 100-106.

Bjerke, B and Hultman, C.M., (2002). Entrepreneurial Marketing: The Growth of Small Firms in the New Economic Era. Edward Elgar publishing inc. UK. Pg 15.

Devendra, C., (2000). Smallholder dairy production systems in developing countries: characteristics, potential and opportunities for improvement. *Asian Australasian Journal of Animal Sciences* **14(1):** 104-113.

Gertenbach, W., (2007). Dairy farming in South Africa-where to now. Institute for Animal Production. Western Cape, South Africa.

Integrated development plan (IDP) (2014/2015).

http://www.matatiele.gov.za/download/IDP(2)/Draft-IDP-Review-2014-2015.pdf (Accessed 2015, December 10).

Rota, A., Sperandini, S and Hartl, M., (2003). Gender and livestock: Tools for design. International Fund for Agricultural Development (IFAD), Rome, Italy.

Mapiye, C., Chimonyo, M., Muchenje, V., Dzama, K., Marufu, M.C and Raats, J.G., (2007). Potential for value-addition of Nguni cattle products in the communal areas of South Africa: a review. *African Journal of Agricultural Research* **2(10):** 488-495.

Masuku, B.B., Masuku, M.B and Belete, A., (2014). Economic Efficiency of Smallholder Dairy Farmers in Swaziland: An Application of the Profit Function. *Journal of Agricultural Studies* ***2*****(2):** 132-146.

Mburu, L.M., Gitu, K.W and Wakhungu, J.W., (2007). A cost-benefit analysis of smallholder dairy cattle enterprises in different agro-ecological zones in Kenya highlands. *Livestock Research for Rural Development* **19(2):** 23-32.

Moran, J., (2005). Tropical dairy farming: feeding management for small holder dairy farmers in the humid tropics. CSIRO Publishing, Collingwood, Australia.

Muchenje, V., Dzama, K., Chimonyo, M., Raats, J.G and Strydom, P.E., (2008). Meat quality of Nguni, Bonsmara and Aberdeen Angus steers raised on natural pasture in the Eastern Cape, South Africa. *Meat science* **79(1):** 20-28.

Musemwa L, Mushunje, A., Chimonyo, M., Fraser, G., Mapiye C and Muchenje V., (2008). Nguni cattle marketing constraints and opportunities in the communal areas of South Africa: Review. *African Journal of Agricultural Research* 3(4)**:** 239-245.

Ngongoni, N.T., Mapiye, C., Mwale, M and Mupeta, B., (2006). Factors affecting milk production in the smallholder dairy sector of Zimbabwe. *Livestock Research for Rural Development* **18(05):** 1-21.

Njuki, J and Sanginga, P. C., (2013). Women, livestock ownership and markets: Bridging the gender gap in eastern and southern Africa. Routledge. http://www.idlbnc.idrc/dspace/litstream/10625/52269/1/iDL-52269.pdf (Accessed 2014, May7)

Pyysiäinen, J., Anderson, A., McElwee, G., and Vesala, K. (2006). Developing the entrepreneurial skills of farmers: some myths explored. *International Journal of Entrepreneurial Behavior & Research*, **12(1):** 21-39.

Thamaga-Chitja, J.M., and Morojele, P. (2014). The context of smallholder farming in South Africa: towards a livelihood asset building framework. *Journal of Human Ecology* **45(2):** 147-155.

Chapter 5 : General discussion, conclusions and recommendations

5.1. General discussion

It was hypothesized that smallholder farmers lacked entrepreneurial attributes and the lack of these attributes limit the profitability and viability of smallholder dairy enterprises. Generally, emerging and communal farmers lacked entrepreneurial attributes although emerging farmers exhibited better entrepreneurial attributes compared to communal farmers.

Profitable and viable dairy farming was skewed against uneducated, youths or female farmers. Low youth participation in dairy farming perpetuates unemployment as youths who make up a substantial proportion of the population continues to be sidelined from entrepreneurship opportunities presented by dairy farming. Male domination also marginalizes women creating an unbalanced distribution of livelihood opportunities. The domination by males place women headed household in dairy farming communities at greater risk of poverty and food insecurity. Technical skills required in dairy production and marketing reduce the potential of uneducated farmers to generate significant income. Despite the high potential of dairy farming to generate income, it is associated with high risk of failure due to technical and natural constraints which prompted some farmers to incorporate other production systems on their dairy farms. The diversification of production systems provides a good safety net during lean and dry periods, but may however lead to decline in dairy production as farmers seek low capital intensive farm ventures.

Emerging farmers are resourceful in terms of social capital and indigenous knowledge systems. These are important assets which can lay a foundation for intervention by government or any

other organization involved in farmer development. Interpersonal skills and IKS cannot be acquired through training unlike marketing strategies, management skills and cost-benefit consciousness which can be enhanced or developed through training. Therefore, farmers who possess interpersonal skills and IKS are in a better position to be assisted.

Training which incorporates modern technologies and IKS based on the farmers‟ attributes can significantly improve the farmers‟ potential to generate income. The training should be geared towards enlightening the farmers in cost cutting measures such as incorporating IKS, labour management and production techniques to increase productivity. The training should also highlight the challenges encountered in dairy farming and how they can be overcome.

The difference between emerging farmers and communal farmers was evident in the reasons behind their choice to engage in dairy farming. Emerging farmers were more inclined towards profit making while communal farmers were driven by surplus or tradition. Both emerging and communal farmers showed lack of essential entrepreneurial attributes. However, emerging farmers had better marketing strategies, management skills and cost-benefit consciousness compared to communal farmers who showed very poor entrepreneurial attributes. The marketing strategies and management skills exhibited by emerging farmers may be improved through training. It may be difficult to assist communal farmers to commercialize their dairy enterprises because their production level is still below household demand. Communal farmers need to be assisted to raise their production to meet household demand before they attempt to commercialize their enterprises. Lack of essential entrepreneurial attributes such as marketing strategies, management skills and cost-benefit consciousness contributed to low profitability and viability of smallholder dairy farming especially in the communal sector.

Challenges such as production costs were similar between communal and emerging farmers. Feed and labour costs were identified as the major production costs and any measure that reduces these costs will significantly improve profit. Milk production per cow does not improve profitability. Productivity and profitability in communal farming may be improved by increasing the herd size. However, emerging farmers are better placed to find solutions to their challenges due to their desire to engage in profitable dairying. Communal farmers show a lack of desire and vision to improve their plight through dairy farming which they have concluded that it is not profitable. The current set-up of the dairy industry does not encourage or promote smallholder dairy farmers. Smallholder dairy farming provides an opportunity to fill the gaps such as inaccessible rural areas which cannot be reached by the formal chain supply.

Youths had lower odds for vision, interpersonal and management skills compared to middle aged and old aged farmers. Males had more interpersonal skills and better marketing strategies compared to female farmers. Highly educated farmers exhibited low interpersonal skills, higher marketing strategies, better management skills and cost-benefit consciousness compared to less educated farmers. Farmers who were employed elsewhere other than their dairy enterprises showed a lack of vision and interpersonal skills compared to their counterparts. Marital status of the farmer did not have any bearing on entrepreneurial attributes.

5.2. Conclusions

Emerging farmers can be assisted to progress to commercial dairy farming since they have already progressed past subsistence farming. The emerging farmers are currently operating with minimal resources, limited entrepreneurial skills and limited training which they supplement

with IKS. This forms the basis for intervention with further training and improved extension services.

Communal farmers may be a difficult group to progress to commercial farming given the current levels of production which are failing to meet household consumption. They need assistance in order for them to reach adequate levels of milk production for subsistence. Communal farmers lack entrepreneurial attributes, resources and extension services. Communal farmers were not fully exploiting IKS opportunities which could improve milk production.

5.3. Recommendations and further research

The smallholder sector should be promoted by developing entrepreneurial skills of the emerging and communal smallholder dairy farmers. Emerging farmers must be identified and supported separately from the rest of the group since they possess some entrepreneurial attribs. Their needs may be different from those of communal farmers. Communal farmers need help from grass root levels using basic training in management and cost cutting measures. The first step should make the communal farmers realize that dairy farming is a profitable business if run properly.

The challenges affecting smallholder farmers can be addressed by tailor made training to suit individual communities, improved extension support services geared towards integration of smallholder farming into mainstream economy and addressing gender and socio-economic issues to provide equal opportunities between different social classes of farmers. IKS remains integral in smallholder dairy sector due to the high capital costs and should be documented, developed and disseminated among emerging and communal dairy farmers.

Farmers should be supported by an efficient extension service which is quick and dynamic to respond to individual challenges in a locality rather than blanket recommendations which cut across wide spectrum of challenges and geographical locations.

Aspects that require further research include the following:

1. Determine value addition to dairy products among emerging farmers as a strategy to improve market penetration.
2. Determine whether IKS will still be relevant under commercial dairy production.
3. Assess whether setting up of milk collection depots, dairy co-operatives and dairy training centers in communal areas can significantly improve milk production and marketing by smallholder farmers.
4. Formalize markets for milk and other farm products.c

Appendices

Appendix 1: Questionnaire

Participant number: _____

Questionnaire

All the information provided here will be treated as **STRICTLY CONFIDENTIAL**

Name of interviewer _____ Date: _____Area:

_____

Please Mark the relevant block with an X. Where there are no blocks, please fill in the blank spaces in handwriting.

Section A: Demographics

Participant number: _____

1. Gender

Male	0	Female	1

2. Age----------

3. Marital Status

Single	0	Married	1	Widowed	2	Divorced	3

4. Are you the household head?

Yes	0	No	1

5. Head of household

Father	0	Mother	1	Grandparent	2	Oldest sibling	3

6. Level of education

No Formal education	1	Primary	2	Secondary	3	Tertiary	4

7. Employment Status

Employed full time	1	Employed part time	2	Unemployed	3	Self-Employed	4

8. Number of people in your household----------

9. Land size (Hectors) …….

Section B – Utilization and Selling

10. Do you use the milk for household consumption?	Yes	No			
11. How do you prefer to consume your milk?	Raw	Pasteurized			
12. Do you prefer your milk to be…..	Home-made	Commercially processed			
13. How much milk do you get					

from one cow per day?					
14. How much milk does your household consume per day?	none	1 Litres	2 Litres	3 Litres	Other(specify) _____
15. Do you sell the milk?	Yes	No			
16. Do you sell the milk raw?	Yes	No			
17. Do you boil the milk before selling?	Yes	No			
18. How much milk do you sell per day?	1-5 Litres	6-10 Litres	11-15 Litres	Other(specify) _____	
19. How frequent do you sell milk?	Daily	Weekdays	Weekly	Other(specify) _____	
20. Is your milk yield meeting consumer demand?	Yes	No			
21. Do you produce milk products?	Yes	No			
22. Which milk products do you sell?	Fermented milk	Butter	Cheese	Other(specify) _____	
23. Where do most of your sales come from?	Milk	Fermented milk	Butter	Cheese	Other(specify) _____
24. How often do you sell the milk product?	Daily	Weekdays	Weekly	Other(specify) _____	

Section C – Knowledge and Training

25. Do you have any form of formal basic training in dairy farming?	Yes	No			
26. Who offered the training?	Extension workers	Project officers	Community member	Veterinarian	Other. _____
27. Do you use the knowledge to inform your practices?	Yes	No			
28. Do you use indigenous knowledge to inform your practices?	Yes	No			
29. Did you receive any training on market quality standards?	Yes	No			

Section D – Market and Marketing Strategies

30	How do you market the milk?	Informally	Farmer‟s meetings	Extension officers	Other specify	
31	How do you compete in the market?	Make products affordable	Offer a credit plan	Subscription farming(delivering to consumer)		
32	What type of market is accessible to you? Tick	Door to door household visits	Churches and schools	Other farmers for processing	People come and buy in the house	Other (Specify)

33	Do you know the milk legal quality market standards?	Yes	No			
34	Do you usually meet the expected quality standards?	Yes	No			
35	How do you get information on milk market quality standards?	Mobile phones	Bulk buyers	Lead dairy farmers	Other specify	
36	How do you transport your milk to the market?	Own transport	Public transport	Other specify		
37	How do you get market price information?	Word of mouth	Mobile phones	Lead dairy farmers	Other specify research	
38	How do you determine the price of milk?					
39	Do you market your dairy products?	Yes	No			
40	How do you market dairy products?	Informal	Newspapers	Farmer‟s meetings	Extension officers	
41	How do you determine the price of dairy products?					
42	How do you market the milk?	Informally	Farmer‟s meetings	Extension officers	Other specify	
43	How do you compete in the	Make	Offer a credit	Subscription		

	market?	products affordable	plan	farming(delivering to consumer)		
44	What type of market is accessible to you? Tick	Door to door household visits	Churches and schools	Other farmers for processing	People come and buy in the house	Other (Specify)
45	Do you know the milk legal quality market standards?	Yes	No			
46	Do you usually meet the expected quality standards?	Yes	No			
47	How do you get information on milk market quality standards?	Mobile phones	Bulk buyers	Lead dairy farmers	Other specify	
48	How do you transport your milk to the market?	Own transport	Public transport	Other specify		
49	How do you get market price information?	Word of mouth	Mobile phones	Lead dairy farmers	Other specify research	
50	How do you determine the price of milk?					
51	Do you market your dairy products?	Yes	No			
52	How do you market dairy products?	Informal	Newspapers	Farmer"s meetings	Extension officers	

53	How do you determine the price of dairy products?	

Section E – Management

54	Where did you get your dairy cattle?	From Heifer Project	From the department of agriculture	I bought it from my own pocket	Inherited	Other (specify)
55	How long have you owned dairy cattle?					
56	How many did you start with?					
57	What type of breed (s) are your dairy cattle?	Indigenous (Nguni)	Crossbreeds	Exotic (Jersey, Ayrshires)		

58	What do you consider when choosing which dairy breed to use?	Availability	Adaptability	Milk yield	Other (specify)
59	Please indicate the type of feeding system you use for your dairy cattle	Zero grazing only (e.g. cut and carry)	Pasture only (grazing full time)	Both	
60	How much is the dairy feed?				

61	Why are you using the above mentioned system?	I don‟t have the knowledge about other feeding systems	I don‟t have resources required for other feeding systems	I don‟t have both		I am satisfied with the conditions of my animals in the current feeding system
62	How do you feed your dairy cattle in winter when the grass is dry in the fields?	I feed them the same way as in summer	I buy commercial feeds as supplements	I give them crop residues		
63	Do you have knowledge on how to make the dairy cow pregnant?	Yes	No			
64	Do you have knowledge on feeding the cow?	Yes	No			
65	What time of the year do the cows give birth?					
66	Do you keep records?	Yes	No			
67	What records do you keep?	Financial	Milk yield	Milk quality reports	Cattle health	

68	How do you prefer to work?	Independently	with other dairy cattle owners in the community	Other (specify)		
69	How do you make decisions that affect your enterprise?	On my own	Consult family	Consult friends	Consult both family and friends	
70	What do you consider as challenges to progress into commercial dairy farming?	capital	Lack of skills	Lack of suitable cattle breeds	Other (specify)	

Section F – Costs and Benefits

71	Do you have hired labour?	Yes	No	
72	How many labourers do you have?			
73	What kind of labour do you use?	Skilled labour	Family members	Community members
74	How do you pay them?	cash	Kind	Other (specify)
75	How much do you pay them?			
76	Do you believe that you generate adequate profit from your sales?	Yes	No	

77	How much money do you generate from your milk sales/ day?	
78	How much money are you generating from your milk products sales/ month?	
79	How much do you spend on animal health services/ month?	

Type of input	**Cost of input**		**Place of purchase and reasons for buying there**
	Summer	**Winter**	

Section G: Livelihoods

80. What do you do with the income that you generate from milk or dairy sales?

Buying dairy feed	Cover health expenses	School fees payment	Cover household expenses	Repay loans	Other specify

81	What benefits are you receiving from dairy cattle?	Easy access to milk for consumption	Sell milk for income	Provide security e.g. for traditional ceremonies	provide nutrients to the fields (manure)	wealth status	Other (specify)

82	Source of livelihood	Rely on sales from milk and milk products	Grow crops and sell them	Employed	Running my own business not related to agriculture	Other (specify)

Appendix 2: Likert scale

Participant number_____

Entrepreneurial Self-Assessment Survey

This survey is not a test; it is for assessing entrepreneurial traits of Nguni cattle owners.

Please answer each of the following questions as honestly as possible.

IN ANSWERING THESE QUESTIONS, PLEASE WRITE THE NUMBER OF HOW YOU FEEL TOWARDS EACH QUESTION IN THE SPACE PROVIDED.

1 2 3 4 5

Strongly disagree Disagree somewhat agree Agree Strongly Agree

_____1. I have a set of goals for the business

_____2. I have a plan for my business to grow

_____3. I am willing to take risks in order to achieve the goals

_____4. The time it takes to achieve the goals does not matter

_____5. I don‟t care how much it costs, as long as I achieve my goals

_____6. I have information about my customers and I know what they want

_____7. I have a way of informing customers of my products

_____8. I am easily reachable

_____9. I make my products affordable to the customer

_____10. I can negotiate and convince my customers to buy

_____11. I can read

_____12. I can write

_____13. I can calculate costs

_____14. I can arrange and delegate duties to my workers

_____15. I keep records of my expenses and income

_____16. I have a good network of colleagues with whom I share ideas and resources

_____17. I am able to resolve conflicts that may arise in the business

_____18. I am able to organise and motivate employees

_____19. I am able to establish good relations with my customers

_____20. I am able to lead by example by being actively involved in carrying out duties

_____21. I am well aware of the costs of all my business transactions

_____22. I am well aware of potential income from all my business transactions

_____23. At the moment, my income will cover all my costs

_____24. If I do not make profit consistently, I will stop running the business

_____25. I am aware that some benefits are not monetary

TOTAL: _____

Appendix 3: Focus group discussions

FOCUS GROUP INTERVIEW GUIDE

1) **What does it mean to you to own dairy cattle?** (Assess the socio-economic vs socio-cultural values)

2) **Describe** your experience of running the dairy farm (SWOT; dairy value chain; market access/information; access to resources; cost break-up [running cost v profit])

3) **How do you interact with other farmers in the community?** (Assess interpersonal skills).

4) **Explain why you started this enterprise** (vision, what are you aiming to achieve; what strategies are you doing currently to help you achieve your goal?).

5) **Do you use indigenous knowledge systems?** If yes explain (Investigate use of IKS in dairy farming).

Appendix 4: Transect walk

TRANSECT WALK (*with the emerging farmers only)*

- Availability & access to infrastructure for dairy farming
- Budget - *costing vs profit*
- Record keeping
- Market information

Appendix 5: Consent Form in English

Consent form

My name is Faith Kudzai Tanyanyiwa and I am a full time student at the University of KwaZulu Natal registered for a Master of Agriculture (Food Security). I am conducting a study on the factors determining the potential of smallholder dairy farmers progressing to commercial farming in Matatiele municipality, Eastern Cape Province. I would like you to participate in this study; your response will be highly appreciated. The following areas will be considered:

- Survey study
- Entrepreneurial attributes checklist
- Focus group discussion
- Transect walk

It is essential to know that

- Participation in this study is voluntary; you can stop participating at any time during the study.
- There will be no payment for participating in the study
- All information will be kept confidential and will only be used for the purpose of this study.
- Overtime the information provided will be destroyed when deemed necessary
- For further information about the study please contact my supervisor Dr Kolanisi 0332606342 or Kolanisi@ukzn.ac.za

I _____ (full name and surname) hereby confirm my understanding of the questionnaire and I understand that I will not be exposed to any risk during the study and that I may withdraw from participating at any point in.

Date: _____ Signature: _____ Cell number: 078 849 4570

Appendix 6: Consent form in IsiZulu

CONSENT FORM IN ISIZULU

Ifomu lemvume

Igama lami ngingu Faith Kudzai Tanyanyiwa, ngingumfundi eNyuvesi yaKwazulu-Natal, ngenza i-Masters kwi Agriculture/kwezolimo (food security). Ngenza ucwaningo ngabakhiqizi bobisi abasafufusa, ngokubuka amathuba abanawo ekufinyeleleni kwezezimakethe.endaweni yase Matatiele, Eastern Cape . Ngingathanda ukuthi ube ingxenye yalolu cwaningo, umubono wakho ungalusizo kakhulu.

Kubalulekile ukuthi wazi okulandelayo:

- Abantu abayingxenye yalolucwaningo ngokuvolontiya, abantu abayingxenye yalolucwaningo bavumelekile ukuthi bashiye phakathi kwalo uma bafisa akukho lutho olubi oluyokwenziwa kubona.
- Ayikho imali eyotholwa abantu abayingxenye yalolucwaningo.
- Imininingwane ezotholakala ngeke isetshenziselwe okunye okuseceleni, izosebenziswa kulolucwaningo kuphela. Imininingwane yabantu abazobe beyingxenye yalolucwaningo izogodlwa.
- Yonke imininingwane yalolucwaningo izolahlwa uma ingasadingeki.
- Uma udinga eminye imininingwane ngalolucwaningo ungathintana no Dkt. Kolanisi ongumphathi walolucwaningo. Utholakala kule nombolo-033 260 6342 noma kolanisi@ukzn.ac.za.

Izwi lobufakazi:

Mina_____ (Amagama aphelele nesibongo) ngiyaqiniseka ukuthi ngichazelekile kahle ngalembuzo engizobuzwa yona futhi ngiyasiqonda isizathu salolucwaningo nokuthi yonke imininingwane etholakele izohlolwa. Ngiyavuma ukuba ingxenye yalolucwaningo, ngiyaqonda ukuthi kuyavolontiywa ukuba ingxenye yalolucwaningo nanokuthi ngingashiya phakathi uma ngifisa.

_____ _____

Sayina Usuku

Appendix 7: Ethical clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

9 December 2015

Miss Faith Kudzai Tanyanyiwa 209503405
School of Agriculture, Earth and Environmental Sciencs
Pietermaritzburg Campus

Dear Miss Tabyanyiwa

Protocol reference number: HSS/1243/015M
Project title: The factors determining the potential of smallholder dairy farmers progressing to commercial farming

Full Approval – Expedited Application

In response to your application received 31 August 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully

.....

pp **Dr Shenuka Singh (Chair)**
Humanitities & Social Scinces Research Ethics Committee

/pm

Cc Supervisor: Dr Unathi Kolanisi
Cc Academic Leader Research: Professor Onisimo Mutanga
Cc School Administrator: Ms Marsha Manjoo

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Telephone: +27 (0) 31 260 3587/8350/4557 **Facsimile:** +27 (0) 31 260 4609 **Email:** ximbap@ukzn.ac.za / snymanm@ukzn.ac.za / mohunp@ukzn.ac.za
Website: www.ukzn.ac.za