DETERMINANTS OF SMALLHOLDER FARMERS' PARTICIPATION IN CATTLE MARKETS IN NGAKA MODIRI MOLEMA DISTRICT OF THE NORTH WEST PROVINCE, SOUTH AFRICA

BY

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DECLARATION

I, Ndumiso Vusumuzi Ezra Mazibuko student number 17092663, hereby declare that the dissertation for the Degree of MSc in Agricultural Economics, submitted at North West University, is my own original work and the sources contained herein have been duly acknowledged. This dissertation has not been submitted for any degree or examination in any other university.

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14/04/2014

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ABBREVIATIONS

LDC	Less Developed Country
FOA	Food and Agriculture Organisation
NAMC	National Agricultural Marketing Council
SACU	Southern Africa Customs Union
SAFA	South African Feedlot Association
ISRD	Integrated Sustainable Rural Development Strategy
GDP	Gross Domestic Production
SPSS	Statistical Package for Social Science
NDA	National Department of Agriculture
ETI	Ethical Trading Initiative
CASP	Comprehensive Agricultural Support Programme
LRAD	Land Redistribution for Agricultural Development
USAID	United States Agency for International Development
NERPO	National Emergent Red Meat Producers Organisation
IFAD	International Fund for Agricultural Development
NWP	North West Province
AFASA	African Farmers Association of South Africa

ABSTRACT

The study was designed to identify and get a better understanding of the determinants of smallholder farmers' participation in cattle markets in the Ngaka Modiri Molema District of North West Province. A hundred and nine smallholder cattle farmers were randomly selected using the simple random sample method. The list of smallholder cattle farmers was obtained from the North West Department of Agriculture and Rural Development (Ngaka Modiri Molema District). Data was collected through the use of structured questionnaire that consisted of demographic characteristics, market-related constraints encountered by smallholder cattle farmers, availability of infrastructure, access to market information, cattle production, cattle nutrition, cattle health, cattle husbandry, and reasons for keeping cattle and markets participated in by smallholder cattle farmers. The data was coded, captured and analysed using the statistical package for social science (SPSS) for frequencies, percentage and probit regression analysis.

The results of the study show that the majority of the respondents in this research were male (72%); married (68%); Christians (74%); not formally educated (45%); and having less than 10 years in farming (61%). The results highlighted that majority of the smallholder cattle farmers used informal markets to market their cattle (83%); mainly used auctions (58%) as a formal marketing channel and were mostly familiar with informal (62%) marketing channels. The farmers received higher prices (65%) from the cattle markets they regularly use and were nearer. The majority of smallholder farmers (55%) do not participate in the most rewarding channels.

Majority of the smallholder cattle farmers were affected by, lack of support from government (96%); limited market information (95%); financial constraints (79%); distance to mainstream markets (60%); and bureaucracy (62%). The results of probit regression model show that out of 15 independent variables considered, the coefficients for 5 variables were statistically significant. These were: the number of heifers ($Z=2.742$: $P<P0.05$), smallholder cattle farmers keeping of farm records ($Z=2.611$: $P<0.05$), the number of years in farming ($Z=-2.451$: $P<0.01$), level of education ($Z=-1.745$: $P<0.01$) and smallholder farmers slaughtering of cattle and selling as carcass ($Z=-1.899$: $P<0.01$).

Keywords: Smallholder. Cattle. Farmers. Mainstream. Markets. Constraints. Participation.

CHAPTER ONE
INTRODUCTION

1.1 Background

Increases in food prices have been a frequent occurrence in the 1970s and 1980s periods as well as during 2006–2008 periods. This creates world-wide food crises causes political and economic instability and social unrest in both poor and developed nations (Delgado, 2008). For example, between early 2006 and 2008, the world experienced a dramatic surge in the prices of commodities and the prices of traditional staples such as maize, rice and wheat, reaching their highest levels in nearly thirty years. The average world price for rice rose by 217%, wheat by 136%, maize by 125% and soya-beans by 107% (Berthelot, 2008). In late April 2008, rice prices hit 24 cents a pound, twice the price that it was seven months earlier. In October 2008, the price upswing decelerated and prices decreased sharply in the midst of the financial crisis and the wake of economic recession (Dawe, 2004; Gallagher et al, 2008).

In many countries, and virtually every less developed country (LDC), agriculture is the biggest single industry. Agriculture typically employs over 50% of the labour force in LDCs with industry and commerce dependent upon it as a source of raw materials and as a market for manufactured goods. Hence many argue that the development of agriculture and the marketing systems which impinge upon it are at the heart of the economic growth process in LDCs. In LDCs the consumer frequently spends most of the household's income on basic foodstuffs - much of which is inadequate both in quality and nutritional content. By contrast Americans spend approximately twelve percent of their total disposable income on food. In Western Europe the figure ranges from about 16% to 99% of disposable income. Furthermore, whereas in developed countries the poor are relatively few in number, and therefore it is economically possible to establish special food distribution programmes to meet their needs, the scale of poverty in most LDCs is such that the commercial marketing system must be relied upon to perform the task of food distribution to poor and not-so-poor alike. This being so, it is imperative that the marketing system performs efficiently (FOA, 2005). Emerging farmers are defined as smallholders who need input markets, markets for services, and output markets for their farming operations. But they tend to be limited in market access because of various constraints. This implies that they produce surplus for the

market. The part of the harvest that is not consumed by the household, or the extended family, will be sold when a market is available (Van Schalkwyk, et al., 2003).

1.2 Marketable livestock numbers

According to Stevens and Jabara (1998), livestock numbers in less developed areas are generally found to be low per producer and that the average weight of animals are generally lower compared to areas characterised by commercial farming. Several constraints that impede on increased productivity (e.g. increased animal numbers and weight, and off-take rates) have been identified by the World Bank (1998). These include animal disease, poor quality and inadequate supply of feed, no or slow adoption of technology and diminishing plant and animal bio-diversity.

In South Africa off-take rates in the small-scale cattle sector is much lower than in the commercial sector, i.e. an off-take rate of between 5 -10 per cent compared to 25 per cent in the commercial sector. This emphasises the challenges that lay ahead in further developing this sub-sector

1.3 Poor condition of livestock

Although a lack of buyers is frequently given as a reason why small-scale farmers are unable to access the market, the fact is that when such buyers do wish to buy from small-scale farmers, the poor condition of livestock results in lower farm gate prices, especially during dry spells. Livestock auctioneers and speculators often raise concerns that they cannot pay competitive prices for animals that are in poor condition or not ready for the market (Luppnow, 2003). De Waal (2004) mentions that the poor condition of livestock is important, but the age of animals (too old) when farmers do sell, is equally contributing to poor prices. Poor condition of livestock is also attributable to inadequate grazing and the extreme degradation of the natural resource. Lack of suppliers of important agricultural inputs for livestock farmers, such as vaccines and feed supplements, and common problems of genetic inferiority of animals further reduces the desirability of animals. The low levels of technology adoption further compounds the problem (Nell, 1998).

1.4 Improved markets and marketing

Livestock farming is a tradition within South African rural systems. It is therefore not a coincidence that the Integrated Sustainable Rural Development Strategy (ISRDS, 2004) identifies livestock farming as the agricultural enterprise with the most likely chance of improving household food security and addressing poverty alleviation in communal farming areas of South Africa (Coetzee et al., 2005). In South Africa, cattle are marketed through a number of channels and these are broadly divided into two categories, namely the informal and formal markets. The former consists of individuals buying livestock for different reasons which include slaughter, as an investment or for social functions such as funerals, customary celebrations, weddings and religious celebrations. The latter consists of selling directly to butcheries, auctions and abattoirs.

In terms of market access, Jooste (2001) concluded that the transition of the small scale sector towards commercial production will ultimately be determined by its access to markets. According to Stroebel (2004), several constraints affect the efficient marketing of livestock in the Eastern Cape Province of South Africa, chiefly of which, are poor marketing infrastructure, lack of marketing herd size, high transaction costs and low purchasing power of buyers. This implies that marketing of livestock is probably one of the most complex policy issues to be addressed for enhancing sustainable smallholder agriculture (Jooste, 2001). Historically, the small scale communal cattle producers have found themselves in a difficult market position because individually they lack sufficient volumes of uniform cattle to attract buyers to their farms Jooste (2001). Although a number of market outlets do exist in the province, Nkosi and Kirsten (1993) pointed out that small scale communal farmers sell their cattle through informal marketing channels which in most cases have low purchasing power and as a result farmers get relatively low prices for their animals. Thus the challenge to livestock farming in communal areas is making use of marketing channels that offers the best cattle prices and hence highest returns. Benson et al. (2001) indicated that these decisions require reliable information about cattle prices, the right selling time, the channels available, cattle breeds and the age of cattle that give the highest returns.

1.5 Research problem

Agriculture is the livelihood of smallholder farmers. It plays important role in South Africa as it contributes to the GDP, employment, rural development and food security. Smallholder

farmers can contribute to the development of South Africa and meeting the demand for food as the population of the country grows. For such objective to be achieved, the smallholder cattle farmers should have access to reliable high value markets. This will improve their incomes hence more sustained commitment and motivation for long-term engagement in farming activities. Currently smallholder farmers are faced with the following constraint, lack of market access, transactional costs, lack of market information, lack of infrastructure and lack of climate change information. In a market economy, no matter how many other factors you introduce to a commercial business, the market will always be the final adjudicator. While other factors are critical to economic endeavour, it is the market that provides the motive for all activities. Without an effective market, production no matter how bountiful is less than useless. "It is wasteful" (Cronje, et al., 1996). The contribution of food price increases to growing levels of poverty and food insecurity around the developing world has highlighted the need for initiatives to ensure South Africa's food security and the need to encourage small and commercial farming as a means of alleviating poverty, creating jobs and opening up access for previously disadvantaged people to formal retail markets.

There are five principal marketing channels for livestock, namely informal markets, speculators or agents, auctions, feedlots and abattoirs. Nkosi and Kirsten (1993) reported that the developing farmers prefer to sell their livestock in informal markets where individuals buy livestock for different purpose for example social functions, customary, wedding, religious celebrations and funerals. At this channel, prices are determined by the farmers and no transactional costs are incurred. However these types of markets are characterized by a high degree of seasonality, poor market information pertaining to prices and quality. The second channel for sale is through speculators. Speculators purchase animals directly from farmers or at auctions and sell them at a profit. The prices are reached through negotiations, which normally is the lowest price possible. Speculators provide their own loading and transport services. Farmers tend to rely on speculators to buy their animals in order to meet their need for cash during certain critical periods of the year. It often happens that the farmers sell animals below market value due to a weak negotiating position and bad timing. A perception exists, and in some instances with good reason, that the speculators are exploiting farmers due to lack of bargaining power and marketing plan.

The third channel for sale is auctioneering. Live auctions are arranged by marketing agents at regular times at strategic points on a commission basis. Animals are sold by public bidding to

the buyer who offers the highest price. Auctions tend to occur in the commercial farming areas where there is sufficient off-take of cattle and are effective mechanism for setting transparent market related prices (Kirsten & Nkosi, 1993). However, the perception exists that the smallholder farmers are receiving the lowest price even at auctions due to poor animal quality and other factors that needs to be investigated. The fourth channel is the feedlot system. The level of integration in the industry increases and the prevalence of direct contract sales between weaner producers and the feedlots have increased (Simela & Mahanjana, 2006). Prices are fixed in advance and the farmers are able to plan the economics of their production. The feedlot industry produces approximately 70 to 80 % of beef in the formal sector in South Africa. Feedlots purchase weaner at ± 110 kg live weight and double the mass in 100-110 days to bring it up to 220 kg carcass. The deregulation of the South African meat industry caused a number of the larger feedlots to vertically integrate into slaughtering of their own cattle, and into wholesaling. A few even branched out into retailing their own branded quality beef products. Most slaughtering is done through the abattoirs which is the fifth channel. Before the market deregulation in South Africa the main function of the abattoirs was to provide slaughtering service to other role players in the meat value chain. Currently the abattoir fulfils an integrated wholesale function by buying animals on the hoof and directly selling carcasses and meat cuts to the retail sector.

The formal cattle markets are the most reliable and effective channels because there is no involvement of the middlemen. However, most of developing cattle farmers hardly have access to this channels. Since the implementation of the land reform programme in South Africa, there have been many targeted interventions aimed at addressing the market constraints facing smallholder cattle farmers and crop farmers through institutions such as Department of Agriculture, Rural Development and Land Affairs. However many smallholder cattle farmers in many areas of South Africa including those in the Ngaka Modiri Maleman District of the North West Province do not have access to these high value, reliable, and effective channels due to many factors which needed to be investigated.

1.6 Research aim

In light of the above research problem, the aim of this study was to identify and get a better understanding of the determinants of smallholder farmers' participation in cattle markets in

the Ngaka Modiri Molema District of North West Province. An understanding of these determinants should help in providing recommendations leading to actual increase of the participation of smallholder cattle farmers in the mainstream cattle markets.

1.7 Main objectives

The main objective of this study was to identify the determinants of smallholder cattle farmers' participation in cattle markets in the Ngaka Modiri Molema District of North West Province. The study, among others, focuses on the following:

- Analysis of the demographic and socio-economic characteristics of smallholder cattle farmers in the study area.
- Assessment of existing cattle markets in which smallholder cattle farmers participate.
- Investigate factors that influence smallholder cattle farmers' choice of cattle marketing channels and reasons for selling.
- Analysis of the effects of socio-economic factors on the smallholder cattle farmers' participation in mainstream cattle markets.
- Analyses of the constraints facing smallholder cattle farmers in marketing that prevents them from participating in the mainstream markets.

1.8 Hypothesis

It may be hypothesized that there is no significant relationship between socio-economic factors (number of sales, number of years farming, household size, contact to extension service, membership in farmers' organisations, number of heifers, farmer slaughter and sell carcass, farmer consult with other farmers before making decision, vaccinate cattle, receive market information, gender of responded, attend short courses on cattle farming, number of cattle, keep farm records and educational level) and market participation.

1.9 Outline of the study

The study is divided into five chapters. The introduction, research problem, aim of the study, objectives and hypothesis are discussed in chapter one. Both national and international literature is reviewed and thoroughly discussed in chapter two. Chapter three outlines the methodology of the study; while the analysis and interpretations of the results, using

percentages, frequencies, tables, graphs and the probit regression analysis are presented in chapter four. Major findings, conclusion and recommendations are presented in chapter five.

1.10 Chapter summary

This chapter explained food prices'crises; domestic market deregulation; cattle and beef production in South Africa; feedlots and finishing; pastoral cattle keepers' marketing behaviour and improved markets and marketing. It also covered other sections including the research problem, aim of the study and the objectives that are aimed to be achieved upon the conclusion of the study and hypothesis.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter reviews literature in an endeavour to investigate the current debates surrounding determinants and contributing factors responsible for smallholder farmers' participation in cattle markets. First, by defining smallholder and emerging farmers and their importance in contributing to the livelihood of poor farmers and global food security. Second, it identifies from both national and international literature, several major constraints affecting marketing of cattle among smallholder and emerging farmers.

2.2. Constraints to livestock marketing by smallholder and emerging farmers

Lack of appropriate transportation facilities and road infrastructure, communication links and storage infrastructure, and poor roads and poor telecommunication networks result in high transaction cost. Sometimes transaction costs are too high for farmers and traders to get any meaningful benefits from their trading activities, thus discouraging smallholder farmers from marketing activities (Jari, 2009; Kherallah & Minot, 2001; Mburu, Wakhungu). Smallholder farmers are also affected by lack of reliable market information; Traders and producers make poor management decisions due to the ineffectiveness of existing market information systems (Adejobi, 2005; Bardhan, 2006). The other constraint is lack of standards for livestock trade. No formal, pre-established standards on weight, prices or grades exist for buying and selling animals (Shaikh, Rehman & Yates, 2002; Arvanitoyannis, Choreftaki & PersefoniTserkezou, 2005; Berry, 2010). Lack of grass root farmers' organizations is also a major constraint for small cattle farmers. Market operators lack the required training in modern business organisation and management practices (Nsoso, Monkhei & Tlhwaafalo, 2004). Another constraint is poor animal nutrition. Poor nutrition contributes to a higher incidence of cattle diseases and parasites. The major diseases that affect cattle are Foot and Mouth Disease (FMD) and blackleg (MAFF, 2006). Other major animal health problems experienced by smallholder cattle farmers are parasites, with liver fluke being the major internal parasite (Soun, Hol, Siek, Mclean, & Copeman, 2006) and ticks and flies the major external parasites. Animal health is recognized to be the source of production losses such as low weight gain, draught

performance, fertility and lactation (Copeman & Copland, 2008); and poor general husbandry: Cattle husbandry intervention of smallholder and emerging farmers is reported to be low in terms of health and disease control. Windsor (2008) reported that smallholder and emerging farmers had little knowledge of husbandry and did not have funds to improve husbandry. Some smallholder and emerging farmers did not have access to vaccines and some were not concerned (Windsor, 2008).

2.3 Clarification of key concepts

This section clarifies key concepts, which are used to conceptualize the content context of this research.

2.3.1 Smallholder farming

The World Bank's Rural Development Strategy defines smallholders in farming as those farmers with a low asset base, operating less than two hectares of land area (World Bank, 2007). FAO study defines smallholders as farmers with limited resource endowments, relative to other farmers in the sector (Blair, 2010). According to Christopher (2007), smallholder farming involves households producing agricultural yields on relatively small plots of land. It also involves direct operation by the farmer and makes use of family labour (manual and management), although they are sometimes supplemented by temporary employees. In addition, smallholder farming makes more use of labour (labour-intensive) rather than capital, and results in production of small amounts when compared to large farms (Kirsten & van Zyl, 1998). Smallholder farms are sometimes known as peasant farms, small-scale farms or family farms. Kirsten and van Zyl (1998), therefore, regards a smallholder farmer as a farmer whose scale of operation is too small to attract the provision of the services the farmer needs to be able to significantly increase his/her productivity.

The review of both national and international literature reveals that limited access to land is the common identification feature, when the term smallholder is mentioned. The limit, most frequently takes the form of a threshold that is usually selected in an ad hoc basis (for example two hectares, mean or median land size). For example, households with less than a threshold land size of two hectares may be characterized as smallholders. However, across countries, the distribution of farm sizes depends on many other factors such as; agro-

ecological and demographic conditions, such as climate, farm-land related factors (for example: soil, slope, altitude) and economic and technological factors.

For instance Chamberlin (2006), using survey data from Ghana, employs farm size as the classification variable, and defines smallholders as farmers with operated farm size smaller than 10 hectares and greater than 0.1 hectares, virtually landless.

A range of other dimensions are important attributes of scale in defining smallholder farmers. Among these attributes, geographical attributes, access, use and ownership of capital, livestock and inputs (including credit) are crucial (Burke, 2009). Moreover, other attributes such as land fragmentation or differentiation between land ownership and use are important characteristics that affect scale in agriculture (Mokitimi, 2007).

The Ethical Trading Initiative (ETI) smallholder guidelines (2005) reveals a number of characteristics common to smallholders, whether or not they control the land they farm or the commodity they produce. They produce relatively small volumes of produce on relatively small plots of land. They may produce an export commodity as a main livelihood activity or as part of a portfolio of livelihood activities. They are generally less well-resourced than commercial farmers, and are usually considered to be part of the informal economy (i.e. may not be registered, tend to be excluded from aspects of labour legislation, lack social protection and have limted records). Furthermore the small farmers may be men or women may depend on family labour, but may hire / employ workers; and they often vulnerable in supply chains.

In the post-apartheid South Africa, smallholders are commonly categorised into three groups, namely; subsistence farmers, who make up the large majority; commercial farmers, a small minority; and emerging farmers' (Department of Agriculture, 2001:5,8). The concept of 'emerging farmer' is understood to refer to farmers who have a 'desire' to increasingly commercialise their production (Niewoudt, 2000).

In light of the foregoing definition of a smallholder farmer, this research defines smallholder farmers as the farmers with limited resources including land area, capital, skills and labour. These are farmers that have poor access to resources such as machinery and credit facilities, as well as minimal government support.

2.3.2 Emerging farmers

As stated in sub-section 2.2.1 above, emerging farming is a category of smallholder farming where farmers involved in such farming have a desire to increasingly commercialise their production (Niewoudt, 2000). The National Department of Agriculture (NDA) in South Africa defines emerging farmers as farmers who are the beneficiaries of one of government's land reform programmes (for example: Land Redistribution for Agricultural Development (LRAD) and Comprehensive Agricultural Support Programme (CASP)), and again as farmers who are mainly dependent on state and semi-state organizations for support and finance and again those farmers who consume and sell some portion of their harvest (NDA, 2006). Gelderblom (2003) defines emerging farmer as a person who aspires to farm successfully within his or her given physical, mental and socio-economic constraints and needs the assistance of an external facilitator to realise this aspiration.

This study uses the concept of emerging farmers to define smallholder farmers that are participating in the cattle market and have intentions to produce and sell more cattle.

2.3.3 Market access

Market access refers to the processes by which people access markets in relation to the nature, efficiency and costs of these processes (Killick et al., 2000). Market access can be related as follows; firstly, to information about product availability, attributes and prices, including the frequency, quality and cost of this information; secondly, to information about counter-parties to transactions, as trustworthiness is critical if payment is not instantaneous or checking of quality is costly; thirdly, to the extent that suppliers can have confidence in market conduct; fourthly, to information on physical costs of accessing a market which is a function of the quality of infrastructure and the transport sector; and finally, to the actual price levels found in the markets in which people transact.

The above definition is close to the IFAD (2004) definition, where market access is related to three dimensions, namely; physical access to markets (distances, costs, etc.); structure of the markets (asymmetry of power relations between farmers, market intermediaries and consumers); and the level of producers' human capital (e.g. understanding of market forces, prices, bargaining, etc.).

2.3.4 Marketing channel/distribution channel/marketing outlets

A marketing channel/distribution channel is defined as a set of interdependent organizations that help make a product available for use or consumption by the consumer or business user (Mansfield, 2003). A marketing channel, according to Lake (2007) is an organized network of agencies and institutions which in combination performs all the functions required to link producers with end customers to accomplish the marketing task.

In marketing, there are two types of distribution systems that signify two extreme points on a continuum (Ramaseshan, 1993). These are; integrated (direct): Direct marketing occurs when the producer connects with the end user. The end user may be a consumer or a business. Direct channels are more frequently used by smallholder farmers as compared to indirect channels. Most producers sell directly to consumers without passing through market intermediaries such as wholesalers, agents, brokers, or retailers who help move a product from the producer to the consumer or business user (Scribe, 2010). In the direct marketing channel, the choice of marketing channel is limited to the end user who could be consumers or businesses. The low transaction costs involved in direct marketing are also an incentive for small scale farmers; and independent (indirect) marketing channels. An indirect channel includes one or more marketing intermediaries performing a variety of functions. Each channel member provides value, performs a function and expects an economic return. In the indirect marketing channel, the choice of channel becomes more diverse and the factors to be considered increases.

In agriculture, distribution channels therefore move agricultural products from farmers to consumers and to other businesses and consist of a set of interdependent organizations such as wholesalers, retailers, and sales agents who are involved in making a product available for use or consumption (Nel, Binns & Motteux, 2001). The intermediaries in the marketing of agricultural products include all interdependent organizations (firms and individuals) that help move a product from the farmer to the end user (Panisello & Quantick, 2001; Chikazunga, Louw).

2.3.5 Cattle marketing agents

Cattle marketing agents are facilitators that render a service of bringing together a buyer and a seller, without them actually owning the cattle, but actively assist in the transfer of ownership

from the producer to the next customer. Their activities include arranging live auctions at regular times at strategic points (Hebinck & Lent, 2007).

2.3.6 Transaction costs

Transaction costs involve the costs of exchanging goods and services, which can arise when emerging farmers endeavour to; gain information on or search for marketing and trading partners (potential buyers or sellers); negotiate contracts; and monitor and enforce the implementation of the agreement (Boughton, 2007;Burke, 2009).

2.4 Domestic market deregulation

Until early in 1998, the marketing of most agricultural products in South Africa was extensively regulated by statute. One of the main characteristics of the control over agricultural marketing was isolation from world market forces. Most products were regulated under the 22 marketing schemes introduced from 1931 and especially from the time of the 1937 Marketing Act. In addition, commercial farmers benefited from a wide range of support services from the State (research, extension) as well as direct and indirect subsidies. Beginning two decades ago, the industry faced increasing pressures for deregulation, a process that was accomplished in two phases over this period. The major change in the first phase was the extensive deregulation of state agricultural marketing schemes within the framework of the marketing act of 1968.

The nation's agricultural sector is still in the process of transition from a regulated to a deregulated environment, since democracy in 1994 and the country's re-entry into the international markets. Deregulation in the agricultural sector has since seen the dismantling of control boards under the auspices of the National Agricultural Marketing Council (NAMC) and the enactment of the Marketing of Agricultural Products Acts of 1996. In the transition process, market concentration has become a reality in the food processing and retail sectors. Emerging farmers have found themselves excluded from the mainstream of the agricultural economy. The dominant supermarkets and processors have tended to favour suppliers who can ensure high volumes, consistent quality and engaged in long-term contracts to that effect (Louw et al., 2006).

2.5 Cattle and Beef production in South Africa

South Africa primarily produces meat for the domestic market. Though it exports some meat, it has been a significant importer of meat until the very recent past. The regional trade dynamic presents an important competitive overview. South Africa has traditionally been a net importer of red meat, with most imports sourced from Botswana and Namibia. The red meat industry in South Africa was controlled by statute from the time of the Meat Trade Control Act of 1932. Control was exercised in terms of the Marketing Act from 1945. Deregulation started with the abolition of the restrictions on the movement of animals from uncontrolled to controlled areas in 1992 and the abolition of restrictive registration requirements for producers, abattoir agents, butchers, dealers, processors and importers in 1993. The Red Meat Scheme was terminated in 1998. Nevertheless, the industry is still directly protected by a high tariff from imports beyond SACU.

Industry-level data on red meat consumption in South Africa need to be interpreted with great circumspection, for two important reasons. First, the existence of the informal trade in meat is widely recognised, and has been researched, but little is known about its magnitude. There is evidence that the production and the consumption of red meat could be under-recorded by as much as 50% and that the informal trade in especially beef really only took off from the late 1980s, i.e. it coincided with the deregulation process. Second, little is known in South Africa about the aggregate behaviour of farmers who keep cattle on communal grazing lands in the former homeland areas beyond the fact that about a third of the total South African cattle herd is kept in these areas, and that the ownership of this herd is very skewly distributed in favour of the relatively wealthy (Grant et al, 2004).

2.6 Pastoral livestock keepers' marketing behaviour

In developing countries, livestock are rarely sold because they play important subsistence functions in the life of rural households which include provision of human needs like food, draught power, manure, social needs and provision of financial security to households (Tapson, 1990). Therefore sales are often stimulated by the farmer's needs for cash than by the characteristics of the demand or the state of the market (Djamen et al., 2007). Forced sales is also an adaptive strategy to dry season feed shortage (Gebremedhin et al., 2007). Although it is argued that small scale cattle keepers are incaple of responding rationally to markets, there are some of them who actively participate in livestock marketing (Nkosi and

Kirsten, 1993). The differences in cattle keepers' objectives and perceptions to cattle production hamper the formulation of effective livestock policies aimed at improving the livelihoods of resource poor cattle keepers (Barrett et al., 2004). Efforts to improve the rural cattle production and market supply of quality live animals should therefore emphasize the understanding of cattle keepers' objectives, perceptions and experiences (Dovie et al., 2006).

The animals usually offered to cattle markets for sale are local breeds with a few crossbreeds (Serunkuuma & Kent, 2001). The herder's decision as to which animal is to be marketed depends on a number of factors which include; the magnitude of the cost to be satisfied and the size, the species composition, age, sex and structure of the herd. For small recurrent expenses, the sale of shoats will usually prove adequate but large expense needs like medication or school fees often necessitate sale of cattle (Ayalew et al., 2003). When the cattle keepers are confronted with the necessity of selling cattle, off-take is restricted to the non-productive elements of the herd such as cull cows, sterile heifers, non-breeding bulls and bull yearlings. Marketing preference is often balanced with the fundamental pastoral considerations like securing the future reproduction of the herd and maximizing milk flows. The herders' decision to sell a specific animal is guided by judging the usefulness of that animal on the criteria of fertility, physical resistance and milk production. The cattle keepers within the cattle corridor are faced with a commercialization strategy characterized by heavy culling of young bulls and forced sales of cows and heifers (Oxfam, 2003). This kind of offtake disorganizes the growth of the herd and for most vulnerable cattle herders leading to a downward spiral of disinvestment. This process of herd contraction has forced most cattle keepers within the cattle corridor to abandon Pastoralism.

2.7 Cattle markets

About 4 million (40% of the total beef cattle herd in South Africa) beef cattle are in the hands of black emerging and communal farmers, yet only 5% are channelled or distributed to the formal markets. Markets can be grouped into formal and informal institutions (Jari, 2009). Institutions are defined by North (1990) as rules of the game that facilitate co-ordination or govern relationships between individuals or groups. Formal markets have clearly defined grades, quality standards and safety regulations and prices are formally set while informal markets embrace unofficial transactions between farmers and from farmers directly to

consumers (Kherallah & Minot, 2001). In comparison to formal markets, informal markets are more common among medium and smallholder farmers. Informal markets among medium and smallholder farmers include; direct sales by smallholders to consumers, either individually or through institutions; sales to farmers' co-operatives, societies or self-help groups that have collecting centres, which boil or cool cattle products such as milk before delivering it, either fresh or soured, to consumers or processors. Most milk marketed through informal markets is consumed raw, a system that has public health implications; and sales to small traders and market agents (milk bars, kiosks or mobile traders), who buy milk from farmers or farmers' cooperatives and sell to consumers or retailers (Gereffi, Humphrey & Sturgeon, 2005).

There are multiple reasons why emerging farmers keep cattle, and these reasons are manure, provision of draught power, slaughter, social security, milk, meat, investment or for social rituals like funerals, customary/traditional celebrations such as lobola, weddings and religious celebrations) (Chimonyo, Kusina, Hamudikuwanda & Nyoni, 1999). This shows how important the association between people and cattle is. Some historians have made the statement that it is doubtful whether mankind would have developed as rapidly as he did without cattle to provide meat, milk, hides, draught power and to serve as an article for barter and an indicator of wealth. Finally, some smallholder farmers keep cattle mainly as a symbol of wealth and as a buffer against economic hardship. Nkosi and Kirsten (1993) posit that generally emerging cattle farmers sell their cattle through informal marketing channels which in most cases have low purchasing power and as a result farmers get relatively low prices for their cattle. Formal markets category (where smallholder farmers sell directly to butcheries, auctions and abattoirs) for cash sales (Ayalew, King, Bruns, & Rischkowsky, 2003). Where transactions happen within formal markets, farmers are getting very low prices for their animals.Cattle auctioneers and speculators often raise concerns that they cannot pay competitive prices for cattle that are in poor condition or not ready for the market (Nkhori, 2004). According to Nkhori (2004), the ages of these animals, also, affect prices. In most cases, these animals are often too old when smallholder farmers do sell and this equally contributes to poor prices (Stroebel, 2004).

In most cases, black emerging and communal farmers have got no reliable market in the area where they live. They have to travel long distances to market venues and there they are told that their animals are inferior and therefore cannot fetch similar market related prices as

commercial farmers. Therefore some farmers will not sell at these markets. This in turn leads to the perception that emerging and communal farmers do not want to sell their animals, when only these farmers want to be paid a decent price for their cattle. The resource poor farmers also do not have exposure to information that will make them aware of and competent in the formal business world of cattle farming (Chimonyo, Kusina, Hamudikuwanda & Nyoni, 1999).

It is clear from the foregoing paragraphs that cattle have the potential to help emerging farmers to meet their, informal objectives (traction to cultivate fields, manure to maintain crop productivity, and nutritious food products for human consumption and income-generation) and formal objectives (sell directly to butcheries, auctions and abattoirs for cash sales) (World Bank 2005).

However, emerging cattle producers, according to the literature (Van Schalkwyk, Groenewald & Jooste, 2003; Chimonyo et al., 1999), are characterized by low levels of market participation. Smallholder farmers do not participate in cattle markets because of a number of reasons, which are now discussed in the next section.

2.8 Market-related constraints encountered by emerging / smallholder cattle farmers

The chief constraints identified in both national and international literature are as follows:

2.8.1 Production constraints

In most cases, all animals (cattle, goats and donkeys) are housed together at all times of the year in open kraals made of thorny branches. These kraals are never cleaned and most last for over many years. This results in outbreak of diseases during wet seasons and the death of livestock (Stür et al., 2001). The large numbers of cattle kept in villages lead to overstocking and severe overgrazing especially in winter where natural pasture is reduced to zero. This results not only in inadequate feed but also in poorer quality pastures each year. Since supplementary feeding is hardly provided due to the costs involved, insufficient nutrients result in high losses (Soun et al., 2006). The high costs of veterinary services, lack of transport and short supply of some drugs prohibit constant and continuous use of these services (Copeman et al., 2008; MAFF, 2006). There is also a shortage family labour and unreliable hired labour to cover all the activities performed at the same time on the farms (crop production, livestock production of various types and requirements, and off farm

activities). This has resulted in poor management due to labour shortages resulting in straying of animals, loss through diseases and poor nutrition (FAO, 2005); and inadequate water sources and long distances to dams or boreholes force some of smallholder farmers to water their animals in municipal sewage ponds (Windsor, 2008).

2.8.2 Infrastructural and logistic constraints

The National Department of Agriculture (NDA) (2005) agrees that most of the emerging cattle farmers in South Africa are located in areas remote from major markets, and where there is a serious lack of both physical and institutional infrastructure. According to United States Agency for International Development (USAID) (2003), this partly explains the poor supplies of cattle to formal market outlets by small-scale farmers (USAID, 2003). Frisch (1999) asserts that in communities that have marketing facilities, they are either in poor state or non-functional because farmers do not have funds to maintain them. The most important physical infrastructural weaknesses for the emerging cattle farmers, according to Bailey, Barrett, Little and Chabari (1999), are related to transport and holding facilities. The National Emergent Red Meat Producers Organisation (NERPO, 2004) state that in South Africa, lack of marketing facilities such as sale pens and loading ramps are some of the numerous factors that impose a serious infrastructural constraint on emerging farmers' ability to market their cattle.

The road system, which is the most important determinant for market development in terms of distribution of inputs and output to and from farms, is the most serious infrastructural bottleneck facing emerging cattle farmers. NERPO (2004) states that apart from the distance to formal markets, the poor state of road networks in South African rural areas, where most emerging farmers are found, imposes a serious constraint. It affects farmers' ability to attract many buyers in their areas since bad road network systems are associated with very high transport costs. In a study conducted by Mngomezulu (2010), farmers stated poor infrastructure such as roads, dams, theft and lack of fencing in communal grazing lands as major challenges that are hindering their cattle production. The underdevelopment of rural roads and other key physical infrastructure such as expensive or unavailable electricity have led to emerging cattle farmers experiencing; high transport costs for agricultural products to the market as well as of farm inputs; and reduced or no investment in cold storage facilities and processing of farm produce, thus reducing farmers' competitiveness. Reduction or lack

of storage and processing facilities constrains marketability of perishable goods such as dairy products (Mngomezulu, 2010; Angula, 2010).

Mngomezulu (2010) concludes his study by asserting that for effective interventions and for improved cattle production and marketing, there is need for road linkages between social, economic, political and environmental matters or the use of a multi-sectoral approach to address different road and electricity challenges that are facing emerging cattle farmers.

2.8.3 High transactional costs

Various researchers (Jari, 2009; Emongor, Louw, Kirsten & Madevu, 2004; Gong, Parton, Zhou & Cox, 2004) highlight transactional costs as barriers to the efficient participation of emerging farmers in different formal markets. Emerging farmers will not use a particular channel when value of using that channel is out-weighed by the costs of using it. Key, Makhura, Kirsten, and Delgado (2001) have isolated high transaction costs to be one of the key reasons for emerging cattle farmers' failure to participate in formal markets.

Remote location of most emerging cattle farmers coupled with poor road networks, result in high transactional costs (especially transport costs) reducing the price that traders are prepared to pay for the cattle (Musemwa et al., 2007). Makhura (2001), and Nkhori (2004) noted that even if emerging farmers are in areas with good road linkages, the distance from the formal markets tends to influence transaction costs. The further away the emerging farmers are from formal markets, the higher the transport costs they incur. As it is a statutory requirement that when purchasing or selling cattle, producers and consumers must have a valid identification certificates and transporting permits (NDA, 2005), farmers' incur extra transport costs to obtain transporting and selling permits from the police station and veterinary offices, respectively. These restrict farmers' participation in distant markets.

From the above exposition, it is clear that formal and informal institutional aspects and their role in marketing and economic development revolve around transaction costs, market information flows and the institutional environment. Various researchers affirm that emerging farmers in developed rural economies; lack adequate market information and contractual arrangements; lack lobbies in the legal environment; and are not easily receptive to changes (Delgado, 1999; Kherallah, 2001).

These factors result in high transaction costs, hence emerging farmers' difficulties in accessing and participating in formal markets. This line of argument is substantiated by Makhura (2001) who explained that when emerging farmers are faced with high transaction costs, they will either stop participation in marketing or resort to other means of marketing such as spot markets. The use of spot markets may not be as rewarding to the farmers as formal markets are, mainly due to traders' opportunistic behaviour. In addition, spot markets are becoming less popular in the liberalized environment (Kachingwe, 2009; Jagwe, Ouma & Machete, 2007).

2.8.4 Lack of access to market information

Market information is vital as it allows suppliers to make informed decisions. Market information enables farmers to take informed marketing decisions that are related to supplying necessary goods, searching for potential buyers, negotiating, enforcing contracts and monitoring (Jari, 2009). Necessary information includes information on consumer preference, quantity demanded, prices, producer quality, market requirements and opportunities (Ruijs, 2002). Farmers are likely to exploit a market opportunity which they know about unlike one which they have no idea exists. The bulk of the literature on market information in developing areas is founded on the assumption that there is a role for public market information services because market information is a 'public good'. According to Fenyes and Groenewald (1995), insufficient market information is common due to; the large number of small producers; inefficient communication systems; and low levels of literacy as well as information administration.

From the foregoing paragraph it clear that the provision of information to emerging farmers is one way of maintaining transparency and inclusiveness. According to Schubert (1993) this will make markets to be more accessible. Frick and Groenewald (1999) posit that emerging farmers will undoubtedly benefit from information about prevailing market conditions, type of product demanded, quality, quantity, price and market opportunities. In their study, Frick and Groenewald (1999) identified several roles of market information, namely; creating stimuli by indicating market opportunities; stimulating competition among suppliers and traders; promoting the adoption of suppliers to the development of demand; and pre-conditioning for the planning and control of market interventions.

However, according to various researchers (Heltberg, Simler & Tarp, 2001; Langyintuo, Ntoukam, Murdock, Louwberg-DeBoer & Miller, 2004; Machete, 2004), emerging farmers in sub-Saharan Africa face a range of marketing and exchange problems, among which informational constraints are much cited. In their dealings with the market, emerging farmers find themselves at a major disadvantage when it comes to marketing knowledge, for example, many; do not understand ways in which markets operate and why prices fluctuate; have little or no information on market conditions and prices; are not organised collectively; and have no or limited experience of market negotiation (IITA, 2001).

According to Montshwe (2006), this lack of marketing knowledge exposes emerging farmers to a marketing disadvantage. According to FAO (2005) emerging farmers normally rely on informal networks (traders, friends and relatives) for market information due to weak public information systems, which leads to them not having up-to-date and reliable market information, making the usefulness of the information doubtful. Additionally, emerging farmers relying on informal networks for market information are at risk of getting biased information due to opportunistic behaviour of the more informed group. Emerging farmers experience a weak bargaining position vis-à-vis traders because often they do not have timely access to salient and accurate information on; prices; locations of effective demand; preferred quality characteristics of livestock produce; nor alternative marketing channels (Burke, 2009; Christopher, 2007; Boughton, 2007).

Bailey et al. (1999) assert that none or poor provision of agricultural information is a key factor that has greatly limited agricultural developmental needs in developing countries. The farmers' information needs are those that enable them to make rational, relevant decisions and strengthen their negotiating ability during transactions with buyers and consequently prevent possible exploitation by better informed buyers (Coetzee et al., 2004). Information needs for communal farmers range from information on prevailing production techniques and market conditions, type of product demanded, quality, quantity, price and market opportunities (Bailey et al., 1999). The more the access the farmer has to information the more cattle he/she will sell. Farmers who had information about market prices and trends tend to make rational and appropriate decisions. Access to information can result in the farmers not completing deals with buyers who exploit them.

Although considerable progress has been observed in the provision of communication systems such as telephone and cellular phone network facilities, emerging farmers still remain

uninformed in terms of; new production techniques; market prices; market trends; and auction sale dates.

Access by small-holder farmers to internet is still limited. In most cases information in South Africa is broadcasted and written in Afrikaans and English, which makes the information unusable by the majority of emerging farmers who only understand their local languages, inter alia IsiXhosa, SeSotho and IsiZulu. The poor transfer of knowledge, skills and information is further manifested by limited interaction of the emerging farmers with extension officers due to poor road networks and resources (Coetzee et al., 2004).

2.8.5 Poorly developed grades and standards

Consumers demand high quality for the goods they buy. In addition, they will not buy food products unless there is a guarantee that they are safe to eat (Kherallah et al., 2001). In other words, consumers make purchasing decisions depending on packaging, consistency as well as uniformity of goods. Most smallholder cattle products have no clearly defined grades and standards and, therefore, cannot meet the consumers' demands (Reardon & Barrett, 2000).

Institutions for determining market standards and grades tend to be poorly developed in smallholder farmers environments. Due to uncertainty on the reliability and quality of their goods, they usually cannot get contracts to supply formal intermediaries such as supermarkets, shops and processors (Benfica et al. 2002). Cattle products from smallholder farmers do not meet certain market grades and standards because these farmers lack the knowledge and resources to ascertain such requirements. It is for these reasons that consumers buy their beef from the large-scale commercial farmers who produce good quality beef from ranching and feed lotting, as compared to the smaller farmers who produce a poorer quality beef products which are not tender.

Generally cattle must have a ration containing; energy (from carbohydrates and fats) to maintain the body and produce (milk, meat, work). The carbohydrates and fats not needed for production are converted to fat and stored in the body; protein is needed for body building (growth) and maintenance as well as milk production. Without protein there would be no body weight gain nor milk production. Excess protein is converted to urea and fat; minerals help in body building as well as in biological regulation of growth and reproduction. They are also a major source of nutrients in milk; vitamins help regulate the biological processes in the body and become a source of nutrients in milk; and water helps all over in body building,

heat regulation, biological processes as well as a large constituent of milk production as well as eggs (Kachingwe, 2009; World Bank, 2007; Benson, Miller & Lichtenwalner, 2001; Jooste, 2001).

Among smallholder farmers, inadequate nutrition is a major cause of low live-weight gains, infertility and low milk yields in dairy cattle.

2.8.6 Organisation in markets

Smallholder farmers tend not to be organised in the markets as they usually sell their limited agricultural produce surpluses individually and directly to the consumers without linking to other market actors (World Bank, 2009; Coetzee, Montshwe & Jooste, 2005). In other words, smallholder farmers lack collective action in markets. Individual marketing of small quantities of produce weakens the smallholder farmers' bargaining positions and often exposes them to price exploitation by traders. They also do not benefit from economies of scale (Kherallah & Minot, 2001).

In a globalized world, there is increasing vertical integration and alliance formation in the agricultural marketing channels and markets, in an effort to meet consumer needs. Such alliances include contract farming, cooperatives and farmer organisations. Agribusiness firms favour contracts with medium to large-scale farmers, such that individual smallholder farmers cannot be part of these contracting arrangements (USAID, 2009). Lack of facilitation in the formation of producers associations or other partnership arrangements makes it more difficult for smallholder producers to participate in formal markets. The greater the degree of organisation in the market, the smaller the transaction costs are likely to be and the easier it is to benefit from the exchange opportunity (Reardon, Barrett, Berdegue & Swinnen, 2009; Resnick, 2004). Unfortunately, lack of collective action among smallholder farmers denies them entry into formal market channels.

2.8.7 Diseases and poor nutrition

Diseases are a major constraint to the improvement of the cattle farming industry in rural areas (Devendra et al., 2000). Animal health issues are barriers to trade in cattle and their products, whilst specific diseases such as inter alia anthrax, foot and mouth, anthrax, foot-and-mouth disease, fowl pest, bovine tuberculosis, scrapie, swine vesicular disease, Aujeszky's disease, bovine leukemia virus, rabies, warble fly, black-leg and contagious abortion decrease production and increase morbidity and mortality (Mwacharo & Drucker,

2005). The outbreaks of such diseases are a threat in particularly to the consumers, cattle producers who do not have medicine and proper disease control infrastructure. Furthermore, movement of cattle and their by-products are difficult to monitor in the poor communal areas (Musemwa et al., 2010). The animals of poor farmers are particularly vulnerable to diseases because of the; expense, absence or unsuitability of animal-health; and production inputs.

Cattle diseases have multiple impacts. Epidemic diseases restrict trade in cattle and their products. The occurrence of such diseases impacts both poor and richer cattle producers by marginalizing them from higher-price cattle markets and restricting their capacity for value-added trade. Diseases further cause multiple impacts by, reducing calving, lambing rates, increased mortality of calves, lambs and kids, decreased milk production, decreased animal off-take, increased veterinary care, which is costly, decreased herd size, and decreased draught efficiency.

In a study that was undertaken by R & AWG-Research and Analysis Working Group (2007), major factors that were analyzed and found to cause poor production and disease in smallholders' cattle include poor hereditary quality of their cattle. Cattle cannot produce more than their hereditary or genetic potential. In addition to poor production, inherited genetic weaknesses and defects also often predispose (weaken) cattle to poor health and disease problems; nutritional deficiencies, imbalances and excesses. These factors cause inefficient production and also predispose to or cause other diseases including digestive, nutritional and metabolic diseases such as ketosis, grass tetany, and milk fever, and weaken resistance to stresses, such as inclement weather conditions and to parasitic and infectious diseases; poisonous plants and toxic substances. These usually result from poor pasture management, improper use of fertilizers, pesticides, drugs and other chemicals; stresses and injuries. These commonly result from improper handling and shipping, inadequate facilities, exposure to adverse or severe weather conditions, fighting, etc.; and infectious and parasitic agents. These include a host of pathogenic bacteria and viruses, internal parasites, such as roundworms, flukes, tapeworms, stomach worms etc., and external parasites, such as ticks, lice, horn flies, mites, etc.

There are also feed-related diseases. The following diseases and disorders are caused by, or exacerbated by, inadequate feed. The most common ones are, bloat and grass lethy. Bloat is caused by cattle gorging themselves in legume-rich pasture and

the risk period, is spring, when clovers and other legumes grow quickly and can come to dominate the pasture mix. While all cattle are susceptible, those over 6 years are more so. The risk is greatest when pasture is short, green and slow-growing. Feeding grain to cattle is rarely a good idea for the smallholder farmer as this result in grain overload. Pregnancy toxaemia, mostly affect fat, pregnant cattle when feed quality is falling. The risk is further increased if the cow has a worm burden, poor teeth or is lame and it is further increased again if the cow is stressed by cold, wet weather, yarding for a long period, transport etc.; and milk fever (hypocalcaemia). Cattle in late pregnancy when the pasture is short, green and slow-growing are at some risk of milk fever (Neven, Odera, Reardon & Wang, 2009; Peacock, Jowsett, Dorward, Poulton & Urey, 2004).

Poor animal nutrition is one of the major causes of low production and poor resistance to diseases and parasites. Nutrition begins in the soil. Fertile soil and good weather are required to produce good yields of the high quality feeds necessary as the basis of a good low cost nutrition program. Nutrition needs to be tied together with the soil fertility program, as most of the deficiency and toxic problems seen in cattle were traced to soil deficiencies and improper use of fertilizers. Imbalanced fertilization results in nutritional deficiencies and toxicities in the cattle. Copper deficiency and molybdenum toxicity caused scours in cattle as a result of over-liming of soils that have very little capacity for lime. Nitrate toxicity, causing vitamin A deficiencies resulting in weak calves and severe pink-eye problems, occurred from using only small amounts of nitrates on soils devoid of organic matter and deficient in sulfur and other nutrients. Magnesium deficiencies were found to be related to problems of grass tetany, retained afterbirth, calf scours and brucellosis susceptibility (Liverpool & Winter-Nelson, 2010; Markelova, Meinzen-Dick, Maginxa & Kamara, 2003).

2.8.8 Lack of lobbies in legal environment

Smallholder farmers lack lobbies in the legal environment. Legal institutions have the potential to influence the activities performed on the market and the costs of exchange. Minot and Goletti (1997) affirm that the formal institutional development of a society has a considerable influence on transaction costs. Thus, if trade laws are transparent then agreements can be legally enforced, leading to information accessibility and lower costs. In other words, effective legal institutions may improve the organisation of the marketing channels and decrease marketing costs (Minten, Randrianarisson & Swinnen, 2009).

As a result of lack of lobbies in the legal environment, rural trade by smallholder farmers prospers where trust has been developed based on repeated transactions or informal relationships (Randela, 2005). Thus, an unfavourable legal environment creates a significant barrier to entry into formal food security trade and limits participation by smallholders in the modern marketing system (Keeler, 2009).

2.8.9 Smallholder farmers and the use of improved technology

There is a direct relationship between technology and the level of development for any country. The higher the level of technology, the more developed the country and vice versa. The importance of technology in the development and distribution of market-related information cannot be over-emphasised (Kasekende, Ndikumana & Rajhi, 2009; Kamara, Kirk & Swallow, 2004). Access to agricultural marketing information is crucial in ensuring meaningful participation of all farmers in mainstream marketing activities. The introduction of technology such as the internet has the potential to benefit smallholder farmers in particular to learn about prevailing; market prices; price trends; current marketing activities; opportunities; and threats, etc. (IFAD, 2010; Guo, Jolly & Zhu, 2007).

By making use of the internet, smallholder farmers can also learn about, export market requirements, logistics, purchasing trends, and contact organisations in foreign markets. (Hazell, Poulton, Wiggins & Dorward, 2007; Harvey, 2006). Carre` and Drouot (2002) posit that smallholder farmers are still lagging in the use of improved technology in agricultural production and marketing. Because of generally low levels of literacy, lack of exposure and distance from improved technology and communication systems, resource-poor smallholder cattle farmers cannot access and understand price information. This limits participation by these farmers in mainstream marketing activities.

2.9 Cattle market channels available for cattle farmers

The choice of marketing channels depends largely on the following factors: availability of the market, price offered in the market, distance to the market,and potential or size of the market (bulk purchase) (Gollin & Rogerson, 2009; Gulati, Fan & Dalafi, 2005).

The challenge to smallholder cattle farming is deciding on making use of marketing channels that offer the best cattle prices and hence highest returns. Benson et al. (2001) indicate that these decisions require reliable information about cattle prices, the right selling time, the

channels available, cattle breeds and the age of cattle that give the highest returns. Lack or inadequacy of, among others, roads, electricity, weighing stations, cattle dips, slaughtering and processing facilities, which raises transaction costs, exacerbates information asymmetries between producers and traders, and discourages investment in processing. The effect of information asymmetry thus puts small-holder famers in a weak negotiating position when dealing with larger buyers and reduces their competitiveness when dealing with supply chains that are becoming increasingly formalized and upgraded (Jari, 2009; Emongo, Louw, Kirsten & Madevu, 2004; Gong, Parton, Zhou & Cox, 2004).

The purpose of keeping cattle has also been identified as having an effect on the likelihood of participating in cattle markets (Musemwa et al. 2010). Small-holder farmers in developing countries have multiple goals for their cattle enterprise. Apart from cash benefits, cattle are closely linked to the social and cultural lives of smallholder farmers for whom animal ownership ensures varying degrees of household economic stability. Jooste (2001) has in this regard asserted that marketing of cattle generally is undoubtedly one of the most complex policy issues to be addressed for enhancing sustainable small-holder agriculture, especially in rural areas (Jooste, 2001).

A number of marketing channels that can be used by smallholder cattle farmers when selling their cattle, are discussed next.

2.9.1 Private sales/ Informal markets

Private sales or informal markets provide the shortest and simplest option making it, popular among smallholder cattle farmers. Through this option, smallholder farmers transact directly to the ultimate consumer (Nkosi & Kirsten, 1993). This method occupies an important position in the cattle marketing arena of the smallholder cattle farmers. Private sales include customers buying cattle for different reasons which include, *inter alia*; slaughter; investment; socio-cultural functions such as, funerals, lobola; weddings; and customary and religious celebrations (USAID, 2003).

Because of many socio-cultural functions performed by means of cattle in African societies, there exists a market amongst individual households (Nkhori, 2004). As a result, private selling is a common practice to smallholder farmers as they are in a position to determine their own prices for their animals. In addition, farmers incur low marketing costs. Private sales are therefore the cheapest and most probably the simplest form of market outlet. Nkhori

(2004) reveals that on-farm or direct sales to the consumer offer the greatest profit margin on cattle for the producer because all middle-men and their fees are eliminated. It offers a year-round marketing outlet; however the demand is irregular with high demand during certain times of the year, like festive seasons and Easter. Most of the cattle traded in these informal markets are primarily old oxen destined for service as draught animals and ultimately for slaughter (Swallow & Brokken, 1997).

Research (Food and Agriculture Organization, 2009; Gulati, Fan & Dalafi, 2005) highlights that informal sales amongst community members, including butchers forms the second preferred marketing channel of cattle among smallholder farmers. The main reasons for selection of this channel is that, prices are negotiated on a willing-buyer, willing-seller relationship; and convenience with no added costs like transport or commissions (Fan & Rosegrant, 2008; Cotula, Vermeulen, Leornard & Keeley, 2009; Dercon & Zeitlin, 2009; Danielson, 2002).

2.9.2 Cattle auction market

Cattle auction markets are established places of business where cattle are assembled at regular intervals and sold by public bidding to the buyer who offers the highest price per head (Nkosi & Kirsten, 1993). These markets are public markets open to all buyers and sellers. As indicated by the NDA (2005), buyers include individuals buying for household use, butchers, commercial farmers and speculators. These auctions operate year round but the number of cattle sold tends to be higher in the summer months and again during late winter and early spring.

Numbers at auctions may increase substantially during emergency situations, such as summer droughts. These auctions provide the facilities to process, weigh and sell cattle and provide an important link in the cattle distribution system. These auctions assemble different types of cattle from many farms into more uniform lots that are more acceptable to buyers. Cattle sold at auctions include bulls, cull cows, and processed and unprocessed calves. Producers bring cattle to auction pens where transactions take place between buyers and sellers facilitated by the auctioneer. Auctions are arranged by marketing agents on a commission basis. Auctions play an important role in cattle marketing, and they are the principal sales outlets for live cattle. Sales of cattle at auctions are done on the hoof. The basic functions of the auctioneer are too; advise buyers and sellers of auctions and to advertise his/her auction; ensure that an auction takes place, and runs smoothly; classify the stock on the hoof according to type, age, etc.; promote the attendance of buyers at respective auction points; duly mark with paint the stock that has been

sold; see to the herding and loading of stock; organise labour to help with selecting and heading off of cattle; and apply the laws governing the selling of live animals at auctions (Gollin & Rogerson, 2009; Gulati, Fan & Dalafi, 2005).

The auctioneer is entitled to a commission from the sale proceedings (paid by the seller or buyer). The success of auctions depends on the number and type of animals and participation of buyers. The different kinds of buyers are individuals buying for household use, butchers and speculators/ agents. A substantial number of agricultural co-operatives and companies are involved in cattle marketing, primarily acting as brokers or agents (Shaikh, Rehman & Yates, 2002; Berry, 2010).

Agents bring buyers in touch with sellers on a commission basis. At these auctions the sellers are paid by the agent immediately or within five days. A number of speculators are active in South Africa. Cattle are purchased by speculators who take ownership and sell cattle at a profit. In cattle marketing, speculators occupy important positions. They buy cattle directly from farmers and also at auctions. Marketing transactions performed by speculators do not take place at a fixed place. They either take place at the farmer's house, local government offices or at the extension officer's place. When marketing cattle through speculators, farmers do not have marketing costs (Soun, Hol, Siek, Mclean & Copeman, 2006).

Transportation costs, the major costs involved in cattle marketing, are incurred by the speculator. The advantage enjoyed by speculators in this case is that there is no commission charge involved. Prices are reached through negotiation. The livestock and meat-marketing agents operating in South Africa have an association called the South African Federation of Livestock Auctioneers and Meat Brokers (SAFLA — MB). However, speculators are still perceived by farmers, particularly smallholder farmers to be dishonest and to treat farmers badly. They are seen as employing a range of tricks in their effort to convince farmers to sell cattle to them, such that at the end farmers who desperately need money will let their cattle go even though not satisfied with the price they are getting (Gollin & Rogerson, 2009; Gulati, Fan & Dalafi, 2005).

According to Nkosi and Kirsten (1993), auctioneers in developing areas experience a number of problems of which lack of reasonable saleable number of cattle is the main problem. Generally, the majority of the small-scale farmers in developing areas do not understand the modus operandi of auctions. Nongoma District municipality is a typical example where an

auction system could not function primarily because farmers wanted the auction to operate the opposite way (i.e. they could not accept price per kilogram and wanted to determine prices in a similar way as during the private sales). Other areas where auctions are not functioning well or are completely absent include Libode, and Port St Johns (Eastern Cape), Ganyesa (North West Province), and Sekhukhune and Bohlabela District municipalities (Limpopo Province) (Montshwe, 2006).

2.9.3 Feedlots

Extensive cattle smallholder farmers have an option of selling their cattle directly to feedlots. South Africa has a well-established feedlot industry. There are currently about 60 commercial cattle feedlots registered under the South African Feedlot Association (SAFA). These feedlots; market their cattle throughout the year; have a standing capacity of ± 320 000 animals; and slaughter around 70 percent of the commercial sector's annual 2 million cattle slaughtered at registered abattoirs (Gollin & Rogerson, 2009; Gulati, Fan & Dalafi, 2005).

Feedlots normally buy weaner calves with live mass of 230 kg from extensive cattle farmers and add 105 kg carcass mass through intensive feeding of about 100 days, eventually slaughtering an animal at 215 kg carcass weight (MAFF, 2006).

Feeder cattle prices are heavily influenced by weight per head, sex, breed, grade and condition. This is true regardless of the marketing channel used. The premiums or discounts associated with these various characteristics reflect differences in value further along the production pipeline that ends with the consumer. For example, buyers of feeder cattle try to estimate feedlot performance and the cost of gain on each set of cattle. The lower the expected cost of gain relative to the expected future sales price per hundred-weight, the higher price buyers are willing to pay (Stür & Varney, 2007; Windsor, 2008).

Smallholder farmers also provide many of the weaner cattle used by commercial farmers for feedlotting (MAFF, 2006).

2.9.4 Abattoirs

South Africa has well-developed abattoir facilities at its disposal. The sizes of abattoirs vary from large to very small units. Some of the large abattoirs have been controlled by a

government parastatal called ABAKOR Ltd., which was sold to the public in October 2000. A significant number of abattoirs are operated as private ventures. These abattoirs differ in size and are located all over the country. Since deregulation of the South African red meat industry in 1993, a rapid growth in the number of registered abattoirs was experienced, namely from 330 in 1993 to 460 in 1999 and there are now more than 480 abattoirs nationwide. Total slaughter capacity at registered abattoirs currently is estimated at 16 500 slaughter units per day (one slaughter unit either equals one head of cattle, or 15 heads of small stock). It is also estimated that abattoirs nationally operate at about 60 percent capacity utilisation. During the regulated era, the abattoir sector largely only offered a slaughter service. Since deregulation, the abattoir sector fulfils an integrated wholesale function by buying animals on the hoof and directly selling carcasses and meat cuts to the retail sector (Burke, 2009; Anriquez & Bonomi, 2007).

Carcass auctions are still held at two abattoirs. At these abattoirs buyers and sellers meet through intervention of a marketing agent. The Red Meat Abattoir Association is currently the mouth piece of all its members.

Abattoirs are not very popular marketing channels within the smallholder farming sector. According to the NDA (2005), the abattoir is the least used marketing channel because of factors which include; they are normally located some distance away from the producers; payments are received a few days or sometimes weeks after the animal has been sold; there is a high risk factor of cattle being condemned on the basis of health status; price is based on the quality of the carcass, not the outward appearance of the animal; many charges that reduce the price of the animal are levied; and it is not economical to sell one or two animals as transport costs will be high (Burke, 2009; Anriquez & Bonomi, 2007).

Abattoirs pay farmers according to age, weight and grade of the animal (Nkhori, 2004). This grading system does not consider the breed and feeding practices. To improve this grading system, there is need for the government to put some tense measures on abattoirs exploiting farmers by paying them equal amounts of money for naturally and genetically modified beef. Abattoirs tend to sell natural beef at high prices at both local and international markets than genetically modified beef and this result in them getting higher than normal returns at farmers' expense. The ability to sell stock at market-related prices would translate their cattle base into a capital base and improved livelihoods.

Group marketing can assist farmers to enjoy economies of scale when using this channel. However, group marketing is not always possible since farmers sell their animals at different times (Gollin & Rogerson, 2009; Gordon, 2008; Gulati, Fan & Dalafi, 2005).

2.9.5 Butchers

Another available option to smallholder farmers is to sell their stock directly to the butchers, which also plays an important part in the marketing of cattle in developing regions. Smallholder cattle farmers can sell their cattle to butcheries that do sell natural meat; hence there is need for the beneficiaries to develop some contract with big butcheries like Woolworths (Windsor, 2008).

Butcheries provide basic marketing services for farmers, particularly smallholder farmers, who are unable to market their cattle efficiently and profitably through other existing formal channels (Kherallah & Minot, 2001). Butchers enhance the marketability of livestock by acting as buyers in their own right and by acting as buyers at auctions. Nkhori (2004) found that good prices and farmers having a strong bargaining power in determining the prices of their stock are the main reasons for some smallholder farmers' satisfaction with sales to butchers.

Research (Hazell, Poulton, Wiggins & Dorward, 2007; Harvey, 2006) has found that out of the five major formal channels described above, the smallholder farmers generally prefer to sell their cattle through public auctions, organised by reliable auctioneer agents. The main reasons for this preference are that; public auctions are normally available at the right time; they normally pay reasonable prices which are market related; stock can be sold in bulk; social and economic relationships can be built; and the farmer, if not satisfied with the price, has an option of returning his/her cattle back without any penalty, except transport costs (Burke, 2009; Ponte, Raakjaer & Crampling, 2007; Anriquez & Bonomi, 2007).

2.10 Chapter summary

This chapter presented the overview or background of the determinants of the participation of smallholder farmers in cattle markets. The chapter presented literature review on market access, marketing channel/distribution channel/marketing outlets, cattle marketing agents, transaction costs, market-related constraints encountered by smallholder cattle farmers, production constraints, poor infrastructural and logistic constraints, high transactional costs, lack of access to market information, poorly developed grades and standards, organisation in

markets, diseases and poor nutrition, lack of lobbies in legal environment, smallholder farmers in the use of improved technology, cattle market channels available for cattle farmers, private sales/informal market, cattle auction market, feedlots, abattoirs and butchers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research methods that were used in conduction the research and the specific research tools. These are study area, research design, empirical research method and data analysis.

3.2 Study area

The North West Province (NWP) covers an area of approximately 116 180 km^2, which brings the population density to approximately 30 people per km^2. The Statistics South Africa (Stats SA) mid-year population estimate of 2006 indicates the North West population as 3.858 million people. The province is largely rural in nature, and approximately 66% of its population lives in non-urban areas. The provincial economy contributed about 5% to the South African economy in 2004. Agriculture contributes 3.4% to GDP nationally and it plays a vital role in the economy of the province as it provides 8% of the province's employment opportunities. Apart from mining, agriculture is the only sector in which North West is acknowledged to have a comparative advantage over other provinces (Stats SA, 2012).

The study was conducted in Ngaka Modiri Molema district in the Northwest Province. The main economic activity in the Ngaka Modiri Molema of the Northwest Province is agriculture, mainly producing crops and livestock. Temperatures range from 17° to 31°C (62° to 88°F) in the summer and from 3° to 21°C (37° to 70°F) in the winter. Annual rainfall totals about 360 mm (about 14 in), with almost all of it falling during the summer months, between October and April. Ngaka Modiri Molema District Municipalies are: Ramotsere Moiloa Local Municipality, Tswaing Local Municipality, Ditsobotla Local Municipality, and Ratlou Municipality.

Source: Wikipedia

Figure 3.1 North West Province Map

3.3 Research design

The research design of a study outlines the basic approach that researchers use to answer their research question (Polit & Beck, 2004). Fowler and Aaron (2010) defines a research design as the overall proactive plan for obtaining trustworthy answers to the questions that have been posed for the study; and for handling some of the difficulties that could be encountered during the research process. Galvin (2009) sees a research design as a blue-print or a detailed plan for how a research study is to be conducted. Jaccard and Becker (2010) advise that a selection of a good empirical research design should be guided by an overarching consideration, such as whether the design does the best possible job of providing trustworthy answers to the research question.

From the latter paragraph, it is clear that for the researcher to meet the aims and objectives of the study, it is important that he/she selects the most appropriate design for achieving the aims of his/her study (Parahoo, 2006). To achieve both the research aims and objectives of this research, and to address its problem, the researcher used both quantitative and descriptive research approaches in designing the empirical design of this study.

3.3.1 Quantitative research design

Hennink, Hutter and Bailey (2011) define quantitative research as a formal, objective and systematic process that is conducted to describe and test relationships and examine cause and effect interactions among variables in empirical studies. Quantitative empirical research in this regard uses a fixed design that organizes in advance the research question and a detailed method of empirical data collection and analysis (Robson, 2007). Parahoo (2006) posits that the quantitative empirical approach to research arises from the belief that human phenomena and variables in human behaviour can be studied objectively. It is for these reasons that the features of the empirical research approach of this study were adopted to be in accordance with the quantitative research paradigm. Its focus was concise and narrow.

The researcher utilized a structured questionnaire, which enabled him to quantify and numerically present the responses of the sampled participants and thus conduct statistical analysis. Howell, Major and Savin-Baden (2010) assert that, in quantitative research, a researcher relies on numerical data. This means that a quantitative research has the potential of generating quantifiable empirical data. Hill (2012) posits that it is primarily concerned with observable and measurable phenomena involving people, events or things, and establishing the strength of the relationship between variables, usually by statistical tests. Fetterman (2010) postulates that a quantitative empirical research lends itself to investigating phenomena that require precise measurement and quantification often involving a rigorous and controlled design. Denzin and Lincoln (2011) states that a quantitative empirical design tends to be fairly structured in order to enhance objectivity, and primarily rests upon numbers aggregated into statistics to enable the researcher to interpret obtained empirical data and reach conclusions; maintained objectivity through structured empirical data collection and exercised control by enhancing the external validity of the study; and by means of the findings of the objectives presented in Chapter 1 and literature reviews which were presented in Chapter 2, self-developed a structured empirical data-collection instrument, i.e. questionnaire. According to Hacker and Sommers (2011), objectivity in the conceptualization of the problem is derived from a review of the literature. A literature review enables the researcher in globally and universally assessing the depth and breadth of available knowledge concerning the research problem.

With quantitative empirical research, the researcher uses post-positivist claims for developing knowledge, such as; cause and effect thinking; reduction of knowledge to specific variables; hypotheses and questions; use of measurement and observation; and the test of theories.

In the latter way, a researcher isolates variables and causally relates them to determine the magnitude and frequency of relationships. In addition, a researcher determines which variables to investigate and chooses instruments which will yield highly reliable and valid scores.

3.3.2 Descriptive empirical design

A non-experimental, univariate, and descriptive survey design was chosen for this study because, it provides an accurate portrayal or amount of the characteristics, for example behaviour, opinions, abilities, beliefs and knowledge of a particular individual, situation or group. The other reason for using this design is because of its high degree of representativeness and the ease in which a researcher could obtain the participants' opinion. It is low in terms of internal validity and high in terms of external validity; and it allows for limited control over the research variables and the research setting (McMillan, 2012).

What the latter statements highlight is that, with descriptive empirical research, the research variable is examined as it exists without a researcher's interference, and control over the research setting is limited (Cresswell, 2009; Denzin & Lincoln, 2008). Control over sample selection is, however, possible and it is necessary to involve a large representative sample to enhance external validity (see sub-section 3.4.4 (i) below) (Pechenik, 2010). In this study, there was no manipulation of variables and the researcher did not attempt to control the empirical research setting. However, the empirical research data collection conditions were standardized to enhance empirical research data quality.

3.4 Empirical research method

The empirical research method used in this research is discussed below by referring to, population, sampling and surveying, questionnaire as an empirical data collecting instrument, and data-analysis proceedings.

3.4.1 Population, sampling and surveying

Mitchell and Jolley (2010) define a population as the entire aggregation of cases that meet a designated set of criteria, while Mouton (2001) defines a sample as elements selected with

the intention of finding out something about the total population from which they are taken. On the basis of these two definitions, population, therefore, refers to the total number of units from which empirical data can potentially be collected (Parahoo, 2006). This means that a population is explainable as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study. In this regard, Leedy and Ormrod (2004) posit that sampling is a process of selecting units from a population of interest, so that by studying the sample, the results obtained from the sample may be generalized to the population from which the sample had been chosen. This means that sampling denotes the process by which the researcher performs the skill of selecting a portion of the population that conforms to a designated set of specifications to be studied.

In the light of the knowledge gained in this section, the population in this study was formed by smallholder farmers raising cattle in Ngaka Modiri Molema District in the North West Province. This population was delimited to a homogenous group of subjects through inclusion/exclusion criteria. The eligibility criteria for inclusion in the study under discussion were that smallholder cattle farmers had to be, farming with cattle, mentally sound in order to consent to participation, willing to participate, 16-years or older, and of either sex.

Smallholder cattle farmers, fitting the above criteria, from Ngaka Modiri Molema District were chosen as a smaller convenience group of the target population.

The sampling method for this study was a simple random probability sample of smallholder farmers raising cattle in the Ngaka Modiri Molema District of North West Province. Proctor, Allan and Lacey (2010) maintain that the use of probability sampling in quantitative research reduces errors and biases in the study. The researcher obtained the names of all eligible smallholder cattle farmers from the extension officers in the Ngaka Modiri Molema District of North West Province. This list of smallholder cattle farmers formed a sample frame from which the researcher selected smallholder cattle farmers at random by assigning a number to each name and 'picking the numbers out of a hat' (Proctor et al., 2010). Sanders (2010) asserts that random sampling is the best single way to obtain a representative sample.

Simple random sampling technique was used to select 109 smallholder cattle farmers from the Ngaka Modiri Molema District. This was done by putting all the names of the farmers in a box and selecting randomly only the required number of farmers that were interviewed. These farmers were willing to participate in the research and met the above sampling criteria. The

empirical research data collection took six-months, as participants were visited at their houses during evenings. Should the participants have been visited during the day and if the researcher was able to collect data on everyday basis the researcher would have taken one month to finish the empirical research data collection.

3.4.2 Data collection instrument

The researcher regarded questionnaire as the most suitable empirical research data collection instrument for this research, because of the following reasons: it ensured a high response rate as the questionnaires were personally distributed to many respondents at the same time to complete and were collected personally by the researcher immediately after each session, required less time and energy to administer, offered the possibility of anonymity because participants' names were not required on the completed questionnaires, and offered less opportunity for bias as they were presented in a consistent manner, and most of the items in the questionnaires were closed, which made it easier to compare the responses to each item.

From the foregoing paragraphs, it is clear that questionnaires are used by researchers to convert empirical information directly given by people into empirical data. In this sense the questionnaire is appropriate to gather empirical data for this research in that it would elicit factual empirical data about the determinants of smallholder farmers' participation in cattle markets in the Ngaka Modiri Molema District of North West Province. The suitability of the questionnaire in this research is based on the fact that the respondents are all active smallholder cattle farmers operating in a rural area. The questionnaire was divided into two sections. Section A required general demographic factors and socio-economic factors. Section B covered elicit responses that would highlight market-related constraints encountered by smallholder cattle farmers. It also covered marketing channel/distribution channel/marketing outlets, availability of infrastructure and logistic-related matters, access to market information, access to market information; cattle production, cattle nutrition, cattle health, cattle husbandry, and reasons for keeping cattle.

3.4.3 Pilot studying of the questionnaire

According to Brink (1996:60), a pilot study is a small-scale version or trial administration of the major study. The purpose of the trial run is to obtain information for improving the

project or assessing its feasibility. Pilot studying of the questionnaire, therefore, refers to pre-testing of the effectiveness and efficiency of the measuring instrument and any difficulties it might impose on the participants. The main of pre-testing the questionnaire is to identify flaws. In addition to the preliminary check made on the questions in order to locate ambiguities, it is scientifically desirable in empirical research to carry out a pilot study of the questionnaire that has not been universally standardized (Tashakorri & Teddlie, 2003) before using it as an empirical research data gathering instrument.

By piloting the questionnaire, the researcher determines whether question items and directions appearing on the questionnaire are clear to participants and whether they understand what is required from them. This is referred to as the pre-testing of a questionnaire (Polit & Beck, 2010). Pre-testing of a questionnaire, therefore, is done to determine its feasibility and validity (Brink & Wood 1998:259). The goal of the pilot study is, therefore, to validate the research instrument and to test its reliability. For the pre-test, a sample of individuals from a population similar to that of the research participants should be selected. The pre-test form should provide space for respondents to comment about the questionnaire itself in order to indicate whether some questions seem ambiguous and to indicate other aspects that can lead to improving the questionnaire (Tuckman, 1994:235). The researcher therefore pre-tested the questionnaire.

The survey questionnaire was pilot tested on the 5.0% randomly selected participants representing the smallholder cattle farmers. All names from the eligible smallholder cattle farmer participants, identified in the list of smallholder cattle farmers in the Ngaka Modiri Molema District that was provided by the extension officers was entered into the SPSS computer analysis system. A random proportionate by group sample of participants meeting the set criteria (N=6), i.e. three male (n=3) smallholder cattle farmers and three female (n=3) smallholder cattle farmers. were selected. The sample group was drawn from the intended target population. These participants were excluded from the subsequent major study. The pre-test group was requested to comment on the questionnaire in terms of its length, unclear or ambiguous questions and any further suggestions as is advised by Proctor et al. (2010).

The results of the pilot survey helped establish stability and internal consistency reliability, face and content validity of the questionnaire. The pre-test study responses were analyzed and revealed only slight technical modifications and minor grammatical aspects in the

questionnaire which here-after needed attention for the final draft. Otherwise, participants reported satisfaction with the effectiveness and the efficiency of questionnaire in testing views on constraints they experience in cattle marketing. Furthermore, a statistician assessed the questionnaire to determine whether any irregularities existed that might hinder data-analysis. The statistician did not propose any amendments. The questionnaire was refined by correcting both the technical and the grammatical errors.

The questionnaire was submitted to the researcher's supervisor for his scrutiny and comments. Approval from the Ngaka Modiri Molema District, North West Department of Agriculture and Rural Development was obtained to have the questionnaire filled-in by the accessible population of smallholder cattle farmers involved in cattle markets. The questionnaires were then personally administered by the researcher to respondents.

3.4.4 Reliability and Validity

This section describes how the questionnaire was validated.

(i) Validity

Validity refers to the degree to which an instrument measures what it is supposed to be measuring (Polit & Beck 2004: 422; Polit & Beck, 2010). Polit and Beck (2010) define the validity of a questionnaire as the degree to which the instrument measures what it purports to measure. This denotes that the questionnaire should adequately address all aspects of the issues being studied. In this study, the researcher pre-tested the questionnaire prior to empirical research data collection to enhance its validity. The questionnaire was assessed for face validity and content validity. Face validity refers to whether the instrument appears as though it is measuring the appropriate construct (Polit & Beck, 2004). Face validity and content validity are the validity issues most frequently reported in the literature (Parahoo, 2006). Face validity basically checks that the questionnaire seems to measure the concept being tested (LoBiondo-Wood & Haber, 2010) and this was assessed by getting friends who studied Agricultural Economics at Master's and Doctoral levels to test-run the instrument to see if the questions appear to be relevant, clear and unambiguous as outlined by Jones and Rattray (2010).

Content validity is defined as the sampling adequacy of items for the construct that is measured (Polit & Beck, 2004). In other words, content validity refers to the extent to which a measuring instrument represents the factors under study. To achieve content validity, questionnaires included a variety of questions on; understanding ways in which cattle markets operate and why prices fluctuate; having information on cattle market conditions and prices; being organized collectively; and having experience of market negotiation.

A content validity test checks that there are enough relevant questions covering all aspects being studied and that irrelevant questions are not asked (Parahoo, 2006). The test is based on judgement as no objective methods exist. A panel of experts is used to evaluate the content validity of new questionnaires (Polit & Beck, 2010). The questionnaire was submitted to such a panel to check that the questions reflect the concepts being studied and that the scope of the questions is adequate, in the manner proposed by LoBiondo-Wood and Haber (2010). The judges included fellow Masters' degree students' busy conducting research in the field of Agricultural Science Economics and Agricultural Science Economists with research experience on the topic.

Questions were informed by the set objectives as well as information gathered during the literature review to ensure that they were scientifically representative of existing national and international research findings on challenges faced by smallholder cattle farmers. Content validity was further ensured by consistency in administering the questionnaires. All questionnaires were distributed to participants by the researcher personally. The questions were formulated in simple language for clarity and ease of understanding. Clear instructions were given to the participants and the researcher completed the questionnaires for those participants who could not read.

All the participants completed the questionnaires in the presence of the researcher. This was done to prevent participants from giving questionnaires to other people to complete on their behalf. For validation, the questionnaires were submitted to a researcher. As a result more questions were added to ensure higher representativeness. Rephrasing of some questions was done to clarify the questions and more appropriate alternative response choices were added to the closed-ended questions to provide for meaningful data analysis (Burns & Grove 1993:373).

External validity was ensured for this research. External validity is defined as the degree to which the study results can be generalized to other people and other research settings (Burns & Grove, 2004). This means that external validity refers to the extent to which study findings can be generalized beyond the sample used. All the persons approached to participate in this research completed the questionnaires. No single person who was approached refused to participate. Generalizing the findings to all members of the population is therefore justified. Seeking participants who are willing to participate in a study can be difficult, particularly if the study requires extensive amounts of time or other types of personal involvement by participants. If the number of the persons approached to participate in a study declines, generalizing the findings to all members of a population is not easy to justify. The study needs to be planned to limit the personal involvement demands on participants in order to increase participation. The number of persons who were approached and refused to participate in the study should be reported so that threats to external validity can be judged. As the percentage of those who decline to participate increases, external validity decreases (Burns & Grove, 2004).

(ii) Reliability

Burns and Grove (2004) refer to reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. According to Parahoo (2006), reliability is a necessary but not sufficient condition for validity. Reliability of a questionnaire, therefore, refers to its ability to yield the same data when it is re-administered under the same conditions but it is difficult to obtain a replication of data when you are dealing with people (Robson, 2007). Reliability refers to accuracy of measurement. Reliability for quantitative research focuses mainly on stability and consistency (Polit & Beck, 2010). Reliability, therefore, means the likelihood of obtaining the same results when the researcher measures the same variable more than once, or when more than one person measures the same variable (Polit & Beck, 2009). Reliability thus relates to the measurement of accuracy of the data collection instrument. An instrument can be said to be reliable if its measurement accurately reflects the true scores of the attribute under investigation (Polit & Beck, 2004:416).

The questionnaires which were answered by the sampled smallholder cattle farmers revealed consistency in responses. Reliability can also be ensured by minimizing sources of

measurement error like data collector bias. Data collector bias was minimized by the researcher's being the only one to administer the questionnaires, and standardizing conditions such as exhibiting similar personal attributes to all respondents, e.g., friendliness and support. The physical and psychological environment where data was collected was made comfortable by ensuring privacy, confidentiality and general physical comfort.

3.5 Data analysis

According to Parahoo (2006), data analysis is an integrated part of the research design, and it is a means of making sense of data before presenting them in an understandable manner. Polit and Beck (2010) refer to data analysis as the systematic organization and synthesis of research data, and the testing of a research hypothesis using those data. Descriptive analysis was carried out on the data collected. Descriptive analysis enable a researcher to reduce, summarise and describe quantitative data obtained from empirical evidence (Polit & Beck, 2004:716).

After the data was collected it was organized and analyzed. For analysis of closed-ended questions, the Statistical Package for Social Scientists (SPSS version 21.0) was used to run the empirical data that was collected from sampled smallholder cattle farmers of Ngaka Modiri Molema District. Empirical data was analyzed by using descriptive and probit regression analysis to test the hypotheses. The main descriptive indicators that were employed were frequencies and mean values. These are useful in analyzing household characteristics as well as analyzing the relationship between variables. Frequency tables were drawn and from these the data was presented in tables, pie diagrams and bar graphs. The open-ended questions were analyzed through quantitative content analysis by the researcher with the aim of quantifying emerging characteristics and concepts. Concept analysis is the process of analyzing verbal or written communications in a systematic way to measure variables quantitatively (Rosenfield, 2009).

3.5.1 Inferential Analysis (Probit regression analysis)

3.5.1.1 The form of the probit model

The probit response variable Y is binary; that is it can have only two possible outcomes which are denoted as 1 and 0 with a vector of regressors Xi, which are assumed to influence the outcome Yi. Specifically, we assume that the model takes form

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

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

$$Y^* = X'\beta + \varepsilon.$$

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

$$Y = \mathbf{1}_{\{Y^* > 0\}} = \begin{cases} 1 & \text{if } Y^* > 0 \text{ i.e. } -\varepsilon < X'\beta, \\ 0 & \text{otherwise.} \end{cases}$$

Source: Hosmer and Lemeshow (2000)

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

3.5.1.2 The model specification

The hypothesis of the model is that there is some probability of an incidence (participation in the cattle markets) at any given circumstance of socio-economic variables within smallholder cattle farmers in the study area. Participation of smallholder cattle farmers in the cattle markets can be described in different ways, but for the purpose of this study participation means whether farmers sell or do not sell their cattle in mainstream livestock markets. The dependent variable considered takes the form of a binary variable (i.e. either 1 or 0), where 1 denotes that a farmer participates in the cattle markets and 0 denotes that a farmer does not participate.

The empirical model to be used for the analysis is specified as follows:

$P_i = P_i (Y_i=1) = Q (X_i, e)$ (i=1, 2, ...n)..... (1)

The model assumed that the probability of i^{th} smallholder cattle farmer participating in the mainstream cattle market P_i (Y_i=1), is a function of explanatory or independent variables, X_i shown and the unknown parameter vector, e The functional specification is as follows:

Participation in the cattle market = $\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots \beta_i X_i + e_i$.

Table 1 shows the variables that were included in the study using the empirical probit model.

Table.3.1: Definition and explanation of variables to be used in the empirical probit model (n=109)

Variable	Type	Description and value	Expected Sign
ParticiMSTR (Yi)		Participation in the cattle market: Participate=1, non-participation=0.	
NmbrSales(X1)	Continuous	Number of sales per year	+
Yrsfarming (X2)	Continuous	Number of years in cattle farming	+
HsehMembr (X3)	Continuous	Number of household members	-
CntctExtentsn (X4)	Binary	Contact to extension service: Yes=1, No=0.	+
BfarmOrg (X5)	Binary	Belong to farm Oragnisation: Yes=1, No=0	+
Heifers (X6)	Continuous	Number of Heifers	+
Slghtr Carcass (X7)	Binary	Slaughter cattle and sell carcass: Yes=1; No=0	+
CFrmrsBdcn (X8)	Binary	Consult farmers before decision making: Yes=1; No=0	+
Vaccinate Cattle(X9)	Binary	Vaccinate Cattle: Yes=1; No=0	+
Mktinfo (X10)	Binary	Receive marketing information: Yes=1, No=0.	+
Gender (X11)	Binary	Gender of respondents Male=1, Female=0.	+
Attshrt Course (X12)	Binary	Attend short courses in cattle farming: Yes=1; No=0	+
HerdSize (X13)	Continuous	Herd size	+
KpFarm Records (X14)	Binary	Keep farm records: Yes=1; No=0	+
EduLevel (X15)	Continuous	Educational Level	+

[A positive sign implies that a unit increase in the explanatory variables leads to an increase the probability of participation in the mainstream market]

3.6 Chapter Summary

This chapter gave an overview of how the study was conducted. The methods that were used to collect and analyze data were reviewed. Empirical data was collected from 109 smallholder cattle farmers in the Ngaka Modiri Molema District. To collect the empirical data, a self-developed questionnaire was personally administered to the respondents (n=109) by the researcher. The Statistical Package for Social Science (SPSS) computer programme was used in analysing the data. For analyzing empirical data, probit regression model was chosen. The results of the empirical research are analyzed and interpreted in the next chapter.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

In this chapter the results of the empirical research are discussed. The data analysis and discussion are mainly focused on the demographic characteristics and socio-economic factors, marketing channel/distribution channel/marketing outlets, availability of infrastructure and logistic related matters, access to market information, cattle production, cattle nutrition, cattle health, cattle husbandry, reasons for keeping cattle described by using frequency distribution and frequency, and the inferential analysis of the data using Probit Regression model.

4.2 Demographic and socio-economic characteristics of the farmers

Table 4.1 below presents the descriptive statistics (i.e. frequencies and percentages) for discrete demographic variables that were investigated and reported on by the sampled smallholder cattle farmer participants of this research. According to Polit and Beck (2004), demographic characteristic profile in an empirical study establishes the biographical parameters of the sampled participant group. Polit and Beck (2004) further add that demographic particulars elicited from participants in both quantitative and qualitative empirical research are nearly identical in most dissertations and theses, which means that empirical research regard this aspect of research as important in determining personal, social, economic, political, and educational profiles of sampled participants with a view of generalizing for the whole population under investigation.

4.2.1 Analysis of smallholder cattle farmers demographic variables (n=109)

The personal and socio-economic characteristics of smallholder cattle farmers in Dr Ngaka Modiri Molema District are presented in Table 4.1. According to Makhura (2001), these aspects are important because the main household activities are coordinated by household head and the head's decisions are most likely to be influenced by such demographic aspects. The results show that the majority (73%) of the farmers were male while 27% were female, 68% were married, 74% were Christians and 45% had no formal education. Most of the

respondents (70%) were aged from 41 to 60 years of age and 62% had contact to extension services, while 33% had contact to extension service only occasionally. The respondents were also engaged in non-farming activities (51%), with most of them (46%) being engaged in municipality projects and 61% had been farming for less than 10 years. 54% of the farmers had a household size of ≤ 5 members and ≤ 5 dependents. About 43% of the farmers have about one household member assisting in farming. Most of the farmers are fulltime farmers (50%), having between 6 and 8 hectares of farming land (39%). Majority (75%) of the farmers did not have organisational membership while 27% of them were members of African Farmers Association of South Africa (AFASA).

4.2.2 Interpretation of smallholder cattle farmers demographic variables (n=109).

The above analysis reveals that, participation of women in smallholder cattle farming still remains a challenge in Dr Ngaka Modiri Molema district. This could also be the result of sampled farmers' households consisting of more males than females. These results confirm Montshwe's study (2006), which highlighted that livestock are generally owned by men, even if they are not in the daily supervision of the animals. Smallholder cattle farmers in Dr Ngaka Modiri Molema district are aged from 41 to 60 years, which is indicative of a paucity of involvement of youth in cattle farming agricultural activities in the District. The smallholder cattle farmers do not have a strong education background with the majority of them having no formal education, which could limit in their adaptation to new cattle farming agricultural innovations. This is a worrisome factor if any progressive development of rural cattle farming agriculture is to be promoted in rural areas like Dr Ngaka Modiri Molema district. Smallholder cattle farmers have to use self-labour in their farming activities. This, again, is a worrisome factor in the progressive development of rural cattle farming agriculture. This revelation could be linked to the labour costs which have risen in the previous years and children being statutorily compelled to be at school during the day. This revelation also is in line with that of Harding et al., (2005) who highlighted insufficient family labour as a production constraint on smallholder cattle farms (e.g. livestock production of various types and requirements and off farm activities). This has resulted in poor management due to labour shortages resulting in straying of animals, loss through theft, diseases and poor nutrition.

Table 4.1: Smallholder cattle farmers personal, social, educational and economic characteristics (n=109)

Variables	Frequency	Percent	Variables	Frequency	Percent
Gender			*Extension officer from*		
Male	79	73	Government	98	90
Female	30	27	Non-Government	8	7
Total	109	100	Other	3	3
Age			Total	109	100
≤40	15	14	*Engage in non- farming activities*		
41 – 60	77	70	Yes	56	51
Above 60	17	16	No	53	49
Total	109	100	Total	109	100
Marital Status			*Names of non-farming activities*		
Single	16	14	Tuck shop	45	41
Married	75	68	Municipality projects	50	46
Divorced	6	7	Tavern	14	13
Widowed	12	11	Total	109	100
Total	109	100	*Number of years farming*		
Religion			≤10	67	61
Christianity	81	74	11-20	41	38.1
Other	24	22	≥20	1	0.9
Total	105	96	Total	109	100
Education Level			*House hold size*		
No Formal Education	50	45	≤5	59	54
Primary School	12	11	≥6	50	46
High School	35	32	Total	109	100
College	8	8	*Dependants*		
University	4	4	≤5	59	54
Total	109	100	≥6	50	46
Organisational membership			Total	109	100
Yes	82	25	*Household members who assist in farming*		
No	27	75	1	47	43
Total	109	100	2	28	27
Name of Organisation			3	34	30
NAFU	15	14	Total	109	100
AFASA	29	27	*Occupation of farmer*		
AGRISA	22	20	Pensioner	2	2
NERPO	23	21	Employed	14	13
Total	89	82	Full time-farmer	55	50
Contact to extension service			Unemployed	8	7
Yes	68	62	Part time farmer	29	27.1
No	41	38	Business man/woman	1	0.9
Total	109	100	Total	109	100
Number of contacts to extension agents			*Number of hectares used for cattle farming*		
Regularly	1	0.9	≤5	34	31
Occasionally	36	33	6 – 8	43	39
Rarely	31	29	9 – 16	32	30
Never	6	6	Total	109	100

4.3 Smallholder farmers herd size

The results in Figure 4.1 show herd size of the smallholder cattle farmers. The results show that 39% of smallholder cattle farmers own 20 to 40 cattle, 32% own 8 to 19 cattle, 19% own 41 to 60 cattle, and 9% own 63 to 79 cattle. It is worrying to see that only a small number of smallholder cattle farmers have a larger herd size. The farmers with a large herd size have a greater probability of selling their livestock even in mainstream markets.

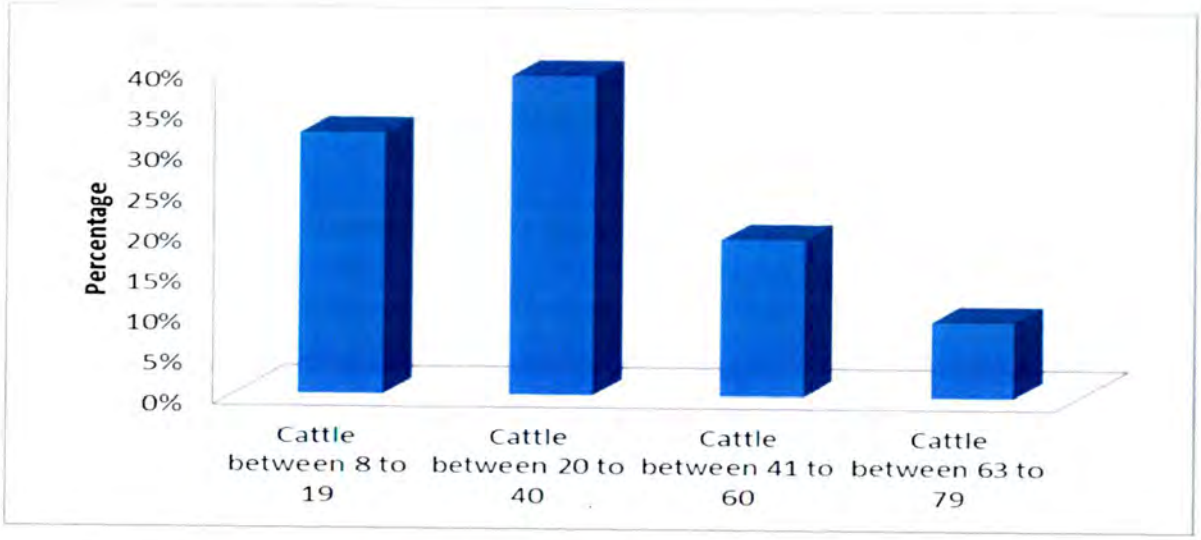

Figure 4.1: Smallholder farmers herd size (n=109)

4.4 Marketing channels used by smallholder cattle farmers

The results in Table 4.2 below show, that the majority (82%) of the farmers use informal markets to market their cattle while 39% use private sales. Some of the farmers use formal markets with auctions (53%) being the second most used marketing channel. About 62% of the respondents are familiar with informal marketing channels.

This finding confirms Nkosi & Kirsten (1993), which highlighted that private sales or informal markets provide the shortest and simplest channel among smallholder cattle farmers, and consequently, it is their most popular marketing option. This is because, according to Nkhori (2004), through these informal market channels, smallholder farmers transact directly to the ultimate consumer. Many socio-cultural functions performed by means of cattle in African societies provide a direct private market channel amongst individual households in rural areas, and farmers incur low transaction costs.

This finding could also be linked to the demographic and socio-economic characteristics of farmers, where it emerged that the majority of smallholder cattle farmer participants have; no organizational membership; and no formal education.

Lack of collective action in the form of organizational membership among smallholder cattle farmers clearly denies them entry into formal market channels, while lack of formal education could be denying them knowledge of the advantages of using various formal market channels such as; formal market channels, which normally pay reasonable prices that are market related. In the formal market channels, stock can be sold in bulk, social and economic relationships can be built, and if the farmer is not satisfied with the price, he/she has an option of returning his/her cattle back without any penalty except for transport costs.

Table 4.2: Marketing channels used by the smallholder cattle farmers' (n=109)

Markets	**Frequency**	**Percent**
Speculators	28	26
Private sales	42	39
Butchers	5	5
Open Markets	28	26
Abattoirs	14	13
Auction	58	53
Informal	90	83
Main marketing channel		
Formal	41	38
Informal	68	62
Total	109	100

4.5 Distances between farms and cattle markets

Table 4.3 provides the smallholder cattle farmers' responses on distances between their farms and cattle markets. The results in Table 4.3, show that farmers travelled less than 10 km to access private sales (89%), between 15 to 30 km to access auctions (44%), and less than 10 km to access informal markets (30%). This finding confirms Nkosi et al. (1993) findings that private sales or informal markets provide an accessible way of easily marketing their cattle because they could be involving customers (which are their neighbours or people in their vicinity) buying cattle for different reasons such as slaughtering, investment, socio-cultural functions, and customary and religious celebrations.

Table 4.3: Distances between farms and cattle markets (n=109)

Variables	Frequency	Percent
Speculators		
10km	10	9.2
Private sales		
≤10 km	97	89.0
12-20km	12	11
Butchers		
5km	4	4
15km	3	3
23km	1	0.9
Abattoirs		
18km	1	0.9
20km	4	4
23km	7	6
Auction		
15 – 30 km	49	44
33 – 45 km	13	13
Informal		
≤10 km	32	30
15 – 30 km	22	20
≥30 km	6	6

4.6 Benefits from markets used regularly by smallholder cattle farmers

The results in Table 4.4 show that farmers (65%) receive higher prices from the markets they regularly use and 28% of the markets are nearer. The results also indicate that most (55%) of smallholder farmers do not participate in the most rewarding channels.

It is pleasing to note that the smallholder cattle farmers who participated in this study prefer markets in from which they receive higher prices. These markets could be either informal markets in the form of private sales or formal markets in the form of auctions, as highlighted above in the marketing channels used by smallholder farmers. This could, also, be an indication that smallholder cattle farmers are concerted in their efforts of enriching themselves in cattle marketing endeavours, i.e. making financial gains in cattle farming.

Table 4.4: Benefits of using marketing channels used regularly (n=109)

Benefits of using the marketing channels used regularly	Frequency	Percent
Receive high prices	71	65
Understand the contract	4	4
Provide inputs	3	3
Nearer	31	28
Total	109	100
Participation in the most rewarding channels		
Yes	49	45
No	60	55
Total	109	100

4.7 Farmers' reasons for not participating in the most rewarding channels and other aspects

This section presents sampled cattle farmers' responses on reasons for not participating in the most rewarding channels and responses on their attendance of cattle farming workshops, contractual agreements, and their regular customers. Table 4.5 reveals that sampled cattle farmers' most popular reason for not participating in the most rewarding market channels were, because of high transaction costs (44%) and herd size (30%). The farmers indicated that their herd sizes are not sufficient for them to participate in most rewarding channels because the numbers demanded in these channels are high. The results also reveal that smallholder cattle farmers (70%) do not attend cattle farming workshops, 75% do not have contractual agreements and 57% do not have regular customers.

The results confirm the findings by Jari et al. (2009) that transactional costs form barriers to the efficient participation of emerging farmers in different formal markets. According to Louw et al. (2004) emerging farmers do not use a particular channel when value of using that channel is out-weighed by the costs of using it. Linked to transactional costs is the lack of contractual business agreements by smallholder cattle farmers.

The non-attendance of cattle farming workshops by smallholder cattle farmers could be linked to the fact that the majority of farmers who participated in this research reported that they lacked formal education. This could mean that it is difficult for them to attend workshops which are always formal in nature, and could be cognitively complex for the farmers who are lacking in formal education.

Not having regular customers could be linked to the poor nutrition and husbandry of cattle of smallholders. Nkhori. (2004) highlights that cattle auctioneers and speculators often raise

concerns that they cannot pay competitive prices for cattle that are in poor condition or not ready for the market. Even ages of cattle animals affect prices. In most cases, these cattle animals are often too old when smallholder cattle farmers do sell them and this equally contributes to poor prices.

Table 4.5: Smallholder cattle farmers reasons for not participating in the most rewarding channels (n=109)

Reasons for not participating in the most rewarding channels		
Variables	**Frequency**	**Percent**
Poor quality cattle	18	14
Herd size	30	30
Transaction costs	48	44
Long distance to the market	13	12
Attendance of cattle farming workshops		
Variables	**Frequency**	**Percent**
Yes	33	30
No	76	70
Contractual Agreements		
Yes	27	25
No	82	75
Regular customers		
Yes	47	43
No	62	57

4.8 Most rewarding cattle marketing channels

The results in Figure 4.2 show the cattle markets which the farmers indicated as the most rewarding channels. The farmers indicated that auctions (41%) are the most rewarding marketing channels; followed by private sales (29%) and then other markets (24%) such as speculators.

The results indicate that auctions are the main formal marketing channels used by smallholder cattle farmers to market their cattle. Hazell et al. (2007) revealed that smallholder farmers generally prefer to sell their cattle through public auctions because they are organised by reliable auctioneer agents, and auctions have the following advantages for them. Public auctions are normally available at the right time, they normally pay reasonable prices which are market related; stock can be sold in bulk, seller-buyer social, and economic relationships can be

built. The farmer, if not satisfied with the price, has an option of returning his/her cattle back without any penalty, except transport costs.

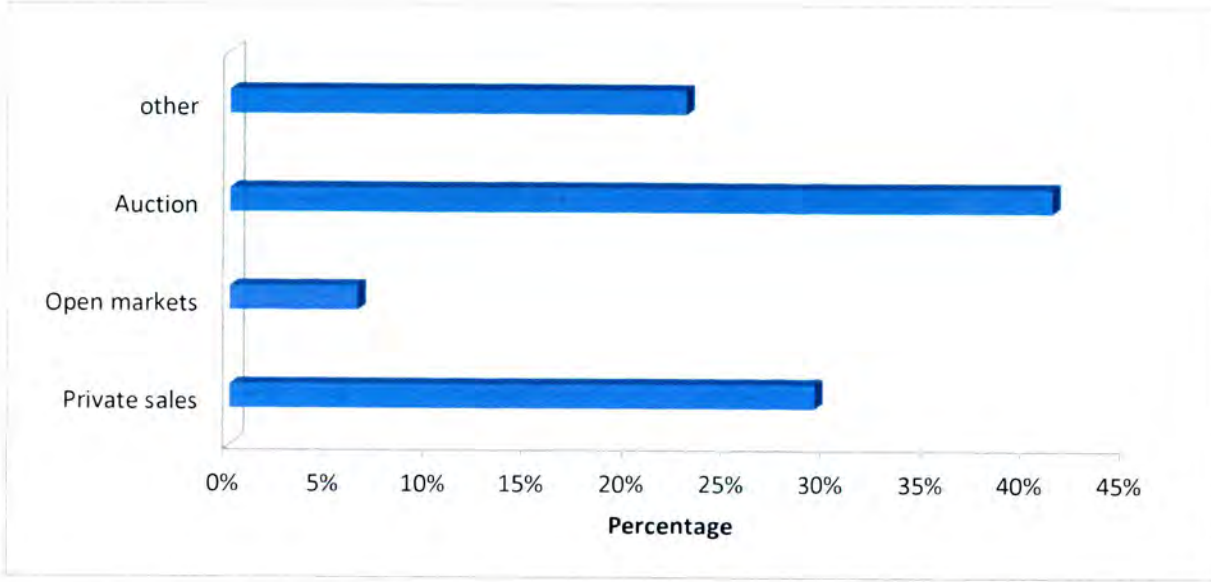

Figure 4.2: Smallholder farmers' views on most rewarding channels (n=109)

4.9 Cattle transportation options/methods (n=109).

This section presents smallholder cattle farmers' ways in which they distribute their cattle during sales. The results in Table 4.6, show that smallholder cattle farmers (62%) hire transport in a form of hired trucks (56%) to transport their cattle to the relevant markets where they sell their cattle. Most farmers (84%) are not satisfied with the condition of the roads that link them to the market.

The results in Table 4.6 above mean that most smallholder farmers who participated in this research do not have their own means of transport to distribute their cattle to market channels. For this purpose, they therefore hire trucks. Hiring of transport could result in high transaction costs for smallholder cattle farmers. The results in Table 4.6 further highlight the link between lack of appropriate transportation facilities and poor road infrastructure, which result in high transaction cost as well. Sometimes these costs are too high for farmers and traders to get any meaningful benefits from their trading activities, thus discouraging smallholder cattle farmers from marketing activities.

Table 4.6: Cattle transportation options/methods (n=109)

Distribution of animals by farmers when selling		
Variables	**Frequency**	**Percent**
Hire transport (individual)	67	62
Use own transport	42	38
Type of transport		
Own Bakkie	48	44
Hired truck	61	56
Satisfaction with the roads that link to the market		
Yes	17	16
No	92	84

4.10 Farmer's access to market information

This section presents sampled smallholder cattle farmers' access to market information, receipt of general market information, frequency of market information received, and language in which market information is delivered in. The results in Table 4.7 show that majority of the farmers (63%) receive market information. About 8.3% of the cattle farmers receive the market information on weekly basis while majority (64%) receive market information bi-annually. The market information is normally delivered in English (46%) and in Afrikaans (30%).

It is pleasing to see that the farmers reported to be receiving market information. However, it is worrisome to notice that the farmers receive the information bi-annually. Market information should be provided at least monthly in order to have cattle farmers up-dated about the current issues in the cattle market on regular basis. The current state of affairs in this study is that market information is not readily available for the smallholder cattle farmers to be able to make informed agricultural decisions. The English language in which the market information is communicated to smallholder cattle farmers still remains a huge challenge for the farmers because of high illiteracy level of the farmers.

The results in Table 4.7 also show that 51% of farmers do not receive market information prior to sales. Those who do not receive market information prior to sales would like to have it from regular sources. The information required by smallholder cattle farmers is production information (36%) and date of sales (12%). The information should be delivered through producer organisation (25%), through cell phone smses (21%) and by extension officers (19%). The smallholder farmers in the study area communicate with other farmers through tribal meetings (62%) and consult with other farmers before decision making (89%). The

farmers are not aware of role player organisations in agriculture (62%) and role player organisations in livestock (58%). The farmers do not have a marketing plan (55%), the farmers who have it its rough and incomplete (38%). The farmers promote their products (58%).

It is worrisome to note that the majority of smallholder cattle farmer do not have; access to market information prior to sales, which leads to them not having up-to-date and reliable market information on cattle promotion and selling. According to Fenyes et al. (1985), insufficient market information is common among smallholder farmers. This could be linked to the majority not being members of any agricultural organization and many lack formal education. According to Machete. (2004), lack of formal education deprives smallholder cattle farmers of the insight in; understanding ways in which markets operate and why prices fluctuate; having information on market conditions and prices; understanding the benefit of being organised collectively; and having enough experience of market negotiation; and a marketing plan, which could be an indication of proactive and strategic organization in selling and promoting their cattle.

Fenyes et al. (1985), highlighted that insufficient market information is attributable to the large number of small producers, inefficient communication systems, and low levels of literacy as well as information administration. According to Burke (2009), lack of marketing knowledge exposes emerging farmers to a marketing disadvantage, e.g., they have a weak bargaining position vis-à-vis traders because often they do not have timely access to salient and accurate information on advantageous factors in marketing such as prices, locations of effective demand, preferred quality characteristics of cattle produce, nor alternative marketing channels.

The literature highlighted that lack of reliable market information leads to traders and producers making poor management decisions as a result of the ineffectiveness of existing market information systems. Market information is vital as it, allows suppliers to make informed decisions, enables suppliers to take informed marketing decisions that are related to supplying necessary goods, searching for potential buyers, negotiating, enforcing contracts and monitoring. Necessary information includes information on; consumer preference, quantity demanded, prices, producer quality, market requirements, and opportunities. The smallholder cattle farmers in the study could rely on informal networks

(traders, friends and relatives) for market information, which could put them at risk of getting biased information due to opportunistic behaviour of the more informed group.

Table 4.7: Access to market information (n=109)

Receipt of general market information	**Frequency**	**Percent**
Yes	69	63
No	40	37
Frequency of market information received	f	%
Weekly	9	8
Bi-annually	70	64
Monthly	30	28
Language market information delivered in	f	%
Setswana	26	24
English	50	46
Afrikaans	33	30
Market information prior to sales	**Frequency**	**Percent**
Yes	54	49
No	55	51
Would like to have regular sources of market information in future	**Frequency**	**Percent**
Yes	58	53
No	51	47
Type of information required		
Dates of sales	13	12
Sales price	6	6
Buyers	3	3
Production information	39	36
The way information should be delivered		
Cellphone SMS	23	21
Extension officers	9	8
Producer organisation	27	25
Tribal meetings	3	3
Communication with other farmers		
Tribal meetings	68	62
Commodity groups	6	6
Farmers unions	35	32
Consultation with other farmers in decision making		
Yes	97	89
No	12	11
Awareness of role player organisation		
Yes	42	38
No	67	62
Awareness of role player livestock organisations		
Yes	46	42
No	63	58
Have a marketing plan		
Yes	38	35
No	71	65
Extent of the marketing plan		
Rough, incomplete plan	40	36.7
Thorough planning	6	5.5
Promotion of products		
Yes	63	58
No	46	42

4.11 Smallholder cattle farmers' main ways of notifying people of sales

The results in Table 4.8 show that smallholder farmers (63%) in the study notify buyers about their cattle through verbal communication and 53% lack transport to transport their cattle.

It is worrisome to note that smallholder cattle farmers do not have proper communication channels, and they have to mainly rely on verbal communication to let buyers know about their cattle sales, and they could be having problems with the marketing of agricultural cattle products and taking informed marketing decisions that are related to; supplying necessary goods; searching for potential buyers; and negotiating, enforcing contracts and monitoring.

It was to be expected that the majority of smallholder cattle farmers would report to be affected by lack of transport. This could be affecting the transportation of their cattle to formal markets, and the proactive involvement in successful cattle products' marketing.

Table 4.8: Smallholder cattle farmers main ways of notifying people of sales (n=109)

Main ways	**Frequency**	**Percent**
Announced	33	30
Verbal communication	69	63
Other	7	7
General problems when moving cattle		
Small size of transport	3	3
Lack of transport	58	53
High transport cost	46	42
Other	2	2

4.12 Information channels regarding output prices

The results in Figure 4.3 show the respondents access to information regarding output prices. Output prices play a very important role in farming. Access to market information (output prices) assists farmers in decision making process. The farmers (53%) indicated that they receive their information through the radio, extension officers (19%) and from their friends / co-farmers (28%). Most of the farmers indicated that information they received was through agricultural programmes in the local radio station. This brings into question, the effectiveness of the extension service by government. Farmers' also indicated that they get information from extension officers, however the farmers interviewed indicated that sometimes the

information from the extension officers is not on time. The farmers also indicated that they meet with other farmers occasionally.

This finding is to be expected in rural areas where radios are the popular communication medium among farmers; there are poor telecommunication networks for most television channels.

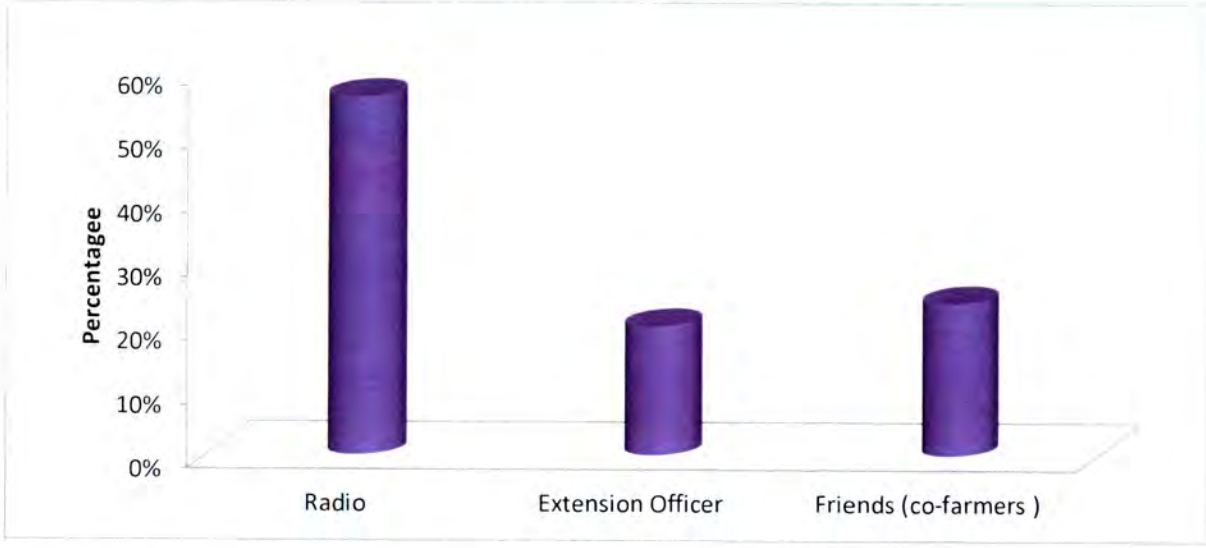

Figure 4.3: Information channels regarding output prices

4.13 Order of importance of market information received by smallholder cattle farmers

This section presents responses of sampled (n=109) smallholder cattle farmers on market information in order of importance as received by smallholder farmers. The results in Figure 4.4 show the information of farmers ranked in order importance. Market information assists smallholder farmers in developing production and marketing plans. The farmers ranked the following information as important: consumption of products (83%), consumer price of products (79%), abattoir volume (57%), prices of production inputs (56%), volume of imports and exports (54%), farm slaughter (23%), and 43% of the farmers indicated that the number of animals in the feedlot information is very important. It can be deduced from this analysis that smallholder cattle farmers mainly keep their cattle for nutritious food products for human consumption and, also, to be paid a decent price for their cattle.

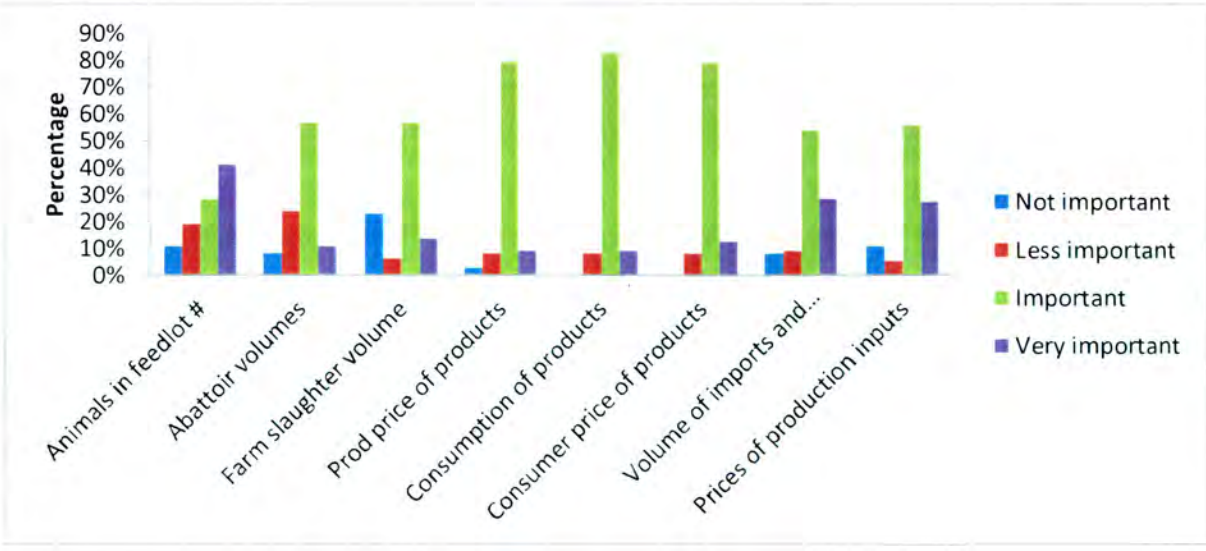

Figure 4.4: Information in order of importance

4.14 Infrastructure and equipment availability to smallholder cattle farmers

This section presents the availably infrastructure and equipment to smallholder cattle farmers. The results in Table 4.9 show that 39% of smallholder cattle farmers in the study area have dehorners while 20% of them have castrators. The farmers (70%) do not slaughter and sell meat. Smallholder farmers in the study area lack critical infrastructure for production purposes. The in ability of the cattle farmers to slaughter and sell the meat/beef could be due to lack of relevant infrastructure, and long distances from big cities and towns where mainstream cattle farming take place.

Table 4.9: Availability of infrastructure and equipment availability (n=109)

Production infrastructure the farmer has	**Frequency**	**Percentage**
Castrator	22	20
Dehorner	42	38
Feedlot infrastructure	13	12
All	7	7
Other	25	23
Slaughter and sell carcass		
Yes	33	30
No	76	70

4.15 Payment procedures and sales

This section presents smallholder cattle farmers' payments procedures and sales. The results in Table 4.10 show that smallholder cattle farmers (59%) participate in markets where they receive payment in cash and 62% of the farmers do not perform price surveys before selling. The farmers (34%) indicated that they negotiate prices with buyers and 28% their prices are market driven. Farmers indicated that they are satisfied with farm gate prices of Private sales (92%), Auctions prices (63%) and Open markets prices (85%). The farmers indicated that they are not satisfied with prices from Butchers (88%) and Abattoirs (80%). Farmers indicated that they have ended up declining selling prices in the following markets private sales (63%), speculators (68%), butchers (78%), abattoirs (77%), auctions (58%) and open markets (16%).

It was to be expected that most of the smallholder cattle farmers would participate in markets where they receive payment in cash because they do not possess bank accounts and also due to the the informal nature of their agricultural marketing business.

However, it is pleasing to see that smallholder farmers participate in cattle markets where they receive cash for their cattle. This has the potential of assuring them of having money to invest back into their enterprises and the farmer is, therefore, always guaranteed cash upon utilisation of that market, which in their case, is informal market.

It is worrying to see that smallholder cattle farmers do not perform price surveys before deciding which market to participate in. Not performing price surveys before selling being a major factor among smallholder cattle farmers could be linked to their not having access to market information prior to sales. Participating in price surveys would, also, surely require profound educational insight into some sciences of Economics and Accounting, which most of the smallholder cattle farmers lack because of either lack or possibly inadequate formal education. Smallholder cattle farmers' lack of performances in price surveys could lead them to having informal markets as their main accessible and financially rewarding marketing outlets for their cattle's promotion and selling, thus not participating in mainstream cattle markets.

It is expected that a highly significant majority of smallholder cattle farmers would be satisfied with farm gate prices of private sales would respond in such a highly positive way because of the greatly informal nature of their approach to cattle farming. The literature

revealed that private sales or informal markets provide the shortest, simplest, and as a result has become the most popular option amongst them. This is so because, through this market outlet option, smallholder farmers transact directly to the ultimate consumer. Nkhori (2004) revealed that on-farm or direct sales to the consumer offer the greatest profit margin on cattle for the smallholder cattle farmers because; all middle-men and their fees are eliminated; it offers a year-round marketing outlet; and most of the cattle traded in these informal markets are primarily old oxen destined for service as draught animals and ultimately for slaughter.

These findings also highlight auctions and open markets to be the second and third largest market outlets. Farmers reported that they are not satisfied with prices from butchers and abattoirs. This finding does not confirm the assertion that butcheries, formal outlets form the second preferred marketing channel, after private/informal outlets, of cattle among smallholder farmers.

Table 4.10: Smallholder cattle farmers' views on payment procedures and sales in the respective channels (n=109).

Payment procedure	**Frequency**	**Percent**
Cash	64	59
Cheque	38	35
Other	7	6
Perform price surveys before selling	**Frequency**	**Percent**
Yes	41	38
No	68	62
Price set during sales	**Frequency**	**Percent**
Famer sets price	24	22
They negotiate	37	34
Its market driven	31	28
It is dictated by buyers	12	11
Other	5	5
Satisfaction with farm gate prices		
Private sales		
Yes	100	92
No	9	8
Speculator		
Yes	93	68
No	16	32
Butcher		
Yes	13	12
No	96	88
Abattoir		
Yes	22	20
No	87	80
Auction		
Yes	69	63
No	40	37

Open market		
Yes	93	85
No	16	15
Farmers acceptance and rejection of selling price		
Private sales		
Yes	69	63
No	40	37
Speculator		
Yes	74	68
No	35	32
Butcher		
Yes	85	78
No	24	22
Abattoir		
Yes	84	77
No	25	23
Auction		
Yes	63	58
No	46	42
Open market		
Yes	17	16
No	92	84

4.16 Access to finance

This section presents responses of sampled smallholder cattle farmers on their access to finance. The results in Table 4.11 show that 97% of the farmers indicated that there are financial institutions in the area. The dominant financial institutions available in the area are commercial banks (71%). The farmers indicated that, banks offer medium-term loans (73%) and short-term loans (32%). Majority of the farmers (86%) indicated that they have applied for loans from banks before while 52% of the farmers indicated that their applications were not approved. About 41% of the farmers indicated that the reasons for non-approval, loans was because of lack of physical security (41%) while 38% of the famers indicated that it was because of lack of performing accounts.

It is pleasing to note that there are financial institutions, mainly commercial banks, available among smallholder cattle farmers, which may grant smallholder cattle farmers medium and short term loans for the development of their cattle farming operations. Loans from financial institutions may enable smallholder cattle farmers to raise capital to invest in their cattle farming enterprises for improved agricultural beef and dairy productivity. It is, however, worrisome to learn that most smallholder cattle farmers applied for loans from banks before, possibly, for their cattle farming operations, but were not granted loans because over 50% of them lacked physical security.

Table 4.11: Smallholder cattle farmers access to finance (n=109)

Financial institution in the Area	**Frequency**	**Percent**
Yes	106	97
No	3	3
Sources of finance		
Commercial Bank	77	71
Agricultural Cooperatives	6	6
Land bank	19	16
Credit Union	3	3
Stokvels	4	4
Services provided		
Short-term loans	26	24
Medium-term loan	80	73
Long-term loan	3	3
Applied for a loan before		
Yes	94	86
No	15	14
Received the loan		
Yes	41	38
No	53	48
Reasons for farmers being denied grants		
Lack of invoices of what has been sold	19	17
Lack of a performing account	41	37
Lack of physical security	45	42
Other	4	4

4.17 Land tenure system and other aspects on the farms

The results in Table 12 show that land tenure system in the study area is mostly (56%) communal land, privately owned (34%) and under lease contract (10%). The farmers indicated that they inherited the land (39%), while 44% of the farmers indicated that the land was allocated to them by the headman (chief), 15% of the farmers indicated that the land is being leased out for them by government, while 3% of the farmers brought their land. The farmers (96%) vaccinate their cattle, while 4% of the smallholder cattle farmers do not vaccinate their cattle. Those who vaccinate their cattle vaccinate them once in six months (81%), once in two weeks (3%) and once in 2 to 4 months (16%). The famers indicated that the knowledge applied in the farms by the farm workers in their farms was average (95%) while 5% of the farmers indicated that it was poor. The knowledge was acquired through experience. Majority of the farmers (62%) sell their cattle in markets were their cattle are not graded before being bought and while (38%) of the farmers perform in markets where their cattle are graded. Majority of the farmers indicated that they have herdman (85%) and they indicated that they only employ one herdman (85%). The herdmen have an informal

education level (77%) and earn a salary of anything from R900 to R1400 (48%); while 42% of them earn a salary of anything from R1500 to R2500 per month.

It is deductible in this analysis that smallholder cattle farmers; operate in communal land, which could be ascribed to Dr Ngaka Modiri Molema District having been part of the homeland system of the Apartheid political dispensation before the New South Africa political dispensation which ushered in April 1994; vaccinate their cattle for good health every six months; apply agricultural knowledge greatly in spite of many lacking formal education; are being assisted by herd men in their cattle farming operations, and most have at least one herd man; and their herd men are mainly informally educated.

Table 4.12: Land tenure system and other aspects on the farms (n=109)

Land tenure system	Frequency	Percent
Communal	61	56
Rent/Lease	11	10
Privately owned	37	34
Acquisition of land	**Frequency**	**Percent**
Brought	3	3
Inherited	42	39
Given by government	16	14

Vaccinate cattle	**Frequency**	**Percent**
Yes	105	96
No	4	4
Frequency of vaccination		
Once per two weeks	3	3
Once in six months	88	81
Other	18	16
Allocated by the headman	48	44
Rate of knowledge applied on the farms	**Frequency**	**Percent**
Poor	6	5
Average	103	95
Good		
Knowledge acquisition	**Frequency**	**Percent**
Experience	109	100
Education		
Cattle graded before trading	**Frequency**	**Percent**
Yes	42	38
No	67	62
Have a herd man	**Frequency**	**Percent**
Yes	92	85
No	17	15
Number of herdman	**Frequency**	**Percent**
1	92	85
2	17	15
Herdman education level	**Frequency**	**Percent**
Formal	18	18
Informal	84	77
Salary of herd man	**Frequency**	**Percent**
900 – 1400	52	48
1500 – 2500	46	42

4.18 Smallholder cattle farmers' annual cost of production

This section presents the smallholder cattle farmers annual cost of production (Figure 4.5). A large portion of smallholder cattle farmers (45%) in the study area have annual costs of production of R11 000 – R19 000, while 23% of them have annual production cost of R20 000 – R30 000 and 14% between R32 000 – R40 000. The cost of production plays a critical role in production. The average cost of production determines whether smallholder farmers are able to make returns on their investments. In the past years the cost of livestock feeds has increased drastically causing an increase in the costs of production for small holder farmers. The farmers have also had to bear the cost of in the price of labour.

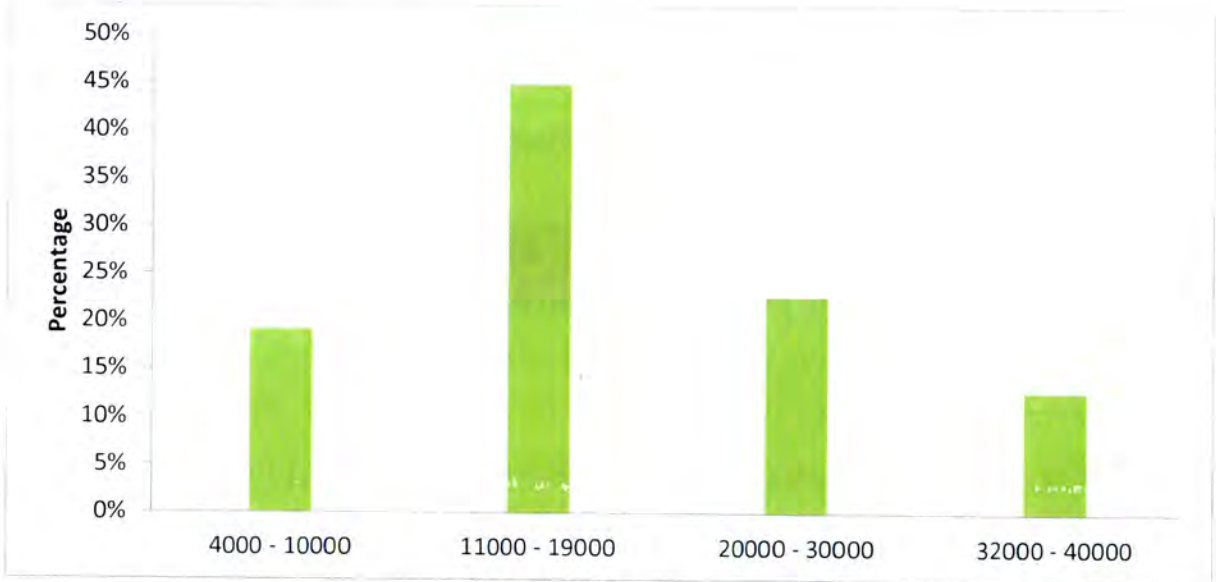

Figure 4.5: Average annual cost of production

4.19 Keeping of farm records

This section presents results of famers' record keeping among the smallholder cattle farmers in the study area. Record keeping is very critical for informed managerial decisions regarding planning for development.

The results in Figure 4.6 show that the majority of smallholder cattle farmers (54%) keep farm records. It is worrisome to note that almost (46%) half of the smallholder cattle farmers do not keep farm records, which could be ascribed to their lack of education as revealed in Table 4.1.

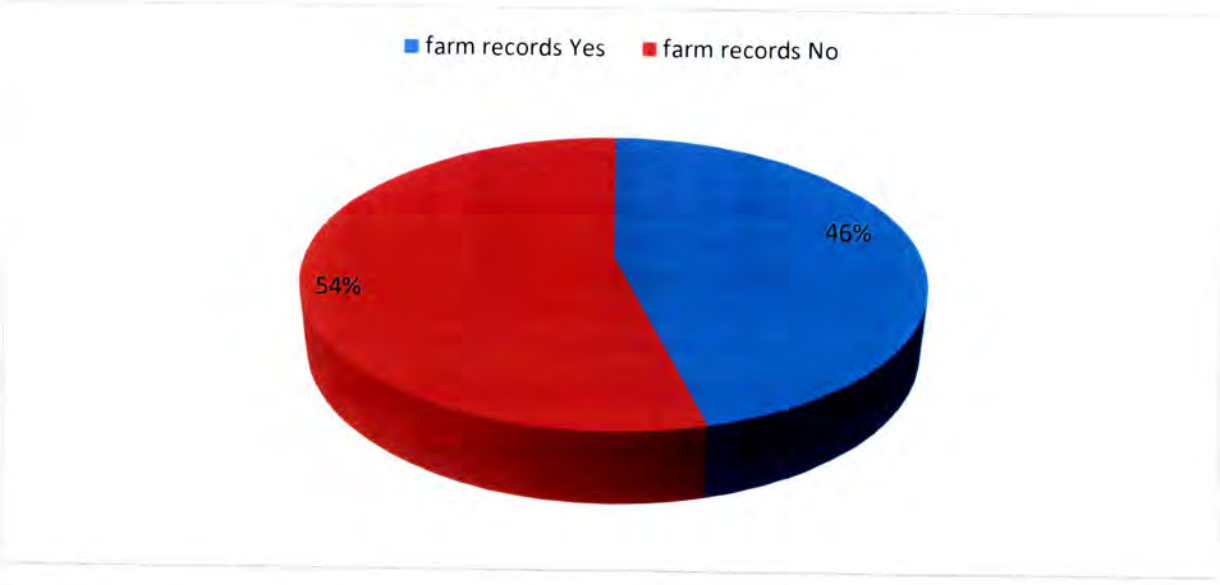

Figure 4.6: Farm records

4.20 Factors influencing farmers' decision on selling prices

This section presents factors influencing farmers' decision on selling prices. The results in Figure 4.7 show factors which influence the farmers' selling prices. Market dynamics play a very important role in determining the farmers' decision regarding selling prices. The farmers (54%) indicated that the selling price of other farmers is important in determining their selling price; 94% of the farmers indicated that the buyers of their cattle also play an important in determining their cattle selling price; 59% of the farmers indicated market at which they participate in is also an important in determining factor of their selling price; 62% of the regarded the cost of production as important in guiding farmers selling price; while 79% of the farmers indicated the market concentration as also one of the determining factors of their selling price and 56% of the farmers indicated that transaction costs also influence the farmers selling price

This suggests that smallholder cattle farmers are concerned about the effects of market concentration in the cattle industry. Market concentration may result from the need to gain economies of size for cattle farmers to remain competitive.

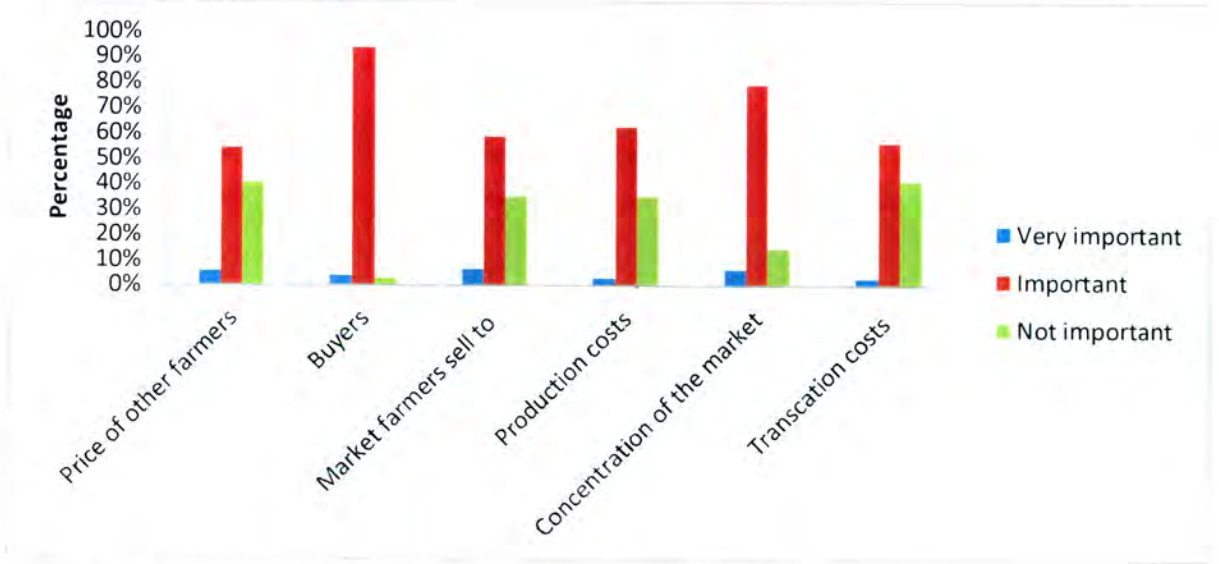

Figure 4.7: Influence on farmers' decision on selling price

4.21 Access to buyers

The results in Figure 4.8 show smallholder farmers access to buyers. Smallholder farmers' ability to access potential cattle buyers play a critical part in assuring good market prices for the farmers. Generally farmers (66%) indicated that it is fairly difficult to find buyers; while 25% of the farmers' indicated that it was difficult to find buyers and 9% of the farmers' indicated that it was easy to find buyers.

It is pleasing to note that smallholder farmers do not have difficulties in looking for buyers in spite of their poor infrastructure and lack of timely market information. It affects farmers' ability to attract many buyers in their areas since, they lack relevant ICT infrastructure and access to market information. This positive finding could be ascribed to private sales. According to Nkosi et al. (1993), private sales include customers buying cattle for different reasons which include slaughter, investment, socio-cultural functions such as funerals, lobola, weddings; and customary and religious celebrations.

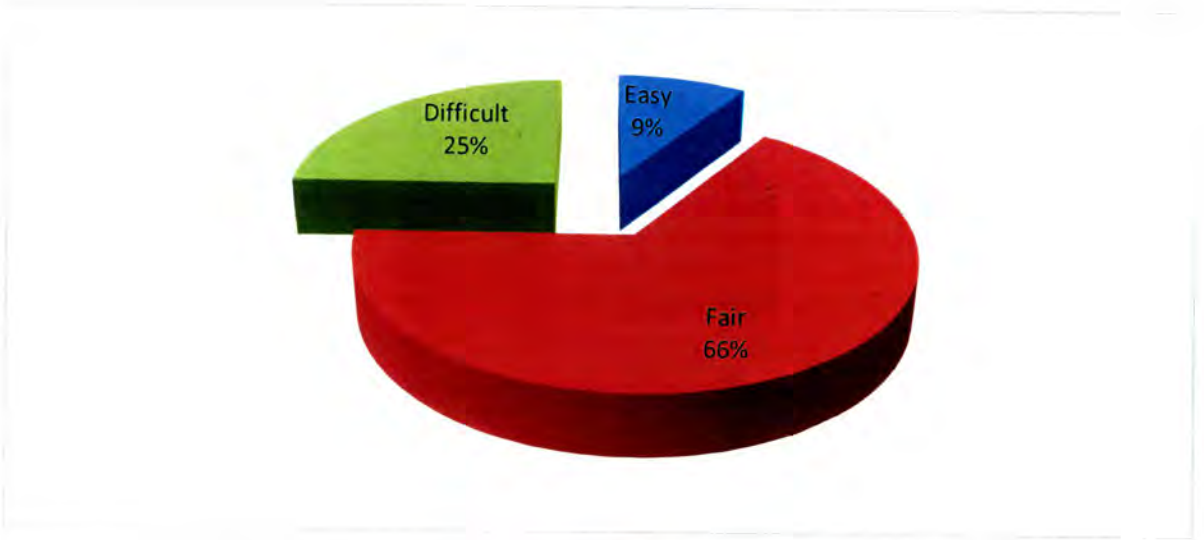

Figure 4.8: Access to buyers

4.22 Supplements used by smallholder farmers

Cattle farmers normally use supplements to fatten their cattle, in preparation for the market and also use supplements during drought seasons. Supplements can be very expensive and smallholder cattle farmers generally have problems procuring them. The results in Figure 4.9 show the supplements used by smallholder cattle farmers in the study area. The farmers indicated that they use fodder (46%), licks (40%) and bonemeal (17%) to supplement their cattle. Even though the farmers acknowledge that supplements play a very important role in improving the growth and quality of animals, they (farmers) are not able to acquire them due to lack of finance. It was expected that fodder would be a popular response for farmers under investigation because the empirical research of this study was conducted during drought and winter, when green grass was scarce in the veld.

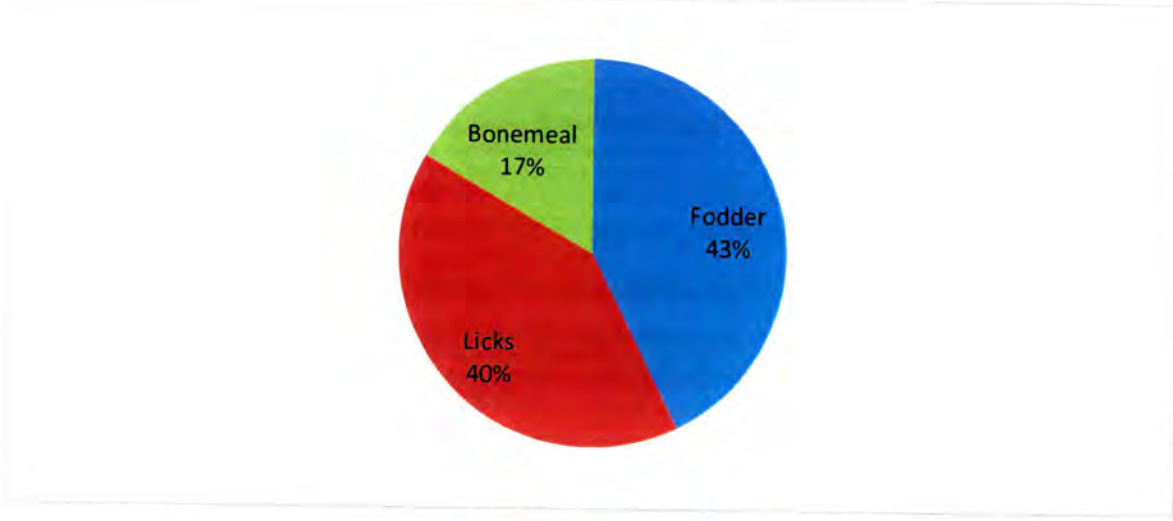

Figure 4.9: Supplements used by smallholder farmers'

4.23 Reasons for keeping cattle

Figure 4.10 shows the farmers' reason for keeping cattle. The farmers' reasons for keeping cattle were for household consumption (63%), ritual slaughter (68%), for sales (57%), for savings (84%), for feast and ceremonies (53%) and draught power (50%).

It can be inferred from this results that smallholder cattle farmers regard cattle farming and thus keeping of cattle as investment in terms of stock and investment for the future when they will be selling for cash. Literature highlights that some smallholder farmers keep cattle mainly as a symbol of wealth and as a buffer against economic hardship; while Musemwa et al. (2010) highlights that smallholder cattle farmers keep cattle for cash benefits.

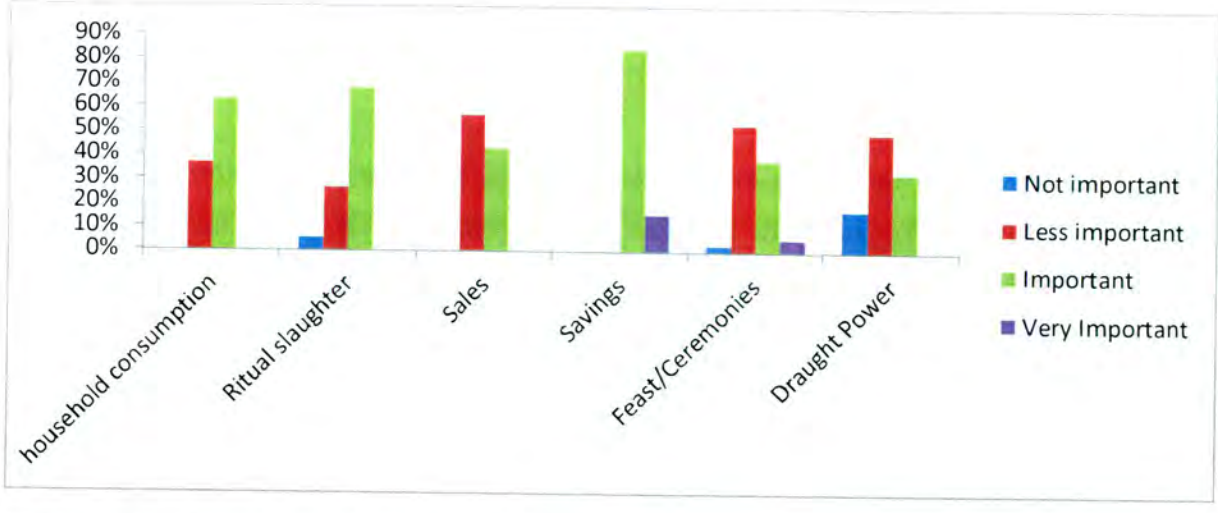

Figure 4.10: Reasons for keeping cattle

4.24 Main reasons for selling cattle

Figure 4.11 shows smallholder farmers' reasons for selling their cattle. The farmers indicated that their main reasons for selling their cattle were to use the money from sales for household consumption (25%), to use the money for livestock purchases (40%), to use the money to pay for the kid's school fees (29%) and to use the money to repay loans (6%). It can be deduced from this results that smallholder cattle farmers have a desire to buy more livestock in order to grow and develop in cattle farming.

Figure 4.11: Main reasons for smallholder farmers selling their cattle

4.25 Constraints faced by the small holder cattle farmers

The results in Figure 4.12 show the main constraints faced by smallholder cattle farmers in the study area. The farmers (95%) interviewed indicated that search for market information was a major problem; 96% of the famers indicated lack of support from government as a major constraint; while 62% of the farmers indicated that lack of trust from institutions involved in cattle is also a major constraint; bureaucracy was also one of the constraints the farmers (62%) indicated; while 79% of the farmers' indicated finance as one of their major constraints. The famers indicate the following constraints as one of their minor constraints: problems related to crime (49%), uncertainty of property rights (15%), problems related to corruption (20%), distance to mainstream markets (60%) and while 26% of the farmers indicated the cost of levies as one of the minor constraints.

It can be deduced from this results that smallholder cattle farmers significantly see lack of government support (backing) and search for market information as the main constraints they face in cattle farming and marketing of their cattle. The review of literature described smallholder cattle farmers as those that have minimal government support, and thus having poor access to resources such as machinery and credit facilities. Lack of reliable market information is responsible for traders and producers such as cattle farmers making poor management decisions due to the ineffectiveness of existing market information systems.

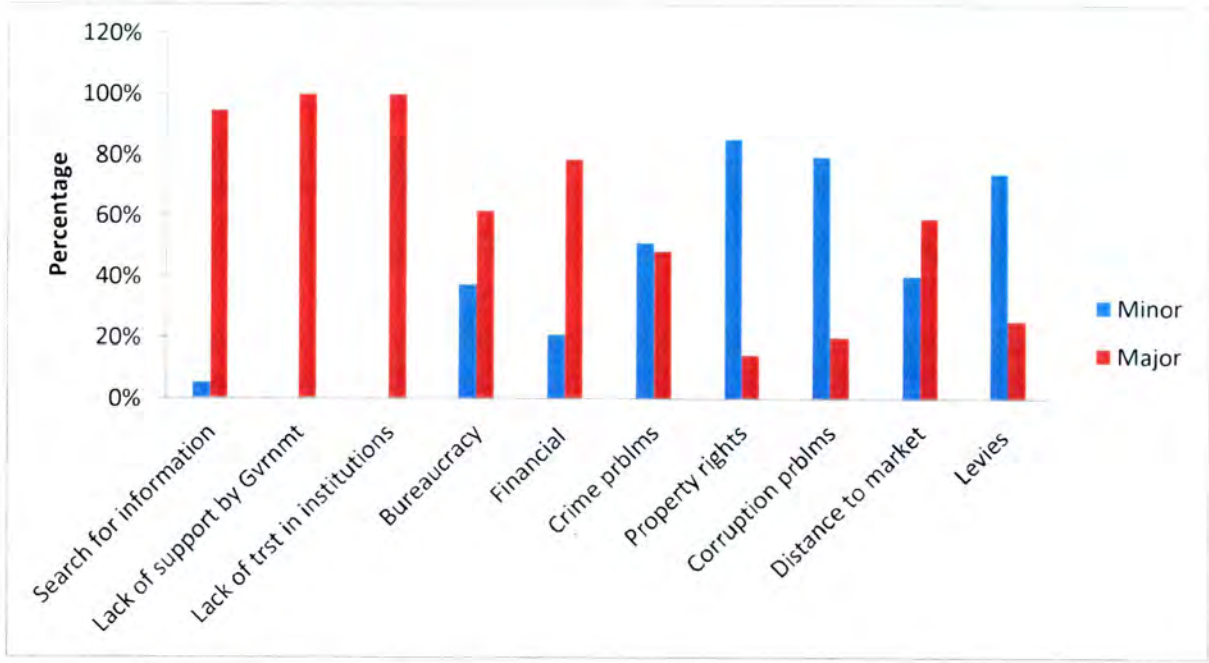

Figure 4.12: Constraints faced by smallholder farmers in cattle farming

4.26 Determinants of participation in cattle markets by smallholder farmers

In this sub-section, a probit regression analysis was performed to find out factors which influence or determine the participation of smallholder farmers in cattle markets in Ngaka Modiri Molema District. In the probit regression model, the dependent variable is binary that means it assumes only two values: the dependent variable considered takes the form of a binary variable (i.e. either 1 or 0), where 1 denotes that a farmer participates in the cattle markets and 0 denotes that a farmer does not participate.

Table 4.13: Result of the Probit regression analysis

Parameter	Estimate	Std. Error	Z	Sig	95% Confidence Interval	
					Lower Bound	Upper Bound
Number of sales	-.011	.016	-.717	.473	-.042	.020
Number of years farming	-.057	.023	-2.451	**.014***	-.103	-.011
Household size	-.069	.051	-1.370	.171	-.169	.030
Contact to extension service	-.093	.162	-.577	.564	-.410	.223
Farmer belong to farmers organisation	.131	.159	.823	.411	-.181	.443
Number of heifers	.000	.000	2.742	**.006****	.000	.000
Farmer Slaughter cattle and sell as carcass	-.471	.248	-1.899	**.054***	-.957	.015
Farmer to farmer consultation for decision making	1.391	1.141	1.219	.223	-.845	3.627
Vaccinate cattle	-.208	.489	-.424	.671	-1.167	.751
Receive market information	.011	.173	.062	.950	-.329	.350
Gender of respondents	-.066	.142	-.461	.645	-.345	.214
Attend short courses on cattle farming	-.184	.251	-.730	.465	-.676	.309
Number of cattle	-.002	.008	-.293	.770	-.017	.013
Keep farm records	1.130	.433	2.611	**.009****	.282	1.978
Educational level	-.158	.090	-1.745	**.081***	-.335	.019
Intercept	-2.564	1.343	-1.909	.056	-3.907	-1.221

Fifteen demographic and socioeconomic explanatory variables, which were believed to influence the participation of smallholder farmers in cattle markets, were included in this analysis. The explanatory variables that are expected to cause variation in the dependent variables are: number of sales, number of years farming, household size, contact to extension service, farmer belong to farmers' organisations, number of heifers, farmer slaughter and sell carcass, farmer consult with other farmers before making decision, vaccinate cattle, receive market information, gender of respondents, attend short courses on cattle farming, number of cattle, keep farm records and educational level. The results of the probit regression model shows that out of 15 independent variables considered, the coefficients for 5 variables were statistically significant. These were:

4.26.1 Number of heifers

A positive and statistically significant relationship (Z=2.742: P<0.05) was found between mainstream cattle markets participation and the number of heifers. The relationship implies that smallholder cattle farmers in the study area tend to increase their mainstream market participation with the increase in the number of heifers. The participation in mainstream cattle markets by smallholder cattle famers' increases as the number of heifers increases, because mainstream cattle markets demand animals which are still young and as the number of heifers increase, this increases the farmers herd size increasing the participation in mainstream cattle markets.

4.26.2 Keeping of farm records

The results also show positive and statistically significant relationship (Z=2.611: P<0.05) between mainstream cattle markets participation and keeping of farm records by smallholder cattle farmers. This relationship implies that smallholder cattle farmers tend to increase their market participation with the keeping of farm records. Record keeping is very critical for informed managerial decisions regarding planning for development. As smallholder farmers keep farm records it, they increase their development planning ability increasing their mainstream cattle markets participation in the future.

4.26.3 Number of years in farming

Smallholder cattle farmers' number of years farming was also found to be statistically significant (Z=-2.451: P<0.01) but having a negative relationship. This implies that as the number years in farming of smallholder farmer increase participation mainstream cattle markets decreases. The reason for the mainstream cattle markets participation decrease as the number of years increase, is because as the years in farming increase the farmers', age of the famers increase and the farmers are likely to lack the energy and interest in the activities related to mainstream cattle farming e.g. attending workshops; organisational memberships and attending Auctions.

4.26.4 Level of education for smallholder cattle farmers

The level of education for smallholder cattle farmers was also found to be statistically significant (Z=-1.745: P<0.01) and having a negative relationship. This relationship implies

that as the education level of smallholder cattle farmers in the study area increase their participation in mainstream cattle markets decreases.

4.26.5 Slaughter cattle and sell as carcass

Slaughtering of cattle and selling as carcass by smallholder farmers was found to be statistically significant ($Z=-1.899$: $P<0.01$) and having a negative relationship with mainstream market participation. This relationship implies that smallholder cattle farmers slaughtering their cattle and selling as carcass decrease participation in mainstream cattle markets. The reason for the decrease in mainstream market participation as the famers, slaughter and sell their cattle as carcass is that mainstream cattle markets which are normally in the form of Auctions may not fetch much price compared to retailing of carcases.

It can be concluded that the variables that have higher probability of affecting the participation of smallholder farmer in mainstream cattle markets are the number of heifers farmers have, keeping of farm records, the number of years in cattle farming, level of education and slaughtering of cattle and selling as carcass. Two of the variables positively influence participation of smallholder cattle farmers in mainstream cattle markets, implying that smallholder farmers are likely to shift to mainstream market participation with increase in number of heifers and livestock farm record keeping.

4.27 Chapter summary

The variables that are likely to shift smallholder cattle farmers to participate in mainstream cattle markets include the number of heifers, smallholder cattle farmers keeping of records, the number of years farming, level of education and smallholder farmers slaughtering of cattle and selling as carcass. Without the significant variables it will be difficult for smallholder cattle farmers in the study area to participate in mainstream cattle markets.

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Major findings of the study

With regards to the objectives of this research as highlighted in section 1.8 (see Chapter 1), the analyses of the empirical research results highlighted the following major findings:

Objective 1: Analysis of the demographic and socio-economic characteristics of smallholder cattle farmers in the study area.

The study highlighted that most farmers are male, married, practised Christianity, have no formal education, aged from 41 to 60 years of age, using self-labour service, having contact to extension service, contact occurs to extension service occurs occasionally, engaged in non-farming activities, most of them a are engaged in municipality projects, have been farming for less than 10 years, with a household number of less than or equal to five and dependents, have one family member assisting in farming, most of them are fulltime farmers, and having between 6 and 8 hectares of farming land.

It can be concluded from these findings that smallholder cattle farming is, mostly, male in orientation, practised by farmers without formal education, not involving more youth in cattle farming, not affording its practitioners to employ labourers for their cattle agricultural development; and practised by farmers without extensive experience in it. It can also be assumed that smallholder cattle farmers are full-time farmers because they are not employed either in governmental or private sector, and consequently smallholder cattle farming have become their means of providing self-employment. On the basis of the latter statement, they are using self-labour service as full-time practitioners of their farms as a means of avoiding costs of paying employees in their business. In this way they cannot be regarded as a viable source of employment for the general population of South Africa.

Objective 2: Assessment of existing cattle markets participated in by smallholder cattle farmers in the study area.

The results for this assessment were that smallholder cattle farmers mainly use informal marketing channels in marketing their cattle, and use auctions as their formal marketing

channel. It can be easily concluded that generally the smallholder cattle farmers do not have having access to a variety of cattle markets. Private/informal markets and auctions are easily accessible for them because of their reasonable distances of between 15 to 30 km to access auctions and less than 10 km to access private/informal markets. It can, therefore, be concluded that distances play a great role in smallholder cattle farmers' ability to access markets. In addition, smallholder cattle farmers may not be participating in a variety of cattle marketing because of their dissatisfaction with the conditions of the roads that link them to the various formal markets in their areas.

Objectives 3: Investigate factors that influence smallholder cattle farmers' choice of cattle marketing channels and reasons for selling.

The study revealed that smallholder cattle farmers travelled less than 10 km to access private sales, between 15 to 30 km to access auctions and less than 10km to access informal markets. The farmers receive higher prices from the cattle markets they regularly use and the majority of smallholder farmers do not participate in the most rewarding channels. Smallholder cattle farmers in the study area hire transport, trucks to transport their cattle to the relevant markets. Farmers are not satisfied with the condition of the roads that link them to the market. The majority of the farmers have access to market information, which they receive bi-annually in English. However, majority of the smallholder cattle farmers, do not have access to market information prior to sales, but would like to have regular sources to market information. They communicate with other smallholder cattle farmers through tribal meetings, consult with other smallholder cattle farmers before decision making, are not aware of role player organisations in agriculture, are not aware of role player organisations in agriculture, are not aware of role player organisations in livestock, and do not have a marketing plan and promote their products.

Majority of smallholder cattle farmers participate in markets where they receive payment in cash, do not perform price surveys before selling, are satisfied with farm gate prices of private sales, auction prices and open markets prices, and are not satisfied with prices from butchers and abattoirs. They have ended up declining selling prices in the following markets: private sales, speculators, butchers, abattoirs, auctions and open markets. Majority of the sampled smallholder cattle farmers notify buyers about their cattle through verbal communication and lack of transport to transport their cattle. The smallholder cattle farmers own 20 to 40 cattle, have an annual cost of production of between R11 000 and R19 000 and

highlighted that it was easy for them when to find buyers. Majority of the smallholder cattle farmers receive their information through the radio and considered ranked consumption of products as important information for production purposes as well as consumer price of products. They ranked the following information as important: abattoir volume, prices of production inputs and volume of imports and exports. Majority of the smallholder farmers regard market concentration as the most important factor that influence farmers' decision on selling price. The smallholder cattle farmers indicated that their reasons for keeping cattle were for savings, household consumption, ritual slaughter and feast ceremonies. The main reason for selling their cattle was to use the money for other livestock purchases. The majority of the smallholder cattle farmers indicated that they use their own savings to fund their cattle farming enterprises.

It is also clear from the findings that the smallholder cattle farmers do not have transport of their own for transporting their cattle to various marketing channels. The farmers indicated that they hire trucks to transport their cattle to their chosen markets where they can be able sell their cattle, which they regard as expensive. The latter conclusion is also accentuated by the smallholder cattle farmers' most popular indication that they were not participating in the most rewarding market channels because of high transactions costs.

The results of the analysis also show that smallholder cattle farmers' main reason for selling their cattle was to use the money for other livestock purchases, and that they use their own savings to fund their cattle farming. It can be assumed in these analyses that smallholder cattle farmers are concertedly determined to be involved in cattle farming to an extent of growing and developing their cattle farming businesses, even without funding from commercial banks and government. Smallholder cattle farmers not attending cattle farming workshops, not having contractual business agreements and not having regular customers can be linked to them not having formal education and, consequently, not having efficient and effective marketing skills.

Objectives 4: Analysis of marketing constraints

The results of the analysis highlighted that most of the smallholder cattle farmers perceive lack of financial and material support from government, search for market information, financial problems, distance to mainstream markets, bureaucracy, cattle theft and drought as the main constraints they face in their cattle farming. It can be concluded through this finding

that both the South African National and Provincial governments are still struggling in implementing effective policies to empower smallholder cattle farmers with financial and infrastructural facilities for developing their farm operations.

Objective 5: Analysis of the effects of socio-economic factors on smallholder cattle farmers' participation in mainstream cattle markets.

The study highlighted that smallholder cattle farmers' reasons for not participating in the most rewarding market channels were high transactions costs and herd size. The farmers do not attend cattle farming workshops, do not have contractual business agreements and do not have regular customers. Majority of the smallholder cattle farmers indicated that they do not keep farm records. The variables that are likely to shift smallholder cattle farmers to participate in mainstream cattle markets include the number of heifers, smallholder cattle farmers keeping of farm records, the number of years farming, level of education and smallholder farmers slaughtering of cattle and selling as carcass.

5.2 Conclusion

This research investigated the current debates surrounding determining and contributing factors responsible for smallholder farmers' participation in cattle markets. Majority of the smallholder cattle farmers use informal markets to market their cattle; mainly use auctions as a formal marketing channel and are a mostly familiar with informal marketing channels. The results highlighted that sampled smallholder cattle farmers' reasons for not participating in the most rewarding market channels were high transactions costs and herd size. The farmers do not attend cattle farming workshops; do not have contractual business agreements and do not have regular customers. Majority of the farmers reported keeping their preferred breeds to higher returns from those breeds. The most popular mainstream market smallholder cattle famers indicated was Auctions. The results of Probit regression model show that out of 15 independent variables considered, the coefficients for 5 variables were statistically significant. These were: the number of heifers ($Z=2.742$: $P<P0.05$), smallholder cattle farmers keeping of farm records ($Z=2.611$: $P<0.05$), the number of years in farming ($Z=-2.451$: $P<0.01$), level of education ($Z=-1.745$: $P<0.01$) and smallholder farmers slaughtering of cattle and selling as carcass ($Z=-1.899$: $P<0.01$).

5.3 Recommendations

Based on the research results of this study, the following recommendations are suggested to help cattle farmers to participate in the most rewarding marketing channels.

5.3.1 Recommendations for practical implementation

- Policy makers should focus more on smallholder cattle farmers if production of more beef in South Africa is to increase and more efficient and effective cattle farmers are to be increased, developed and produced.
- Since it became clear that distance from the farm to the market significantly affect channel choice decision among smallholder cattle farmers, government should ensure developing markets for cattle within reach of rural areas. This will motivate a lot of smallholder cattle farmers to participate in cattle/beef supply chain thereby by increasing their income and subsequently their livelihood.
- Government and agricultural industry organisations should commit in the mainstreaming of smallholder cattle farmers into the mainstream cattle markets and economic activity. In doing that government should design (in collaborations with relevant stakeholders) and implement initiatives to assist and accelerate the development of smallholder cattle farmers. Government should assist the farmers with; infrastructure, equipment, accreditation, market facilitation, business plan development and international exposure trips by voting for more funding similar to that in Education and Health sectors.
- Government and agricultural industry organisations should develop, design and implement formal educational initiatives in the form of programmes that have the efficacy to capacitate smallholder cattle farmers in the field of cattle farming. Such programmes should:
    - develop literacy levels on cattle farming;
    - specifically, train smallholder cattle farmers on cattle production, rearing, marketing etc. This must be directed at capacitating smallholder cattle farmers in developing or improving their productivity and levels of entrepreneurship; and
    - be in the language of trainees, that is to say: Smallholder cattle farmers in the North-West province should be trained in Setswana, while those in KwaZulu-

Natal should be trained in Setswana etc. This is an important consideration as smallholder cattle farming is practised in all provinces in South Africa.

These formally oriented educational initiatives would be a way of showing that the government and agricultural industry are revolutionizing smallholder cattle farming by, specifically, investing in human capacity development through initiatives such as mentoring, coaching and structured training programmes that are measureable in terms of impact on farmers trained. These programmes should be the custodians of Adult Basic Education and Training and Further Education and Training Centres. Such centres should have qualified scientists to provide Cattle Farming Science to smallholder cattle farmers without any formal education.

5.3.2 Recommendations for further research

Similar studies, which determine contributing factors responsible for smallholder farmers' participation in cattle markets, must be carried out to specifically include variables identified in literature that influence marketing channel choice decision such as, lack of market information, high transaction costs, poor transportation facilities and road infrastructure, lack of storage infrastructure, low and poor standards for livestock trade, no affiliations to grass root farmers' organizations, poor nutrition, as well as poor general husbandry. Such studies should also examine all likely channels as well as reveal the value accumulating to each channel. In addition, research should be done in market information distribution to cattle farmers focusing on various ways best producers of cattle and beef can get into market information particularly price.

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Appendix A

NORTH WEST UNIVERSITY
YUNIBESITI YA BOKONE BOPHIRIMA
NOORDWES UNIVERSITEIT
MAFIKENG CAMPUS

FACULTY OF AGRICULTURE, SCIENCE & TECHNOLOGY

SCHOOL OF AGRICULTURE

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Dear Sir/Madam,

TO WHOM IT MAY CONCERN

This is to introduce Ndumiso Mazibuko a Masters Degree student in the Department of Agricultural Economics and Extension, North-West University, Mafikeng Campus, South Africa. He is currently on his research work with farmers. The title of the research project is Determinants of smallholder cattle farmers' participation in cattle markets in Ngaka Modiri Molema District of the North West Province. Therefore, your assistance and cooperation is highly solicited for. Thank you for your envisioned understanding.

Yours faithfully,

Programme Coordinator

Appendix B

Questionnaire for smallholder cattle farmers

The overall aim of this questionnaire is to determine the participation of small holder farmers' in the cattle markets

Section A: DEMOGRAPHIC

Gender	**Male**	**1**
	Female	**2**

Age		**Years**

Marital Status	Single	1	Married	2	Divorced	3	Widowed	4

Religion	**Christianity**	**1**	**Muslims**	**2**	**Hinduism**	**3**	**Jews**	**4**	**Others**	**5**

Education Level	**No Formal Education**	**1**
	Primary School	**2**
	High School	**3**
	College	**4**
	University	**5**

Sources of land	**Personal**	**1**
	Rented	**2**
	Allocated through e.g.) Land Reform	**3**
Specify	**Other**	**4**

Are you a member of any farmer organisations (group)	**Yes**	**1**
	No	**2**

If yes please name them?	

What are your sources of labour	**Self**	**1**
	Family	**2**
	Hired	**3**

If yes how often	**Regularly**	**1**
	Occasionally	**2**
	Rarely	**3**
	Never	**4**
Do you have contact to extension services	**Yes**	**1**
	No	**2**

Where is the extension officer from	**Government**	**1**
	Non-Government	**2**
Specify	**Other**	**3**

Do you engage in non-farming activities	Yes	1
	No	2

If yes name them	

How long have you been farming		years

What is your household size		Persons

Total number of people in the household	1 Males	
	2 Females	

How many dependents do you have		Persons

How many household members assist with cattle farming		Persons

How many cattle do you have?	

Occupation	Pensioner	1
	Employed	2
	Full time-Farmer	3
	Unemployed	4
	Part time farmer	5
	Business	6
	Other (specify)	7

How many hectares in your farm do use for cattle farming		Ha

Cattle Composition:	
Cattle on the farm	Number of cattle
Oxen	
Bull	
Cows	
Heifers (cattle)	

The use of cattle on the farm	
	Use
Oxen	
Bull	
Cows	
Heifers (cattle)	

Which cattle marketing channel do you use regularly ?	
MARKET	**REASON**
Speculators	
Private sales	
Butchers	
Open markets	
Co-operatives	
Abattoirs	
Auction	
Informal	
Other (specify)	

Is your marketing channel formal or informal?	Informal=0
	Formal =1

How far is your farm from the markets where you sell?	Distance
Speculators	
Private sales	
Butchers	
Open markets	
Co-operatives	
Abattoirs	
Auction	
Informal	
Other (specify)	

How do you think the systems you are not satisfied with could be improved?

.....

.....

.....

.....

In terms of the market channels you use regularly, what are the main benefits?				
Receive high prices	Understand contract	Provide inputs	Nearer	Other (Specify)
1	2	3	4	5

Which channel do you regard as the most rewarding		
	Speculators	1
	Private sales	2
	Butchers	3
	Open markets	4
	Co-operatives	5
	Abattoirs	6
	Auction	7
	Informal	
	Other (specify)	8

Do you participate in the most rewarding channels?	Yes	No

If no what are the Reasons for not participating in	Poor quality cattle	1

the most rewarding channels	Size of herd	2
	Transaction costs	3
	Long distance to the market	4

How much are the average annual costs of production ?	R

Number of cattle sold per market time				Annually	
Cattle:	No.	Price/unit	Total income	No.	Price/unit
Cuffed bulls					
Cuffed cows					
Heifers					

What are your reasons for selling the cattle?	Reasons

Do you attend workshops to learn about cattle farming practices?			
Yes	How often?	No	Reason for not?

How difficult is it to look for buyers?	Easy	Fair	Difficult	Reasons

Do you have contractual agreements or a guaranteed / ready market (formal or informal) with any agribusiness outlet e.g. butchery?

Yes	No

Do you have regular customers, who always buy from you?

Yes	No

How do you distribute your animals when selling?	Hire transport (individual)	1
	Hire transport (group)	2
	Use own transport	3
	Move animals by foot	4
	Buyers transport	5

What type of transport do you use?	Own Bakkie	1
	Own Truck	2
	Trekking	3
	Own Tractor	4
	Hired truck	5
	Others	6

When selling, do you combine your livestock with other farmers?	Yes	1
	No	2

If yes, state the main reason	You sell at the same time	1

	You sell at the same market	2
	Others (specify)	3

List market channels available in your area.	Market channels:

The type of training available in your area	Training programme

How do you rate the quality of your cattle		
Poor	Good	Very Good

Are you satisfied with the total number of roads that link you to the market?	Yes	No

How do you obtain information about your output prices?						
Radio	Television	Newspapers	Internet	Extension	Friends	Other:
1	2	3	4	5	6	7

Are you a member of any farmers Union?	Yes	1
	No	2

If yes name them?	

If yes are you satisfied with the Unions in terms of technical information provision?	Yes	1
	No	2

How difficult is it looking for buyers for your cattle?		
Easy	Fair	Difficult
1	2	3

Do you have access to market information?	Yes	No
Do you receive market information?	Yes	No

Source		Type of information provided					
	Rank	Prices	Dates for sales	Buyers	Market demand	Market Opportunities	Other (specify)
Public administration							
Media							
Extension officers							
Friends							
Co-farmers							
Buyers							
Other (Specify)							

How often do you receive the information?					
Daily	Weekly	Monthly	Bi-annually	Annually	Other (specify)

Which language is used to deliver the market information?

....

What changes took place in your herds over the last year			
	Number		Number
Births		Sales	
Purchases		Death	
Exchanges for goods		Theft	
Received as gifts		Slaughtering	
Received for lobola		Gift made	
		Used for lobola	

How many cattle do you keep which you don't own? .....

What are the benefits of keeping the mostly preferred breed		Breed
Earn high returns	1	
Body weight is heavy	2	
Not easily stolen	3	
Easily adapt to harsh conditions	4	
Other	5	

What is the main factor creating risk when producing cattle	Drought	1
	Theft	2
	Predators	3
	Others	4

Do you milk your cattle	Yes	1
	No	2

If yes, what do you use your milk for	Home consumption	1
	Sales	2
	Other	3

If sold how many litres per day? .....
How much is price per litre? .....
If no, give a reason? .....

Do you use supplement to feed your livestock (e.g. licks,fodder ect.)	Supplement	Quantity /year	Price/year
	Fodder		
	Licks		
	Bonemeal		
	Other		

If not using supplement, what is the main reason	Expensive	1
	Market is far	2
	Other	3

Tick or Name the cattle production infrastructure you have...	Castrator	1
	Dehomer	2
	Feedlot	3
	All	4

	Other (such:)	5

Do you slaughter and sell carcass			No. Annual
	Yes	1	
	No	2	

If yes, where do sell it.	Consumers	1
	Butchers	2
	Other	3
Do you receive market information prior to sales	Yes	1
	No	2

What type of information do you get?	Market information	1
	Production information	2
	Financial management	3
	Animal husbandry	4
	Other (specify)	5

If you don't receive market information, would you like have a regular source in the future?	Yes	1
	No	2

What type of information would you like to receive	Dates of sales	1
	Sales price	2
	Buyers	3
	Production information	4
	Financial management	5
	Pasture management	6
	Other (specify)	7

How do you want it delivered?	By post	1
	By internet	2
	Cellphone SMS	3
	Extension officers	4
	Producer organisation	5
	Annual calendar	6
	Tribal meetings	7
	Commodity groups	8
	Other (specify)	9

How do you communicate with other farmers?	Tribal meetings	1
	Commodity groups	2
	Telephone	3
	Farmers unions	4
	Other specify	5

Do you consult other farmers before making decisions? Yes | No

If yes, what do you usually consult other farmers about?

.....

.....

.....

Are you aware of the role played by organisations in marketing?

Yes	No

Do you have a marketing plan?	Yes	1
	No	2

If yes, to what extend do you plan	Rough, incomplete plan	1
	Thorough planning	2

Are you aware of role player organisations within the livestock industry?	Yes	1
	No	2

Do you promote your products? .....

If no, do you realise a need for promotion? .....

How will you rate the following information in order of importance?				
	Not important	Less important	Important	Very important
Number of animals in feedlot	1	2	3	4
Abattoir volumes	1	2	3	4
Farm slaughter volume	1	2	3	4
Producers price of products	1	2	3	4
Consumption of products	1	2	3	4
Consumer price of products	1	2	3	4
Volume of imports and export	1	2	3	4
Value of imports and exports	1	2	3	4
Prices of production inputs	1	2	3	4
Others (specify)	1	2	3	4

Complete below for payments and how long it takes to receive the payment?				
List the marketing channel	How are you paid?			Time taken for the payment
	Cash	Cheque	Other (specify)	

Do you perform price surveys, before selling?

Yes	No

How is your price set during sales?				
I set the price	We negotiate	It is market driven	It is dictated by buyers	Other (Specify)

How do you decide the sale price of your livestock? (Mark with an X as appropriate)			
	Very important	Important	Not important
It depends on the price of other farmers			
It depends on the buyer			
It depends on the market we sell to			
It depends on the production costs			
It depends on the concentration of the market			
It depends on the transaction costs			

Are you satisfied with the farm gate prices?	CHANNEL	Yes	No
	Private sales	1	2
	Speculator	1	2

	Butcher	1	2
	Abattoir	1	2
	Auction	1	2
	Open market	1	2

Have you ever declined a selling price and ended up not selling	CHANNEL	Yes	No
	Private sales	1	2
	Speculator	1	2
	Butcher	1	2
	Abattoir	1	2
	Auction	1	2
	Open market	1	2

Have you ever sold an injured or sick animal	Yes	1
	No	2

Which are the main ways to notify people about sales	Announced	1
	Verbal communication	2
	Other (such as)	3

When you sell cattle, how is the fat condition? .....

What general problems do you experience when moving your cattle?	Small size of transport	1
	Lack of transport	2
	High transport costs	3
	Other (specify)	4

What missing resources would you need that you consider in improving your enterprise?	
Technique specification	
Technical Inputs	
Technical Information	
Technical Equipment	
Technical infrastructure	

If you have ever been denied grants what where the reasons?	Lack of invoices what has been sold	1
	Non residency of the community	2
	Lack of a performing account	3
	Lack of security (physical assets-farm machinery and livestock)	4
	Other (specify)	5

What are the main constraints that you face in running your cattle farming business?		
	Minor challenge	Major challenge

The search for information		
Lack of support by the government		
Lack of trust in the institutions		
Bureaucracy		
Financial		
Problems associated with crime		
Uncertainty of property rights		
Corruption problems		
Distance to the Market		
Levies		
Transport costs		

List what you consider to be the major problems you face in marketing your goods?

.....

.....

.....

Suggest ways in which such problems can be addressed?

.....

.....

.....

Have you ever attended short courses related to your cattle business	Yes	1
	No	2

If yes, which course	Budgeting	1
	Marketing	2
	Animal husbandry	3
	Other (specify)	4

If no, what specific training do you need	Budgeting	1
	Marketing	2
	Record keeping	3
	Animal husbandry	4
	Other (specify)	5

Do you keep farm records	Yes	1
	No	2

Where do you get money (Capital to invest in farming)?	
Source	Amount
Borrowing from the Bank	
Borrowing from friends	
Borrowing from your family	
Your own savings	
State Aid	
Other (such as :)	

Indicate the land tenure system on the land in use and how you acquired it			
Land tenure system		How you acquired the land	
Communal	1	Bought	1
Rent / Lease	2	Inherited	2
Privately owned	3	Resettled	3
		Leased	4

		Given by government	5
		Allocated by the headman	6

Do you vaccinate your cattle	Yes	1
	No	2

If yes, please indicate how often	Frequency:	
	Once per week	1
	Once per two weeks	2
	Once a month	3
	Twice a month	4
	Other (specify)	5

How do you rate the farming knowledge applied on your farm?

Farmers Knowledge	Poor	Average	Good

How was the knowledge Acquired	Experience	1
	Education	2

Employees knowledge	Poor	Average	Good

How was the knowledge Acquired	Experience	1
	Education	2

Which farm records do you keep?		
Records	Yes	No
Costs	1	2
Sales	1	2
Other (Such as:)	1	2
	1	2
	1	2
	1	2

Is your cattle graded before trading? Yes No

Do you have problems meeting the grades? Yes No

Do you have access to any of the following, indicate	Infrastructure		Condition		
			Bad	Fine	Good
	Sales pen	1			
	Loading ramps	2			
	Off loading ramps	3			
	Good roads	4			
	Value adding	5			
	Market info	6			
	Telephone	7			
	Computer	8			
	Water	9			
	Other (such as)	10			

Do you have a herdman	Yes	1
	No	2

If yes, how many are they? .....

What is their educational level	Formal	1
	Informal	2

How much is the herdman paid per month? .....

How do you rate their knowledge on the following?			
	Good	Fair	Poor
Mating	1	2	3
Gestation	1	2	3
Weaning	1	2	3
Handling	1	2	3
Pasture management	1	2	3

Do you have any financial institutions in your area?	Yes	1
	No	2

If yes, name the source	Commercial bank	1
	Agricultural cooperatives	2
	Land bank	3
	Credit union	4
	Stokvels	5
	Family and friends	6
	Credit club	7

What are the services received from the source used	Short-term loan	1
	Medium-term loan	2
	Long-term loan	3
	Others	4
	Other (Specify)	8

Have you applied for a loan before	Yes	1
	No	2

Did you receive the loan	Yes	1
	No	2

Why do you keep your cattle?				
	Not important	Less important	Important	Very important
House hold consumption	1	2	3	4
Ritual slaughter	1	2	3	4
Sales	1	2	3	4
Savings	1	2	3	4
Feast and ceremonies (lobola)	1	2	3	4
Drought power	1	2	3	4
Other (specify)	1	2	3	4

How many do you keep for?		No:
	Household consumption	
	Sales	
	Savings	
	Feasts and ceremonies	
	Drought Power	

Before selling your produce what value adding activities do you perform? (tick at appropriate)		
Activity	Tick	Importance
Washing		
Cutting/ Slaughtering		
Take to feedlot		
Other (specify)		

Do you want to increase your herd sizes	Yes	1
	No	2

If yes, give three main strategies on how you will increase your herd sizes	By not selling for a while	1
	By improving the breeding stock	2
	Both	3
	Other (such as)	4

What is the main reason for selling your cattle?	
Drought	1
I need cash for household consumption	2
I need cash for other livestock purchases	3
I need money to pay for my kids school fees	4
I want to repay a loan	5
Other (specify)	6

Who assists you in decision making	Extension officers	1
	Private agents	2
	Family members	3
	Co-farmers	4
	Other specify	5

How many times a year are each of this cattle available in the farm sold				
	Easter	June	Festive sea	All year
Oxen				
Bull				
Cows				
Heifers (cattle)				

Please indicate the number of cattle Bought and Sold in the last 12 months		
	Bought	Sold
Oxen		
Bull		
Cows		
Heifers (cattle)		

What are the main constraints that prevent you from selling your cattle to the high value markets?	

Are you willing to participate in the mainstream cattle markets?	Yes
	No

If yes: reasons	
If no: reasons	