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COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

BY

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PREFACE

During colonial rule in sub-Saharan Africa in general and specifically during apartheid in South Africa commercial agriculture received unfair promotion and advantage over the communal subsector. The majority of blacks were thus excluded from the mainstream formal agricultural economy. Such exclusion of blacks from the mainstream formal economy resulted in excessive poverty and inequality among these South Africans. When they assumed power in 1994, the new South African democratic government began a process of bridging the gap between subsistence agriculture and commercial agriculture by commercialising the subsistence subsector. This policy-shift imperative has however until very recently achieved but little. In particular, access to factors of production and of participation in the mainstream formal market still largely favours the commercial subsector to the detriment of black farmers – mostly those in the so-called Bantustans. Also, where progress has indeed been recorded in this commercialisation initiative, such progress has been very insignificant. The slow pace of this commercialisation has led to some perpetuation of race-based poverty and socio-economic inequalities in South Africa. As much as the new commercialisation initiative provides some obvious opportunities for the resource-poor farmers specifically in the communal subsector, it is however obvious that some considerable constraints are confronting this process. Identifying the opportunities and the constraints that face this process is critical for policy-makers, for the communal farming community, for the other stakeholders of this process and for the agricultural development initiatives currently being undertaken in South Africa in general. A poor understanding of the prevailing opportunities and the subsequent constraining factors of this process might affect the expected policy development and, in addition, the implementation of the said process. Furthermore, public programmes in respect of government's targets on poverty alleviation, removal of socio-economic inequalities and economic rehabilitation among formally disadvantaged black farmers could also be seriously constrained. The researcher developed an interest in the success of this particular commercialisation process as it was unfolding in South Africa and decided to embark on the present study with a particular emphasis on the identification of the opportunities and constraints in respect of the said process. The contribution of the study towards, on the one hand, finding solutions to the constraints of this process and, on the other, subsequently identifying its opportunities could be immense in respect both of the material facts of the process and the development of some new empirical knowledge, particularly in the fields of sustainable community development, sustainable agriculture and/or agricultural economics among others. Critical evaluation of the findings of the study could provide some basis for some further research in this field, which is the ultimate objective of the study.

MAFUKATA M.A.

VOORWOORD

Gedurende die koloniale bewind in sub-Sahara-Afrika in die algemeen en in besonder gedurende die apartheidsera in Suid-Afrika is kommersiële landbou op onregverdige wyse bo die bestaanskommunale subsektor bevorder en bevoordeel. Aldus is die meerderheid swartes van die hoofstroom formele landbou-ekonomie uitgesluit. Die gevolg van sodanige uitsluiting van die hoofstroom formele ekonomie was buitensporige armoede en ongelykheid onder swart Suid-Afrikaners. By hul bewindsaanvaarding in 1994 het die nuwe Suid-Afrikaanse demokratiese regering 'n proses aan die gang gesit om die gaping tussen bestaans- en kommersiële landbou te oorbrug deur die kommersialisering van die bestaanssubsektor. Hierdie beleidsverskuiwende imperatief het egter tot baie onlangs weinig verrig. Die toegang tot produksiefaktore en deelname aan die hoofstroom formele mark bevorder die kommersiële subsektor in groot mate ten koste van swart boere – meestal dié in die sogenaamde Bantoestans. Waar vordering ten opsigte van hierdie kommersialiseringsinisiatief wel gemaak is, was sodanige vordering onbeduidend. Die slakkegang van hierdie kommersialisering het aanleiding gegee tot die perpetuering van ras-gebaseerde armoede en sosio-ekonomiese ongelykhede in Suid-Afrika. Desnieteenstaande die feit dat die nuwe kommersialiseringsinisiatief sekere ooglopende geleenthede vir boere met 'n gebrek aan hulpbronne bied, veral in die bestaanskommunale subsektor, is dit egter duidelik dat dié proses voor 'n aantal beduidende beperkinge te staan kom. Dit is krities dat beleidvormers, die bestaanskommunale boerderygemeenskap, die ander belanghebbendes by hierdie proses en landboukundige ontwikkelingsinisiatiewe wat in die algemeen tans in Suid-Afrika onderneem word, die geleenthede en beperkinge wat die proses in die gesig staar, sal identifiseer. Gebrekkige begrip van die heersende geleenthede en die gevolglike beperkende faktore in hierdie proses kan sowel die verwagte beleidsontwikkeling as die implementering van die genoemde proses beïnvloed. Boonop kan openbare programme ten opsigte van die regering se teikens vir armoedeverligting, asook die verwydering van sosio-ekonomiese ongelykhede en die ekonomiese rehabilitasie van voorheen benadeelde swart boere ernstig aan bande gelê word. Die navorser het 'n belangstelling ontwikkel in die sukses van hierdie besondere kommersialiseringsproses soos dit in Suid-Afrika ontplooi het en het besluit om die huidige studie te onderneem met die bepaalde klem op die identifisering van die geleenthede en beperkinge van die genoemde proses. Hierdie studie kan potensieel 'n besondere bydrae lewer ten opsigte van sowel die materiële feite van die proses as die ontwikkeling van nuwe empiriese kennis, veral op die gebiede van volhoubare gemeenskapsontwikkeling, volhoubare landbou en/of landbou-ekonomie – enersyds deur die vind van oplossings vir die beperkinge van hierdie proses en andersyds deur die daaropvolgende identifisering van geleenthede. 'n Kritiese evaluering van die bevindinge van hierdie studie kan ook die grondslag vorm vir verdere navorsing op hierdie terrein – die uiteindelike doel van hierdie studie.

MAFUKATA M.A.

DECLARATION

I declare that this thesis "**Commercialisation of communal cattle-production systems in the Musekwa Valley**" hereby submitted for the degree of Doctor of Philosophy at the University of the Free State, is my own independent work, and has not been submitted for the purpose to any other University. I hereby forfeit any copying of this thesis to the University of the Free State.

Ek verklaar dat die proefskrif "**Commercialisation of communal cattle-production systems in the Musekwa Valley**" wat hierby vir die graad Doktorandus van Filosofie aan die Universteit van die Vrystaat deur my ingedien word, selfstandige werk en nie voorheen deur my vir 'n ander universiteit ingedien is nie. Ek doen voorts afstand van die outeurreg van die proefskrif ten gunste van die Universteit van die Vrystaat.

_____ .....

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Supervisor: Date

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Co-Supervisor: Date

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To all of you and many others too many to mention I say "*...it is not the critic who counts, not the person who points out how the strong stumbles or where the doer of deeds could have done them better. The credit belongs to the person who is actually in the arena, whose face is marred with dust and sweat and blood, who strives valiantly, who errs and comes up short again and again because there is no effort without error and short-comings, who knows the great devotion, who spends himself in a worthy cause, who at the best knows in the end the achievement of triumph and at worst, if he fails while daring greatly, knows his place shall never be with those timid and cold souls who know neither victory nor defeat...*"

Theodore Roosevelt

DEDICATION

This thesis is dedicated to all those children who still walk long distances to school around the world and also to the late Mr Ramudzuli Aubrey Mukhodobwane who laboured hard under unbearable working conditions to see the success of poor African children. I haven't met a teacher who tried so much hard than this hero in the education field. To my late Mom Vho-Mbulaheni Mushaathama Johanna *nee* Makhavhu-Ramabulana and my dad Vho-Muvhulawa Wilson who gave their all, working hard from dawn to dask on the farms around Pretoria to bring me thus far. I can't wish otherwise, you were not supposed to be here to witness this achievement. Let God receive all the Glory!

Above all, I also dedicate this thesis to my co-supervisor Dr Luis Schwalbach and his wife who both died tragically during its finalisation.

LIST OF ACRONYMS

ABET	:	Adult Basic Education and Training
ACR	:	Agricultural Commercialisation Roadmap for communal production systems
ACR	:	Agricultural Commercialisation Roadmap
ADB	:	African Development Bank
AEASA	:	Agricultural Economic Association of South Africa
Agri-BEE	:	Agriculture Black Economic Empowerment
AIACC	:	Assessment of Impacts and Adaptations to Climatic Change
Aida	:	Animal Identification Act
ANSA	:	Affiliated Network for Social Accountability
ARC	:	Agricultural Research Council
ASARECA	:	Association for Agricultural Research in Eastern and Southern Africa
ASGISA	:	Accelerated Shared Growth Initiative in South Africa
BBBEE	:	Broad Based Black Economic Empowerment
BC	:	Before Christ
BIM	:	Banco Internacional de Mozambique
BSE	:	Bovine Encepphalopathy
BVV-1	:	Bovine heresvirus type 1
CASP	:	Comprehensive Agricultural Support Programme
CBO	:	Community Based Organisation
CEEPA	:	The Centre for Environmental Economics and Policy in Africa
CF	:	Contract farming
CHH	:	Child-headed Household
CODESRIA	:	Council for the Development of Social Science Research in Africa
Danida	:	Danish International Development Assistance
DOA	:	Department of Agriculture
Eskom	:	Electricity Supply Commission
EU	:	European Union
FAO	:	Food and Agriculture Organisation of the United Nation
FMD	:	Foot and Mouth Disease
GCIS	:	Government Communication Information Service

GDP	:	Gross Domestic Product
GGP	:	Gross Geographical Product
GNP	:	Gross National product
HDI	:	Human Development Index
ICN	:	International Classification for Nursing
ICNP	:	International Classification for Nursing Practice Programme
IDT	:	Independent Development Trust
IFAD	:	International Fund for Agricultural Development
IFPRI	:	International Food Policy Research
ILRI	:	International Research Institute
IRIN	:	Investor Relations Information Network
ITCZ	:	Inter-tropical Convergence Zone
KyD	:	Kaonafatso ya Dikgomo
LDoA	:	Limpopo Department of Agriculture
LGDS	:	Limpopo Growth and Development Strategy
LRAD	:	Land for Redistribution and Agricultural Development
LSD	:	Lumpy Skin Disease
LTA	:	Land Tenure Act
MAFISA	:	Micro-Finance Scheme for Agriculture in South Africa
Mm	:	milimetre
MT	:	Farm/Trust Number
n.d.	:	Not dated/undated
NAFU	:	National African Farmers Union
NAMC	:	National Agricultural Marketing Council
NEPAD	:	New Partnership for African Development
NERPO	:	National Emerging Red meat Producers Organisation
PLAAS	:	Programme for Land and Agrarian Studies
R & D	:	Research and Development
RDP	:	Reconstruction and Development Programme
REPS	:	Rural Environmental Protection Scheme
RLRA	:	Restitution of Land Rights Act
SANPAD	:	South Africa and the Netherlands Research Programme on Alternatives in Development
SAS	:	Statistical Analysis System
SLAG	:	Settlement Land Acquisition Grant
TBD	:	Tick-borne Diseases

US$	:	United States Dollar
USAID	:	United States Agency for International Development
VVP	:	Village Pay Phone

GLOSSARY

Word	Meaning
Bantustans	Reserves known as homelands created for Black South Africans by the apartheid regime
Khoro	Community gatherings that are held at the chief's homestead
Lobola	Payment for a bride to the in-laws when getting married
Muxwatu	A local shrub that grows at Dolidoli village and used by the locals to treat fresh wounds
Tshivenda	A local indigenous dialect spoken by the Vhavenda tribe of Northern Limpopo Province of South Africa
Ukuthwala	A tribal practice by the Xhosa in the Easter Cape Province, South Africa where young girls are forcefully taken away for marriage
Vhandalamo	One of the many tribal clans found in the Limpopo Province among the Venda Tribe of South Africa – especially in the Northern part of the Vhembe District.
Vhatwanamba	One of the many tribal clans found in the Limpopo Province among the Venda Tribe of South Africa – especially in the Northern part of the Vhembe District.
Wakulima shushushu	Agricultural middlemen and marketing agents in Tanzania

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COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

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Abstract

This study was conducted among 55 (n=55) randomly selected communal cattle farmers in the Musekwa Valley of the Limpopo Province, South Africa. The farmers were interviewed using closed and open-ended questions as part of a structured questionnaire-based survey. Thirty key informants were further profiled and interviewed using both closed and open-ended questions. The main objective of the study was to investigate the constraints on and the opportunities for the commercialisation of communal cattle-production systems in the study area. The specific objectives were to characterise both the communal production systems and also the cattle farmers. The study further estimated the productivity of the communal cattle-production systems and additionally measured the degree of participation of cattle farmers in the mainstream formal cattle-marketing activities in the study area. The results of the study revealed that all the interviewed communal cattle farmers in the study area did indeed farm in a communal land-use system. In addition, the results revealed that the majority of the communal cattle farmers in the study area were old, lacked proper formal school education, had poor basic literacy, and lacked entrepreneurial and animal husbandry skills that constrained commercialisation of this particular cattle-production subsector.

The descriptive results of the study revealed the majority of the communal cattle farmers in the study area to be poor adopters of banking (52.7%), animal breeding (74.1%), farm insurance (100.0%), loans and credit (92.7%), private land (100.0%), own transport (94.5%), commodity marketing (60.0%) and membership of formal farmer organisations (80.0%). The empirical results of the study revealed that 60.0% of these particular cattle

farmers were probably not productive, while only 40.0% were probably productive. The majority of the cattle farmers are currently still largely subsistence orientated in that the results revealed that 56.4% of the farmers were selling their animals through informal marketing channels and only 43.6% were selling through formal marketing channels.

Cattle production, productivity and mainstream formal cattle marketing are mainly constrained by these farmers' poor access to cattle-production inputs, meagre household endowments, poor adoption of modern technologies, lack of on- and off-farm infrastructure, inadequate skills in animal husbandry and the weak institutional support provided to them. Furthermore, the empirical results revealed that distance to the mainstream formal cattle market, the poor keeping of farm records, cattle ownership and weaning of calves had the most significant impact on farm productivity and on mainstream formal cattle-market participation among the farmers. Among the opportunities revealed by the results of the study were the current pro-poor agricultural policy developed by the South African government specifically to reform and commercialise the communal agricultural systems, good farmer experience regarding cattle production, the existing formal cattle-marketing options and the willingness of farmers to adopt new cattle-production and -marketing technologies and skills. Measured on the Agricultural Commercialisation Continuum (ACC), the cattle-production systems in the study area displayed some increased characteristics of a highly subsistence-oriented agricultural production system.

Key words: ***communal cattle farmer, market participation, commercialisation, Agricultural Commercialisation Continuum (ACC), Agricultural Commercialisation Roadmap (ACR), transaction costs, productivity, loan, farmer organisations***

Samevatting

Hierdie studie is uitgevoer onder 55 (n=55) ewekansig-geselekteerde bestaanskommunale veeboere van die Musekwa Vallei in die Limpopo Provinsie van Suid-Afrika. Onderhoude is met dié boere gevoer aan die hand van oop en geslote vrae wat deel was van 'n gestruktureerde, vraelysgebaseerde opname. Die profiele van dertig sleutelinformante is opgestel, waarna onderhoude met hulle gevoer is aan die hand van oop en geslote vrae. Die hoofdoelwit van die studie was om ondersoek in te stel na die beperkinge op en die geleenthede vir die kommersialisering van kommunale veeproduksiestelsels in die studiegebied. Die spesifieke doelwitte was die tipering van sowel die kommunale produksiestelsels as die veeboere. Verder het die studie die produktiwiteit van die kommunale veeproduksiestelsels beraam, asook die mate waarin veeboere deelgeneem het aan die hoofstroom, formele veebemarkingsaktiwiteite in die studiegebied. Volgens die bevindinge van die studie het al die kommunale veeboere in die studiegebied met wie onderhoude gevoer is inderdaad by wyse van 'n kommunale grondgebruikstelsel geboer. Die bevindinge het ook getoon dat die meerderheid van die kommunale veeboere in die studiegebied oud was, 'n gebrek aan behoorlike formele skoolonderrig gehad het, oor swak basiese geletterdheid beskik het en 'n gebrek aan entrepreneuriese en veeteeltvaardighede gehad het wat die kommersialisering van hierdie besondere veeproduksiesubsektor aan bande gelê het.

Die beskrywende bevindinge van die studie het aangedui dat die meerderheid van die kommunale veeboere in die studiegebied nie van banke (52.7%), diereteling (74.1%), plaasversekering (100.0%), lenings en krediet (92.7%), private grond (100.0%), eie vervoer (94.5%), kommoditeitsbemarking (60.0%) en lidmaatskap van formele landbou-organisasies (80.0%) gebruik gemaak het nie. Die empiriese bevindinge van die studie het aan die lig gebring dat 60.0% van hierdie spesifieke veeboere waarskynlik nie produktief was nie, terwyl slegs 40.0% waarskynlik was. Die meerderheid van die veeboere is tans steeds grootliks bestaansgeoriënteerd deurdat die bevindinge aangetoon het dat 56.4% van die boere hul diere deur middel van informele bemarkingskanale en slegs 43.6% deur middel van formele bemarkingskanale verkoop het.

Veeproduksie, produktiwiteit en hoofstroom formele veebemarking word veral aan bande gelê deur hierdie boere se gebrekkige toegang tot veeproduksie-insette, die karige

beskikbaarheid van huishoudelike middele, ontoereikende aanvaarding van moderne tegnologieë, die gebrek aan op-die-plaas- of weg-van-die-plaasinfrastruktuur, onvoldoende veeteeltvaardighede en die swak institusionele ondersteuning wat aan hulle voorsien word. Die empiriese bevindinge het verder aangetoon dat afstand na die hoofstroom formele veemark, gebrekkige byhou van plaasboekhouding en ontoereikende tegnologieë ten opsigte van vee-eienaarskap en die speen van kalwers die mees betekenisvolle impak op boere se plaasproduktiwiteit en op hoofstroom formele veemarkdeelname gehad het. Van die geleenthede wat tydens die studie aan die lig gekom het, was die huidige landboukundige beleid gemik op armes wat deur die Suid-Afrikaanse regering ontwikkel is met as spesifieke oogmerk die hervorming en kommersialisering van die kommunale landboukundige stelsel, 'n positiewe ervaring deur die boer aangaande veeproduksie, boere se goeie ervarings in verband met veeproduksie, die bestaande formele veebemarkingsopsies en boere se bereidwilligheid om nuwe veeproduksie en -bemarkingstegnologieë en -vaardighede toe te pas. Gemeet aan die Landboukundige Kommersialiseringskontinuum, het die veeproduksiestelsels in die studiegebied enkele eienskappe vertoon van 'n landboukundige stelsel wat in 'n hoë mate bestaansgeoriënteerd is.

Sleutelterme: kommunale veeboer, markdeelname, kommersialisering, Landboukundige Kommersialiseringskontinuum, Landboukundige Kommersialiseringspadkaart (ACR), transaksiekoste, produktiwiteit, lening, landbou-organisasies

CHAPTER 1

ORIENTATION TO AND BACKGROUND OF THE STUDY

"...one of the most serious post-independence errors of judgment by African nations is lack of political wisdom to give priority to agriculture and rural development..." Mandivamba Rukuni in Mbeki (2011: 207).

1.1GENERAL INTRODUCTION

This chapter serves as a general introduction to the study and provides the necessary background and justification for the study. It also describes the research problem, explains the study objectives, gives a brief description of the study area, the reasons for the choice of the Musekwa Valley study area and describes the general layout of the study.

1.2 BACKGROUND TO AND MOTIVATION FOR THE STUDY

Most of the post-colonial countries in sub-Saharan Africa – including South Africa – had dual or so-called "*two agricultures*" agricultural production systems inherited from the colonial and from the apartheid regimes (Mmbengwa, 2009; Van Schalkwyk *et al.*, 2007; Vink, 1993; Williams *et al.,* 2008). Thus, on the one hand, there was the resource-poor communal subsistence agricultural system and, on the other, the well-endowed privatised commercial agricultural system (Mapekula, 2009; Mngomezulu, 2010; Roth & Haase, 1998; Van Schalkwyk *et al.,* 2007). In South Africa, the communal beef cattle production system constituted the oldest cattle subsector – especially for the Africans (ARC, 2011: 25; Nengovhela, 2010) providing livelihoods and household income to millions of resource-poor rural populace.

Prior to independence and liberation in most of these sub-Saharan African countries, blacks were forced both to stay and to farm in the overcrowded, fragmented and under resourced communal areas (Agergaard & Birch-Thomsen, 2006) marred by adverse poverty, food insecurity and low household incomes that were below the poverty line – especially in South Africa (Monde *et al.,* 2006). Whites on the one hand stayed and farmed in well-resourced private commercial areas in highly commercialised production systems yielding massive economic returns (Kadzere, 1999; Montshwe, 2006; Morgan & Tallard, 2006; Mudhara, 2010). It is evident that the actions of the minority white colonial and apartheid regimes were informed by a combination of their long-

existing stereotypical attitudes, culture, values and theories about Africa and Africans (Richner, 2005) which Mazibuko (2010) argued promoted *"...unbalanced relationship between indigenous people and non-indigenous people throughout the world...resulting in the exploitation of the indigenous people for the benefit of dominating non-indigenous groups..."* Mazibuko (2010) furthermore argued that the consequences of this unbalanced relationships and stereotype tendencies between indigenous and non-indigenous people goes beyond lack of income and wealth among the exploited indigenous peoples – it also alienates the indigenous peoples to social inferiority, expose them to socio-economic vulnerability and in addition perpetuate their continuous social isolation – making such groups to remain in the so-called "*poverty trap*" with increasingly limited technical and economic opportunities (Pote, 2008).

Mmbengwa (2009) further argues that the main aim of this dual agricultural system in South Africa was to exclude blacks from the mainstream formal agricultural economy based on the so-called "*separate development*" principle. This approach therefore created massive socio-economic challenges in the country (Van Schalkwyk *et al.,* 2007) with the black communities who were mainly located in the so-called homelands created by the notorious Bantu Self-Government Act of 1959 becoming both economically disadvantaged and marginalised in terms of allocation of productive resources (Agergaard & Birch-Thomsen, 2006; Manona, 2005; Terreblanche, 2002). As a result, black communities in South Africa were effectively confined to low-income subsistence communal farming. Against the subsistence approach characterising black agriculture, white farmers became increasingly profit-minded, economically viable and highly competitive (Adams *et al.,* 1999; Koranteng, 2010; Oettle *et al.,* 1998; Pote, 2008; Van Schalkwyk *et al.*, 2007; Verschoor, 2003; Vink & Van Rooyen, 2009; Xingwana, 2009). Clearly, two distinct first and second agricultural economies were created effectively shaped by race attitudes laws – one low-incomed and the other highly incomed and competitive (Nengovhela, 2010).

Various laws and policies were developed by the apartheid regime further to perpetuate discrimination, exclusion and the marginalisation of blacks from commercial agricultural economy (Nthakheni, 2006; Randela, 2005). The said practice eventually resulted in increased race-based poverty (Mbuli, 2008) and in further socio-economic disparities between black South Africans and white South Africans (Baloyi, 2010; Barrett, 2007; Behnke, 2006; Gilimani, 2005; Grwambi *et al.,* 2006, Jones *et al.*, 2002; Kirsten & Van Zyl, 1998; Manona, 2005; Mistry, 2000: 178; Moyo, 2003; Mudau, 2010; Simbi & Aliber, 2000; Vink & Van Rooyen, 2009; Wynne &

Lyne, 2003) making South Africa one of the highest most socio-economically unequal societies in the world (Leibbrandt *et al.,* 2010; Mbuli, 2008; Woolard, 2002).

So as further to consolidate this practice, blacks were systematically reduced to being suppliers of cheap migrant labour for especially the white-dominated commercial agricultural and mining operations (Mistry, 2000; Simbi & Aliber, 2000; Vink & Van Rooyen, 2009) furthermore pushing and adding to the economic and poverty hardships among resource-poor black population in South Africa (Cloete, 2010). It is evident that, both now and in the future, socio-economic issues in South Africa will largely be determined by the country's political and historical past (Mbeki, 2011: 15) as such factors still influence modern socio-economic environment in South Africa – and the Southern African Development Community (SADC) region as a whole (Atanda, 2011). This assertion is corroborated by Moabelo (2007) who argued that political and social processes in South Africa have determined and shaped access and ownership of productive resources such as land among others – especially among the resource-poor black people. It is clear that socio-economic practices in South Africa are linked precisely with the much longer global and local history that propagated racial inequality and neo-colonial domination of the blacks (Cronin, 2012: 1).

It was after independence and liberation in most of the formerly colonised African countries, that the majority of governments and international development agencies began to commercialise their communal farming systems with a view to making them more viable, productive, sustainable and commercially orientated (Abera, 2009; Gebre-Medhin *et al.,* 2006; Gilimani, 2005; Mudbhary, 2006; Negassa & Jabbar, 2007; Randela, 2005; Satyasai & Viswanathan, 1997). The arguments advanced by most of these post-independence governments for commercialising their communal agricultural production systems were largely based on what Abera (2009), Gibreel (2002) and Govereh *et al.* (1999) hinted at in the following "*... meeting the challenge of improving rural incomes in Africa will require some form of transformation out of the semi-subsistence, low-income and low-productivity farming systems that currently characterised much of rural Africa ...*"

In addition, these governments argued that the existing dual agricultural systems continued to perpetuate economic marginalisation, poverty and socio-economic inequalities among society and that communal systems in the majority of post-independence countries were ready to be commercialised (Barret, 2007; Chipeta *et al.*, 2008; FAO, 2008; Jaleta *et al.,* 2009; Randela, 2005). Further assumptions of these governments were that such commercialisation might, in

addition, improve government revenues through increased foreign exchange earnings and an increased tax base, which could in turn be used to finance several other government investments in, among others, job-creation and social-protection initiatives (Chilonda *et al.*, 2007; Cullis & Watson, 2005; Meyer *et al.*, 2009; Moloi, 2008; Randela, 2000; Teshome, 2006) – especially among those countries whose economies were largely dependent on their agricultures because they lacked mineral deposits and oil reserves in particular (Davies, 2008). Furthermore, the said governments also envisaged that commercialisation of the communal agricultural production systems could potentially provide a useful strategy and approach to maximise the targets of the Millennium Development Goals (MDGs) and also global economic integration of the agricultural sector (FAC CAADP, 2011; Mbeki, 2011: 16). However, it became evident that the perpetual dual agricultural policy – specifically in South Africa and generally in sub-Saharan Africa – would continue severely to compromise the MDG targets, particularly in relation to poverty reduction among the vulnerable groups such as female and child-headed households (Zuwarimwe & Kirsten, 2011).

Most countries in sub-Saharan Africa commenced with the commercialisation of the communal agricultural subsector almost three decades ago (Mbeki, 2011: 212). For example, the Sudan started its commercialisation of communal agriculture process back in the colonial time (Gibreel, 2002). South Africa only began its agricultural commercialisation process in the mid-1990s (Grwambi *et al.*, 2006; Randela, 2005). Policies that would motivate and encourage communal farmers to commercialise their agricultural production systems were developed and subsequently implemented (Van Averbeke & Mohamed, 2006). For example, African heads of State called for an accelerated agricultural development and commercialisation initiative in the African continent by adopting the so-called Comprehensive African Agricultural Development Programme (CAADP) which they argued would improve agricultural output in the African countries by approximately 6.0% *per annum* in the next 20 years from the year 2002 (Mmbengwa, 2009). On the other hand, the new South African democratic government argued that commercialisation of communal agriculture in this country might improve the appalling socio-economic conditions of the resource-poor black farmers and of the rural poor – particularly those in the former Bantustans where the majority of the poor live (Lahiff, 1997a; Manona, 2005; Nesamvuni *et al.*, 2003; Nthakheni, 2006; Randela, 2005; Xingwana, 2008).

Based on the impact of the so-called dual race-based agriculture, the South African government sought to redress the situation, among others by adopting what some studies (Leibbrandt *et al.*,

2010; Van der Berg & Louw, 2003) called an economic redistributive policy. Therefore the new programme known as the Reconstruction and Development Programme (RDP) with regard to agricultural commercialisation policy framework received strong support from what the former president of the Republic Mr Thabo Mbeki argued when he hinted thus *"...no economy can meet its potential if any part of its citizens is not fully integrated into all aspects of that economy..."* In view of the assertion by President Thabo Mbeki, Mbuli (2008) argued that *"...endemic and widespread poverty continues to disfigure the face of our country. It will always be impossible for us to say that we have fully restored the dignity of all our people as long as this situation persists. For this reason, the struggle, to eradicate poverty has been, and will continue to be, a central part of national efforts to build the new South Africa..."*

From these assertions, it is evident that President Mbeki had recognized the fact that South Africa's economic practices; be they in agriculture, manufacturing, provision of service among others were not inclusive or representative enough of the general populace of the country – but excluded certain segments of society in particular black people. In view of Mbeki's argument, it is therefore clear why the African National Congress (ANC) government which Mbeki represented premised and strongly believed that the new agricultural policy framework might improve the socio-economic conditions of the resource-poor black farmers and the rural poor in particular with special focus on those in the former Bantustans in particular who are basically among the poorest of the poor in South Africa (Lahiff, 1997a; Manona, 2005; Nesamvuni *et al.*, 2003; Nthakheni, 2006; Randela, 2005; Xingwana, 2008). To furthermore consolidate the pro-poor ambition of the post-apartheid government to redress inequality in the South African economy, the government began to establish and support new economic ventures targeting the formerly disadvantaged poor blacks in particular in all economic sectors including agriculture (Olubode-Awosola, 2006). In addition, the South African government sought to increase black agribusiness entrepreneurs by at least five percent *per annum* and to also improve agricultural government support services to assist the emerging black farmers (Mmbengwa, 2009).

Based on this ambition, it became clear that the marginalised African communal resource-poor farmers had to be integrated into the mainstream formal economic activities as active participants – which might increase opportunities for the black farmers to become active participants in the socio-economic practices of this country (Schultz, 2012). This further strengthened the argument of the former President of the Republic, Nelson Mandela who once hinted thus *"...changing the inequality and inefficiency of the apartheid regime in South Africa,*

rural areas can become productive and sustainable..." (Jiyane, 2002). As a result, pro-poor agricultural policies envisaged to motivate and encourage communal farmers to commercialise their agricultural production systems began to unfold (Van Averbeke & Mohamed, 2006). These new policies were hoping to promote black economic empowerment and poverty reduction among others (Olubode-Awosola, 2006; Randela, 2005) believing that "*...no country has ever achieved major increases in productivity and the material standards of living of its citizens without a structural transformation of its economy...*" as hinted by Staatz *et al.* (1993). In other words, Staatz *et al.* (1993) argued that improving people's living standards in sub-Saharan Africa was to be improved from agricultural transformation from subsistence-orientated production towards an integrated market-orientated economy. Such transformations began to take place in the 1980s and 1990s in most African countries.

The so-called commercialisation of African agriculture was to be achieved by shifting of economic policy to a more pro-poor approach with more focus on increased rural development (Hall & Aliber, 2010) and by removing barrier factors such as poor access to productive resources to agricultural marketisation and development (Staatz *et al.,* 1993). In South Africa, most of these barrier factors emanated from apartheid (Olubode-Awosola, 2006). This study therefore focuses on the commercialisation of communal farming as it has evolved in South Africa, with a particular focus on the livestock-production systems. However, the study also recognises that livestock-production systems in South Africa are too wide to be studied in a single study of this nature and hence the focus on specifically the cattle-production systems.

1.3 RESEARCH PROBLEM STATEMENT AND RESEARCH QUESTIONS

Since the late 1990s, the South African government has been engaged in a process of commercialising its communal agricultural production systems, the ultimate goal being to create a new, unified agricultural economy. Government argued that this would be achieved by dismantling the apartheid-created dual agricultural economy that had hitherto marginalised, perpetuated and entrenched poverty, especially among resource-poor black farmers despite the latter also being capable and efficient farmers who were furthermore ready to commercialise (Grwambi *et al.,* 2006; Mudau, 2010; Mudhara, 2010; Pote, 2008; Van Averbeke & Mohamed, 2006). Various policies were developed to facilitate such commercialisation (Mthembu, 2008; Randela, 2005; South Africa Yearbook, 2003/2004: 65). For example, Idasa (2009) and Mthembu (2008) reported that a new Ministry of Rural Development and Land Reform in South Africa had been established to focus on the imperatives of the agricultural commercialisation

initiative by prioritising rural development, agrarian transformation, land reform and the facilitation of improved credit access, particularly among resource-poor communal farmers.

However, there have since been some considerable constraints on how best to create effective conditions and to find an appropriate strategy to commercialise this subsector (Department of Agriculture, 1995; Makhura *et al.,* 1997; Van Averbeke & Mohamed, 2006). In other words, regardless of these imperative policy changes, this process has been clouded with massive constraints, and is, in addition, slow-paced and unattainable (Van Schalkwyk *et al.*, 2007; Wynne & Lyne, 2004). In order to commercialise this subsector effectively, it is imperative that the said constraints be investigated, identified and removed. Yet, despite the identified constraints, there are however also some opportunities conducive to this process, which also need some investigation. The following research questions guide the study:

- What are the general characteristics of the communal cattle-production systems in the Musekwa Valley study area?
- What are the general demographic characteristics of the communal cattle farmers and farming households in the Musekwa Valley study area?
- What are the constraints affecting the commercialisation of the communal cattle-production systems in the Musekwa Valley study area?
- What are the opportunities for the commercialisation of the communal cattle-production systems in the Musekwa Valley study area in view of the communal agricultural commercialisation initiatives currently occurring in South Africa in general?
- What policy contributions can a study of this nature make to improve the commercialisation initiatives of communal cattle-production systems in South Africa in general with reference to this particular study area?

1.4 STUDY OBJECTIVES

1.4.1 The main objective of the study

The main objective of the study is to investigate and identify constraints and opportunities in respect of the commercialisation of communal cattle-production systems in the Musekwa Valley study area in the Makhado Municipality of the Limpopo Province in South Africa.

1.4.2 The specific objectives of the study

The specific objectives of the study are to:

• Briefly characterise and describe the communal cattle-production systems as adopted by communal cattle farmers in the study area

• Characterise and describe the demographic and endowment characteristics of the communal cattle farmers in the study area

• Show how the farmer demographic and endowment characteristics provide opportunities for commercialisation — while on the other hand impacting on the process as constraints

• Estimate the productivity of the communal cattle-production systems in the study area

• Investigate, identify and profile current cattle-market practices among communal cattle farmers in the study area

• Measure the degree of participation in the mainstream formal cattle market among the communal cattle farmers in the study area

• Measure the level of commercialisation of the cattle-production system in the study area

• Provide a simplified communal agricultural commercialisation roadmap for developing regions — especially in South Africa where commercialisation is currently unfolding

• Provide policy recommendations for the various stakeholders of the commercialisation process in the study area

1.5 RESEARCH HYPOTHESES

This study hypothesises that the best way to render the communal cattle farmers in the study area more productive, competitive, economically viable and sustainable is to commercialise their cattle-production systems. Such commercialisation can only be possible if the general characteristics of the cattle-production systems as adopted by the communal cattle farmers in the Musekwa Valley and the demographic characteristics of the local cattle farmers are both sufficiently known and properly understood. Demographic characteristics will provide an understanding of the behaviour and practices such as livelihood strategies and farming practices

among the farmers – which will assist policy making and strategic planning (Juma, 2009). Furthermore, the study hypothesises that the constraints on and also the opportunities for the commercialisation process in the study area result from the general and the demographic characteristics of not only the cattle-production systems but also those of the local cattle farmers. However, these characteristics do not have the same impact on the commercialisation process in the Musekwa Valley.

Employing empirical methodologies such as the binary logistic regression models might assist in the identification of those factors expected to have the most significant effect on the commercialisation initiatives of the said cattle-production systems. This could assist policy-makers in developing relevant, effective and efficient policy to fast-track the commercialisation process in the study area. In addition, if the correct level of commercialisation of the subsector is sufficiently and correctly determined and measured through the so-called *Agricultural Commercialisation Continuum (ACC)*, it might be easier for the policy-makers to identify, estimate and know the real needs of the particular system when commercialising as than would be the case if such levels were unknown.

1.6 BACKGROUND TO THE STUDY AREA

The Republic of South Africa was born on 31 May 1910 under the minority white settlers (Westaway, 2012) – and currently has nine provinces which came into being after 27 April 1994 at the birth of a new democratic black majority government of the African National Congress (ANC) led by its former president Nelson Rolihlahla Mandela. This section briefly describes the background of the Limpopo Province in general and introduces specifically the Musekwa Valley study area. The provincial profile is documented in Baloyi (2010), Banda (2005), Department of Agriculture (1994), IFAD (2002), Kabanda (2004), Lahiff (1997b), LGDS (2005), Meliko *et al.* (2011), Mwabu (2001), Nesamvuni *et al.* (2003), Schulze (1997), South Africa Yearbook (2008/2009: 24), South Africa Yearbook (2003/2004: 26) and Whitbread (2010). Figure 1.1 indicates that the Limpopo Province is a landlocked province.



Figure 1.1: The geographical location of the Limpopo Province, South Africa

Source: eyesonafrica.net

The Limpopo Province, South Africa shares international borders with Zimbabwe in the north, Mozambique in the east, Botswana in the west. Locally, the province shares its borders with the North West Province in the south west, Gauteng Province in the south and Mpumalanga Province in the south east. Limpopo Province's major economic centres which provide regional alternatives for goods and services to the local population are Belabela, Elisras, Giyani, Lebowakgomo, Mankweng, Modimolle, Mokopane, Musina, Phalaborwa, Polokwane, Thabazimbi, Thohoyandou and Tzaneen among others (Makhura & Wasike, 2003). Crucial goods and services such as co-operatives, roller mills and supermarkets are found here (Makhura & Wasike, 2003). The Limpopo Province covers approximately 123 910km² or 10.25% of the total land area of South Africa. Approximately 37.0% of Limpopo Province is suitable for arable farming, 50.1% for grazing and 12.2% for wildlife. This province has five geographic districts called *District Municipalities*, namely Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg. The population in this province totals approximately 5.6 million people of mixed racial groups and ethnicity, this number comprising whites and coloureds (9.6%), and Northern Sotho (52.1%), Tsonga (22.4%) and Venda (15.9%) ethnic groups. The province contributes

approximately 6.5% to the National Gross Domestic Product (NGDP) and its Annual Gross Geographical Product (GGP) *per capita* is approximately R1 264. The Human Development Index (HDI) lies at 0.4, while the national HDI fluctuates between 0.6 and 0.7 (Booysen-Wolthers, 2007). Approximately 32.4% of the population earn less than US$1 per day, which makes this province one of the poorest regions in South Africa (Mapedza *et al.*, 2008) with the Eastern Cape and KwaZulu-Natal provinces thereafter (Jiyane, 2002; Mbuli, 2008). The Musekwa Valley study area is located in Ward 37 of the Makhado Municipality, which is one of the four local municipalities in the Vhembe District (Tshitangoni *et al.*, 2011) of Limpopo Province as indicated in Figure 1.2.

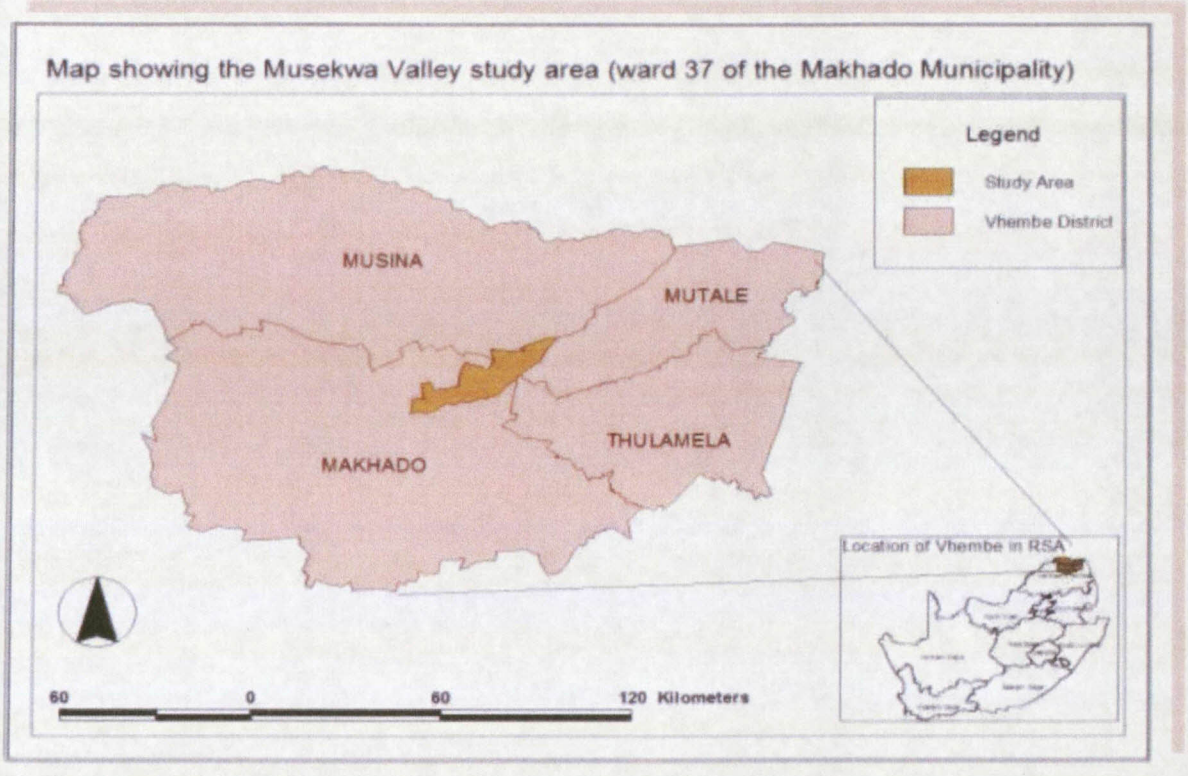


Figure 1.2: Geographical location of the Musekwa Valley study area, Vhembe District Municipality

Although this study is not about the history of the communities of the Musekwa Valley, such history might however shed some light on the circumstances of these communities (Mazibuko, 2010) – especially in relation to their agricultural, livelihood and economic practices. The Musekwa Valley was under the traditional leadership of a *Vhandalamo* Chief called Tshishonge Musekwa who ruled the area from *Manenu* and later *Tshianane-tsha-vhakololo* in the early 1700. The valley comprised several villages stretching from *Manaledzi* near the Hendrick Verwoerd Tunnels North of Louis Trichardt and West of the greater Nzhelele. The valley

stretches behind the Northern side of the Tshiendeulu Mountains Eastwards towards an area called *Hamaposwo* in the farm Smokey 163MT as indicated in Figure 1.3. Some locals claim that Chief Tshishonge's chiefdom stretched as far as *Tombo-lo-hwala-tshirundu* in the North and *Dondwe* in the North East. Currently, several traditional chiefs rule independently from chief Musekwa in different villages after settling in this area for several reasons. However, the view that the valley – especially the Musekwa village belongs to Chief Musekwa is contested by some of the local chiefs and commoners such as Nepfumembe who argues that Nepfumembe is the original inhabitant of this village. However, some further contest also that Nepfumembe was never a traditional chief in this area but a respected traditional healer. Most of the communities in this valley however began to arrive in the Musekwa Valley approximately 50 years ago from different places. Apart from the *Vhandalamo* of the Musekwa clan, the Afton, *Maangani-a-nngwe*, the *Vhalaudzi* of Khomele, Maranikhwe and Sane communities were some of the earliest arrivers in this valley. Those of the other communities such as the *Singo* of Dolidoli and the *Vhatwanamba* of HaTshivhula at Khomele and Strathaird villages arrived later in the mid-1960s.

Key informant interviews revealed that some of these communities settled in this valley for its lush natural resources for grazing and watering livestock in particular while some were resettled in the valley by the former apartheid regime in collaboration with the Mphephu Territorial Traditional Council of the late Venda Paramount Chief Patrick Ramaano Mphephu Ramabulana who on 13 September 1979 became the first President of the so-called Venda Republic in the main South Africa. The most interesting case is that of Dolidoli village which only came into existence as a result of approximately five families which settled in the area during a drought period which fell in most parts of the greater Nzhelele area in the early 1960s. The five families who settled at the current Dolidoli Village were in search of livestock feed from the Mbiyanani Mountains. This group of five families was later joined by a group from Makhavhu clan of Landou-Swongozwi in the Soutpansberg Mountains near Louis Trichardt which arrived at Dolidoli after a chieftainship succession family feud. However, some contend that this group was resettled at Dolidoli after their land was dispossessed in various farms in the Soutpansberg.

Clearly, either as choice or livelihood and economic coping strategy, all the communities in this valley prioritized livestock farming. It has been a wide practice among resource-poor communal farming households in the developing regions to improve household livelihoods and reduction of poverty through livestock farming (Ashley *et al.,* 1999). All the communities in the Musekwa Valley settled in former trust farms of Afton (*Afton* 171 MT), Dolidoli (*Keerwerder* 169 MT),

Khomele (*Garside* 164 MT), Maangani (*Njelelepoort* 193 MT), Maranikhwe (*Msekwa* 194 MT), Musekwa (*Msekwa* 194 MT and *Telema* 190 MT), Sane (*Natalie* 170 MT) and Strathaird (*Strathaird* 173MT) as indicated in the geographical locations of the villages (Figure 1.3).

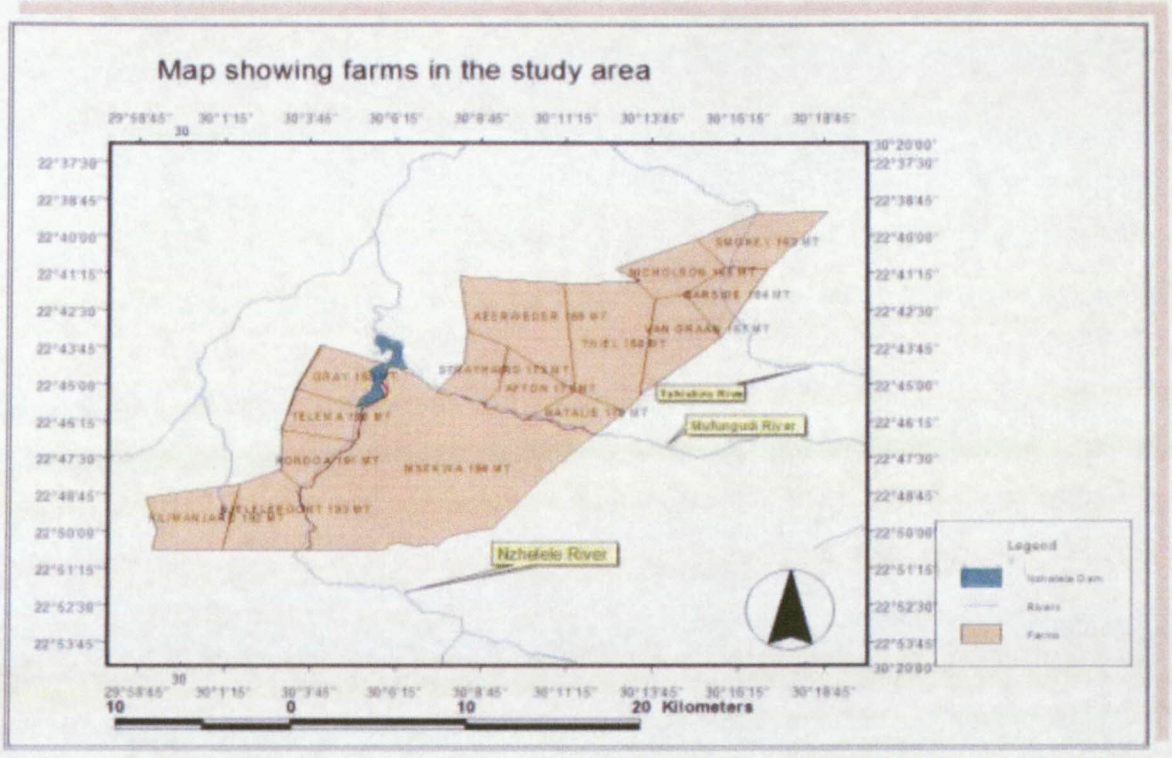


Figure 1.3: Villages comprising the Musekwa Valley study area

The estimated population in these villages is approximately 6 179 people. The study area is located in the far northern arid and semi-arid region of this province that is characterised by being frost-free with dry and hot subtropical humid summers and mild winters and very high temperatures. The latter can reach approximately 45°C in summer and 22.7°C in winter. The province has an approximated rainfall of between 201 and 400mm *per annum*, which falls during November to March. The rainfall in the study area is influenced by the topography of the Soutpansberg Mountains, which generally influences the local climatic factors.

1.7 CHOICE OF THE STUDY AREA

The Musekwa Valley study area is one of the most famous for cattle production in the greater Nzhelele area of the Makhado Municipality, Vhembe District. It is evident that cattle production provides a livelihood strategy and a platform for the majority of the resource-poor communal farmers in this area to participate in the local and regional agricultural mainstream formal

economy. However, it has emerged that most communal cattle-production systems in South Africa are still too subsistence and highly characterised by low productivity with low calving percentages; high pre-weaning and post-weaning mortality rates and poor market participation of farmers — especially in the mainstream formal market (Nengovhela, 2010; Stroebel, 2004).

This researcher noted this fact that most communal cattle-farming communities in South Africa display low productivity in cattle production and that the participation of such farming communities in mainstream cattle formal market is generally poor. According to Sebina & Düvel (1998) the communal livestock production sub-sector in the developing regions such as Botswana for example has been bedevilled with a continuous decline of productivity especially with regard to production indicators such as calving percentages, off-take rates, mortality rates and commodity sales. Despite current efforts by the South African government to improve these farmers through commercialisation of their agricultural production systems, these farmers continue to be "*trapped*" within this unproductive and unsustainable production system. Obviously, there are constraints (Van Schalkwyk *et al.,* 2007) as much as there are opportunities emanating from the new communal agricultural policy transformation which seeks to commercialise communal agriculture in South Africa. Constraints to commercialisation are a common phenomenon in transforming agricultural production systems — Malaysia being the most recent example (Talib, 2007). In view of this, this researcher premised that, on the one hand, there was indeed a need to overcome these constraints while, on the other, maximizing the opportunities, and hence the study. The major basis for the choice of the study area was influenced by efforts currently being undertaken by the Ministry of Agriculture in embarking on commercialisation initiatives among some of the villages in the study area through the Comprehensive Agricultural Support Programme (CASP). Furthermore, the study area was chosen for its cost-effectiveness to the researcher for reasons of proximity. The local farmers were moreover willing to participate.

1.8 OUTLINE OF THE STUDY

This thesis comprises fourteen chapters.

Chapter One introduces the study, provides justification for the choice of this particular topic, outlines the objectives of the study, states the problem and provides background information on the Limpopo Province in general and specifically on the study area.

Chapter Two reviews the relevant literature and focuses on the general demographic characteristics of communal cattle farmers and production systems in sub-Saharan Africa. The literature review further identifies existing opportunities for and constraints regarding the commercialisation of the communal agricultural subsector and focuses on livestock and cattle in particular.

Chapter Three elaborates on the study design, methodology, sampling procedures, data collection and the instruments of analysis, the theoretical framework, choice of the specific models for analysis and the ethical considerations that guided the conduct of the researcher.

Chapter Four presents the agricultural resource inventory of the study area by describing mainly the geographical location, size, topography, soil, climate, vegetation and the carrying capacity of the grazing area, the population, the land-holding systems and the existing infrastructure.

The results of a questionnaire-based survey on the general characterisation of the communal cattle-production systems in the Musekwa Valley and those of the key informant interviews are dealt with in Chapters five to ten.

In Chapter Five the descriptive results regarding the general characteristics of the communal cattle farmers in the study area are presented.

Chapter Six presents the results relating to household endowments among communal cattle farmers in the study area.

Chapter Seven provides the results relating to the characteristics of the cattle-production systems adopted by the communal cattle farmers in the study area.

Chapter Eight presents the results of the farmers' farm risk coping strategies.

Chapter Nine describes the results regarding farmer membership and affiliation to farmer organisations.

Chapter Ten describes the results on the cattle marketing channels among the communal cattle farmers in the study area.

Chapters Eleven provides the empirical results regarding the binary logistic regression models while identifying factors that have the most significant impact(s) on farm productivity.

Chapter Twelve provides the empirical results regarding the binary logistic regression models while identifying factors that have the most significant impact(s) on mainstream formal market participation among these farmers.

In Chapter Thirteen there is an analysis of the level of commercialisation of the communal cattle-production systems at the study area.

In Chapter Fourteen there is a general summary, the conclusions are set out, policy recommendations are made and areas for further research are identified.

CHAPTER 2

LITERATURE REVIEW

"...why is so much that is said, written and spent on development having so little effect on the problems it seeks to address...?" Mazibuko (2010).

2.1 INTRODUCTION

Chapter one summarised the general introduction and motivation of the study. This chapter reviews the literature used in the study. Its main objective is to provide the contextual framework for the study by investigating and submitting empirical arguments, views and findings of other related studies on the subject of commercialisation of communal agricultural production systems with particular reference to cattle production in sub-Saharan Africa. Literature review will allow this study to become a partner in research with other studies in what Botes (2004) argues "*...ensures that you include a multiplicity of views, thereby enhancing the validity and relevance of your research attempts...*" The main focus of this literature review is the general characterisation of the communal cattle-production systems, general characterisation of communal cattle farmers, and theoretical aspects of commercialisation of communal production systems, existing opportunities and the constraints for the commercialisation of communal production systems in the developing regions in general and in sub-Saharan Africa in particular. This characterisation might provide a useful understanding of the factors with influence on the production and marketing of cattle in the communal cattle production systems both in the Musekwa Valley and the rest of South Africa. In addition, the understanding might present a framework for the formulation of policy and intervention strategies with regard to commercialisation of the communal cattle-production systems in the study area (Schwalbach *et al.*, 2001) – so as to improve cattle production and market systems among communal cattle farmers in particular (Hangara *et al.*, 2011).

2.2 GENERAL CHARACTERISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS

This section investigates and profiles the general characteristics of the communal agricultural production systems in the sub-Saharan Africa region with particular interest on livestock production. Livestock production systems in sub-Saharan Africa, general demographic characteristics of communal farmers with particular reference to cattle farmers, socio-economic

role of cattle in sub-Saharan Africa, access to factors of agricultural production among communal cattle farmers in sub-Saharan Africa and farm management practices particularly in terms of farm risk control and management among the communal cattle farmers in sub-Saharan Africa form the main focus of this literature review. The main objective of this review is to show how these factors influence and affect the commercialisation of communal production systems among communal farming communities in various developing regions particularly the sub-Saharan Africa region. These factors are premised to play a critical intertwined role in determining the ability of the communal farmers to produce, sustain and market their animals and other related products. The review argues that commercialisation of the cattle-production systems in this case study requires a thorough understanding of all the interrelated factors involved and the role each factor plays in the process. In other words, it requires more than an understanding of livestock and cattle in particular (Stroebel, 2004).

2.2.1 Livestock production systems in sub-Saharan Africa

The livestock production subsector has been one of the oldest agricultural practices providing livelihood to the majority of the population in the developing regions — especially in sub-Saharan Africa. This subsector is also immensely growing with major economic contribution and outputs in butter, meat and milk production — feeding billions of people around the world especially resource-poor rural populations of the developing regions (Köhler-Rollefson & Mundy, 2010). As reported (De Haan *et al.*, 1997; Hazell, 2007; Fakoya, 2007; Kruska *et al.*, 2002; Lenne & Thomas, 2006; Sere *et al.*, 1995; Steinfeld *et al.*, 2006; Stroebel, 2004). Livestock production in sub-Saharan Africa in particular is practiced in four major production systems as indicated in Table 2.1.

Table 2.1: Livestock production systems in sub-Saharan Africa

Production system	Characteristics	Location
Cattle ranching system	Its main output is meat which is exported to Europe.	Southern Africa particularly Botswana, Namibia and South Africa.
Mixed crop-livestock system	Multi-production in nature with particular focus on both livestock and crop outputs. It is nutrient recycling in an interdependent partnership of crop and livestock. Limited export capacity although it produces 67.0 % of the total cattle and 64.0 % of the small-ruminants in sub-Saharan Africa. Provides livelihood, employment, income and draught power to approximately 65.0 % of the people in the communal areas in sub-Saharan Africa.	Semi-arid areas of West Africa, East Africa and South Africa.
Pastoral-nomadic/semi-nomadic system	Depends on the use of natural grasslands and crop residue in a communal grazing system. Reliant on the interaction of climatic, soils, vegetation, human and livestock factors. This system is vulnerable to droughts and overgrazing. Its main output is beef, live animals, hides and milk which are sold to primarily informal marketing channels. Approximately 9.0 % of its output is exported.	Stretch from the African Sahel across the northern parts of sub-Saharan Africa to the horn of Africa including parts of Botswana, Namibia and Angola.
Urban-based/industrial/landless system	Focuses mainly on intensive dairies, poultry and monogastrics such as pigs. It has large export base and it is part of the so-called "Global livestock revolution". It also produces tones of waste products characterised by heavy soil, air, surface water pollution, degradation of natural habitat and loss of bio-diversity. This system has limited export capacity as a result of rapid growth in domestic and urban demand of their output.	Areas of high population density and purchasing power such as the coastal areas of East Asia, Europe and North America.

Adapted from: De Haan *et al.* (1997); Hazell (2007); Fakoya (2007); Kamuanga *et al.* (2008); Kruska *et al.* (2002); Lenne & Thomas (2006); Sere *et al.* (1995); Ruhangawebare (2010) and Stroebel (2004)

It is evident that all these livestock production systems; cattle ranching, mixed crop-livestock, pastoral-nomadic/semi-nomadic and the urban-based/landless/industrial systems as indicated in Table 2.1 bear some interrelated and interdependent characteristics in what is commonly known as backward and forward system linkage. These production systems also reveal that they are also not static as they always change depending on factors such as agro-ecological features and cultural norms of the people of the respective region (Kaumbata, 2009; Sibanda, 2008). Demographic changes, farmer's production objectives, climatic variations, shortage of water resources, availability of land, historical; cultural; socio-economic legacies, policy, and changes in vegetation cover among others are some of the factors influencing the continuously changing nature of these production systems (Hijawi, 2002; McIntryre *et al.,* 2009; Sibanda, 2008). Additionally, livestock production systems vary due to an interrelation of these factors (Gemeda, 2009). Livestock production — with reference to cattle in South Africa — especially in the study area is therefore expected to be significantly influenced by the nature and the general characteristics revealed by these production systems. This means that the choice of the particular livestock production systems by respective farmers varies from region to region depending on some of these factors (Gemeda, 2009; Kaumbata, 2009; McIntryre *et al.,* 2009; Sibanda, 2008).

2.2.2 General contribution and benefits of the livestock production subsector in the agricultural sector in sub-Saharan Africa

Agriculture has been a major contributor and a key driving force for poverty alleviation and accelerated economic development for several decades in sub-Saharan Africa (Chilonda *et al.,* 2007; Nyikai, 2003; Tewodros, 2008) feeding millions of people and earning valuable export capital for the economies particularly through export of special cut meat, skins and hides among others (Nengovhela, 2010; Sibanda, 2008). For example, the pastoral livestock production subsector which is mainly practiced in the communal areas contributes approximately 60.0% of beef and veal, approximately 40.0% of small ruminant meat and 70.0% of the milk in sub-Saharan Africa (Kamuanga *et al.,* 2008). Jahnke (1982) indicates that in the 1980s, the average agricultural *per capita* income was estimated at US$285 billion (29.0%) of the total agricultural contribution into the Gross Domestic Product (GDP) of this region.

Ethiopia earned between 12-15.0% in export revenue *per annum* from its powerful livestock production subsector in the mid-2000 (Tewodros, 2008) whereas Namibia currently earns approximately 25.0% of its export earnings *per annum* from its beef industry for example (Katjiungua, 2011). While the over-all contribution of agriculture into the Ugandan Gross

Domestic Product (GDP) is approximately 42.0% *per annum* (Ashburner *et al.*, 2002), livestock production contributes an approximated 9.0% of the total Gross Domestic Product (GDP) and 17.0% of the total Agricultural Gross Domestic Product for example (Ruhangawebare, 2010). This indicates that agriculture; in particular its livestock production systems is a major contributor to the improvement of welfare of many people in the sub-Saharan Africa region in particular in terms of household food, livelihood provision and regional income among others (Apili *et al.*, 1999; Govereh *et al.*, 1999). This is corroborated by Ashburner *et al.* (2002) who reported that agriculture provided approximately 80.0% of the total 22 million Ugandan people with employment. Abebe (2011) and Belay & Manig (2004) reported that approximately 45.0% - 50.0% of the Gross Domestic Product (GDP) in Ethiopia is generated from agriculture which further contributes approximately 85.0% of employment to the country's 67.2 million people (Feleke, 2008) and further generates approximately 83.9% -90.0% of the total export earnings in this country (Belay & Manig, 2004).

Livestock production contributes approximately 17.4% into the total Southern African Development Community (SADC) regional agricultural Gross Domestic Product (GDP) with a total mainstream formal market value of approximately US$5 billion *per annum*. Among the subsectors in agriculture, livestock production has been a major contributor to most of the economies in the sub-Saharan Africa region in terms of household livelihood, generation of household income and foreign exchange earnings in particular (Chilonda *et al.*, 2007; Kamuanga *et al.*, 2008; Randela, 2000; Tewodros, 2008; Van Schalkwyk *et al.*, 2007). For example, Cullis & Watson (2005) argued that for many decades the Botswana economy has been largely dependent on the livestock subsector for its foreign exchange earnings. There were 1.19 million cattle in Botswana in 1934 and this number increased to 2.70 million by 1990. The growth of the cattle production subsector in Botswana might be as a result of the government's role in attracting investors into the subsector in Botswana. This growth was achieved through privatization of common rangelands, provision of subsidies to the farmers and adoption of other policy initiatives that promoted cattle production and marketing for example (Cullis & Watson, 2005). Clearly, there has been some increased level of commercilisation of cattle production activities in Botswana in the current decade – and hence the increased output of the subsector.

In addition, the Overseas Development Institute (2007) reports for example that Namibia also emerged as a strong producer of livestock particularly cattle after its independence from South Africa in 1985. Currently, Namibia exports approximately 85.0% of boneless beef and veal per

year to both the European Union and South Africa among others. Hangara *et al.* (2011) reported that Namibia earned approximately US$ 128 million from cattle farming with further earnings of approximately US$ 57 million *per annum* from its exported weaner calves. As a result of this increasing role and importance of livestock production in most modern economies in the developing regions – especially in sub-Saharan Africa, livestock production has become an important strategic tool to meet broad national development and socio-economic requirements in these regions (Randela, 2000). Focus in this section has been particularised on South Africa as the main concern for the study.

In general, the agricultural sector's contribution to the Gross Domestic Product (GDP) in South Africa increased at an average rate of approximately 3.8% between 1946 and 2005 (Meyer *et al.*, 2009). According to the South Africa Yearbook (2009/10: 45), field crops such as maize (*Zea mays*), wheat and hay for example have a total agricultural monetary value of R37.3 billion while horticulture such as citrus fruit and vegetables among others have a total agricultural monetary value of R28.1 billion. Vink & Van Rooyen (2009) summarised the total agricultural sectoral contribution into the national Gross Domestic Product (GDP) in South Africa as indicated in Table 2.2.

Table 2.2: Agricultural subsectoral contribution into the national GDP in South Africa

Period	**Field crops Percentage**	**Horticulture Percentage**	**Livestock production Percentage**	**Total Percentage**
1966-1970	42.5	16.2	41.3	100
1971-1975	44.9	16.4	38.7	100
1976-1980	47.1	16.4	36.5	100
1981-1985	42.0	16.4	41.6	100
1986-1990	37.7	19.1	43.2	100
1996-2000	33.0	25.1	41.9	100
2001-2006	30.4	26.9	42.7	100

Adapted from: Vink & Van Rooyen (2009)

It is evident from this table that the livestock subsector has been the major contributor in the over-all national agricultural Gross Domestic Product (GDP) in South Africa from 1966 to 1970. Despite South Africa's severe droughts of 1966, 1982-1984 and 1992 to 1993, the agricultural subsector continued to perform reasonably well with increased performance between 1994 and 2008 (Vink & Van Rooyen, 2009). This improvement might suggest that the South African

agricultural authorities were prepared for these drought periods by providing relief resources to the affected farmers among others. From 1971 to 1985 the field crops subsector became the major contributor to the agricultural Gross Domestic Product (GDP). Again, the livestock subsector became the major contributor to the agricultural Gross Domestic Product (GDP) from 1986 to 2006. However, according to Baloyi (2010), the livestock production subsector in Limpopo Province is currently the second largest agricultural contributor (5.8%) after horticulture (15.5%) in the national agricultural income output as indicated in Table 2.3.

Table 2.3: Contribution of major agricultural subsectors in the Limpopo Province to Gross South African Farming Income

Subsector	**Percentage contribution into the GDP**
Horticulture	15.5
Livestock	5.8
Field Crops	4.4
Other	4.3
Total Average Percentage	8.3

Adapted from: Baloyi (2010

According to Baloyi (2010), the Limpopo Province contributes approximately 8.3% of the national agricultural income. Furthermore, horticulture (57.0%) and livestock production (25.0%) are also major contributors to the provincial Gross Domestic Product (GDP) as illustrated in Table 2.4.

Table 2.4: Percentage subsectoral breakdown in the Limpopo provincial agricultural GDP

Subsector	**Percentage contribution into the GDP**
Horticulture	57.0
Livestock	25.0
Field Crops	11.0
Other	7.0
Total	100

Adapted from: Baloyi (2010)

According to Meyer *et al.* (2009) the livestock subsector had contributed approximately R36 billion in the South African total Gross Domestic Product (GDP) in 2007 with an estimated R22 billion from export earnings. The focus of the study is the livestock production subsector which

should be understood according to its monetary value and output in the SADC's regional livestock economy as indicated in Table 2.5. It is evident as indicated in Table 2.5 that the poultry and cattle subsectors are the main livestock production systems with the largest monetary output in the livestock production subsector in South Africa with Gross Domestic Product (GDP) values of approximately R22.4 billion and R12.2 billion.

Table 2.5: Total value of the livestock production subsector in the national agricultural GDP

Livestock product	**Value of the GDP (R'000)**
Poultry and poultry products	22 489 165
Cattle and cattle products	12 218 500
Milk	9 279 426
Sheep (*Ovis aries*) and goats (*Capra hiricus*) slaughtered	2 818 915
Pig slaughtered	2 592 813
Other	2 577 268
Wool	1 499 505
Total	53 475 592

Adapted from: Meyer *et al.* (2009)

On the other hand, Kaumbata (2009) reported that poultry (931 million), goats (197 million), cattle (172 million), pigs (167 million), sheep (157 million) and donkeys (11 million) are the most popular livestock species in the SADC region as indicated in Table 2.6.

Table 2.6: Livestock population in the SADC region

Livestock	**SADC**	**South Africa**	**South Africa's Percentage to the total number of livestock in the SADC**
Poultry	276 million	121 million	43.8
Goats	197 million	6.4 million	3.2
Cattle	172 million	13.5 million	7.8
Sheep	157 million	2.8 million	1.7
Donkeys	11 million	150 000	3.8
Pigs	4.6 million	1.6 million	34.7
Total	817.6 million	145.5 million	17.8

Adapted from: Abdallah (2007); Behnke (2006); Kaumbata (2009) and the South Africa Yearbook (2008/09: 53)

Kaumbata (2009) and Tewodros (2008) argued that the main producers of cattle in the sub-Saharan Africa region are Botswana, Ethiopia, Tanzania and Zambia. On the other hand, Chilonda *et al.* (2007) revealed that Tanzania (27.8%), South Africa (21.1%) and Madagascar (16.4%) are the main producers of cattle in the SADC with a total output of approximately 66.3% of the total cattle population in the region. Both Botswana and Namibia have smaller populations of cattle but they are some of the best cattle exporters in the SADC (Chilonda *et al.*, 2007). On the other hand, sheep (2.8 million), cattle (13.5 million), goats (6.4 million), horses (270 000) and donkeys (150 000) are the main livestock species in South Africa (Behnke, 2006; South Africa Yearbook, 2008/09: 53) perhaps from their affordability to acquire.

In the entire sub-Saharan Africa region, the Ethiopian Highlands has the majority of the donkey population of approximately four to five million which is the second largest donkey population in the world in one given country with approximately 2-3 animals per household (Pearson *et al.*, 2001). The largest number of working donkeys is in China (Nengomasha *et al.*, 2000). This means that donkeys are not necessarily an economic factor in sub-Saharan Africa only but most of the regions in the world including emerging global economies such as China. This is corroborated by Nengomasha *et al.* (2000) who further revealed that Eastern Europe, Northern Spain and some Mediterranean countries also have some considerable number of donkeys.

Comparatively, South Africa has by far fewer cattle than Ethiopia (Tewodros, 2008) because Ethiopia is ranked first in cattle population in sub-Saharan Africa (Gemeda, 2009; Kidanu, 2010). In terms of Table 2.6, it is evident that South Africa contributes approximately 17.8% of the total livestock species in the SADC region. In addition, it is evident that the SADC region has a broad multiple livestock production system which might become a major source of household employment, income, livelihood and national export earnings in this region particularly among the millions of its population which is largely made of rural dwellers (Chilonda *et al.*, 2007; Jahnke, 1982).

Evidence exists that animals still play a major role in socio-economic activities of many resource-poor societies worldwide especially in the communal areas of the developing regions. Tefera (2011) corroborates this view by arguing that approximately six million draught oxen provide draught power in Ethiopia as compared to only 500 000 tractors for example. Animals such as donkeys are also a crucial role-player in the economic activities of most rural resource-poor populations in the SADC region and around the world as the majority of people who depend on animal traction mostly prefer donkeys (71.9%), cattle (26.5%), mules (1.5%) and

horses (0.1%) in particular (Jones & Maroge, 2007). This shows how these animals are valued in this region particularly among the poor elderly farmers in the rural areas who mostly rely on these animals for draught power among others. Ethiopia produces the majority of horses (58.0%), mules (46.0%), donkeys (37.0%) and camels (8.0%) in the sub-Saharan Africa region and these animals are a critical part of the Ethiopian draught power economy (Tefera, 2011). Most of Ethiopia's draught power is through Equines (Feleke, 2008).

However, a contrasting scenario exists in countries such as Burundi, Rwanda and the eastern part of the Democratic Republic of Congo where animal draught power is hardly adopted among the resource-poor rural dwellers mainly due to the fact that farmers in these areas have smaller sizes of farms and furthermore have crops that do not need such kind of traction (Otte & Chilonda, 2002). It is however regrettable that in most parts of the developing regions "*animal draught power*" – a major economic asset is fast being replaced by *ad hoc* mechanisation by policy-makers who continue to undermine and neglect its contribution in the socio-economic practices of resource-poor populations (Jones & Maroge, 2007). Pearson *et al.* (2001) argue that animals such as donkeys might also be crucial in the marketing of perishables such as vegetables and fruit in areas where mechanised transport is unattainable and expensive. Furthermore, this might provide cattle farming households with diversification opportunities of their household income. For example, some resource-poor households also use donkeys to provide transport (Feleke, 2008) for other members of the community at a cost as indicated in Figure 2.1.



Figure 2.1: A donkey-pulled wagon delivering goods for a customer at Maangani village, Limpopo Province

Since the domestication of small ruminants such as sheep (*Ovis aries*) and goats (*Capra hiricus*) in Southwestern Asia; Iran and Iraq between 10 000 and 6 000 BC, these animals have since continued to play a major role in the socio-economic practices of people around the world – especially those in the resource-poor areas of the developing regions such as Ethiopia and South Africa (Ketema, 2007; Nthakheni, 2006; Stroebel, 2004). It can therefore be argued that small ruminants such as goats and sheep in general have also become increasingly popular and also play a major socio-economic role among communal farmers in the SADC region apart from cattle (Mapekula, 2009; Tewodros, 2008). This is because small ruminants are mostly cheaper to acquire and to maintain - especially among the vulnerable poor such as women. In addition, small ruminants such as goats and sheep also provide foods such as milk and meat for poorer households in the developing regions - and can also be furthermore sold to provide household emergency income (Ketema, 2007; Tano *et al.*, 2002). Others such as sheep might also provide manure and wool among others (Ketema, 2007; Gemeda, 2009). For example, Ketema (2007) reported that in some parts of rural Ethiopia, manure (4.9%), milk (16.3%), meat (20.2%), sale (30.5%), social capital (4.3%) and savings (23.7%) formed the main reasons of farming on small ruminants. Generally, the livestock subsector in the SADC region has a considerable economic output as indicated in Table 2.6. The study concerns itself with cattle production in the communal areas of South Africa. Cattle in particular have a multi-functional purpose, role and functions in South Africa in particular and in sub-Saharan Africa in general (Musemwa *et al.*, 2008; Nthakheni, 2006) as indicated in Table 2.7.

Table 2.7: Functions and benefits of cattle among communal cattle farmers

Function	**Product**
Clothes	Hides; skins;
Food	Milk; cheese; meat; blood; skins
Manure	Fertilizer; fuel; flooring; plastering
Monetary	Capital wealth; investment; income from: hiring working animals; sale
Social	Lobolo; dowry; ceremonies; religious; rituals; status; recreational
Work	Draught power-cultivation; transport of goods and people; pumping water
Other benefits	Create employment

Adapted from: Ahuja & Redmond (2001); Chawatama *et al.* (2005); Chintsanya *et al.* (2004); Chonco (2009); Juma (2009); Kamuanga *et al.* (2008); Mocwiri (2006); Montshwe (2006); Mwanza (2007); Nkhori (2004); Nthakheni (2006); Okonno-Adhiambo (2002); Oluka *et al.* (2004); Otte & Knips (2005); Phophi (2004); Schwalbach *et al.* (2001); Starkey & Fernando (1998) and Stroebel (2004)

It is evident that for decades the backbone of socio-economic practices of communal populations in most parts of the sub-Saharan Africa region has been cattle rearing as revealed by its major contribution and influence in the socio-economic practices of the majority of the people in this region. The implication is that any attempt to develop, diversify, improve, modernize or commercialise cattle-production systems in these areas must guard against being disruptive and dismantling of this core value of cattle production in these areas. Instead such processes shall be complementing and enhancing. It should further be noted that the viability, success, productivity and sustainability of cattle farming in these areas have also been basically influenced by the availability of grazing land and land tenure systems.

2.2.3 Land tenure systems in South Africa

According to Davies (2008), access to land and land tenure rights were never problems of the indigenous Africans prior to colonisation of Africa because every household had access to farming and residential land space. Customary land use rights were meant to avoid landlessness and to promote maximum efficiency of production without outside stewardship – and until very recently most rural dwellers in most developing regions such as Burkina Faso, Cameroon, Mozambique and Zambia have shown increased preference of the indigenous landholding rights to the Western model of individual ownership of land. Some of those who prefer indigenous landholding rights argue that this is the model that indigenous Africans both understand and know (Davies, 2008). It was only after colonisation of Africa – and during apartheid in South Africa particularly that indigenous Africans began to be denied farming land tenure rights and also the Western model of individual tenure rights introduced (Davies, 2008; Francis, 2002; Mbeki, 2011: 207; Mistry, 2000: 97). This resulted in the overcrowding and congestion of the marginalised indigenous Africans in patches of land highly characterised by overstocking, unproductive, mostly poor, marginal and degraded soils unsuitable for arable farming in particular and only marginally suitable for livestock farming (Musemwa *et al.,* 2010; Nthakheni, 2006; Simbi & Aliber, 2000).

Evidently, during colonialism and apartheid, rural land rights among the indigenous Africans were reduced to residential purposes than farming. Poor landholding rights might lead to several challenges such as unrestricted access to animal grazing which in turn might lead to resource degradation among others (Makepe, 2006). Until most recently, land rights in these formally black reserves are still communally held by tribal *chiefs* on behalf of communities. This means that individuals do not have any land tenure rights and security in most of the so-called former

homeland areas in South Africa (Adams *et al.,* 1999; Mapekula, 2009). Practically in most communal areas in South Africa, only those locals under the administration of the respective *chief* might farm in the communal land (Nell, 1998). Land tenure issues are in sharp contrast with the arrangements in Ethiopia where all land has been owned by the state and in basically controlled by the authorities since the 1975 land reform process in Ethiopia (Belay & Manig, 2004). However, the same author further reported that although the land is state-owned, farmers can still access additional farm land through rental or borrowing. In South Africa prior to liberation in 1994, approximately 676 000 households were affected of this communal system of landholding and land-use rights rendering the majority of the population landless and excluded from commercial agriculture (Walker, 2004). This skewed landholding rights made land a very emotive and politically sensitive issue in South Africa and other parts of the sub-Saharan Africa countries such as Ethiopia and Zimbabwe among others — especially post-liberation (Belay & Manig, 2004; Manenzhe, 2007; Obi, 2006). It must be emphasised that land becomes an emotive issue among most black ethnic groups in South Africa in particular because it is largely viewed beyond economic value but spiritual and also political significance (Moabelo, 2007).

As a result of limited access to suitable cropping land resulting from the fact that the larger proportion of land in Africa is also dry (Mbeki, 2011: 141), the majority of these indigenous Africans resorted to livestock production as a survival strategy against hunger and poverty (Musemwa *et al.,* 2010). These landless households remained limited in terms of agricultural production, productivity and sustainability with increased poverty levels which were particularly severe among the vulnerable groups such as women and youth — especially those in the so-called Bantustans or native homelands (Adams *et al.,* 1999; Manona, 2005; Walker, 2004). According to Nell (1998) and Nesamvuni *et al.* (2003), communal landholding rights in regions such as the former Venda and Old Qwaqwa homelands of South Africa contributed in a livestock production system highly characterised by overstocking of the grazing land, low reproductive and growth rates of animals and in addition, low farm productivity among others.

In general, communal land right systems are characterised by insecurity of land tenure and inability of the communal farmers to use the particular land as collateral to access bank loans among others which also discourages potential investors in this subsector (Adams *et al.,* 1999; Maine, 2007). It is based on these anomalies that the majority of post-independence African governments advocated for agricultural commercialisation to facilitate for a more economic competitive and productive agricultural sector for the resource-poor communities and farmers.

These governments sought to use commercialisation of agricultural systems in these areas to improve on the socio-economic welfare of the populations (Govereh *et al.,* 1999). In South Africa, the so-called Black Land Act 27 of 1913, Native Land Act 20 of 1923, Native Trust and Land Act 18 of 1936 and the creation of the homelands were designed to deny individual landholding to the blacks and to suppress black farmers in particular (Manenzhe, 2007; Mistry, 2000; Moeti, 2007; Mohamed, 2006; Obi, 2006; Vink & Van Rooyen, 2009).

As a result, blacks only occupied approximately 13.0% of the total land space in South Africa during apartheid while whites owned more than 80.0% of the total land space (Kirsten & Van Zyl, 1999; Manenzhe, 2007; Miller & Pope, 2000). This exclusion of blacks from landholding rights still have some significant impact on their agricultural production capacity and commercial capability as it continues to undermine their sustainable livelihoods and poverty alleviation strategies in particular (Manenzhe, 2007; Moyo, 2003). As a result, black farmers were reduced into communal producers targeting domestic consumption and livelihood sustainability while whites produced for the mainstream formal markets. Blacks became generally poor while whites became increasingly rich. This created a two-barreled economy with massive socio-economic inequalities between the poor blacks and the rich whites (Randela, 2005). Blacks were to provide labour for the mines and white farmers (Simbi & Aliber, 2000).

Therefore, South African agriculture has to be understood in the context of the country's past socio-economic history such as its segregatory educational system, poor health care for the blacks and lack of infrastructure and skewed distribution of productive resources among others (Mirugi-Mukundi, 2009; Vink & Van Rooyen, 2009). It is evident that, both now and in the future, economic issues in South Africa will largely be determined by the country's political and historical past (Mbeki, 2011: 15; Moabelo, 2007) and this might involve all agricultural practices as well. It is in this context of South Africa's apartheid past that a new land tenure policy was developed after 1994 in order to reverse and redress all the land tenure injustices created by the former apartheid regime (Nthakheni, 2006) to help develop the rural economy and redress poverty among resource-poor households (Lahiff *et al.,* 2008, Moabelo, 2007). The Redistribution of Land for Agricultural and Residential Purposes (LRAD), Extension of Security of Tenure (EST) and Restitution of Land Rights (RLR) were developed as facilitating programmes to implement land tenure reforms post-apartheid (Howard, 2002; Kariuki, 2003; Manenzhe, 2007; Manona, 2005; Nthakheni, 2006) amidst various other land policies meant to facilitate reforms (Moabelo, 2007).

2.2.3.1 The Redistribution of Land for Agricultural and Residential Purposes (LRAD)

This programme is facilitated through two programmes to make land available to the poor, farm workers, labour tenants and black emergent farmers for both residential and agricultural purposes in particular (Lahiff, 1997; Matshego, 2011). The so-called Settlement for Land Acquisition Grant Programme (SLAG) was established to facilitate redistribution of farming land to the formerly disadvantaged groups (Kariuki, 2003). In the SLAG programme, the beneficiaries are expected to contribute a minimum of R15 000. Beneficiaries in the Redistribution of Land for Agricultural and Residential Purposes (LRAD) programme contribute R5 000 to access government grants of between R20 000 to R100 000 (Nthakheni, 2006) to acquire land for agricultural purposes or to improve the existing land usage (Kariuki, 2003). By 2003, approximately 51 968 hectares of land had already been distributed to the beneficiaries in the Limpopo Province through the LRAD programme (Nesamvuni *et al.,* 2003).

Of this already distributed land, approximately 48 507 hectares of land are suitable for livestock production. However, this programme has its own problems. Beneficiaries of this programme are unable to access post-settlement technical support and skills training in agricultural production and land management among others in particular. This might be as a result of government budgetary constraints (Nxesi, 2011: 7). This is consistent with the findings of Werner & Kruger (2007) who reported that land reform beneficiaries in Namibia for example, have no financial assistance from government either in the form of grants or subsidies. The so-called Farmer Settlement Policy on State Land in South Africa as revised in 1995 also allows settlement of farmers on State land on lease basis. In this programme, farmers are expected to contribute about R25.00 per animal per month. In addition, farmers settled on private land are levied an amount of R6.00 per animal per month. As a result of these programmes, about 171 black livestock farmers in Limpopo Province have already been resettled (Nthakheni, 2006) for example.

2.2.3.2 Security of land tenure

This programme guarantees tenure rights to people such as farm workers and farm dwellers who live on land which they do not own. The indigenous customary land tenure system of South Africa which involves traditional *chiefs* falls under the auspices of this legal provision. The Communal Property Association Act 28 of 1996 facilitates land rights reforms in the communal areas (Kirsten & Van Zyl, 1999). However, Adams *et al.* (1999) reports that land reform in the

communal areas shows numerous challenges and pitfalls. Some of these land tenure challenges involved severe tensions and incipient violence in some places in South Africa. Most *chiefs* in South Africa resist land tenure reforms from communal land rights in their trusteeship to individual land tenure holding some fearing loss of their dominance on land rights in these communities. However, courtiers such as Kenya managed to transform their land tenure systems (Adams *et al.,* 1999). Despite resistance to land tenure reforms by traditional *chiefs*, Mulolwa (2002) argues that there is an inevitable need to reform communal land tenure rights in contemporary sub-Saharan Africa. Such land tenure reforms have become more desirable and inevitable in facilitating more investments and exploitation of the economies of scale in agricultural development and modernisation particularly in South Africa.

2.2.3.3 Restitution of land rights

The Restitution of Land Rights Act 22 of 1994 (Lahiff, 1997) facilitates and governs the processes of this programme. This programme is designed to facilitate the reinstatement of lost land tenure rights to those individuals and communities whose tenure rights were dispossessed through racially discriminatory laws as from the 19th of June 1913 (Pretorius, 2003). The claims to the restoration of such dispossessions should have been lodged with the so-called Land Claims Commission by 31 December 1998. Nthakheni (2006) reports that approximately 102 000 hectares in the Limpopo Province has already been transferred to the various claimant communities and individuals. Of these already transferred hectors of land in the Limpopo Province, about 43 689 hectares are declared suitable for livestock production. This programme has also experienced some hostility and violence between current land owners who are mostly white commercial farmers and the claimants resulting in the current commercial farmers not developing their farms as a result of uncertainty over unresolved and pending land claims. In addition, unavailability of land and rising prices of land also constrain transformation of land tenure rights because financial institutions in South Africa also become reluctant to issue loans to communal farmers (Obi, 2006; Nthakheni, 2006).

2.2.4 Cattle ownership patterns in sub-Saharan Africa

There are various mechanisms adopted by livestock owners to acquire and own cattle among communal cattle farming communities in sub-Saharan Africa. According to Nthakheni (2006) and Schuh (1999) the majority of the communal livestock farmers in South Africa purchase (68.0%), inherit (28.0%) and/or use other undisclosed means (4.0%) to acquire livestock,

particularly cattle. For example, Musemwa (2008) found that the majority of cattle farmers in the Eastern Cape Province of South Africa purchase (80.0%) inherit (20.0%) and/or acquired their animals as gifts (10.0%). Malan (2011: 3) reported that in the Eastern Cape Province of South Africa, some households might also receive large numbers of cattle as payment for young girls who are abducted and forced into marriage in a traditional practice known as *ukuthwala*. It is common that animals are given to other people in most parts of the sub-Saharan Africa region.

Ruhangawebare (2010) reported that approximately 54.1% of communal cattle farmers in the Central Western Regions of Uganda inherited their animals while others also buy their animals or receive them as gifts through what is locally known as *empano*. In the Sokoto area of Nigeria, Mamman (2001) reported that receiving cattle as gifts from parents and relatives was also very common particularly among young women on their marriages and also among sons as appreciations by their fathers. For example, parents would give an animal to their daughter on marriage as a parting gift to the husband's house in a practice locally known as *Sagoraje*. Other parents give an animal to an obedient daughter, son or relative which may not be returned in a traditional system known as *jaljale*. Other people receive an animal to rear and on delivering this animal back to the giver after a while, the receiver is only expected to return the female animal but the offspring remains with the receiver in what is traditionally known as *Nanganaye*. Others are given an animal as a gift but are required to keep the female cow and return the offspring in what is traditionally called *Jalanaye*. All these means of acquiring cattle might also increase the number of cattle owned by individuals who in turn might increase the number of cattle volumes available for sale in the mainstream formal market (Hangara *et al.*, 2011; Montshwe, 2006; Nkhori, 2004).

However, these ownerships through inheritance particularly among the vulnerable groups such as widows and orphaned children are not without challenges. There are incidences where some greedy and desperate relatives usually pounce on these vulnerable people who have inherited the animals to dispossess them their inherited animals particularly in rural Zimbabwe where such incidences have been found to be mostly common (Francis-Chizororo, 2008). Mamman (2001) also reported some incidences of conflict regarding animals given to married daughters in the Sokoto area of Nigeria where married women fight their spouses for the custodian and control of the animals particularly when crucial decisions have to be taken. In addition, there is evidence that there are communal cattle farmers who also keep animals belonging to other people in sub-Saharan Africa (Sumberg, 2003). For example, ownership of livestock differs from region to

region in most cases. In the Southern Africa region in countries such as South Africa and Swaziland, Manona (2005) and Sikhondze (2008) argue that it is common for people such as kinsmen and successful cattle herders to keep cattle loaned out to them by others particularly migrant labourers, neighbours and relatives for example.

In the Eastern Cape Province of South Africa for example, Manona (2005) reported that approximately 14.7% of people keep livestock belonging to others. In other words, the so-called inter-household livestock exchange as gifts or loans among kinsmen is a common practice in most rural livestock farming households (Lybbert *et al.*, 2000). There are implications regarding ownership of the animals. With regard to farm productivity – especially in the mixed crop-livestock agricultural production system, communal cattle farmers with larger herds of cattle for example were likely to increase their capacity to maintain soil fertility by recycling nutrients as a result of increased manure and urine they obtain from the larger herd of cattle (Ashley *et al.*, 1999; Lybbert *et al.*, 2000). On the other hand, if the animals the farmer keeps belong to the respective communal farmers who keep them for example, it is easier for such farmers to have increased probability of control and influence of decision-making among others in terms of production and formal market participation unlike when such animals belong to other people. Cattle farmers are therefore expected to be more productive and likely to participate in the mainstream formal cattle market particularly where such farmers are keeping larger herds of cattle – and when such animals belong to them (Nkhori, 2004).

Ownership of livestock in South Africa is increasingly diverse as livestock owners prefer and keep different animal species. Some communal farmers prefer cattle, goats, sheep, pigs and fowls or their combination whereas others prefer a certain species and/or breed type depending on their circumstances and needs (Nkhori, 2004). Nthakheni (2006) for example, reports that cattle ownership in South Africa is determined by the desire of the farmers to maximise household consumable products, household investment and keeping large stocks for savings, security and access to cash for emergency purposes.

In addition, Welsh & Endicott (2003); IFAD (2007); Mbiti (1969: 50); Oladele & Monkhei (2008) and Oluka *et al.* (2004) considered that cattle ownership patterns in most developing regions are also influenced by culture; religious factors and affordability to purchase such animals. Religion and culture in most cases particularly exclude women from livestock ownership, production and market participation decisions, marginalising them to an extent of reducing their socio-economic status in society, creating their intensive poverty levels and dire

economic inequality with men particularly in the developing countries (IFAD, 2007; Oladele & Monkheli, 2008; Oluka *et al.,* 2004; Welsh & Endicott, 2003; Javed *et al.,* 2006). Inequality in resource access especially with regard to income stifles economic growth and development of a country – especially where the larger population is more affected (James, 2012).

General livestock ownership patterns in countries such as Botswana and Ethiopia for example, corroborate the view that women continue to be disadvantaged and marginalised in terms of livestock ownership, access to land and housing property in particular (Kalabamu, 2005; Tewodros, 2008). This is confirmed by the wide gap between men and women in terms of livestock ownership. Oladele & Monkhei (2008) for example, reported a livestock ownership ratio of five men to one woman (5:1) and a ratio of three cattle to one (3:1) for men and women respectively in Botswana while Tewodros (2007) indicated that 54.0 % of men owned cattle in Ethiopia. Chawatama *et al.* (2005) reported that in some sub-Saharan African communities such as Zimbabwe, priced livestock such as cattle are officially registered in the names of the husbands for dipping purposes.

In most of these communities, women mostly own lesser priced livestock such as donkeys and chicken which are generally considered of less status, prestige and monetary value compared to cattle (Starkey & Fernando, 1998). As a result of women marginalisation in terms of cattle ownership, Rwelamira (1999) argued that there was a need to promote women cattle ownership in order to improve their involvement in formal economic activities. This view is also shared by Arisunta (2010) who argued that by promoting women ownership of priced assets such as cattle and land might promote faster achievement of equity, equality and rural development among resource-poor communities in particular. In addition, improving women access to productive assets might considerably change behaviour patterns among women – especially with regard to farming decisions because access to assets is known to have influence on decision-making (Juma, 2009).

2.2.5 Herd composition and numbers

In some parts of rural South Africa, communal cattle farmers keep between one and eleven heads of cattle per household (Nthakheni, 2006; Stroebel, 2004). There is a great difference between the number of animals kept by individual farmers between the communal and commercial farmers in South Africa. Mapekula (2009) reveals that cattle herd size in the South African commercial farming subsector ranges between 50 and 300 heads per farm; which

translates into 110 heads of cattle per farm on average. Small cattle herd sizes among communal cattle farmers in South Africa often result from poor calf performance (Mapekula, 2009) and various other factors such as increased herd mortality rates as a result of climatic or epidemiological shocks among others (Lybbert *et al.,* 2000). Lybbert *et al.* (2000) further argued that the effect of such shocks affect the marketing of cattle because it results in low rates of marketed off-take rates of cattle among the affected farming communities.

The cattle herd composition in the communal subsector in South Africa is approximately 45.6% of breeding females, 44.4% of females, 36.0% of replacement heifers and 15.3% of bulls (Stroebel, 2004). Swanepoel *et al.* (2000) reported that the majority of the communal farmers in South Africa keep cows (51.0%), heifers (19.0%), bulls (17.9%), calves (7.7%) and oxen (3.4%). This is consistent with the findings by Nthakheni (2006) who reports herd composition of cows (55.0%) among communal cattle farmers in some parts of communal South Africa with some differences in calves (20.0%), bulls (14.5%) and oxen (10.5%). Musemwa *et al.* (2010) reports herd composition among communal farmers in the Eastern Cape Province of South Africa of cows (36.0%), heifers (18.0%), bulls (4.0%), calves (21.0%), oxen (8.0%) and steers (13.0%).

In Kuwait's dairy subsector, farmers kept an increasingly high numbers of heifers because they are used for the future replacement of the older and uneconomical females in the herd (Razzaque *et al.,* 2009). This is consistent with the findings reported by Ruhangawebare (2010) among pastoralists of Central Western Regions of Uganda where heifers constituted approximately 24.3% of the total number of cattle kept by farmers. In addition, Ruhangawebare (2010) furthermore revealed that approximately 81.4% of the pastoralists of Nyabushozi County in the Mbarara District, Uganda have more females in their cattle herds than any other group. However, in contrast, Mwanza (2007) found that there are some rural areas in South Africa where cattle farmers kept more oxen, cows and heifers than the rest of the species particularly in areas where oxen are used for traction purposes.

Reasons for the choices and preferences of the species kept by farmers in the cattle herd vary from farmer to farmer and from region to region depending on circumstances and conditions affecting the farmers. However, in South Africa, the majority of the communal farmers with larger herds of cattle keep at least 30 breeding females in their cattle herds (Montshwe, 2006). This makes breeding females the largest percentage of cattle herd kept by most communal farmers with larger cattle herds in South Africa followed by bulls. Female cattle are popular

because they are mostly kept by communal farmers for future reproductive and milk production roles in particular (Mapekula, 2009). In addition, Simalenga & Joubert (1997) argue that bulls are popular among communal cattle farmers in South Africa in particular because they are used for draught power and for breeding purposes. The ability of the farmer to handle a certain number of cattle and the availability of labour in the particular household also determine the farming household's capacity to own cattle (Nthakheni, 2006). For example, Ainslie (2003) reports that communal cattle farmers in the Eastern Cape Province in South Africa keep an average of nine cattle per household. Stroebel (2004) reported that communal cattle farmers in South Africa keep between one and 67 heads of cattle. Ainslie (2003) further reported that the majority of farmers (54.0%) keep at least between one and six cattle with a further 8.0 % of those who keep at least 20 cattle.

2.2.6 Breeds of choice

Rcgc (1999), Moraka (2000) and Moyo *et al.* (1996) submit that sub-Saharan Africa has been home to a vast number of indigenous cattle breeds – especially among communal farmers (Khombe, 2002; Moraka, 2000; Ndebele *et al.,* 2007; Rege, 1999; Van der Valk, 2008). The popularity of indigenous breeds might be resulting from the fact that unknown cattle breeds rarely have a market in most sub-Saharan Africa region (Tano *et al.,* 2002). Rege (1999) further reported that there are approximately 145 cattle breeds in sub-Saharan Africa composed of Interbred indigenous, Sanga, systematically created composite breeds, Taurine Longhorn, Taurine Shorthorn, Zebu (*Bos Indicus*) and the Zenga (Zebu-Sanga). According to Zulu (2008), the main cattle breeds in sub-Saharan Africa are the humpless *Bos tautus*, humped *Bos indicus*, *B. taurus* X *B. indicus* (Sanga) and the Sanga X Zebu (Zenga) which are found in the majority of the countries in the region. Figure 2.2 indicates some of the various cattle breeds which are common in the sub-Saharan Africa region.



Figure 2.2: Indigenous cattle breeds of sub-Saharan Africa

Adapted from: EmbryoPlus

South Africa is dominated by cattle breeds such as the Afrikaner, the Nguni, locally-bred composite Bonsmara, the Drakensberger and the so-called Western Sanga which is common in the North West Province (Moraka, 2000; Schoeman, 1989; South Africa Yearbook, 2009/2010: 52). The indigenous Zebu breeds dominate in Kenya, most of the Sahel and in some West African countries (Mamuanga *et al.,* 2008; Kiptarus, 2005) while indigenous breeds such as the Afrikander, Nguni, Kashivi, Mashona and Tuli which are part of the Sanga cattle breed are generally preferred by communal farmers in most of the countries in the Southern Africa region such as Namibia, South Africa and Zimbabwe in particular (Khombe, 2002; Moraka, 2000; Moyo *et al.,* 1996; Musemwa *et al.,* 2008) when compared to the exotic breeds.

Ruhangawebare (2010) reported that approximately 51.0% of communal cattle farmers in the Central Western Regions of Uganda kept the so-called indigenous Ankole breeds with at least 57 animals per farming household, 45.0% of these farmers kept a minimum of 35 cross-bred animals and a further 1.0% of the farmers who kept a minimum of three exotic animals.

Generally, the majority of the communal cattle farmers (93.6%) in the Central Western Regions in Uganda preferred and kept indigenous breeds than exotic breeds which are preferred and kept by a mere 6.4% of these farmers. It is evident that the indigenous cattle breeds dominate among communal cattle farmers in most parts of the sub-Saharan Africa region depending on circumstances and preferences of the respective farmers.

Indigenous breeds are popular among communal cattle farmers because unlike the exotic and cross-breeds, these breeds adapt well to the generally harsh climatic and environmental conditions of sub-Saharan Africa (Cullis & Watson, 2005; Moraka, 2000; Nekhofhe, 2002; Rege, 1999). On the other hand, cattle farmers in most sub-Saharan African countries feel that the exotic breeds which were introduced by white settlers in Africa (Kinambuga, 2010; Van der Valk, 2008) are more susceptible to diseases and some nutritional deficiencies which might pose some challenges as to their suitability for production and the markets in this region (Tangta *et al.,* 2002). In other words, indigenous cattle breeds might be expected to provide cheaper production options for the farmer as these animals might cost lesser in production costs as compared to exotic breeds (McIntryre *et al.,* 2009). For example, Moraka (2000) argued that the relatively smaller body frames of indigenous breeds might be advantageous particularly during feed shortages as their bodies might require lesser feed than the exotic larger-bodied breeds.

In addition, indigenous cattle breeds also have high fertility and calving rates and are also more productive as compared to the exotic breeds such as the Sussex (Moyo *et al.,* 1996). For example, when studying the production and reproduction efficiency of indigenous cattle particularly the Nguni and Sanga, Schoeman (1989: 55) concluded that the Sanga breed has very high calving rate (89.6%) while the Nguni heifers reached puberty much earlier (349.9 days) when compared to the Bonsmara (419.0 days) and the Drakensberger (407.2 days) for example. This suggests that the indigenous cattle breeds might become a major household and regional economic role-player in the cattle-production systems in sub-Saharan Africa given its immense performance and genetic qualities.

However, the fact that approximately 32.0% of these indigenous cattle breeds in sub-Saharan Africa are at risk of extinction, remains a huge challenge in cattle production in this region. Rege (1999) reported that approximately 47 types of indigenous cattle breeds in sub-Saharan Africa are facing extinction due to several factors. Existing studies (Rege, 1999; Zulu, 2008) among others revealed that indiscriminate crossbreeding and diseases are some of the major factors contributing to the threat of extinction of most of these breeds. For example, the Amabowe breed

of Zimbabwe has become a rare breed as a result of the outbreak of Rinderpest in Zimbabwe (Zulu, 2008). It is in view of these challenges on indigenous cattle breeds that Zulu (2008) further argued that it has become increasingly imperative for these cattle breeds to be conserved in order for sub-Saharan Africa to cope with its unpredictable future in cattle production, and in addition to sustain its cattle production practices.

This chapter does not suggest that there is an overall preference or agreement among all communal cattle farmers that indigenous cattle breeds are the best for this region. Perceptions on their performance and suitability remain divided among various communal cattle farmers. For example, in Botswana, communal cattle farmers show different interest and preference on cattle breeds they keep. Nkhori (2004) reported that communal cattle farmers in Botswana prefer the exotic-mixed breeds to indigenous breeds. The same author reported that approximately 83.0% of the communal cattle farmers in Botswana keep exotic-mixed cattle breeds with a further 6.0% who keep pure exotic breeds. Only 11.0% of the communal cattle farmers in Botswana keep the indigenous Tswana breed. The reasons for this preference of the exotic breeds to the indigenous Tswana breeds among cattle farmers in Botswana are yet to be known.

These preferential differences in breed types in the sub-Saharan region might be suggesting that the choice of cattle breeds differs from place to place and farmer to farmer depending on the preferences and needs of the respective local farmers. The needs of the individual farmer also determine the reasons for farming in livestock – especially cattle (Sebina & Düvel, 1998). Nthakheni (2006) and Tangta *et al.* (2002) report that the choice of cattle breeds in South Africa and Ethiopia for example particularly among communal cattle farmers is influenced by various factors. These factors might also include high adaptability rate of the breed to the local environmental conditions, its frame size, fertility, temperament, colour and its traction utility.

In addition, some communal cattle farmers in particular believe that for an animal to survive in a particular environment, it needs to be able to feed on available feed and to have an immune system resistant enough to possible disease infections; the qualities which the indigenous breeds are known to possess (Mapekula, 2009; Tangta *et al.,* 2002). As a result, most communal cattle farmers in the developing regions mostly opt for the indigenous breeds which often differ characteristically with exotic breeds (Bayer & Adcock, 2003; Jama *et al.,* 2008; Mabunda, 2008: 1-2; Mapekula, 2009; Marufu, 2008; Musemwa *et al.,* 2008; Mwai *et al.*, 2005; Nkhori, 2004; Okonno-Adhiambo, 2002; Otieno *et al.*, 2006 and Welz, 2008).

On the other hand, the same authors argued that exotic breeds require high production inputs, intensive care and better management, are generally not cost-effective to keep because they are poorly adapted to local harsh environmental conditions and poor feed, calve for the first time late and have shorter reproductive life, are less tolerant to local diseases particularly tick-borne diseases, have superior quality in terms of larger body size, better carcasses compared to indigenous breeds and are generally preferred by commercial cattle farmers and traders compared to the indigenous breeds. This means that cattle management practices among communal cattle farmers in the developing regions might have to be a crucial factor for farm productivity, sustainability and commercialisation in particular.

2.2.7 Cattle management practices among communal farmers in sub-Saharan Africa

Livestock production methods and skills among most communal farmers in countries such as the Sudan in sub-Saharan Africa are still underdeveloped (Yagoub *et al.,* 2007). Kahi & Rewe (2008) argue that there is a need to improve on the methods and skills of livestock production in the developing regions to guarantee efficiency and productivity of this subsector. According to the same authors, technologies concerning animal health, veld management, nutrition, animal reproduction and breeding genetics are priorities in guaranteeing an efficient and productive livestock production system.

Other equally important technological applications of livestock production include animal husbandry, animal temperamental, management of grazing systems, animal feed supplementation, animal identification, record keeping, mating and calving seasons, weaning methods, dehorning, castration of bull calves and disease control and management (Nekhofhe, 2002). These could be improved by keeping of farm records so that the farmer might be able to manage and monitor among others the growth and performance of the animals (Banga, 2002). These skills can be improved by employing the use of extension service among others (Yagoub *et al.,* 2007). Improved quality of these aspects raises the likelihood of successful commercialisation of an agricultural production system — both on the inputs (production) and output (market) sides. For example, proper nutritional management on the animals might improve both the productive and reproductive performance of the animals which in turn might influence economic returns (Labuschagnė, 2001). Proper management of animal nutrition might improve milk yields for example which could be sold for household income among others (Pedersen & Madsen, 1998). Crucial factors affecting farm productivity, its sustainability and mainstream formal market participation among communal farmers are discussed hereunder.

2.2.7.1 Management of the grazing space

Communal lands are mostly characterised by uncontrolled and unrestricted grazing (Mahabile *et al.*, 2005) which might result in overstocking, overgrazing, indiscriminate grazing of animals without choosing the animals and high exposure to natural resource degradation (Easenjor, 2004; Makepe, 2006; Mapekula, 2009). This results from the fact that no particular individual is directly responsible for veld management among others (Dapaah *et al.*, 2001; Mocwiri, 2006; Nthakheni, 2006) as decisions on access and use of land are taken by community leaders (Sokoni, 2007). This land management system constraints livestock development considering that most developing regions are faced with acute shortage of arable land and pasture particularly during drought periods (Francis, 2002; Shetto, 2008).

Shortage of grazing land might result from the predominantly mixed crop-livestock production systems adopted by communal farmers in these regions which might reduce the availability of the grazing land by promoting irrigation or cropping of the land among others (IFAD, 2001). Among others, communal grazing land is characterised by overstocking encouraged by none disposure of animals and concentration of animals in particular points of grazing such as grazing spaces closest to the villages and water points (Ayenew *et al.*, 2007; Madzudzo & Hawkes, 1996). Sebina & Düvel (1998) among communal livestock farmers might further be compounded by the fact that the majority of the farmers in these areas were found not to have been very keen with adoption of effective copying strategies such as reduction of stock among others to control and manage overstocking and overgrazing. When grazing is affected, animals become physically poorly conditioned. Poorly conditioned animals might reduce farm productivity and mainstream formal market participation among communal cattle farmers in particular (Montshwe, 2006) as it impacts on animal quality and also reduce revenue on sale (Masike & Urich, 2008). The veld should be properly managed as it is the most important resource for cattle production particularly in terms of animal grazing.

Enforcing correct stocking rates in most cases, reduction of livestock herd sizes, encouraging the use of crop residue and purchased feeds in the feeding of livestock, encouraging farmers to make use of stall-feeding on livestock and to sell livestock might be useful strategies for effective grazing land space management and improving sustainability. Another mechanism used by communal livestock farmers is that of leasing land for private farming. However, this strategy has limitations because wealthier farmers might benefit more than poorer farmers (Sokoni, 2007). This strategy might also be self-defeating to economic equalization and it might also be

counter-productive as it might further promote the dual nature of agriculture of the rich commercial and the poor communal farmers particularly in South Africa.

2.2.7.2 Livestock feed and feeding systems

Communal lands in most parts of sub-Saharan Africa region are increasingly characterised by limited feed resources from time to time. Various measures were developed in different regions of the developing regions to combat feed shortages. For example, Van de Pol & Jordaan (2008) reported that rotational grazing as introduced in South Africa in 1966 and the so called Fodder Grazing Management System as introduced in 1997 among communal livestock farmers in the Limpopo Province were introduced to manage feed shortages. Oumer (2009)and Van de Pol & Jordaan (2008) argued that limited availability of natural feed resources might be resulting from veld degradation due to overgrazing and selective grazing, droughts and extended periods of severe water shortages in the region. As most farmers realise that livestock feed might impact on farm productivity (Kidanu *et al.,* 2010), the majority of livestock farmers in these grazing systems rely on indigenous browses for their animals because concentrates are unaffordable for most of these resource-poor farmers (Gemede, 2009). The most popular feed resource in most communal livestock farming areas in the developing regions are natural pasture, crop residue, crop aftermath and weeds (Tajebe *et al.,* 2011; Teklu *et al.,* 2010). However, some of those farmers who can afford some means of supplementation mostly do so. Feed supplementation is aimed at providing nutrients that are not available or are insufficient to livestock. Diminishing plant and bio-diversity, low protein and mineral levels during different pasture seasons such as winter and drought periods, inadequate grazing as a result of bush encroachment (Pienaar, 2006) among others and extreme degradation of the natural resources force livestock farmers to supplement their animals in order to increase their productivity and market conditioning (Dapaah *et al.*, 2001; Kellems & Church, 2002; Manona, 2005; Montshwe, 2006). Animals with poor nutrient intake might experience poor reproductive performance, low productivity and diseases (Khan & Usmani, 2005; Labuschagnè , 2001) with consequences such as reduction of farm output and additional resources required to manage and control the diseases in order to maintain the production level (Chilonda & Van Huylenbroek, 2001). This is critical in regions characterised by animals exposed to risky garbage consumption and harmful insects by grazing or scavenging in open spaces not suitable for grazing (Garces, 2002). Productivity can be improved by better supply of feed and improved animal health supplies and services – especially if the health service improves the genetic capacity of the animal (Tano *et al.,* 2002).

Availability of livestock feed is becoming a critical factor affecting livestock production particularly in the developing regions where farmers rely on natural pasture and other indigenous browses for livestock feed and supplements for example (Ayenew *et al.*, 2007; Feleke, 2008; Gemeda, 2009). As a result, traditional supplementation methods such as the use of crop residue and industrial byproducts such as cassava tubers and leaves, maize, noug cakes, wheat bran, groundnuts, cow peas husk, sorghum stover and agro-industrial by-products are fast emerging as alternatives for supplementation in most developing regions such as the Central African region, Ethiopia, South Africa and Thailand (Awa *et al.*, 2002; Stroebel, 2004; Wanapat *et al.*, 2007). The growing reliance on these livestock supplementation strategies might be as a result of the higher costs of purchased supplementation inputs. To solve the problem, in countries such as Thailand, subsistence farmers are being trained in the skills of preparing farm-based supplements from by-products such as cassava for example (Wanapat *et al.*, 2007) while in South Africa, most communal livestock farmers either carried their crop residue to supplement their animals or sent their animals to feed on the residue left in the field (Stroebel, 2004). In addition, vast trees in sub-Saharan Africa are also used by communal livestock farmers for livestock feed supply (Gachimbi *et al.*, 2004). In addition, Yagoub *et al.* (2007) argue that animal husbandry can be improved by improving fodder production and yield if communal livestock farmers could be trained to adopt modern production technologies of fodder production.

2.2.7.3 Cattle identification

Cattle identification is a compulsory requirement of law in South Africa (Montshwe, 2006). The Animal Identification Act (Aida), Act 6 of 2002 regulates the registration of unique markings for all declared and listed animal groupings. The aim of this regulation is to ensure compulsory identification of animals and easier tracing of these animals of their rightful owners when lost or otherwise (South Africa Yearbook, 2008/09: 57). Despite this requirement, some communal farmers still do not identify their animals (Nekhofhe, 2002) though there is evidence that the majority of farmers who adopt animal identification prefer ear tags and fire branding (Montshwe, 2006). Perceived high costs, a complicated process of registration of the brand used for cattle identification and the high cost of purchasing the branding equipment are constraints of animal identification (Coetzee *et al.*, 2004). In addition, some of these farmers do not identify their animals in fear of possible claims lodged against them after their animals had caused road accidents as most animals are left to wonder in the roads particularly at night (Montshwe, 2006).

Cattle identification is also pre-requisite for livestock insurance (Doyer, 2010) commercialised cattle farmers are therefore expected to identify their animals as they are expected to insure their animals particularly those expensive pedigree animals.

2.2.7.4 Farm record keeping

Generally, the majority of communal cattle farmers in sub-Saharan Africa do not keep farm records (Zulu, 2008). For example, Pedersen & Madsen (1998) found that communal cattle farmers in Sanyati, Mashonaland West Province of Zimbabwe did not keep any farm records on their animals in particular. However in sharp contrast to this, the majority of these farmers in most parts of communal South Africa keep farm records. However, farm record keeping among these farmers varied from place to place. For example, Nell (1998) found that 97.0% of these farmers in the former QwaQwa homeland in South Africa keep farm records while Montshwe (2006) reported that approximately 87.0% of livestock farmers in Hammanskraal, Sterkspruit and Ganyesa villages of the North West Province also keep farm records. Only 13.0% of the farmers in these villages do not keep records. A contrasting situation has been reported in the Eastern Cape Province where farm record keeping among communal cattle farmers has been very low as only 22.5% to 31.3% of the farmers keep farm records (Musemwa, 2008).

According to Nell (1998), of those farmers who keep farm records in the Qwaqwa area of the Free State Province, approximately 96.0% of the farmers either keep the cost, income or livestock production records. However, the inventory records are the least kept as the majority of the communal livestock farmers (91.0%) do not keep them. In addition, Eaton & Shepherd (2001) argue that farmers who are contracted keep farm records more than non-contracted farmers. Records make farm management easier (Nell, 1998). In East Africa, record keeping is not popular particularly among the pastoralists in the communal areas of East Africa in particular who prefer to memories the ancestry of their animals which they use for several generations (FAO, 2009).

Keeping of records is an important barometer of advanced livestock managerial skills in terms of registration of stock numbers; calf management and enhancement of herd performance among others (Duren, 2001; Lyimo *et al.*, 2004; Nell, 1998) as it becomes an imperative practice in improving the farm enterprise and to enhance market participation opportunities for the respective farmer. Farmers who keep records are therefore expected to be both productive and active participants in the mainstream formal cattle market as farm records assist the farmer with

herd management and improvement on reproductive efficiency and farm proficiency for example (Duren, 2001). Poor record keeping by local farmers might lead to lowered performance of the national herd (ARC, 2011: 25).

2.2.7.5 Calving rates

Cattle breeds in South Africa are generally characterised by low calving percentages of between 60.0 and 65.0% *per annum* in an ideal situation of approximately 90.0 and 95.0% calving percentage (Labuschagnè , 2001) and in addition, long calving intervals among its beef herds. Nedambale & Nengovhela (2011) reported that calving rates among subsistence and emerging cattle farmers is approximately 40.0% while that among the commercial farmers is approximately 65.0% *per annum*. For example, Moyo *et al.* (1996) reported that the calving rates of the indigenous Afrikaner and the Sussex breeds in South Africa were a mere 56.0%. This poor calving rates among cattle breeds might be the result of poor animal management, environmental deficiencies, and poor reproductive performance of female animals, genetic and physiological factors affecting livestock production among communal cattle farmers in particular (Labuschagne, 2001; Messine *et al.*, 2007).

However, cattle breeds such as the Mashona (74.0%), Nkone (67.0%), Tuli (70.0%) and the Sanga (89.6%) have shown some tremendous calving rates in Southern Africa (Moyo *et al.*, 1996: 204; Schoeman, 1989). Another crucial factor affecting calving rates is calving intervals of cattle breeds. According to IRIN (2007), Ndebele (2007), Nthakheni (2006), and Stroebel (2004) the calving intervals among different cattle species in most Southern African communal areas range between 24 and 36 months largely as a result of poor fertility of animals, poor cow nutrition after parturition, shortage of proper breeding bulls, lack of a systematic breeding programme which eventually extends mating and calving seasons among animals and absence of a systematic weaning programme among communal farmers in these areas.

In South Africa for example, the majority of communal cattle farmers leave their calves with their dams until natural separation occurred (Mapekula, 2009; Nthakheni, 2006).This might result in extended calving intervals among animals. Most cattle in South Africa calved between October and February. This is as a result of the availability of some good grazing between January and March during which period the mating activities among animals are generally high. Undesirable extended calving intervals might be controlled by resorting to correct breeds of

cattle such as the indigenous Nguni breed which is generally efficient and also has shorter calving intervals when compared to the exotic breeds (Rege *et al.*, 2006).

2.2.7.6 Weaning of calves

Approximately 50.0% of communal cattle farmers in Zimbabwe wean their calves six to eight months after their birth in order to prevent loss of weight on the cow (Ndebele *et al.*, 2007). However, some communal cattle farmers in South Africa do not wean their calves preferring to leave their calves with their dams until natural separation occurred and only when separating such calves when selling the mothers (Dapaah *et al.*, 2001; Nthakheni, 2006). This is corroborated by Mapekula (2009) who revealed that approximately 45.0% of communal cattle farmers in the Eastern Cape Province of South Africa leave their calves with their dams until natural separation occurred. However, Mapekula (2009) argued that natural weaning of cows might delay postpartum ovarian and reduction of reproductive efficiency among cows.

In addition, according to Mapekula (2009), those other communal cattle farmers in South Africa particularly in the Eastern Cape Province who wean their calves prefer metal plate weaning (40.0%) and calf separation from the mother (15.0%) to wean the calves. The home-made nose plate fitted on the calf to induce calf weaning method might be good in reducing weaning stress, allowing the weaning cow to quickly regain lost weight. It is important to note that calf weaning methods preferred by cattle farmers might differ from place to place and farmer to farmer. For example, most commercial farmers prefer weaning methods and strategies that guarantee effectiveness to reduce risk among their animals (Wright & Pruitt, 2005; Bletzinger, 2000).

In addition, Wright & Pruit (2005) reported that communal cattle farmers who do not practice calf weaning, are discouraged by sophisticated procedures involved in calf weaning; lack of technological knowledge on calf weaning such as weighing of animals, required intensive labour when weaning the calves, lack of proper infrastructure such as adequate drainage, clean feed-bunks and waterers; good environment which might assist in stress management generally associated with sicknesses and diseases resulting from long distance transportation of the calves and expensive supplementation. IRIN (2007) and Nthakheni (2006) further reported that success in calf weaning might be constrained by poor fertility of the animals, lack of proper control of calf weaning strategies and lack of a systematic breeding programme among others. It is of paramount importance for the communal cattle farmer to know that poor skills and knowledge of calf weaning might affect animal health, animal performance and physical conditioning

particularly when animals are exposed to high levels of stress during the weaning process (Blezinger, 2000; Wright & Pruitt, 2005). This might result in enormous economic losses on the communal cattle farmer (Blezinger, 2000). In addition, animals exposed to weaning stress are prone to diseases such as Bovine Respiratory Disease and rumen abnormalities among others (Erasmus, 2008).

2.2.7.7 Dehorning of calves

Dehorning is not a popular practice in some communal areas in South Africa (Nekhofhe, 2009). For example, Mapekula (2009) found that 90.0% of communal cattle farmers in the Eastern Cape Province in South Africa do not practice animal dehorning. There are various reasons to poor adoption of cattle dehorning in these communities. These might include lack of knowledge on dehorning and lack of the required equipment needed for cattle dehorning. Animal dehorning is performed in order to reduce risks such as injuries to farm workers and other animals (Weary, 2000). Neeson & Colson (2002-2003) submit that shoulder and leg injuries are the most common injuries among animals that have not been dehorned.

Dehorning is a stressful and painful experience for the animals and therefore should be properly managed to reduce the amount of pain felt during the process. Dehorning should be handled when the animals are still young and the horns have not developed as yet to reduce stress and pain. Dehorning through sedative treatment, sedative combined with local anesthetic and a combination of sedative, local anesthetic and non-steroidal anti-inflammatory treatment are the most popular methods used by experienced farmers (Weary, 2000). Sedative treatment allows for careful administration of the local anesthetic with no response by the calf. Sedative combined with local anesthetic allows for dehorning with no pain response by the calf while a combination of sedative, local anesthetic and non-steroidal anti-inflammatory treatment reduces the response to the pain both during dehorning and even in the hours that follow. Removal of horn buds from young calves using caustic paste or hot iron is also popular. However, hot-iron dehorning often caused behavioural responses characterised with increased circulatory corticosteroids in animals (Weary, 2000).

2.2.7.8 Castration of bull calves

Castration might be vital for value-adding on the calf. Castrated bull calves are expected to sell faster than those which are not castrated. Castrated bull calves are generally preferred by traders as they are mostly less aggressive, less likely to injure other animals in the feedlots, prevent

unwanted heifer pregnancies and also have improved meat, carcass quality and temperament (Mach *et al.,* 2008; Therdford, 1997). As castration could be painful and stressful, farmers are advice to avoid castration of bull calves over a certain age but to consider castration when the calf is still small and sexually immature (Irwin, 2004). However, Stookey *et al.* (2000) argue that castration of bull calves could be performed from the age of one day all the way up to past sexual maturity. Proper infrastructure and equipment such as elastrator rings, emasculatome or a Newberry surgical knife (Irwin, 2004; Lane *et al.*, 1996; Stookey *et al.*, 2000) should be in place when performing castration to avoid disease infections, decreased animal feeding performances and unwanted animal mortalities.

2.2.7.9 Livestock disease control and management

Livestock disease has been a major development and commercialisation constraint of the livestock subsector in most developing regions such as sub-Saharan Africa and Kuwait for decades (Randela, 2000; Razzaque *et al.,* 2009). Chilonda & Huylenbroek (2001) contend that livestock disease in the developing regions – especially among resource-poor communal farmers should be prioritised in terms of eradication, prevention and treatment to minimise its negative effects on animal production and livestock development in the subsector. It is evident that inadequate and poor management of livestock among communal farmers in particular has become one of the major causes of high livestock disease prevalence in the developing regions (Razzaque *et al.* 2009). In addition, lack of important inputs such as vaccines affects animal quality and performance in the communal farming areas of South Africa (Montshwe, 2006). This re-enforces the argument by Mamman (2001) who argued that the state should become a major role-player in cattle production by providing information on cattle disease to the farmers – especially if any progress is envisaged in disease control and management in the developing regions.

D'Leteren & Kimani (2008), Montshwe (2006), Morgan & Tallard (2006), Musemwa *et al.* (2008) and Nell & Schwalbach (2001) further reported that animal diseases such as the Foot and Mouth Disease (FMD) and other diseases such as tick-borne diseases among others are major causes of cattle productivity reduction and constraint to production and marketability of cattle in sub-Saharan Africa. In addition, livestock diseases might also impact on marketing as affected animals might be restricted for trade to certain areas – especially international regions such as the European Union (Scoones & Wolmer, 2007; Shiimi *et al.*, 2010). Furthermore, these diseases might also result in poor animal growth, infertility, abortion, low milk yields and

increased mortality rates among others. For example, Budeli *et al.* (2009) reported that diseases such as tick-borne and East Coast fever have cost the sub-Saharan Africa region approximately one million cattle in 1989 with a total market value of between R70 million and R200 million per year in South Africa alone.

What is challenging in Southern Africa however is the fact that communal cattle farmers find it difficult to adopt preventative disease control measures preferring rather to treat diseases when they occur than their total prevention (Marfo, 2004). As a result of poor adoption of preventative disease control measures among communal cattle farmers in Southern Africa in particular, tick-borne diseases in particular have become a serious constraining factor for cattle production especially among resource-poor communal cattle farmers (Marufu, 2008; Rikhotso, 2005). In addition, the removal of subsidies on vaccines and drugs, associated with unrealizable and inconsistent cattle dipping services as a result of government bankruptcy in most cases further aggravates livestock disease burden constraints in sub-Saharan Africa (Chawatama *et al.*, 2005; Bryceson, 2002). However, reduction of the number of cattle mortality rates as a result of diseases by at 6.0% in the communal cattle subsector in particular might provide communal regions with food enough to feed an additional 250 million people (Randela, 2000).

Furthermore, diseases such as the lumpy skin disease (LSD) are also very common among communal cattle farmers in South Africa. According to the South African National Department of Agriculture (2000), there were approximately 152 outbreaks of this LSD cattle disease in the Limpopo Province as compared to the Eastern Cape (50), Free State (four), Gauteng (nine), KwaZulu-Natal (eight), Mpumalanga (88), Northern Cape (24), North West (143) and the Western Cape (109) provinces in South Africa in the year 2000 alone. Nationally, there were 587 reported cases of this disease in the same year. This disease has a very long history in the northern part of South Africa since its first detection in the so-called Transvaal province; currently Limpopo Province in 1946 (Bagla, 2005).

According to Animal Health Australia (2009), the LSD is an acute to chronic, highly infectious, generalised skin disease of cattle in particular. The disease belongs to the *Capripoxvirus genus* of the family *Poxviridae*. Though it is mainly a cattle disease, the Australian Veterinary Emergency Plan (2009) has reported that some few cases of this disease have been identified among the so-called Asian Water Buffalo (*Bubalis bubalis*). It is believed that this disease was first diagnosed in Zambia in 1929 and later spread in the entire sub-Saharan Africa region and Madagascar (Animal Health Australia, 2009; Bagla, 2005; Carn & Kitching, 1995). However, in

the late 1980s, this disease also became common in North Africa particularly in the Suez and Ismailia areas in Egypt where it was first identified in 1988 (Ahmed & Zaher, 2008; Animal Health Australia, 2009; El-Nahas *et al.*, 2011; Thomas, 2002). The same authors furthermore revealed that the LSD disease can be fatal if left uncontrolled resulting in high cattle mortality rates and major economic losses.

This disease might be transmitted through biting arthropods, drinking of milk from infected cows particularly by young calves and by saliva of the infected animals when using same drinking facilities with the uninfected animals among others. Bagla (2005) however found that transmission of this disease remains unestablished. This disease can have devastating results including lowered breeding potential of the animals, lowered and complete loss of fertility among bulls and cows, increased probability of abortion, temporary or permanent loss of milk production, loss of animal body condition, damaged hides and increased cattle mortality (Bagla, 2005; Carn & Kitching, 1995). This disease is very common particularly during wet summers and autumn in South Africa (Bagla, 2005). However, some incidences of this disease have been reported in winter in countries such as Egypt in particular (Ahmed & Zaher, 2008; Animal Health Australia, 2009; Thomas, 2002). This disease can be controlled by using live attenuated vaccines (Carn & Kitching, 1995).

Budgetary constraints, inadequate policies and weak government extension services and organisation in most sub-Saharan African countries have resulted in poor livestock health and adoption of health services among the rural poor to such an extent of introducing privatized veterinary services to improve efficiency of service and reduction of state costs in livestock production (Chilonda & Van Huylenbroek, 2001). However, Nesamvuni, (2004) reports that South Africa has an effective veterinary programme to assist communal livestock farmers with among others, livestock vaccinations, clinical services and disease control measures against diseases such as anthrax, rabies, FMD and brucellosis through the Veterinary Services Division. To further control and manage livestock diseases, it is compulsory in South Africa for livestock farmers to dip their livestock at least twice a month (Randela, 2000). On the other hand, it is imperative for cattle farmers to practice caution particularly with calves and animals purchased from open sales. Such animals are often contaminated and farmers have often experienced massive mortalities and economic losses after purchasing such animals (Boyazoglu, 1997; Kampa *et al.*, 2004; Kim & Boyd, 2003; Viltrop *et al.*, 2002). Factors such as these are constraining to the cattle export market particularly with regard to the European Union (Van den

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Bosch, 2008) which has stringent measures for meat products from other regions. Evidently, poor far management with regard to disease control and inadequate health care services among communal livestock farmers in the developing region are major causes of the decline in the productivity of the subsector in general (Belay & Manig, 2004).

2.3 CHARACTERISATION OF COMMUNAL CATTLE FARMERS IN SUB-SAHARAN AFRICA

This section profiles the demographic and endowments characteristics of communal cattle farmers in sub-Saharan Africa. There is consensus that the demographic characteristics of communal farmers in South Africa particularly those in the former homelands are not yet fully known. Rwelamira *et al.* (2000) argued that most studies in South Africa ignored the impact and interrelationship of demographic and socio-economic factors of farmer households on agricultural development. If crucial agricultural factors such as commercialisation are to be clearly understood and realised, demographic and endowments characteristics of the farming households in South Africa need to be investigated, documented and known particularly in the communal subsector. McIntryre *et al.* (2009) argued that these characteristics are pre-requisite for all agricultural practices, and therefore crucial for policy determination.

Knowledge of these farmers' demographic information might be crucial in understanding the dynamics of agricultural development and provide both the theoretical and empirical information critical to the improvement of new appropriate agricultural policy development based on true issues affecting the generally poor populations in the rural areas. Lack of such understanding makes it difficult for policy-makers to design policies that improve communal food production, livelihood strategies and economic development in South Africa. Farmer behaviour such as livestock production strategies, preferences and choice of the market channels and determination of market transaction costs among others are largely influenced by such demographic and endowment factors.

Of major importance is that information on the demographic characteristics of communal farmers might indicate on the socio-economic areas that have to receive attention on these farmers so that their living standards might be improved. Improved living standards might be crucial in determining the chances of these farmers to trade successfully in mainstream formal market, even beyond the borders of their respective countries (Katjiuongua, 2011). Among others, age of the farmer, language of the farmer, tradition, way of life and religion, household size, the farmer's level of education, ability to communicate, household income, expenditure and

adoption of new technologies and access to agricultural economies of scale (Bopape & Myers, 2007; Fox & Van Rooyen, 2004; Karli *et al.,* 2006; McIntryre *et al.,* 2009; Nell, 1998; Nkhori, 2004; Ngqangweni & Delgado, 2002) play a major role in agricultural development and commercialisation. Diale (2009) substantiates this view by arguing that farmer demographic factors have major influences on community development and farming practices among others. It is therefore imperative to understand these inventories as they might have some major influence on farming decisions particularly with regard to farmer adoption of new technologies in cattle production and participation in the mainstream formal cattle marketing activities among others (Nell, 1998; Montshwe, 2006; Karki & Bauer, 2004).

On the other hand, Claude (2010) argued that farmer demographic and endowment typology might provide valuable farming information for policy and strategic development in agriculture. The same author further reported that it is on these grounds that the Eastern Cape Animal Information Systems Amathole (ECAISA) was set-up on 12 September 2007. This programme gathers and provides a large-scale periodic quantitative census of livestock in this province. These farmer demographic and endowments characteristics are reviewed in the study for comparison with the results of the study as reported in chapters five to thirteen respectively to determine their relevance and impact in the success or lack of it in the commercialisation of communal cattle-production systems in the Musekwa Valley study area of the Limpopo Province, South Africa.

2.3.1 Age distribution among farming household members

Age of the farmer might affect the general output of agricultural practice and also impact on agricultural development (Van Zyl, 1996). It might also affect labour supply for the farm as older farmers are expected to find it difficult to cope with the physical nature of the work in agriculture especially in the physically demanding livestock production subsector (Mmbengeni & Mokoka, 2002). Poor labour supply in the cattle-production system might be constraining for productivity because cattle-production like any other livestock-related production is more labour-intensive (Ashley *et al.,* 1999). Furthermore, it might also impact on the general health of the particular farmer which is a crucial aspect in agricultural practice. However, age of the farmer also relates to farmer experience (Randela *et al.,* 2000) and the farmer's capacity to make certain farming decisions (Grwambi *et al.*, 2006; Nkhori, 2004).

Farmer experience associated with age is likely to also impact on ownership of livestock. This is because in most cases older farmers were found to own and also keep more animals than younger farmers (Balagdtas *et al.*, 2007). In addition, experienced farmers are also expected to have more experiential and personal experience on cattle production in particular more than less experienced farmers. It is common that younger generations lack appropriate skills and expertise (Mbeki, 2011: 121). In addition, experienced farmers are also expected to be more successful than less experienced farmers in their farming practices (Mudau, 2010). Furthermore, age makes adoption of modern technologies either simple or difficult for individual farmers. For example, Mmbengeni & Mokoka (2002) argued that older farmers might struggle to understand and comprehend sophisticated and complex modern agricultural training approaches, methodologies and content theory – which might require some adjustments in order to suit their old age.

On the other hand, Karki & Bauer (2004) also argued that older farmers are likely to be skeptical to new innovation which might make adoption of new technologies more difficult for them. Older farmers are expected to be late adopters of new technologies if ever they decide to adopt such technologies because they are generally risk-cautious and are therefore expected to resist change. In addition, Matungul *et al.* (2002) argued that older farmers tend to be more productive and also more market-orientated as their vast experience is expected to increase their production and the mainstream formal cattle marketing knowledge in particular. Older farmers are more likely to access potential marketing channels through contacts established through their several years of farming and interaction with potential traders. These might reduce market transaction costs and eventually encourage the communal cattle farmer to actively participate in the mainstream formal cattle market.

The average age of the household head in the communal farming households in South Africa is approximately 49 years. However, these findings varied among provinces (Rwelamira *et al.*, 2000). Grwambi *et al.* (2006) reported that the majority of the communal livestock farmers in South Africa are over the age of 50 years while others are distributed between 41-50 years of age. There are relatively fewer farmers within the age bracket of 31-40 years. Montshwe (2006) reported ages of between 55 and 61 years as average. These results indicate that cattle farmers in the communal areas of South Africa are expected to be older and matured (Grwambi *et al.*, 2006). According to Musemwa *et al.* (2010), between 61.0% and 85.0% of cattle farmers in the communal areas of the Eastern Cape Province in South Africa are aged over 50 years of age.

In addition, Ainslie (2003) found that approximately 48.0% of cattle farmers in the Eastern Cape Province in South Africa are aged 65 years and above. Whereas the findings of Van Zyl (1996) argued that agricultural success has the highest possibility within the age group of 31 to 45 years, it should be noted that there are fewer young farmers in most communal areas of South Africa, not only in livestock production but in other subsectors such as field-crops and horticulture. For example, Mudau (2010) reported that there were a high number of older farmers than youth in the field-crop production subsector in some communal areas of South Africa. The majority of the youth are neither interested nor involved in agriculture in general – not necessarily in livestock farming. However, this is more intense and common in livestock production in most communal areas of South Africa (Grwambi *et al.,* 2006). Based on this, D'Silva *et al.* (2009) argued that as a result of the aging factor among communal farmers and lack of continuity as a result of lack of participation of the youth, the agricultural sector faces extensive threats in terms of productivity and sustainability. Persons between the age group of 14 and 35 years are referred to as youth in South Africa (Francis *et al.,* 2011).

2.3.2 Gender distribution among communal cattle farmers

Nthakheni (2006) found that there are approximately 10.2% women livestock farmers in the communal areas of South Africa as compared to 89.8% of men livestock farmers. Nkhori (2004) found that in Botswana for example, approximately 92.0% communal cattle farmers are men and only eight percent women. Gender distribution trends in the livestock subsector are also significantly similar with trends in other agricultural subsectors in South Africa depending on regions. For example, Mudau (2010) reported that approximately 87.0% of men own irrigation plots in communal South Africa although 53.0% of such plots are cultivated by women. In this case, men own the means of production whereas women only provide labour for production.

These findings are in contrast with those of Mthembu (2008) who reported that approximately 80.0% of crop farmers in the Mkhambathini Local Municipality in KwaZulu-Natal Province are women. Only 20.0% of the farmers in this area are men. In addition, Stroebel (2004) found that women are mainly involved with dairy production in particular in order to pay for sundry necessities such as regular purchases related to children and household consumption not necessarily ownership of large ruminant livestock and its production. Where women are involved in large ruminant production for care purposes such as identification and attendance to their illnesses and their daily needs, men on the other hand own and also manage herds and

flocks (Tewodros, 2008). Mmbengeni & Mokoka (2002) corroborated this finding reporting that women communal farmers in South Africa are mainly concentrated in menial community gardens, dry-land irrigation and farming with small-ruminants such goats, sheep and poultry. Oluwatayo & Oluwatayo (2012) also found that women in Southwestern Nigeria also specialized on small-ruminants – especially goats (71.9%), poultry (53.5%) and sheep (28.1%) among others. According to Mmbengeni & Mokoka (2002), women in some parts of rural South Africa mainly focused on small-ruminants despite the fact that they constituted between 60 and 70.0% of the total agricultural workforce in South Africa.

According to Webb & Mamabolo (2004), women farmers in some communal areas of South Africa rely therefore on their migrant husbands for livestock-related decisions especially market-related decisions. This is because of traditional and cultural beliefs that generally prohibited women from participation in such decisions. Under these circumstances, it is difficult to empower and integrate women in the production and marketing of large ruminants in the communal areas of the developing regions. Women empowerment is a major socio-economic tool particularly where women are exposed to better education opportunities because they might be able to make use of their skills in livestock production and also in their marketing (Tsikoane *et al.*, 2007). Integration of women into the major agricultural economic subsectors such as livestock production – especially as major assets owners such as animals and land might promote their socio-economic development, reduce poverty and hunger among this group and also improve sectoral productivity and economic returns of agriculture in general (Himonga & Munachonga, 1988; McIntryre *et al.*, 2009). In addition, women integration in the agricultural mainstream economy might also enhance their income earning power outside the home which might further strengthen their power position and independence by liberating them from the skewed socio-economic control of their spouses (Anarfi & Fayorsey, 1999).

It is clear that inequality and discrimination are in most cases issues of gender bias – especially in the developing regions (Buor, 2008) – and increased policy efforts targeting empowerment and integration of women and youth in agriculture might create interest among these groups to actively play a role in the sector's development (Cloete, 2010). However, in the current decade, Joala (2012) reports that the African continent has moved quickly to prioritise women socio-economic emancipation and development through the so-called African Women's Decade (2010-2020) - being a political initiative launched in Nairobi, Kenya in October 2010 as an

extension of the First Conference on Women which was held in Mexico in 1975 with an objective of:

- fighting poverty among women
- promoting economic empowerment of women
- promoting entrepreneurship among women
- promoting agricultural development and food security
- combating health challenges, reducing maternal mortality and HIV/AIDS among women
- promoting education and sustainable development among women
- and promoting access to finance and gender budgeting especially with regard to production and marketing initiatives among women

Joala (2012) further reported that these targets might be consolidated by the African Union Women, Gender and Development Directorate (AUWGDD) which promotes gender equality in the African continent. Based on current women empowerment issues, donors, gender activists and researchers in Africa have emerged advocating for greater efforts and intensification of women empowerment and integration into mainstream formal economic practices in particular (Doss, 1999). Improvement of women in most of these areas including maternal health might also empower them – especially with regard to economic productivity and development (Bazant, 2008).

2.3.3 Farming household size

The average farming household membership in the communal areas of South Africa ranges between one and sixteen members per household depending on areas. On the other hand, in most countries in Sub-Saharan Africa the average household membership size is approximately 5.3 members per household (Akpalu, 2005; Hosegood & Timaeus, 2005; Musemwa *et al.,* 2010; Rwelamira *et al.*, 2000). It is clear that the average household size in South Africa is significantly in par with household size in Kenya where Gachimbi *et al.* (2004) and Waithaka *et al.* (2007) reported that household membership is reported to be as high as fifteen members per livestock farming household. The minimum household membership in Kenya ranges between five and 6.2 members per household depending on districts.

The advantage of larger households is that household members might provide labour supply to the communal farming enterprise (Jera & Ajayi, 2008) especially the younger members of the

household when the older members of the particular household retired or are old to such an extent of not coping with the physically demanding nature of livestock farming practices (Ayenew *et al.*, 2007). On the other hand, Nthakheni (2006), Seyoum (2008) and Van Zyl *et al.* (1996) argued that larger households might have other implications such as increased need for more income; cost of living and also increased probability of poverty levels. According to Hosegood & Timaeus (2005), in 1996, women are the majority household heads in South Africa as they head approximately 55.0% of household units.

According to Montshwe (2006), it is important to consider the size of the household in communal livestock production as members of a household might have to depend on the farming enterprise for household income and livelihood (Hangara *et al.* 2011). In addition, household members might also have to provide labour to the farm enterprise – and any reduction of household size due to migration for example might be detrimental to labour output (Doss, 1999). In other words, there might have to be inter-dependence between household and the farming enterprise where each benefits from the other. For example, the larger the household the more efficient the farm enterprise might become as a result of the labour supplied by the household members to the farm (Manona, 2005). In addition, household size might have an impact on farm decisions regarding production and commodity marketing among others as the various members might be needed for various decisions. On the other hand, the size of the household might also increase the demand for purchased goods which might increase the probability of such farming households selling some of their animals to meet such needs. This might be substantiated by the results reported by Hangara *et al.* (2011) who indicated that ownership of cattle decreased with an increase of household size among communal cattle farmers in Namibia despite the fact that such correlation was not significant. Ownership of cattle might decrease in this regard because of the dependence of the household members on the farm; either through selling or slaughtering of the animals. However, Montshwe (2006) argued that households that have a greater number of sons were expected to withhold selling their animals in order to use them in paying for *lobola* when their sons got married (Montshwe, 2006). This might decrease the probability of the farming households to participate in the market while on the other hand increasing the probability of these households to increase their herds.

2.3.4 Level of education among cattle farming household members

Grwambi *et al.* (2006) argued that educational level and status of the farmer play a crucial role in determining their behaviour in agricultural production. In South Africa, Mahanjana (2009)

reported a farmer age range of between 54 and 60 years of only four to six years of basic schooling. This factor is expected to impact on the development of communal agriculture drastically particularly its commercialisation. According to Mahanjana (2009), the majority of communal farmers in South Africa are old and of poor educational background. The farmer needs some formal education in order to be able to access and assess important agricultural information and modern farming practices among others (Seyoum, 2008).

Communal farmers who have no formal education face constraints regarding adoption of new agricultural innovations and technologies, for example (Jera & Ajayi, 2008; Nell, 1998). This is expected to be problematic in South Africa considering the findings of Maphalla & Salman (2002) who reported that access to education is seriously impeded by several factors such as long distances which children travel to school and high costs for schooling especially in the rural areas. These factors might be leading to the increased learner drop-out rate currently prevailing in most South African schools. For example, approximately 20.0% of the total high school learners drop-out of school in a particular year making the South African school system highly inefficient (Mbeki, 2011: 100). Jansen (2011: 17) further corroborates this finding by reporting that learner drop-out in South African schools has been historical citing the fact that of the 1 035 192 learners who started school in the year 2000, only 496 090 managed to sit for their exit level (Grade 12) of high school examination education in 2011. This means that approximately 52.0% of these learners dropped-out of school before the exit level some 12 years thereafter. Learner drop-out and non-schooling have become very common in sub-Saharan Africa in general (Lumumba-Kasongo, 2005: 30) especially among resource-poor households (Franscis *et al.*, 2011). This might be a major constraint to skill development which might subsequently lead to poor skill proficiency in the region (Juma, 2009) in other areas such as livestock production and marketing among others.

Farmer innovation skills are known to be dependent on the impact of the educational background of the respective farmer (Nell, 1998). Complementary skills such as farm managerial skills, numerical literacy and understanding of basic science are critical factors and prerequisites for farmer innovation abilities in agricultural production (Collier & Dercon, 2009). This is further corroborated by Van Zyl *et al.* (1996) who argued that better farming performances are largely achieved in situations where the particular farmer has demonstrated some higher level of education. In South Africa, this might be highly compromised as a result of an inefficient education system (Mbeki, 2011: 100) characterised by various flaws such as poor

teacher training and development system – especially with regard to curriculum developments, poor morale among teachers due to sectoral challenges especially poor salaries and increased workload (Brynard & Netshikhophani, 2011). Nkhori (2004) argued that less educated communal farmers find it difficult to assimilate information at lower costs and therefore face higher transaction costs when engaging in mainstream formal cattle marketing. Collier & Dercon (2009) further argued that most communal farmers rely on extension service and officers mostly through the so-called "model" farms or village-based trial stations. They also copy from other farmers to compensate their lack of formal school education. Formal school education helps improve access to information through digital means, newspapers and bulletins and most of these sources are in second languages such as English which most communal farmers in most developing regions are unable to read because of illiteracy (Nkhori, 2004).

In a recent study conducted by Grwambi *et al.* (2006) in the Capricorn district of Limpopo Province in South Africa, it is revealed that Standard five (Grade Seven) is the highest educational level attained by the majority of communal cattle farming household members. There are very few communal farming household members who attained secondary education and/or above. Grade repetition and drop-outs among learners particularly at high school might be some of the causes of limited attainment of high school education in South Africa (Mbeki, 2011: 100). These findings are corroborated by Mmbengeni & Mokoka (2002) who found that educational levels among communal farmers in South Africa reveal that approximately 62.0% of these communal farmers have Grade Zero to Grade Five education; approximately 20.0% has Grade Six to Grade 10 education whereas only 3.0% has a tertiary education level. This is comparatively lower than the findings reported by Gachimbi *et al.* (2004) who found that 96.0% of the communal cattle farmers in Kenya have some form of formal education. In addition, the same author indicated that of the communal cattle farmers in Kenya, who have some sort of formal education, 37.0% have secondary education and only 8.0% have a tertiary vocational training.

What clearly remains a challenge in the South African communal livestock farming subsector is that there is a generally higher illiteracy level among the youth and women who both contribute approximately 59.7% in general illiteracy levels in South Africa (Booysen-Wolthers, 2007; Roux, 2005). Illiteracy among women continues to constrain economic their growth and productivity despite the efforts of the United Nations and the so-called Universal Declaration of Human Rights which among others emphasise the "*...Rights of education for all...*" (Nambinga,

2007). For example, in Ghana, women illiteracy is as high as 40.0% while that of men is approximately 22.0% (Buor, 2008). In South Africa for example, Roux (2005) further reported that in 2001, approximately 18.0% of young South Africans aged 20 years and older lacked any formal school education, while only 22.0% in the same age group only attained primary level education. In addition, people with a matriculation certificate amounted to approximately 20.4% and only 8.4% having attained higher education qualifications. In addition, Roux (2005) revealed that the larger proportion of youth who have reached working-age in South Africa is almost unemployable due to lack of proper skills and less manual labour demand in the South African economy. This might create some serious socio-economic challenges among this group in particular and often this has also led to some public disturbances such as protests and violent reactions in society. Clearly, illiteracy has become a major constrain of human advancement and economic development in many respects while on the one hand, literacy advanced even the poor (Nambinga, 2007) confirming what O'Malley (2005: 13) hinted thus "*...illiteracy is a tool of oppression...*" and what Paolo Freire commented thus "*...literacy is freedom...*" (Larney, 2006; Nambinga, 2007). Literacy goes beyond acquisition of technical skills but also serves as a platform for "*...cultural action for freedom...*" allowing individuals to understand the broader complexities of the socio-political world around them (Larney, 2006). In addition, literacy improves the quality of life and also emancipates people from poverty (Mamburu, 2004).

However, given the current projected educational growth especially among the younger generation (18-24 year olds) in South Africa, literacy is likely to improve. Approximately 16.0% of university students are within the 18-24 year age group and this is expected to increase to 17.5% by 2010. This shows that the South African government realizes the need to have better educated youth. In 2007, South African university student population was approximately 714 000 which increased to approximately 798 000 in 2009. This number is expected to increase to approximately 820 000 students by 2010, which is approximately 2.1% growth rate per year (Dibetle *et al.*, 2009). However, what remains a considerable concern is the fact that amidst better entrances at university among the youth, drop-out rates are again too high at this level also because of poor preparation of these learners at high school – especially with regard to career guidance – compounded by limited access to information on what to study - and high failure rate (Maake, 2012: 3).

Additionally, drop-out rates in South African schools are further increased by premature termination of schooling as a result of pressure on children who lose their parents to diseases

such as HIV/AIDS and in addition substance and alcohol abuse among school-going children – especially the use of crystal methamphetamine (*tik*) and dagga which is very common in most Western Cape schools among others (Rooth, 2005). However, school drop-out is not only rife in South Africa but elsewhere in sub-Saharan Africa region as well. For example, in Kenya - especially among the so-called Turkana tribe, Juma (2009) found that the high school drop-out rates among primary (62.9%) and secondary school (33.9%) learners could be attributed to the nomadic nature of their household farming system.

In addition, IFAD (2001) reported that most developing countries are faced with a challenge of gender imbalances in education particularly in literacy. Illiteracy is also common among minority ethnic groups of various societies in the developing countries. With illiterate people being more likely to be poor (Aitchison & Alidou, 2009), those minority ethnic groups, and the rural poor found in remote areas, illiterate women and children are therefore more vulnerable to poverty. Fischer & Buchenrieder (2010) argued that poverty has been one of the major challenges among ethnic minorities in the developing regions. Among the Blach Thai, Tay and the Hmong of Vietnam's minority ethnic groups for example, Fischer & Buchenreider (2010) reported that approximately 69.0% of them are poor. It is evident that ethnicity remains a crucial factor in resource access in some countries in sub-Saharan Africa. For example, Balagtas *et al.* (2007) found that ethnic identity influenced ownership of livestock in Cote d'Ivoire where it was discovered that the Peulh tribe dominate in livestock ownership for example. Illiteracy, lack of knowledge and appropriate skills in modern livestock production practices, for example, are some of the factors constraining women advancement in livestock production. As a result of these factors, women mostly rely on indigenous knowledge practices on livestock production (Oluka *et al.,* 2004). IFAD (2001) reported that in 1983 rural women in India for example, were 12.0% more vulnerable to poverty when compared to their male counterpart. Increased educational levels are expected to raise the probability of increasing farm productivity among communal farmers in the developing regions with increased likelihood of higher standard of living and quality of life (Gachimbi *et al.,* 2004; Juma, 2009). On the other hand, increased farm productivity is expected to increase the probability of household livelihood security in terms of endowments and institutional resources (Jacinta *et al.,* 2010).

2.3.5 Household endowments among communal cattle farmers

This section discusses farmer household endowment levels as they relate to agricultural commercialisation among communal livestock farmers in the developing regions. Among others

household income and expenditure, infrastructure, water supply, housing, electricity, access to telecommunication and transport ownership of farmer households as indicators of endowments were observed. The status of the socio-economic endowments of the farming household; access to capital, land-use rights, ownership of cattle, ownership of transport, access to modern animal supplementation strategies among others are some of the critical determinants of agricultural commercialisation and development capacity among communal farmers in the developing regions. Understanding the distribution of household endowments among farmer households might better the understanding of the fact that the distribution of these endowments among farmers also vary and occur under different conditions and environments. There is a need therefore to design solutions to address these differences bearing in mind these varying distributions of endowments. In other words, agricultural commercialisation as a socio-economic betterment instrument for resource-poor farmers has to consider the fact that distribution of endowments among farming households might play a major determinant factor on the process as this might also affect access to other crucial factors such as farm inputs; education; farming skills; market resources and infrastructure among others.

It is generally agreed that lack of these socio-economic endowments among certain rural farming households has contributed to high levels of poverty among the rural poor in the developing regions particularly in sub-Saharan Africa. For example, farming households with better access to some of these endowments are generally expected to effectively exploit investment and expansion opportunities in agriculture particularly in livestock production and mainstream formal market decisions (FAO, 2008; Karki & Bauer, 2004; Schwalbach *et al.,* 2001; Uchezuba *et al.*, 2009). In addition, farmer resource endowments might determine adoption behaviour and levels of adoption of technological innovation by communal farmers (Man & Sadiya, 2009). For example, better endowed farmers in productive resources such as land and credit access for example, were expected to have increased levels of technological adoption than lesser endowed farmers (Karki & Bauer, 2004). Such well-endowed farmers were expected to have increased commercialisation index than vulnerable farmers (Randela, 2005).

2.3.5.1 Household income

Most households in the communal farming areas of South Africa derive their income from informal businesses, remittances, formal and informal employment, various government social welfare grants such as the child support grant for the children up to 18 years of age – being a government-initiated poverty-alleviation programme which started in 1998 (Leibbrandt *et al.,*

2010); foster care grant; disability grant; care dependency grant and grants for war veterans, and government old age pension which is protected by the so-called Older Persons Act of June 2006 in particular for promoting basic human rights for the elderly (Marais & Eigelaar, 2007). Other households derived their income from off-farm migrant labour, hawking, sales of firewood by women in particular, livestock and cash crop sales (Ainslie, 2003; Altman *et al.*, 2009; Anteneh *et al.*, 2004; Bonti-Ankomah, 2001; Dapaah *et al.*, 2001; Francis, 2002; Grwambi *et al.*, 2006; Mudau, 2010; Ortmann & King, 2007; Taylor, 2007; Van der Westhuizen & Van Zyl, 2002).

According to Aliber & Hart (2009), agricultural practices, government grants, employment and remittances from migrants constituted major household income sources for most of resource-poor rural dwellers in some parts of South Africa. According to Schwalbach *et al.* (2001), in the North West Province, South Africa, some communal cattle farmers are employed in mining (44.0%), taxi industry (15.0%), commercial farms (13.0%) and the public service particularly in education and the police service (4.0%). As a result of extreme poverty and poor income generation strategies, some households in places such as AmaZizi of the Drakensberg area of KwaZulu-Natal Province, South Africa also resorted to illegal means of household income generation such as dagga selling (Mazibuko, 2010). Mung'ong'o (2003) also reported that some women in some households in Tanzania brewed and sold beer for income.

According to IFAD (2001), the majority of these patterns of income generation in parts of South Africa are consistent with income patterns among smallholder livestock farming households in the Near East and North Africa regions. For example, these farmers also supplement their income by growing and selling food crops among others. The same authors also found that the Near East and North Africa, West and Central Africa, Asia and the Pacific including East and Southern Africa regions, smallholder livestock farming households mostly derive their income from off-farm low-return sources to supplement their income. For example, Gachimbi *et al.* (2004) reported that the majority of communal farmers in Kenya derive their income from agricultural activities (40.0%) while other income is generated from livestock activities in particular (26.0%), cash remittances from relatives employed in urban areas (22.0%), small-scale business (8.0%) and wages (5.0%).

Wages and salaries also played a critical role in generating household income in the communal areas of South Africa (Chonco, 2009; Grwambi *et al.*, 2006; Mudau, 2010) though South Africa is generally a low wage country (Aina *et al.*, 2004). Wages and salaries might also be effective resources for spreading farm risk particularly during periods of poor farm performance where

farming households are exposed to this risk (Konseiga, 2004). In addition, wages and salaries might provide an effective income diversification strategy among these farming households which might be a crucial determinant of increased production and mainstream formal market participation (Hangara *et al.* 2011). According to Man & Sadiya (2009), diversification of household income sources might assist farming households to increase access to advanced agricultural technologies which might result in productive, sustainable, profitable farming activities and increased probability of commercialisation. Bonti-Ankomah (2001) also revealed that approximately 62.0% of the communal farming households earn income lower than R1 000 a month while approximately 21.0% of the population in the urban areas also earn income less than R1 000 a month.

Low income might also be resulting from low educational levels among the majority of the population in South Africa who might as well be from the elderly group with limited formal employment opportunities (Ssekibuule, 2010). Vulnerability to poverty is therefore higher in the communal areas than it is in the industrialised areas in South Africa and as a result of low wages; the majority of the population, particularly in the communal areas have difficulty in sustaining their dependents that are often exposed to and suffered chronic malnutrition. This is evidenced by the large number (22.0%) of children under nine years of age suffering from underweight, poor cognitive development, stunting, increased risk of morbidity and impaired immune functions among others (Altman *et al.*, 2009; Bonti-Ankomah, 2001). It is therefore evident that household income might be crucial for improved personal well-being of individual farmers and in addition also becomes a major determinant of economic development and increased productivity potential of an economy (Mazibuko, 2010).

Nthakheni (2006) found that approximately 34.0% of communal farmers' households in South Africa had an average income of between R201 and R600 per month. Approximately 7.8% of the households received income ranging from R2 000 per month. Households with no income at all per month amounted to approximately 6.0%. These findings are slightly lower than the findings reported by Schwalbach *et al.* (2001) in the Free State Province where approximately 41.8% of the farmers had income ranging between R1000 and R1 999 with 23.0% of the farmers having income of between R500 and R1 999 and a further two percent of the farmers with income ranging from R499 or less. This means that farmer income distribution in South Africa differs from place to place (Nthakheni, 2006). In 2007, real disposable income among the blacks in South Africa was growing by approximately 3.6% *per annum* as compared to the national

overall of approximately 2.8% growth rate *per annum* which might improve the living standards of the majority of the population (Ligthelm, 2007). Income patterns have bearing in agricultural investment and participation as evidence exists that households with access to off-farm income were likely to invest and participate in agricultural production and market participation unlike those households with no access to such incomes (Nthakheni, 2006; Stroebel, 2004). Clearly, off-farm income might reduce the inter-household disparity in farm production assets – thereby reducing household inequality (Kurosaki, 1995). However, Hangara *et al.* (2011) argued that farmers with access to off-farm income might withdraw from cattle marketing activities as they already have access to needed household disposable income.

2.3.5.2 Household expenditure

The majority of communal farming households in South Africa spend more on food (Altman *et al.*, 2009). Rural populations spend approximately 23.0% of their income on food while the urban population spends approximately 15.0% (Bonti-Ankomah, 2001). Gachimbi *et al.* (2004) reported that the majority of communal farming households in Kenya spend mostly on food (37.0%), school fees (24.0%), social activities (19.0%), health (10.0%) and credit repayments (5.0%). Bonti-Ankomah (2001) further revealed that communal farming households in South Africa spend an average of R588 per month while those in the commercialised areas spend approximately R945 per month for household food provision. This little income poses some challenges especially for an economy which is highly characterised by high income inequality, extremely high levels of absolute poverty between black South Africans and white South Africans and low wage incomes ranging between R1 981 for the rural households and R4 553 for the urban households per month (Bopape & Myers, 2007) as compared to other middle income economies in the world (Altman *et al.*, 2009). Grain products such as maize and horticultures such as fruits and vegetables have higher expenditure rates among the rural poor as compared to meats and related products (Altman *et al.*, 2009).

Communal farmer households in South Africa also spent their on-farm income on the education of their children, health provision, paying village taxes and other household purchased goods (Musemwa *et al.*, 2008). On on-farm activities, Nthakheni (2006) reported that expenditure is distributed on acquiring medicines (61.2%) and dipping chemicals for the animals (16.2%) with the rest of the expenditure (12.6%) distributed among other on-farm activities. The actual value amount of money spent by individual communal farming households in South Africa ranged between R360 and R1 700 per farmer household *per annum*. Farmers acquire these inputs

fearing outbreak of tick-borne diseases on animals which could result in increased mortalities and reduction of off-takes available for the market. This might be problematic taking into consideration that cattle mortality rates in communal areas were significantly higher as Nthakheni (2006) and Stroebel (2004) reported rates of approximately 15.7% and 15.6% respectively.

2.3.6 Household infrastructure

According to Hilzinger-Maas (2007), during apartheid, South Africa was characterised by a large area of fragmented and dispersed rural settlements located mainly in black homelands which were created by the apartheid government. This homeland system alienated the majority blacks from South Africa's main economic growth centers. These homelands were mainly without access to basic infrastructure such as schools, roads, water supply, electricity, sanitation and proper housing. Post-apartheid, these formally disadvantaged settlements still exist with lesser developed infrastructure compared to their urbanized counterparts. However, new agricultural development policies are improving infrastructure supply particularly in the former disadvantaged communal areas of the so-called black homelands and Bantustans. The view is that infrastructure development in these areas might enhance agricultural development and commercialisation (Mthembu, 2008) as lack of such infrastructure might affect both production and mainstream formal market participation among resource-poor farmers (Hangara *et al.*, 2011). Government hopes that this might emancipate the poor and also create a generation free from deplorable socio-economic circumstances which are currently continuing to haunt rural communities long after apartheid – especially in the case of South Africa (Mbazira, 2007).

2.3.6.1 Water supply

It is a well known fact that access to fresh water among farmers is critical for agriculture (McIntryre *et al.*, 2009) especially in the crop-livestock subsector where limited availability of water and adequate rainfall might lead to long dry spells which might be detrimental for both crop and livestock (Oumer, 2009). Approximately 36.0 % of the population in Africa has access to drinking water. However, most of the water is not clean (Black, 2004). Approximately 24.0% have household water connections and 40.0% have access to water through other means such as boreholes. Some rural areas in South Africa have approximately 50.7% of the communal cattle farming households having access to piped water in the so-called Reconstruction and Development Programme (RDP) stands, while approximately 49.3% access water from

communal stand water pipes (Grwambi *et al.*, 2006; Rwelamira *et al.*, 2000). It appears that access to clean water in sub-Saharan Africa in general is a major challenge despite the vast resources from major river basins in the Congo, Niger, Nile, Orange, and the Zambezi (McIntryre *et al.*, 2009).

Furthermore, Lake Chad; Nyasa; Tanganyika and Victoria are also major water sources of this region. In view of this and the findings of a study conducted in South Africa, Nthakheni (2006) argued that water supply in the communal areas of South Africa remains a serious challenge to both human and livestock use as most supply is carried out through boreholes and rivers. Challenging though is that these most of these sources are constantly under threat of persistent and long drought periods. However, some resource-poor communities in South Africa have had government programmes such as the Comprehensive Agricultural Support Programme (CASP) provide crucial replacement or new water-supply infrastructure such as windmills and boreholes. Of importance is that shortage of water is a global challenge as a result of growing populations, increased demand of water for household use, poorly managed livestock production, rising consumption in industry and rising demand and usage in the agricultural sector (Black, 2004; Peden *et al.*, 2006). Maine (2007) and Peden *et al.* (2006) further argued that shortage of water in most cases affected communal livestock production particularly in areas where dipping of animals is necessary and also compulsory. Availability of water for on-farm activities is pre-requisite for agricultural performance in general (Gachimbi *et al.*, 2004). In addition, shortage of water in cattle production can also affect milk yields which might be a constraint in terms of proper calf growth in particular (Mapekula, 2009). In addition, certain cattle breeds such as the cross-breeds require increased amount s of water to survive (Tangta *et al.*, 2002).

2.3.6.2 Sanitation

Access to proper sanitation has been a major challenge in most African countries. Button (2002) claimed that over a third of Africa's population lacked proper sanitation. While Grwambi *et al.* (2006) reported that approximately 40.0% of households in some parts of communal South Africa had unventilated pit latrines while the other 40.0% had no access to any means of sanitation. This means that the remainder 20.0% had access to other forms of sanitation (Grwambi *et al.*, 2006). Most of the corrugated iron sheet made pit latrines structures are preferred by the local poor in South Africa because they are cheaper to construct; easily purchased from the local hardware building material dealers and they are also durable unlike mud-constructed structures which disintegrate especially during the rainy seasons. Lack of

proper sanitation leads to compromised health standards for particular communities and this has direct impact on general productivity and growth of a particular country as most income for example might be directed to medical expenses than on essentials such as on-farm inputs acquisition, provision of household food, education and other basic purchased needs (Bonnard, 2001). Proper sanitation might prevent outbreak of diseases such as cholera among others (Mubaya, 2010).

2.3.6.3 Housing

Provision of housing in South Africa is aimed at poverty reduction and improvement of people's lives by providing housing closest to work and social amenities such as sports and recreation among others (South Africa Yearbook, 2009/10: 308-311). The same authors further revealed that the South African Housing Act of 1997 provides guidelines to all the spheres of government on housing in South Africa. In addition, various other laws such as the Housing Development Agency Act, 2008 being Act 23 of 2008, Rental Housing Act, 1999 being Act 50 of 1999 and the Social Housing Act, 2008 being Act 16 of 2008 were enacted to provide various frameworks on community housing.

Among others, the government aims to upgrade informal dwellings into properly planned dwellings by 2014/15 financial year, facilitate access of affordable housing for all and provision of rental housing for the poor (South Africa Yearbook, 2006/2007: 375-386). Access to proper housing enables people to improve their well-being, to better their general conditions of living and to improve their productivity capacity (Aina *et al.*, 2004). Proper housing is essential for poverty alleviation, economic and welfare development purposes (Ssekibuule, 2010). Approximately 13.5 million people in South Africa had been provided with new low-cost government houses by 2009 (South Africa Yearbook, 2009/10: 308).

The South African government has built low-cost house for the less-privileged South Africans – being a programme sponsored by the so-called Reconstruction and Development Programme (RDP). On the other hand, some village individuals also have modern brick house mostly common among the affluent households even in the rural areas of South Africa. In addition, some traditional mud-huts with cemented floor around the house are also common in rural communities in South Africa while ordinary traditional rural mud huts mostly common among the poor households of the rural areas are also a common sight. It is evident that the housing structures reflect on the economic capabilities of the households. Those households that have

better financial muscles have better housing structures whereas those who are poorer mostly use poorer housing structures and some house supplied by government. However, some dwellers opt for traditional housing structures because they are affordable as the materials used to construct such structures are locally found. In addition, traditional housing structures are also built in accordance with the local climatic factors – they are cooler during the hot summers and warmer during winters.

According to Grwambi *et al.* (2006), approximately 69.7% households of communal cattle farmers in the Capricorn District, Limpopo Province of South Africa own brick houses while those who live in traditional mud huts amount to approximately 18.9%. Approximately 7.5% of the households live in informal shacks and slums while 3.9% lived in rented or joined houses. These figures are in line with those reported by Nethengwe (2007) who reported that 69.0% lived in brick houses, 20.0% in traditional mud huts, seven percent in informal houses such as shacks and four percent in other undisclosed housing structures. There are fewer people in the rural areas of South Africa who live in rented houses as opposed to a large number of people who rent their accommodation in the urban areas.

However, the results reported by Olubode-Awosola (2006) revealed that there are still some wide disparities in terms of provision of housing among the South African communities as it is evident that formal housing in the Free State Province still remains behind. A paltry 29.2% of rural people own formal houses in the Free State. According to the South Africa Yearbook (2009/10: 311), approximately 71.1% of households still rent their accommodation in South Africa with middle- to lower-income blacks and coloureds the worst affected. This number might be accredited to poor housing policies of the former apartheid regime that excluded and discriminated against blacks and coloureds in terms of provision of housing. In addition, when people own the houses they live in, there is increased probability that more people might access increased disposable income and basic purchased goods as they might not be spending their income on rented accommodation (Aina *et al.,* 2004).

2.3.6.4 Access to energy

The Electricity Supply Commission (Eskom) which is a state-owned enterprise (Eskom, 2009: 9) is the main producer and supplier of electricity in South Africa. Eskom produces approximately two thirds of the total electricity in Africa (Moodley *et al.*, 2005; South Africa Yearbook, 2009/10: 193). The parastatal owns the vast majority of all the existing electricity plants in South

Africa (Wilson & Adams, 2006) though there are other independent suppliers such as municipalities. South Africa's three main sources of electricity are coal (between 90.0 and 91.0%), nuclear (7.0%) and other sources such as liquid fuels and hydropower (2.0%) (Moodley *et al.*, 2005; Philportt & Clark, 2002). A total of 368 municipalities own 22 power plants which produce approximately five percent of the total electricity supply in South Africa. Other private entities produce and supply approximately two percent of the total electricity supply in South Africa. Despite this capacity, the majority of households in South Africa still lack proper supply and access to electricity particularly among the rural poor blacks (Malzbender, 2005). South Africa has a wide base of energy sources apart from electricity. These energy sources supply energy to industry (32.2%), transport (26.8), residential (19.4%), commerce (7.8%), mining (7.5%), agriculture (2.6%) and other non-specified sectors (3.0%).

In addition, household energy supply in South Africa – especially among resource-poor rural dwellers has been through indigenous sources such as fuel wood. Women and children have become incredible sources for fuel wood collection in particular in response to poor supply and lack of household electricity supply especially in the resource-poor rural areas. For example, approximately 80.0% of fuel wood collection in the Giyani area, Limpopo Province is handled by women and children as a coping strategy for lack of electricity supply in the area (Masekoameng *et al.*, 2005). The South Africa Yearbook (2009/10: 188) reported that the majority of households in the rural areas of South Africa resort to other means of access to energy such as fuel wood (50.0%), coal (18.0%), illuminating paraffin (7.0%) and an undisclosed number that derives its energy from gas. These strategies are also corroborated by Button (2002), who found that approximately 95.0% of the resource-poor communities in sub-Saharan Africa depends on fuel wood and cow dung for household chores such as cooking and heating. Olubode-Awosola (2006) reported that 31.3% and 52.7% rural households in the Free State Province have access to electricity for cooking and lighting respectively. This is in sharp contrast with the situation in Ethiopia where Gemeda (2009) reported that a paltry 0.4% of the rural population has access to electricity for home use. It is for these reasons that Eskom (2009: 6) and Wilson & Adams (2006) argue that it becomes highly desirable that reliable and acceptable levels of reliability in electricity production and supply in sub-Saharan Africa be maintained to ensure sustainable economic development in the region. However, electricity supply in sub-Saharan Africa might remain a hurdle of development when taking into consideration the fact that of the 1.6 billion people in the world who still have to access household electricity, the majority (99.0%) reside in the developing regions in particular sub-

Saharan Africa which has approximately 75.0% of the total population in these developing regions without access to household electricity (ABB, 2003; Dinkelman, 2008).

2.3.6.5 Access to telecommunication infrastructure

Access to appropriate telecommunication infrastructure in the developing countries has been found to accelerate, improve and develop the standards of living of the poor (Kanyenze *et al.*, 2006) although there are still some considerable limitations to most resource-poor populace in these regions to access such infrastructure (Dlamini, 2010). Access and improvement of telecommunication infrastructure in the remote areas of the developing regions allows for the resource-poor farming populace to access various means of production, to access and integrate their largely communal agricultural production systems with the formal agricultural markets among others (Kanyenze *et al.*, 2007). In Bangladesh for example, communication among the rural poor was improved by a community project known as the Village Pay Phone (VPP). This project leased mobile phones to rural female members of the so-called *Grameen* Bank scheme for microfinance assisting village women to access finance (Friedman, 2005; IFAD, 2001). This project improved communication in the rural areas in Bangladesh. Ahuja & Redmond (2001) reported that access to village phones in Bangladesh has had a significant impact on agriculture particularly in relation to access of market information. Of the countries in the Southern Africa Development Community (SADC) region, Kanyenze *et al.* (2006) found that South Africa has a better advanced technological infrastructure. However, Musemwa *et al.* (2008) reported that there has been some considerable progress in the development and provision of communication infrastructure in most developing regions in particular. The same author further reported that landline telephones, mobile networks and radio have become the most popular means of communication in the majority of the developing regions.

Approximately 80.9% of cattle farming rural households in the Free State Province in South Africa have access to telephones particularly the mobile units (Olubode-Awosola, 2006). In addition, there has been some considerable growth of access of other forms of information sources such as television, newspapers and magazines in the developing regions. South Africa has also been experiencing tremendous growth of the mobile industry with the introduction of service providers such as Vodacom, MTN, Cell C and Virgin mobile (South Africa Yearbook, 2009/10: 112). The same authors further reported that as a result of improved access to these sources, South Africa has also experienced growth in internet access which is currently approximately 5.3 million users which has been projected to reach approximately nine million

users by 2014 making South Africa's telecommunication subsector one of the fastest growing sectors in this region. This growth is expected to increase access to information sources which might further enhance access to crucial agricultural information, promote interaction and learning particularly among resource-poor farmers (Eskola, 2005). However, the fact that the resource-poor farmers in the communal areas of sub-Saharan Africa mostly lacked proper access to communication infrastructure remains increasingly critical. This is corroborated by Mazibuko (2010) who argued, thus *"...the poor usually do not have the information to help them make sound decisions. Participation requires that people are well informed about issues that relate to business decision-making..."* From this argument, it is evident that communication infrastructure in sub-Saharan Africa needs some improvement in order to improve access to information. However, Parikh (2007) concede that with the emergence of the mobile phone mostly in the rural areas of the developing regions, most resource-poor farmers in particular might be able to access crucial information and also improve communication – which might lead to efficient markets and sustainable economic practices among rural farmers.

2.3.6.6 Access to transport

It is generally agreed that transport inefficiency in sub-Saharan Africa is a major constraint of agricultural development particularly with regard to communal agriculture. Njenga (2003) corroborates this view when reporting that poor road networks in Kenya for example needed approximately US$1.2 billion to be restored and maintained. On the other hand, inefficiency of transport has also resulted in huge agricultural losses particularly in the cotton and rice industries - especially during heavy rains in Kenya (Njenga, 2003). It appears that transport unavailability, inefficiency and lack of affordability might remain constraining to agricultural development particularly commercialisation. This is re-enforced and corroborated by the view which Nengomasha *et al.* (2000) attributed to the former President of Tanzania, the legendary Kambarashe Julius Nyerere who lamented *"...while the great powers have been to the moon and back and are now even communicating with the stars...we are still trying to reach the village and the village is getting even more remote..."* Evidently, sub-Saharan African agriculture is faced with serious transport constraints for its development and commercialisation – especially mainstream formal market participation among communal resource-poor farmers in particular. For example, resource-poor dairy farmers in Nakuru, Kenya face serious market constraint with regard to reaching proper markets due to transport constraints (Kinambuga, 2010).

Meanwhile it is generally accepted that South Africa's transport challenges are based largely on its approximately 754 600km total road and street infrastructure which are basically underdeveloped. The underdeveloped road infrastructure negatively affects farm input access – and furthermore retard output transportation to the marketing points in South Africa (Van Schalkwyk *et al.*, 2007). According to the South Africa Yearbook (2006/2007: 575), South Africa has many kilometers of gravel and unclassified access roads particularly in the rural areas where the poor mostly live. The underdeveloped road network infrastructure affected economic operations and daily life activities particularly livestock production and commodity transportation (Erasmus, 2008). It is evident from what Musemwa (2008) presented that transport availability and affordability remain a huge constraint of agricultural commercialisation among communal farmers in South Africa. Lack of transport might result in farmers having to track livestock for long distances to the marketing points in order to reduce associated transaction costs arising from hiring of vehicles to transport their animals to the markets (Bailey *et al.*, 1999). Long distance transportation of the animals might also be bad and unproductive as animals were most likely to be exposed to unnecessary long-distance-travel stress which might lead to other complications such as contraction of diseases. In addition, long distances to the markets might lead to high transaction costs forcing livestock farmers to track their animals to the markets and only doing so occasionally (Aklilu *et al.*, 2002). In addition, transport costs also vary according to distance to the market and the number of the animals the farmer is carrying to the market (Mamman, 2005). As a result of high transport transaction costs, some farmers might be forced to opt for walking their animals to the market. Walking the animals for long distances to the markets might result in the animals losing weight and affecting their market price among others. Most rural populations in South Africa do not own any means of transport particularly vehicles. This is because the majority of the poor in South Africa live in these rural areas where these poor are unable to purchase and own vehicles (Francis, 2002). As a result, these resource-poor rural farmers rely on public transport for both on and off-farm activities (Nieuwoudt & Groenewald, 2003). Alternatively, some resource-poor farming households also resort to using animals such as donkeys, cattle, horses and mules for transport. These households find this alternative affordable and convenient as most of these animals are easier to find, cheaper and tolerant to most of the work required from them.

However, the stereotypical tendency of regarding donkeys as only of a rural set-up should change because donkeys have been a major transport factor for both rural and peri-urban areas in the developing regions. For example, Pearson *et al.* (2001) revealed that donkeys have been also

used to carry tef straw among livestock farmers and also some goods in Addis Ababa, Ethiopia for decades. According to Oudman (2002), donkeys might give a work output of approximately 15 000 hours in approximately 14 years. This might point to the fact that if well-utilised, donkeys might be very productive and economically valuable for resource-poor farmers. Oudman (2002) summarised the productivity of the donkey well when saying "*...when a donkey refuses to work, it is almost always because the work is impossible for the animal not because it is "stubborn"...*" Jones & Maroge (2007) and Nengomasha *et al.* (2000) further argued that donkey power might still play a crucial role in improving transport challenges in sub-Saharan Africa particularly where these animals are still found in large numbers. Bad road infrastructure in the communal areas of South Africa is also a constraint for agricultural performance and commercialisation. Transformation of the road infrastructure in South Africa might improve agricultural performance and commercialisation opportunities particularly in the rural areas. An effective and competitive transport system of a country might be critically important for an efficient agricultural marketing system while an infrequent, expensive and poor quality transport system might derail and impede agricultural development and marketing (De Bod & Havenga, 2010; Hine & Ellis, 2001). In addition, Musemwa *et al.* (2010) also found that cattle farmers in some communal areas of South Africa particularly in the Eastern Cape Province who had access to personal means of transport actively participated in the mainstream formal market more than those farmers who did not have such access. Close proximity to proper roads and means of transport might integrate communal farmers better into the mainstream formal market and make their participation easier (Abera, 2004).

2.3.7 Farmer experience in cattle production

Farmer experience can include knowledge acquired formally or informally acquired. Indigenous farming skills and knowledge by farm workers, who have lived and worked in the commercial farms (Van Zyl *et al.,* 1996), are also critical for agricultural development. Knowledge gathered from training in cattle production, commodity marketing, record keeping and general entrepreneurship is also a valuable asset as it determines the success of the particular communal farmer in terms of improving production and marketing among others (Montshwe, 2006). Farmer experience can also be gained in meetings between farmers to share experiences as farmers mostly enjoy and prefer learning from one another. However, the fact that farmers do not meet as regularly as they should (Wimberley, 2008) might constrain such experience. Most communal farmers in South Africa have on average approximately 12 and 17 years experience (Montshwe, 2006; Sebopetji & Belete, 2009).

2.4 COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN SUB-SAHARAN AFRICA

This section defines what commercialisation means for the purpose of the study. The section also briefly describes the rationale for commercialisation of communal agriculture in sub Saharan Africa, summarises the various approaches used in agricultural commercialisation in various developing regions and also identifies related constraints and opportunities in agricultural commercialisation with particular reference to cattle-production systems in the communal areas.

2.4.1 Defining commercialisation

Agricultural commercialisation is a process involving transformation of agricultural production systems that produce mainly for household consumption purposes to a production system producing for the mainstream formal markets (Gibreel, 2002; Seyoum, 2008; Sokoni, 2007). These authors further conceded that commercialisation might be achieved by monetization of the communal production systems and by introducing new technological agricultural activities in such farming systems in order to increase such systems' share of marketable surpluses. These transformations might target the production or the so-called inputs side and the outputs side which entail the production and commodity side (Abebe, 2011; Jaleta *et al.*, 2009; Leavy & Poulton, 2007; Omiti *et al.*, 2007) of the communal production systems. In other words, commercialisation might be made possible when those communal farmers who are unable to access the mainstream formal markets are made to access such markets (Leavy & Poulton, 2007) or when those farmers are made to access previously inaccessible farm inputs such as farm equipment and new technological assistance in order to stimulate production of specific outputs (IFAD, 2003).

2.4.2 Rationale of agricultural commercialisation

Commercialisation of communal agriculture has become an indispensable pathway to stimulate and achieve meaningful regional economic development, modernisation, economic growth and poverty alleviation particularly among the resource-poor communities (Jaleta *et al.*, 2009; Magingxa & Kamara, 2003; Mellor, 2004; Nindi, 1993; Wynne & Lyne, 2003). Commercialisation of community natural resources has also been regarded as an option to earn household income – promoting self-reliance, contribute to community welfare (Dlamini, 2010) and also boost national production and manufacturing of expensive resources such as bio-fuels, soap and candles in poor communities among others. For example, the commercialisation of

Jatropha (*Jatropha Curcas*) in the Mutoko District of Zimbabwe was envisaged to contribute massive monetary returns for poor households and also to boost the Zimbabwean bio-diesel manufacturing by approximately 10.0% per production cycle. In addition, current global economic liberalisation and globalization are also imposing transformation challenges on the subsistence agricultural subsector to increase its productivity and mainstream formal commodity marketing in order to compete in these markets (Nyikani, 2003). This view is corroborated by the submission of Raditloaneng (2009) who argued that subsistence agriculture can no longer provide sustenance to both rural and urban communities, arguing therefore that this subsector needs to consider transforming into commercial in order to be able to address crucial issues with regard to poverty among others.

However, it is evident that agricultural commercialisation has its own limitations for some scholars of agricultural commercialisation argue that the process might have both positive and negative implications (Jaleta *et al.,* 2009; Stockbridge, 2007). In other words, these researchers argue that these benefits and gains of agricultural commercialisation might remain doubtful, unguaranteed, untested and inconclusive. In addition, Olubode-Awosola (2006) also revealed that commercialisation initiatives might be costly to maintain citing an example of a commercialisation project in the former Qwaqwa homeland in the Free State Province, South Africa. Government had to discontinue the initiative as a result of high cost to maintain the project. Evidently, agricultural commercialisation cannot be entirely made a panacea for under-development among resource-poor farmers. However there is consensus among others (Govereh *et al.* 2004; Jari, 2009; Randela, 2005) that whilst there are some notable questions and doubts on the usability, gains, impact and profitability of agricultural commercialisation; particularly among vulnerable groups such as women and children, there also are some reasonable grounds to associate agricultural commercialisation with increased farm productivity, mainstream formal market participation among resource-poor farmers, economic growth and agricultural development (Leavy & Poulton, 2007; Olubode-Awosola, 2006). Worth noting is the fact that this study argues that the notable short-comings of commercialisation however cannot sufficiently outweigh its benefits (Jaleta *et al.,* 2009). Therefore, these short-comings are outside the primary objectives of the study.

2.4.2.1 Commercialisation as a policy framework strategy

Gilimani (2005) and Jacobs (2009) indicate that in South Africa, commercialisation of subsistence agriculture was mainly used by the post-apartheid government as a guiding

conceptual approach and facilitation policy to integrate and bridge the gap of the country's dual agricultural system by integrating the subsistence agricultural subsector with the commercial agricultural subsector. This approach has also been adopted by the government of Sierra Leone post-war period (Government of Sierra Leone, 2010).

2.4.2.2 Commercialisation as labour-recruitment facilitator

Commercialisation of agricultural production systems in the developing regions has brought about some increased commoditisation of labour output through the emergence of a hired farm labour for cash system (Sokoni, 2007). With the communal agricultural farmers' reliance on traditional means of labour — where most of the labour is provided for by members of the particular household, and their inability to recruit monetised labour, Randela (2005) and Sokoni (2007) found that in South Africa agricultural commercialisation was also used to facilitate an expansion of monetised labour supply into the communal production systems thereby increasing direct income benefits for both the farm worker and the communal farmer. According to Mmbengwa *et al.* (2011), this is the case because farm labour is fast becoming highly skilled and technological in order to deal with the demands of a highly commercialised; productive and efficient agricultural production system.

2.4.2.3 Commercialisation as an income generation tool and household livelihood improvement

Commercialisation of the agricultural communal production systems is a common and potential powerful tool to improve and increase income levels among communal farmer households and the non-farmer rural populations and therefore reduced poverty among such populations (Bonnard, 2001; Gilimani, 2005; Hendricks & Msaki, 2009; Jaleta *et al.*, 2009; Mellor, 2004; Randela, 2005). Income generated from commercialised agricultural systems is also spent in other non-farm sectors to acquire and access other equally important household essentials and inventories not produced by the households such as health care, better housing, education and basic amenities such as sanitation (Mellor, 2004). As a result of the improved income generated from agricultural commercialisation, poor populations were able to improve their household dietary diversity, access quality diets and improved nutritional energy intakes (Jaleta *et al.*, 2009; Meyer *et al.*, 2009). Clearly, communal farming households might substantially increase their opportunities with regard to household livelihood and food security among others through commercialisation – especially by increasing crop-livestock marketing (Makhura *et al.*, 1997). This is consistent with the findings of the FAO (2008) who reported that two thirds of the three billion rural people in the developing regions depend on agrarian income for household

livelihood. It is furthermore argued that communal agricultural commercialisation offers an option to income generation and sustainable food security particularly where communal farming was found to have inadequately addressed those other non-food household needs (Nyikai, 2003).

2.4.2.4 Commercialisation as an employment creation tool

Kirsten & Van Zyl (1998: 560-571) and Moloi (2007) conceded that agricultural commercialisation might be an employment and income generation tool among communal farming households in South Africa. According to Jaleta *et al.* (2009), commercialisation provides employment particularly where the agricultural production is more labour-intensive. South Africa has massive migration of rural youth to its urban and metropolitan areas in search of better employment and improved livelihood opportunities (Solomon & Viljoen, 2003) as hinted by Meijerink & Roza who argued *"...the integration of rural with urban areas means that healthy young people move out of agriculture, head to town, leaving women in charge of the farm..."* This migration of youth from the rural to the urban areas in South Africa might be resulting from the fact that there are approximately three million young people between the age of 18 and 24 years who are out of school, lacking in foundational skills, lacking in entrepreneurship and in addition are also not formally employed (Nzimande, 2011; Smith, 2011). The South African traditional industries are reluctant of employing young inexperienced graduates – and government also lacks intervention to promote entrepreneurship among the youth to minimise unemployment and lack of productivity (James, 2012). Furthermore, the Millennium Development Goals Mid-Term Country Report (2007) reported that approximately 1.3% of these young people have never attended any formal school and therefore lack skills for formal employment. It is clear from this that an opportunity to create a human and social capital pool through the youth for economic growth is being missed. Critically, James (2012) and Smith (2011) argued that lack of formal employment and productivity among the youth might have dire social consequences such as crime, violence, unrests and teen pregnancies – considering the outbreak of youth violence in countries such as Iran, Tunisia and Morocco among others.

As a result of lack of opportunities – especially in the rural areas of the developing regions, youth migrate to urban areas. Migration of youth might increasingly affect provinces such as KwaZulu-Natal (22.4%), Eastern Cape (16.0%) and Limpopo (13.3%) who have the highest number of youth population in South Africa — especially those who neither go to school nor have formal employment (Dinbabo, 2011), largely poor and lacking in access to productive resources such as land and farming capital among others. Youth migration might be a huge

factor of constraining commercialisation of communal agricultural production systems – especially where the agricultural production system is characterised by low agricultural potential and low market access (Pender *et al.,* 1999). This might be a crucial factor especially in South Africa where there is increased unemployment rates among the youth (du Toit, 2003). Increased unemployment among the younger generation of the population might be resulting from lack of skills, size of the youth labour force, increased job demand, high expected wages and discontinued recruitment of the labour force in general as a result of unexpected global economic recessions (du Toit, 2003). In addition, inconsistent performance of agriculture and the fact that agriculture is also mainly a seasonal activity (Parikh, 2007) rural areas are often lacking in opportunities for the youth – and hence their migration to other well-endowed areas. Realising the need to emancipate the economically struggling youth in South Africa, Randela (2005) argued that commercialisation of communal agriculture – especially in the cotton producing communities in rural South Africa might improve their opportunities to access jobs in the rural areas – which might be critical in encouraging especially the rural youth to stay in these rural areas. This according to James (2012) might provide an incentive for the youth in South Africa to become crucial participants and assets for economic development.

This might also assist in terms of reducing the ever-increasing urban populations which are fast becoming a negative socio-economic development factor as a result of continuous rural-urban migration of skilled and able-bodied youth in particular (Kamuanga *et al.,* 2008). Most crucially, youth and adult male migration might also result in several other undesirable consequences such as unplanned urban settlements, increased informal housing and backyard housing structures, lack of access to basic amenities such as sanitation; water and health service which might lead to spreading of diseases and vulnerability to risks such as flooding and fires among others (Turok, 2011). Of major challenge is the fact that migration for employment might further entrench income inequality by shifting labour from low-income rural sector to the industrialised high-income sectors in the urban areas (Rwelamira, 2008). On the other hand, it is clear that rural-urban migration might also lead to concentration of poverty in the urban areas and increased pressure on resources and service delivery among others (Mmbengwa, 2009; Nkosi, 2010). Agricultural commercialisation might be used to build infrastructure and create employment opportunities in the rural areas to an extent of avoiding congestion of the population in the urban areas where local government service has already been over-stretched – to such an extent of increasing health hazards such as bacterial and parasitic diarrheal diseases and HIV/AIDS for example (Collinson *et al.,* 2010; Nguedo-Yongsi, 2009). In addition, efforts should also be made

to retain the youth in the rural areas as they are potential "*future*" farmers in those areas (Musemwa, 2008).

2.4.2.5 Commercialisation as an instrument for rural and agrarian development

Agriculture in South Africa is faced with severe resource deficiencies such as lack of production inputs, infrastructure, modern technology and equipment — especially in the rual areas and specifically with regard to the communal subsector. In South Africa, this is as a result of past apartheid policies that discriminated against blacks who formed the majority of the rural population (Xingwana, 2008) in what Mmbengwa (2009) called "*separate development*" based on race. According to Ngqangweni *et al.* (2002), agricultural infrastructural and resource limitations affected investment in the livestock production subsector in particular. In the current dispensation of agricultural commercialisation, agricultural commercialisation pessimists argue that rural communities and agriculture might immensely benefit through commercialisation. Among others, commercialisation is expected to attract increased involvement and participation of agrarian developmental agencies such as private sector companies, Community-based Organisations (CBOs) and Non-Governmental Organisation (NGOs) into some active role in infrastructural and farmer agricultural development.

These agencies might ultimately provide various other farming and non-farming inputs, crucial infrastructure, increased agricultural investment, improved institutional and service access, promotion of private investment in agriculture, improved access to credit, technology transfer, agricultural marketing training and farmer entrepreneurial skills among others (Sokoni, 2007; Wickramasinghe, 2009). Their involvement might also assist with regard to farmer skill development and improvement of other related attributes such as agricultural mentorship and farmers training — especially with regard to adoption of new technologies. Clearly, this promotes active participation of resource-poor communal farmers in the output market – thereby increasing their capabilities to accumulate capital while on the other hand farmers also benefitting from commercialisation by increasing participation in inputs market and access of commercialised services (Leavy & Poulton, 2007). Commercialisation effectively empowers resource-poor communal farmers with regard to access of purchased goods and services – and therefore providing a major platform for poverty eradication among these communities (Apili *et al.*, 1999). It is within this context that agricultural commercialisation becomes a valuable tool for improved household welfare, increased farm production and provision of agrarian development and economic growth among resource-poor communal farmers in particular (Apili

et al., 1999). Evidently, agricultural commercialisation provides a strategy to deal with underdevelopment especially where such farmers are "*trapped*" within subsistence production without a proper way to participate in mainstream formal marketing (Mathijs & Noev, 2002).

2.5 DRIVERS AND TRENDS INFLUENCING COMMERCIALISATION OF COMMUNAL AGRICULTURAL PRODUCTION SYSTEMS IN SUB-SAHARAN AFRICA

Commercialisation of communal agricultural production systems is determined by what is known as external and internal factors (Jaleta *et al.,* 2009). External factors are those factors which are beyond the influence and scope of the communal farmer (Abebe, 2011; Uchezuba *et al.,* 2009; Von Braun & Kennedy, 1986) and these might include population growth, urbanization and demographic changes, technological change, introduction of new commodities, development of infrastructure including market institutions, rising labour opportunity costs, improved macro-economics particularly the non-agricultural sector, introduction of new trade and sectoral policies, consumption preferences, improved production and market opportunities among others. On the other hand, internal factors determining agricultural commercialisation might involve factors such as subsistence farmer's resource endowments in land, natural resources, labour supply, physical capital such as infrastructure and human capital including socio-economic typology; age, level of education, experience, access to training of the farmer among others (Uchezuba *et al.,* 2009).

2.5.1 External factors

Catelo & Costales (2008), Hammilton (2008), Kindness & Gordon (2001), Kristeasen (2002), Montshwe (2006), Omiti *et al.* (2007), Pinstrup-Andersen & Shimokawa (2006), Randela (2005), Rivera-Ferre (2007) and Steinfeld (2004) found that new government policy replacing inappropriate market policies is a critical factor stimulating commercialisation of communal production systems in the developing regions. These policies regularize agriculture, promote fairer access to agricultural markets, promote market-friendly agricultural policies for the poor and create appropriate agricultural institutions and functioning markets among others. According to Satyasai & Viswanathan (1997), population growth for example, plays a critical role in determining volumes of marketable commodity surpluses in regions with deficient market linkages. Increased population and urbanization are also determinant factors of the rising demand for food of animal origin around the world (De Haan, 2006; Hammilton, 2008; Mwai *et al.*, 2005). To justify the increase in the demand of foods of animal origin in the developing

regions, Delgado *et al.* (1999) estimated the rise of beef demand at approximately 87.0% while that of milk was approximated at 75.0% *per annum*. In order to meet the demand of these foods of animal origin, communal farmers are expected to increase their production and productivity, and commercialisation is one instrument that could be used to address such a need.

Increasing market availability as a result of global trade liberalisation particularly in agriculture raises the possibilities for the formerly excluded producers in the developing regions to access the agricultural commodity export market. There are an increasing number of regions currently accessing the foreign agricultural markets in the developing regions. For example, IRIN (2008) reported that the Swazi cattle market had an emerging opportunity to access levy-free beef trading with the European Union (EU) beef market as a result of the quality of the beef produced in Swaziland which is almost 100.0% hormone-free; an important requirement by the European Union (EU). Before the trade concessions for Swazi beef, Swaziland was only allowed to export into the European Union (EU) a limited quota of approximately 10 000 tons of beef *per annum* with approximately 80.0% trading levy charged by the European Union (EU). In view of some of these external factors affecting agricultural commercialisation, Bodley (2001) argued that more food needed to be produced per unit of space in the developing regions in particular and the pathway to producing such enough food is through agricultural commercialisation.

2.5.2 Internal factors

These are those factors that the farmer would normally be able to influence and manipulate to a certain extent as they concern the farmer's personal endowments. Landholding and land-use rights, natural resources, labour supply, physical capital such as infrastructure and human capital among others are some of the internal factors that might be manipulated (Jaleta *et al.*, 2009; Uchezuba *et al.,* 2009). Farmers might be able to influence technological factors such as increased use of purchased agricultural inputs and access to both hard and soft infrastructure. These are pre-requisite for agricultural commercialisation (Satyasai & Viswanathan, 1997) and farmer ability to determine, influence and adopt them might enhance new agricultural market opportunities therefore promoting commercialisation initiatives.

2.6 AGENTS FOR AGRICULTURAL COMMERCIALISATION IN THE DEVELOPING REGIONS

2.6.1 Government intervention

Globally, governments have played crucial roles in the development of agriculture. One area which dominates government intervention in agriculture is provision of extension services. According to Ajieh *et al.* (2008), approximately 81.0% of all agricultural extension services in the world are provided for by governments of the respective countries. It is evident that Public Service has a major role to play in agricultural development. In the United States and the European Union for example, farmers have received massive subsidies amounting to billions of dollars and Euros (Lumumba-Kasongo, 2006: 9). Furthermore, Lumumba-Kasongo (2006: 9) further revealed that American farmers have received these massive subsidies to facilitate for their productivity and performance particularly in competition against farmers from the European Union who also receive massive subsidies from the so-called Common Agricultural Policy (CAP). Government might also play an interventionist role by placing into place policies that encourage good performance in agriculture. For example, it is believed that poor government policies during President Kaunda's humanism approach had contributed in Zambia's poor performance in agriculture (Nyanga, 2006). This began to change considerably during the shifting of the humanism approach during President Frederick Chiluba's government which started to bring reforms in the Zambian economy by liberalising the economy.

Inability to access and participate in the mainstream commercial markets by communal farmers, lack of traders, unreasonable farm-gate prices and inflexible trade requirements among others (Kindness & Gordon, 2001) prompted the South African government to introduce several agricultural policy instruments in the early 1990s to facilitate market access and active participation of communal farmers. This is corroborated by the submissions made by Godana & Hlatshwayo (1998) who argued that it is in the interest of every state to improve the lives of its people by ensuring a vibrant economy with secured property rights, competitive markets and creation of infrastructure among others. It is therefore understandable that Mamman (2001) argued that the state has to become an important participant in livestock production in particular by providing information on cattle disease, new variety of cattle, extension service and prices of cattle in the market to support resource-poor farmers in the communal areas.

In South Africa for example, the Marketing of Agricultural Product Act of 1996 which facilitated the formation of the National Agricultural Marketing Council (NAMC) aimed at

phasing out of agricultural marketing boards, the phasing out of import and export control measures in agriculture, elimination of subsidies and introduction of tariffs and subsequent protection of the domestic agricultural sector value chains against unfair global competition was passed to promote a competitive agricultural economy which caters for the needs of all farming sectors. These new policy shifts promote equitable access to competitive and profitable markets by administering market-access measures in both domestic, import and export trade among all sectors of farmers in South Africa beyond race (South Africa Yearbook, 2008/09: 57).

Potentially competitive and proactive policy support might become an effective strategic tool to develop and promote viable livestock market niches for the communal farmers (Kirsten & Van Zyl, 1998). The Land Care Initiative, farmer support service provision known as the Strategic Plan for Agriculture of 2001 and the Agricultural Sector Plan for South Africa (Jacobs, 2009; Moerane, 2008) are some of the programmes and policies introduced by government to facilitate improved agricultural policy support in agricultural market access and other valuable resources such as acquisition of inputs, improved infrastructure and access to extension service among others (Marfo, 2004; Moerane, 2008; South Africa Yearbook, 2008/09: 57). Improved access to agricultural extension service in particular has of late received much policy and strategic attention and improvement in South Africa (Mathabatha, 2005). Other initiatives such as the Comprehensive Agricultural Support Programme (CASP) which was launched in 2004 to expand provision of support service particularly among beneficiaries of the land reform and other agrarian reform programmes, Micro-Finance Scheme for Agriculture in South Africa (MAFISA), Land reform policies, Broad Based Black Economic Empowerment (BBBEE) programmes, ASGISA and the Constitution of the Republic became fundamental pillars of infrastructure development, financial access, commodity market access by farmers, provision of farm land in the farmer resource-poor areas of South Africa (Jacobs, 2009; Hall & Aliber, 2010; Moerane, 2008; Mudau, 2010). This is corroborated by Nesamvuni (2004) who reported that the Limpopo Province Department of Agriculture (LDoA) spent approximately 60.0% of its budget on the improvement of communal agriculture. The provincial Department has also initiated numerous other policy improvements such as compulsory animal vaccinations, disease control and monitoring measures on anthrax; rabies and brucellosis for example. Increased agricultural budget spending especially among communal and black emerging farmers in South Africa has been encouraged by the national government (Moloi, 2008).

Provision of dipping chemicals, vaccines and other required drugs are also provided by the Veterinary section of the Department which conducts regular dipping of animals and provision of clinical services in the communal areas of the province. There are also bull schemes and bull-heifer schemes that the Department assists the cattle farmers with in order to improve the quality of the animals. The aim of the improved policies on agriculture in the province is to run a cattle producing system in the communal areas that produces healthy and marketable animals (Nesamvuni, 2004). Nthakheni (2006) also reported programmes such as the food security initiative, drought relief, research and extension and water policy as some intervention strategies introduced by government to assist communal farmers. These policies improve both the production and the market sides of agriculture which becomes a good sentiment for agricultural commercialisation. On the other hand, poor and bad government policy might be counter-productive and worsening to the constraints facing agricultural development (Nwankwo & Wolgang, 2008). It is evident that government plays a critical role in commercialisation of agriculture in South Africa. This is corroborated by Ajieh *et al.* (2008) who reported that countries such as Nigeria for example, have also provided valuable input in agricultural commercialisation through the provision of valuable service to the farmers particularly with regard to extension service.

2.6.2 Vertical linkage agencies

For the purpose of the study, vertical linkage agencies refers to Contract Farming (CF) agencies such as Private Business Enterprises that allow farm enterprises to influence farmers to produce according to the specifications of their requirements (Anim, 2010). This influence allows for the contracting enterprises to actively participate in and provide control over farm production processes while not owning or operating such farms (Balasubramanian, 2004; Strohm & Hoeffler, 2006) or owning that farm. Among others, sourcing agricultural commodities from other farmers in what is generally known as a Nucleus Estate Model of production (Bijman, 2008; Eaton & Shephered, 2001) is also very popular among contracting enterprises. Bijman (2008) also reported that partnership or agreement between one or more farmers and contracting agencies such as processing and/or marketing firms is another form of contracting for the purpose of supplying selected agricultural products under forward agreement, frequency and pre-determined prices to the farmer in return for provision of inputs, technical advice on issues such as farm management, facilitation of market access and participation, guarantee of a good price and market on sale, maximisation of profit after sale, pre-determined prices and reduction of transaction costs among others (Balasubramanian, 2004; Braja, 2008; D'Silva *et al.,* 2009;

Eaton & Shephered, 2001; IFAD, 2003; Kindness & Gordon, 2001; Kumwenda & Madola, 2005; Mahanjana, 2009; Randela, 2005). These contracts might be written or verbal (IFAD; 2003; Randela, 2005; Strohm & Hoeffler, 2006). Contract farming has been in operation in agriculture for decades even in Southern Africa — especially in the 1950s (Wooded, 2003). Contract farming (CF) has become a popular linkage instrument of communal agricultural producers and agri-business in the past two decades in the developing regions (D'Silva *et al.*, 2009; Eaton & Shephered, 2001). The growth and expansion of contract farming in these regions might be as a result of increased efforts by private-public-international aid agencies to cooperate with communal farmers in these regions (Elepu & Nalukenge). On the other hand, Contract farming has become a popular approach for livestock industrialization in modern agriculture (Gura, 2008). This is as a result of the changes of agricultural and food markets in the developing regions which have become more liberalised, integrated, globalised and consumer driven in a global economy extensively influenced by an expansion of agri-business and increased levels of privatization (Errapa, 2006).

As a result of high transaction costs on primary inputs such as veterinary medicine; animal vaccines; animal feed supplements; animal breeding material and equipment and lack of capital among communal farmers in some communal areas of South Africa particularly in the livestock subsector, Grwambi *et al.* (2006) argued that this subsector finds itself faced with enormous commercialisation constraints. In this regard, Contract farming (CF) is expected to become a viable option to maximise access to these inputs among the farmers in South Africa. In addition, both the contracting agencies and the farmer benefit from this partnership because the arrangement distributes production and mainstream formal market risk between them (Bijman, 2008; Randela, 2005). Contract farming (CF) promotes collective marketing of agricultural output and it therefore improves farmer and involvement in the agricultural value chain (Tooth *et al.*, 2009). For example, in the Asia region particularly in Japan and South Korea, Contract farming (CF) in the poultry farming subsector in particular is developing into a viable tool linking the communal subsector with its market-orientated subsector while the dairy and pig subsectors in India, the Philippines, Thailand and Vietnam are also becoming highly contractually based (Catelo & Costales, 2008). The same authors reported that despite the fact that Contract farming (CF) is becoming a huge interest in several less developed and developing regions such as India, Japan, the Philippines, South Korea, Thailand and Vietnam; it remains difficult to trace its origin in Latin America and Africa. However, evidence exists that it is also becoming a factor in these regions too. For example, Kenya has had some considerable progress

in the advancement of Contract farming (CF). IFAD (2003) and Strohm & Hoeffler (2006) reported that Kenya was able to exploit its new emergence of Contract farming (CF) agricultural economy in advancing its agricultural commercialisation and diversification initiatives as compared to other African countries such as Mozambique and Zambia. However, Contract farming (CF) has its own limitations for both the farmer and the contracting agency (Eaton & Shephered, 2001). Farmers find it difficult to meet the expected contract standards resulting in considerable losses of contract revenues when those contracts are terminated. Communal farmers cannot enforce the contract. These factors are exacerbated by the fact that there are obvious inequality of negotiation and bargaining powers between the communal farmer and the powerful agri-business entities that contracted the particular communal farmer. Communal farmers in Africa are sensitive with regard to their farming independence. They feel threatened when their farm management functions are reduced and challenged by the contractors and they think they become labour providers in their own farms.

Contacting agencies usually demand to provide management functions of the farming enterprise and also to specify quantities and qualities of the product (Catelo & Costales, 2008; Kindness & Gordon, 2001) which most farmers regard as interference. As a result of these factors, conservative and orthodox farmers were expected to abstain from participation and involvement in Contract farming (CF) (Karli *et al.*, 2006). In addition, Contract farming (CF) might create dependency behaviour of the farmer as the market is guaranteed in such a way that in case of the contractor failing to provide the market, the farmer has no alternative market. Farmer dependency is common among communal farmers in South Africa particularly as these farmers lack basic entrepreneurship skills in livestock production (Vatta *et al.*, 2008) which might enhance their innovation (Jha, 2009). Eaton & Shephered (2001) further mentioned that the contracting agencies are also faced with challenges such as unavailability of land particularly for those productions needing access to large spaces of land, farmer discontentment, as a result of discriminatory buying; late payments; change in pricing and inefficient extension services, diversion of agricultural inputs and extra-contractual commodity marketing among others. It is evident that Private Business Enterprises have become a critical partner of agricultural commercialisation, development and growth worldwide (Ajieh *et al.*, 2008).

2.6.3 Civic Organisations

Mulaudzi (2006) describes civic organisations as those community-based organisations that interact among each other for a common good of a particular society particularly in places and

needs where government finds it difficult to reach. Farmer-based organisations such as the National African Farmers Union (NAFU), National Emerging Red Meat Producers Organisation (NERPO) and cooperatives in the case of South Africa are some of these organisations. International organisations such as the Israel Cooperative Development Agency working through local Non-Governmental Organisations (NGOs) such as the South Africa-Israel Forum have also emerged to assist communal farmers to develop their farming expertise particularly on current agricultural trends in areas such as the formation of agricultural partnerships and cooperatives by providing training to the farmers (Matlala, 2010: 7).

Pouden (2007) found that farmer-based cooperatives have been used in several developing countries for the resource-poor communal farmers as agents of agricultural commercialisation. Cooperatives such as marketing institutions, farm inputs supply, service provision, production and processing are strategic pillars of agricultural commercialisation in the developing regions. These cooperatives have been successfully used as farmer empowering agencies in supplying farm inputs such as on-farm machinery and equipment, provision of shelter for livestock, provision of livestock feed at low cost, provision of new farm technologies, providing guaranteed commodity marketing service, provision of service such as credit access and serving as educational and training agencies on modern business techniques to member farmers and improving agricultural production and productivity in the livestock; fruit and vegetable production subsectors by minimizing losses and increase in commodity profit (Naledzani, 1992; Pouden, 2007).

Other organisations such as the agricultural marketing institutions, marketing cooperatives, parastatal marketing agencies, commodity boards and financial institutions, private sector entities, community-based organisations and Non-Governmental Organisations have been used in the developing regions to facilitate agricultural commercialisation in both the production and commodity marketing levels. Among others, they provide and facilitate essential services such as para-veterinary services, brokering relationships between stakeholders particularly farmers and business enterprises and also form important agencies for farmer skills transfer, searching and dissemination of market information and acting as marketing agencies or linkages with the mainstream market for the communal farmer (Bailey *et al.*, 1999; Bonaglia *et al.*, 2008; Chipeta, *et al.*, 2008; Kindness & Gordon, 2001; Satyasai & Viswanathan, 1997). Mellor (2004) argued that civic organisations and Non-Governmental Organisations might assist in organising farmers into farming associations which in turn might facilitate subsistence farmer integration in the

commercial agricultural markets by resolving challenges faced by these farmers in terms of access to economies of scale. For example, Farmer organisations such as National Emerging Red Meat Producers Organisation (NERPO) and National African Farmers Union (NAFU) have been used to fast-track agricultural commercialisation in South Africa. However, the impact and effect of these organisations were largely limited as a result of poor membership of farmers in these organisations because of poor farmer educational levels, ability to communicate, income levels and ability to adopt new technologies which affect their ability to participate in farmer organisations (Jera & Ajayi, 2008; Karli *et al.*, 2006).

2.7 AGRICULTURAL COMMERCIALISATION IN THE DEVELOPING REGIONS

This section investigates the various approaches used in the commercialisation of communal agricultural systems in sub-Saharan Africa and elsewhere in the developing regions. Two approaches; commercialisation of the inputs and outputs sides of the communal production subsector have been investigated for the purpose of the study taking into consideration the argument submitted by Abera (1999) and Eskola (2004) that commercialisation can occur on the output side of production with increased marketed surplus or/and on the inputs side when there is an increased use of purchased inputs, for example. Of particular importance is that both these types of commercialisation might occur simultaneously and not necessarily in isolation.

2.7.1 Commercialising the inputs side

The inputs side of agriculture is its production side where farmers have to access production resources such as drugs for livestock, fodder, on-farm infrastructure which might include grazing camps and water supply, land and services such as extension and finance. The inputs side might be commercialised through agricultural development agencies and government interventions among others. These agencies are expected to ensure that farmers accessed required raw materials such as animal feed, vaccines and drugs. In the case of livestock production, these institutions might have to provide the animals as raw material to the subsector (Gura, 2008).

In addition, the inputs side might also be commercialised through monetisation of resources by encouraging buying and hiring ownership systems of land instead of the traditional mechanisms of land ownership which are mainly communal. Replacement of traditional means of agricultural labour access by a cash-orientated labour system, replacement of government-orientated interventionist agricultural policies by increased involvement and linkages of the communal

farmers and the private sector through micro/small/medium and large business enterprises have been successfully used in various communal regions in the developing countries such as Sri Lanka, Tanzania and Zambia among others (Bonaglia, 2008; Kindness & Gordon, 2001; Sartorius, 2006; Sokoni, 2007; Wickramasinghe, 2009).

2.7.2 Commercialising the outputs side

The outputs side is the commodity side; i.e., the cattle marketing side. Market access by farmers is the primary objective of every commercial production. Commercialisation of agriculture aims at facilitating output from the communal subsector to reach the mainstream formal markets. Increasing the share of marketable surplus and introduction of new agricultural production activities are well-known strategies of output commercialisation approaches. Collective agricultural marketing for example has been identified and has become an effective tool to improve farmer bargaining position in the vertical agricultural value chains in communal production systems of countries such as Hungary (Töth *et al.*, 2009).

This commercialisation might be conducted through the various agencies of commercialisation such as Non-Governmental Organisations among others. Such organisations often influence the structures, conduct and performance of commodity marketing channels and their choice of the particular markets and they therefore become critical strategic instruments for output commercialisation (Bailey *et al.*, 1999). Researchers such as Eskola (2004) argued that output commercialisation might be achieved through infrastructure development where road networks are developed to improve trader mobility, infrastructure is developed within the locality in order to shorten distances which might reduce transport transaction costs for the farmer and on the other hand, improving communication networks to promote faster market information dissemination, market searching and commodity promotion among others.

2.8 CATTLE MARKETING SYSTEMS AND CHANNELS AMONG COMMUNAL FARMERS IN SUB-SAHARAN AFRICA

Marketing is an important component of every successful enterprise and it is equally important to have an organized market system in place if an agricultural enterprise is to survive (Naledzani, 1992) particularly when there is evidence that only 27.0% of communal cattle farmers in South Africa are able to make profit from their farming activities, approximately 17.0% of them just break even while 56.0% are operating on a loss (Schwalbach *et al.*, 2001). The choice of marketing channels and systems depends on; farmer's location, demographic

characteristics such as economic status, access to market information and technologies, availability of formal mainstream markets, prices offered by the formal mainstream markets, profitability, distance to the markets and the potential of the markets to absorb the stock on sale among others (Guvele, 2001; Jari, 2009; Montshwe, 2006; Musemwa *et al.*, 2008; Nkhori, 2004).

While there are conflicting conclusions on the reasons for African communal cattle farmers in selling their animals, Mtetwa (1978) argued that communal cattle farmers in Africa are careful sellers of their animals as they usually avoid exploitative capital markets by only selling when the prices are good. The same author argued that Zimbabwean communal cattle farmers are not limited by cultural and socio-religious factors when selling their animals. This is contradictory to Swaziland where communal cattle farmers avoid selling their cattle for such reasons (IRIN, 2008). Coppock (1994) and Werner (1997) have also concluded that pastoralists in most parts of Africa particularly among Ethiopian pastoralists and the Hereros of Namibia do sell their cattle to obtain cash particularly during dry seasons. One other challenge that has been identified in the sub-Sahara Africa's communal cattle production subsector is continuous marginalisation of women cattle traders where these women traders are restricted mainly to within-village transactions. This significantly reduces their income, economic productivity, independence and development. The restriction of the women farmers to within-village transactions is also aggravated by the fact that men own most of the transport means used to access the distant marketing channels in most communal areas in the developing regions (Starkey & Fernando, 1998). Also, Dapaah *et al.* (2001) found that most communal livestock farmers in South Africa still lack essential marketing skills and knowledge – especially with regard to livestock marketing.

For example, most of the communal livestock farmers are not aware of the best periods for selling their animals as most of them sell their animals during winter and dry seasons when the animals are in poor condition and therefore attracting low prices. In addition, successful trading requires understanding of the characteristics of the farmer's potential trader. It is paramount to understand the conduct of the market before identifying who the trader is. Bayer *et al.* (2004) argued that preferences of the trader play a determinant role in the market performance of the cattle production subsector particularly when it has to compete against other well performing livestock subsectors such as poultry and pork - which continue to give the cattle subsector some considerable performance challenge in the formal mainstream market in particular. According to

Grwambi *et al.* (2006), mainstream formal market traders mostly demand large volumes of stock for example. What remains a challenge is that communal farmers in general produce low off-takes for the markets which may not be enough to meet the requirements of the mainstream formal markets. This is a constraint that hampers effective participation of the communal farmers in the mainstream formal markets. Communal farmers fail to meet volume demands and higher quality expected by the mainstream formal traders. These factors retard effective marketing (Kindness & Gordon, 2001; Sartorious & Kirsten, 2006; Shiferaw *et al.,* 2007). The choice of marketing systems and channels also depends on the behaviour of both the communal cattle farmer and the buyer.

Ward *et al.* (2005) reported that weight, gender, frame, muscling, condition, horns and health of the animal were the most considered factors by cattle traders in the United States of America when purchasing animals. For example, on feeder calves, traders paid less for calves that recorded higher weight while unhealthy, too thin and too fat calves with horns are undesired or penalized when pricing. In South Africa, particularly in the communal areas of the Eastern Cape Province, for example, private cattle traders prefer cattle that fulfill their cultural and traditional beliefs (Robertsen, 2008). Musemwa *et al.* (2008) also reported that some traders prefer steers than bulls while others prefer Nguni breeds than exotic breeds as a result of the Nguni breed's good meat and milk production ability among others (Musemwa, 2008).

There are several agricultural commodity marketing channels used by communal farmers in the developing regions particularly in South Africa (Mthembu, 2008). The choice of a particular marketing channel differs from place to place in communal areas of South Africa depending on the particular farmer's needs and preference (Montshwe, 2006). In the case of cattle marketing, butcheries; speculators; private buyers; farmer cooperatives; municipal abattoirs and auctioneers; friends; public informal buying for various functions such as funerals, weddings, traditional ceremonies and traditional rituals dominate the livestock market in the sub-Saharan Africa region in particular (Bailey *et al.*, 1999; Jari, 2009; Montshwe, 2006; Nkhori, 2004; Nthakheni, 2006; Ruhangawebare, 2010).

Generally, in sub-Saharan Africa, informal trade and traditional marketing channels play a critical role in livestock marketing transactions as farmers are afforded an opportunity to dispose of their animals at farm gate prices where returns were generally higher than in the mainstream formal markets (Hazell, 2007; Musemwa *et al.*, 2008; Steinfeld *et al.,* 2006; Strohm & Hoeffler, 2006). There is preference for the traditional informal marketing channels among communal

cattle farmers in most communal areas in South Africa despite the limitations of the informal marketing channels. The fact that the informal marketing channels largely depend on ceremonies, traditional activities and other emergencies and in addition, low quantities of animal stock, infrequent customer base and inconsistency (Montshwe, 2006) might force some of these farmers to consider selling their animals to the formal marketing channels.

Butcheries are more popular formal marketing channels among communal cattle farmers in Botswana as a result of their proximity to the sellers for example. Selling farmers get immediate payments and there are also no product grading hurdles involved while national marketing channels have lower prices and a grading system (Nkhori, 2004). In the Central Western Region of Uganda, Ruhangawebare (2010) reported that the majority (56.0%) of the communal cattle farmers sold their animals to abattoirs. Nieuwoudt & Groenewald (2003) found that auctions and immediate local community are the most popular livestock selling marketing channels in South Africa. These findings dispel incorrect assumptions that indigenous Africans – especially those in the communal areas only produce their livestock – especially cattle for subsistence reasons without real commitment to the market. In fact, Davies (2008) argued that indigenous African livestock farmers have been established traders of livestock for decades.

Some communities in sub-Saharan Africa use village representatives who travel to distant markets to negotiate deals on behalf of farmers. The so-called "*Wakulima Shushushu*" in Tanzania is an example (Chipeta *et al.,* 2008). Middlemen and brokers are also popular in Ethiopia, Kenya (Kiptarus, 2005) and the Sudan especially in the so-called cross-border trading which is popular in these countries despite heavy taxation on the animals in-transit to the markets in Sudan and Ethiopia in particular (Awuor, 2007). Several countries have established national marketing channels that buy livestock directly from the communal and small-scale farmers. These national agricultural commissions are responsible for slaughtering and marketing of all the beef that their respective countries export to various destinations. The Hungarian Collective Agricultural Marketing Centre for example, assisted Hungarian livestock farmers since its formation in 1996 by intensifying marketing orientation and providing high standard, up to date and efficient marketing services (Töth *et al.*, 2009). Botswana has Botswana Marketing Commission (Nkhori, 2004), Kenya relies on the Kenya Meat Commission which was established in 1960 but operated up to 1987 (Bailey *et al.*, 1999).

South Africa has the National Agricultural Marketing Council (NAMC) established after the abolishment of agricultural control boards through the Marketing of Agricultural Products Act,

47 of 1996 (Moerane, 2008; South Africa Yearbook, 2007/2007: 82). The NAMC promotes access to markets to communal farmers by promoting, facilitating implementing programmes and measures which seek to support equitable access to competitive and profitable agricultural markets in a sustainable way among other strategies. NAMC facilitates fair, open, efficient and competitive domestic markets by developing policies and strategies that enhance agricultural efficiency in value chain marketing, for example, through leasing with other government departments (South Africa Yearbook, 2008/09: 57). Nthakheni (2006) also reported that this council has to provide services such as market information, export advice and product development for the farmers.

2.9 FACTORS CONSTRAINING COMMERCIALISATION OF COMMUNAL PRODUCTION SYSTEMS IN SUB-SAHARAN AFRICA

This section identifies and discusses various factors constraining commercialisation of the communal agricultural production systems. Efforts have been made to focus this review on South Africa in particular. Leavy and Poulton (2007) argued that the farmer's ability to access the mainstream formal markets is crucial if any agricultural commercialisation initiatives are expected to be successful. Maginxa & Kamara (2003), Wynne & Lyne (2003) and Montshwe (2006) identified several intertwined constraining factors limiting commercialisation of communal and small-scale cattle-production systems in South Africa.

2.9.1 Discriminatory commodity pricing

Dovie *et al.* (1999) argued that one serious challenge still facing communal cattle farmers in South Africa in particular remains that cattle produced in the communal subsector among others do not fetch the same prices as that produced in the commercial subsector in most cases. This is despite the fact that the quality of the animals in both the subsectors might in all probability favourably compare. This is corroborated by Braidotti (2011) who also argued that cattle performance among the communal and commercial subsectors in South Africa might not bear any significant differences as communal cattle also favourably compete against commercial cattle. However, this discrimination of the cattle with regard to market price might be inherent and recurring from the bad apartheid time agricultural production and marketing policies when blacks were all-together discriminated against (Vink, 1993). This price discrimination might discourage these communal farmers from participating in the mainstream formal markets.

These farmers might opt for the traditional informal markets which might be rewarding to communal cattle farmers because these markets might offer better price options and increased farmer freedom of determining the prices of their animals (Montshwe, 2006). The availability of fair-pricing markets on the other hand might provide incentives to the communal farmers to actively participate in these mainstream formal markets realising the profit they might make from such participation. In addition, profit maximisation might further provide these farmers with an opportunity to develop new technologies and new markets among others (Teka, 2009). However the new agricultural policy in South Africa offers protection for the communal cattle farmer against unfair pricing mechanism of the mainstream formal commodity marketing (South Africa Yearbook, 2008/2009). Eaton & Shephered (2001) reported that discriminatory pricing was also a factor in Contract farming (CF) and this is a constraining factor for agricultural commercialisation as farmers often engage in disruptive farmer discontentment.

2.9.2 Inferior animal quality

Communal cattle farmers in South Africa have no strict livestock disease control measures particularly in those Foot and Mouth Disease (FMD) prone areas and this becomes a major constraint for such farmers to enter the mainstream formal cattle market (Nthakheni, 2006). In addition, the same author also argued that on certain instances livestock traders in South Africa often complain that the quality of the animals produced by communal cattle farmers are generally inferior in physical quality among others, as a result of their old age and poor body condition at sales. This view is corroborated by McNeil & Matjuda (2007) who argued that cattle from the communal subsector in South Africa currently do not meet the requirements of the feedlots mainly due to poor breeding of the animals. Inferiority of quality affects the price and performance of the animals when sold particularly in the mainstream formal marketing channels (Montshwe, 2006; Musemwa *et al.,* 2008; Sones *et al.* (2002). This view is also corroborated by Jacobs (2008) who argued that the mainstream formal markets often look for a good price, good quality of the animal and delivery time when buying stock among others.

Due to poor management practices, animals in the communal areas in South Africa have retarded growth and with low reproductive rates. Indiscriminate breeding leads to inbreeding of the animals characterised by uncontrolled and unstructured selection procedures of breeding bulls which often were of inferior quality (Anteneh *et al.*, 2001; Chintsanya *et al.,* 2004; Okonno-Adhiambo, 2002). Poor adoption of modern technological approaches in animal breeding such as artificial insemination often lead to animal inbreeding which are highly

characterised by occasional physical deformation in animal off-springs, high mortality rates, poor fertility, low calving rates, genetic inferiority and low productivity among livestock in the subsistence subsector in the developing regions (Anteneh *et al.*, 2004; Montshwe, 2006). Gura (2008) corroborated this argument by reporting that traditional breeds and production systems in the developing regions were considered unproductive and backwards. All these factors might affect animal standing and quality in the mainstream formal markets (Nthakheni, 2006) by reducing the desirability of affected animals among traders (Montshwe, 2006). Inferior animal quality is expected to remain a challenge for the subsistence farmer particularly when ticks and other external parasites that harm the animals were remaining problematic (Chonco, 2009). The over-all effects of these limitations and constraints are a low productive cattle-production system.

2.9.3 Market-related challenges

2.9.3.1 Poor cattle off-take

Communal cattle farmers often fail to meet critical aspects of the commercial traders' expectations and specifications such as enough stock numbers and tight delivery schedules as they mostly produce and supply less off-take for the markets. Approximately 59.2% of communal cattle farmers in South Africa keep an average of between ten and 10.8 head of cattle (Moorosi, 1999; Nthakheni, 2006; Stroebel, 2004) which might be a small number to provide enough off-take for the mainstream formal market in particular. Musemwa *et al.* (2010) found that in the communal areas of the Eastern Cape Province in South Africa cattle off-take rates was between five and 10.0% of the total cattle herd as compared to approximately 25.0% in the commercial subsector.

Hangara *et al.* (2011) reported cattle off-take rates of between 2.0% and 20.0% among communal cattle farmers in the northern communal areas and South Cordon Fence in Namibia. The same author reported approximately 25.0% off-take rates in the commercial sector in Namibia. The high off-take rates in some of the communal areas of Namibia might be the catalyst of the high export performance of the cattle subsector which contributes approximately 70.0% of total export cattle in this region (Hangara *et al.*, 2011). On the other hand, the poor off-take rates which are estimated to be as low as 2.0% in some areas among the communal cattle farmers particularly in the northern communal areas might emanate from increased number of non-productive breeding cows in the cattle herd and high neo-natal mortalities among the

animals among others (Nthakheni, 2006). In addition, Moraka (2000) and Moyo *et al.* (1996) also found that productivity and reproductivity also differed from one cattle breed type to the other. This might have some effect on the off-take rates as off-take might also have to depend on the respective cattle breed type kept by individual farmers. For example, indigenous Sanga cattle breeds such as the Mashona, Nkone and Tuli might have high calving rates which might yield better off-take when compared to breeds such as the *Bos taurus* (Moyo *et al.*, 1996).

2.9.3.2 Accessibility of the cattle markets

Communal cattle farmers in Southern Africa in particular experience long distances to the markets because they lack established marketing centres where they live and produce their animals (Grwambi *et al.*, 2006; Mbilinyi & Nyoni, 2000; Musemwa *et al.*, 2008; Nkhori, 2004; Nthakheni, 2006). The same authors also argued that there are limited links with the mainstream formal cattle traders and in addition, limited number of cattle traders at village level in particular. Poor market accessibility is also caused by socio-economic constraints such as poor communication infrastructure affecting communal cattle farmers in the communal areas which often lead to poor access to effective cattle market information for example (Montshwe, 2006; Musemwa *et al.*, 2008; Nthakheni, 2006; Satyasai & Viswanathan, 1997). The same authors further argued that most villages where communal cattle farmers are situated in South Africa are in the remote areas with no supporting infrastructure and efficient marketing systems making it difficult for communal cattle farmers to access the mainstream formal cattle markets.

If lack of marketing infrastructure such as roads and cattle trading points can be properly developed in the communal areas, communal cattle farmers are expected to access the mainstream formal market in an improved manner (Bahta & Bauer, 1997; Montshwe, 2006). Continuous lack of access to proper infrastructure might perpetuate continuous increased transaction costs on the side of the farmer which might discourage the farmer from commercialisation by resorting to farm-gate selling (Mthembu, 2008). It is evident that mainstream formal cattle marketing are a huge challenge among communal cattle farmers particularly in Southern Africa (Hangara *et al.*, 2011). In short, Shiimi *et al.* (2010) summarised marketing constraints among communal livestock farmers in sub-Saharan Africa when saying *"...livestock systems are characterised by long marketing chains featuring great distances, numerous phases of weight gain and feeding regimes, multiple levels of traders and transactions, a multitude of steps and stages of processing, and a variety of employment creating services and inputs..."* However, Dlamini (2010) argued that improvement of infrastructure in

the developing regions such as South Africa might reduce high transaction costs for market participants – thereby improving market effectiveness and efficiency in communal agriculture.

2.9.3.3 Low levels of literacy among farmers

There are low levels of literacy among communal cattle farmers in South Africa in terms of cattle marketing knowledge, administration of market information and understanding of cattle market dynamics resulting in exploitations and malpractices by marketing channels such as speculators, middlemen and other marketing intermediaries. High illiteracy levels among communal farmers result in less adoption of new technologies such as communication technology which becomes a crucial constraint for commercialisation. For example, most communal areas in South Africa were dominated by farmers who only spoke, read or write their native languages only. With most of the agricultural market information published in either English or Afrikaans, the majority of the farmers in these communities do not find the information helpful (Musemwa *et al.*, 2008). It is evident that the educational level attained by the farmer and existing awareness might play a major role in the effectiveness and competence of the farmer in agricultural production and market participation in particular (Hangara *et al.*, 2011; Montshwe, 2006). There is therefore a need to emphasise the value of education in communal areas experiencing increased illiteracy among their productive groups such as the youth (Pender *et al.*, 1999).

2.9.4 Animal production, management and productivity challenges

Inability to increase productivity affects the farmer's ability to access the mainstream commercial market and therefore impedes commercialisation efforts. Inability to increase productivity in the communal subsector is influenced by several factors such as inability to control, manage livestock diseases and inability to reduce transaction costs. Poor animal disease management and control are promoted by absence and lack of comprehensive vaccination programmes for animals and failure to meet international demands for animal certification and traceability and lack of livestock genetic improvements as a result of poor livestock managerial skill development among communal farmers (Dapaah *et al.*, 2001; Montshwe, 2006).

Genetic improvement in animals is pre-requisite for farm productivity (ASARECA Secretariat, 2009). In sub-Saharan Africa, most of these factors were as a result of government budgetary constraints which compel governments to reduce budgets (Bryceson, 2002; Kherallah *et al.*, 2000). IRIN (2008) also reported that while there were some opportunities for developing

countries such as Swaziland to access the European Union (EU) beef market for example, chances were that such countries were not be able to effectively access those markets as a result of poor skills in animal husbandry and high livestock mortality rates – which affect their off-takes and quality of the product. In addition, exogenous factors such as climatic patterns; persistent droughts and skewed rainfall distribution, lack of resources such as unfavourable water and grazing, high exposure to parasites that transmit various diseases, uncontrolled breeding, were often problematic to producing for the markets (Nthakheni, 2006).

2.9.5 Poor inputs supply

Communal farmers are faced with considerable lack of access to agricultural inputs leading to low productivity in the developing regions as a result of factors such as lack of institutional support base, low genetic potential of the animals, poor nutrition and increased animal diseases (Feleke, 2008) among others. Communal farmers are by and large faced with poor access of livestock production inputs such as vaccines and drugs for example after many years of official neglect in South Africa in particular (Hall & Aliber, 2010). Makhatla *et al.* (2005) argued that any successful agricultural enterprise needs to have support from a reliable base of inputs suppliers within reach of the incumbent farmer. In addition, production inputs might be accessed through loans and credit facilities among others (Satyasai & Viswanathan, 1997).

However, in a country such as South Africa, communal farmers for example, might not be able to provide any basis of equity on such important loans and credit among others for various reasons. This is because communal farmers in South Africa lack property rights and land ownership which might be used as collaterals to acquire such loans, for example (Nthakheni, 2006). These factors are constraining to commercialisation and market access for subsistence farmers in particular (Rahji & Adeoti, 2010) because it becomes difficult for the farmers to acquire critical farm inputs. Such farm inputs might require large capital outlays to cover high transaction and transformational costs in new production and market technological innovation (Boehlje, 2004) for example.

In addition, high transaction costs to purchase inputs such as animal vaccines and feed supplements and lack of technical knowledge for the application of inputs (Cuellar, *et al.*, 2006; Montshwe, 2006) were also constraining commercialisation. Farmers in the communal areas were also to contend with high transportation costs as a result of long distances to the service and business centers and other nodal points (Makhura & Wasike, 2003) and high cost of

infrastructural development which forms a primary driving force for commercialisation under every condition (Satyasai & Viswanathan, 1997). Improvement on these crucial factors might improve, enhance and encourage competition in agricultural trading with particular reference to livestock production (Mwabu & Thorebecke, 2001). For commercialisation to be successful there has to be adequate and timeous inputs supply (Satyasai & Viswanathan, 1997). Lack of inputs also results in the decline of agricultural productivity (Cuellar, *et al.*, 2006).

2.9.6 Support-base challenges

Communal farmers need a lot of support by agricultural authorities and government to make them productive and sustainable. However, for several reasons including budgetary limitations and service efficiency, agricultural authorities and governments in most sub-Saharan Africa countries find it difficult to dispense most of the critical support required by communal resource-poor farmers. This section only focuses on extension support and financial assistance as the major constraints faced by most farmers in the communal areas of the developing regions – especially in South Africa where farmer support was based on race.

2.9.6.1 Lack of extension support

According to Grwambi *et al.* (2006), other factors that impact on the communal cattle subsector from commercialisation include inadequate extension services and visits. Baloyi (2010) reported that lack or poor extension service and visits are common in the communal areas in South Africa with 56.0% communal farmers unable to access such service or visits. Most governments in sub-Saharan Africa have reduced spending in services such as agricultural extension to curb on rising public spending (Chapman & Tripp, 2003). Lack of extension service might also negatively impact on farmer training, access to information; technologies and credit particularly among women who are discriminated against by male technicians and extension agents in particular (Nindi, 1993). Women have been victims of economic exploitation in the developing regions for decades – and this increased illiteracy, unemployment and underdevelopment within this group (Jiyane, 2002).

Lack of extension service has led to the privatization of this service in most countries which might result in this service being highly expensive and unaffordable for most of the farmers, and therefore unable to reach most of them (Chapman & Tripp, 2003; Taylor, 1998). According to Naledzani (1992), extension support is a crucial factor in determining market participation among communal farmers as it might improve farmers' knowledge of commodity production

and market factors, improve farmers' productivity and in addition improve income generation ability among others. Furthermore, increased extension service might also enhance the probability of farmer participation in the mainstream formal markets especially in the communal cattle-production systems (Montshwe, 2006) where such participations are still low. Forstner (2004) concluded that a unit increase in extension visits to the farmers for example, might increase the probability of those farmers to sell their livestock by approximately 0.011 whereas increased access to farmer training on livestock production increased farmer probability of selling their livestock by approximately 0.293 in South Africa. Furthermore, agricultural extension might also be crucial in dissemination of information to resource-poor farmers as farmer support to access information. To corroborate this view, Machete *et al.* (2004) reported that extension service among communal farmers is a major source of information particularly in Southern Africa. Furthermore, NERPO (2005) also reported that most communal cattle farmers in South Africa prefer to receive agricultural information through agricultural extension officers and mail. It is evident that extension service still plays a major role in the technical advice and linkage with farmers (Bello & Salau, 2009) despite its lack of effectiveness and efficiency of service at times (Mathabatha, 2005). There are incidences where access to market information among communal farmers is greatly constrained by lack of extension service to the communal farmers in South Africa and eventually affect the possibilities of those farmers selling their animals and to participate in the mainstream formal market in particular (Bahta & Bauer, 2007).

2.9.6.2 Reluctance of commercial institutions to finance communal agriculture

One other institutional support challenge concerns reluctance by commercial institutions to finance communal agriculture in the developing regions (IFAD, 2003; Rahji & Adeoti, 2010). This reluctance is as a result of uncertainties in the levels of farm inputs; outputs and the waiting time between inputs and outputs in the communal agriculture subsector (Rahji & Adeoti, 2010). Bonaglia *et al.* (2008) also reported that lack of government funding has lead to a decline in agriculture as a result of limited and unstable public resources in the past two decades in the developing regions. It is evident that agricultural development in the South African communal areas is greatly constrained by intertwined factors including lack of reliable markets for the produced output and also absence of reliable inputs supplier base within reach and accessibility among the communal farmers in particular (Makhatla *et al.*, 2005).

2.9.7 Poor infrastructure

Poor infrastructure is a major obstacle to economic rehabilitation and commercialisation in sub-Saharan Africa region as argued by both the New Partnership for Africa Development (NEPAD) and the African Development Bank (ADB) (Mangwiro, 2007; New Agenda, 2007). Physical infrastructure such as poorly maintained roads linking villages and business nodal points in particular might become imposing limitations for communal farmers to access the mainstream formal agricultural markets particularly when associated with high transaction costs (Daapah *et al.*, 2001; Musemwa *et al.*, 2008; Mwabu & Thorebecke, 2001). South Africa has a daunting task to recover from years of neglect by the apartheid regime in terms of its poor investment in infrastructure development particularly with regards to blacks (Nengovhela, 2010; Nthakheni, 2006; Randela, 2005). According to Ngqangweni & Delgado (2002), lack of this infrastructure undermined agricultural production and also discourages investment in the sector. This might also result in the loss of agricultural commodities particularly where rural settlements were situated in remote areas away from the urban markets or business nodal points (Musemwa *et al.*, 2008).

On the other hand, Makhura & Wasike (2003) argued that transaction costs are reduced when communal farmers have access to service centers, nodal points, potential urban markets, and major towns. The same authors further reported that the minimum distance communal farmers travelled to nearby towns in South Africa was approximately 25km while the longest distance was approximately 60km depending on places. Other infrastructural constraints to commercialisation and agricultural productivity include inadequate transport for both on and off-farm activities as most communal farmers in the developing regions do not own means of transportation but rely on public and other people's generosity (Aklilu *et al.*, 2002; Niewoudt & Groenewald, 2003). Ortmann & King (2007) discovered that in KwaZulu-Natal Province of South Africa, in the Impendle and Swayimana villages, communal farmers owned only 37.5% and 27.5% of transport means respectively, for example. Lack of access to transport significantly raises transaction costs as farmers have to hire transport from other sources when transporting their animals to the markets.

This is made more difficult particularly where traders are reluctant to travel to the farms to buy stock as a result of high transaction costs associated with poor roads, long distances and poor loading facilities. These conditions are common in the communal areas of South Africa (Montshwe, 2006). Erratic supply of basic needs such as telecommunication infrastructure,

electricity, water and inadequate on-farm equipment such as cattle loading ramps and equipment, inadequate market space, vandalized camp fences and livestock market points are some critical infrastructural deficiencies facing communal farmers in the developing regions such as Nigeria and South Africa (Grwambi *et al.,* 2006; IFAD, 2001; Mamman, 2005; Ortmann & King, 2007; Satyasai & Viswanathan, 1997). Improved road infrastructure improves the quality of lives of individuals and therefore increase the possibilities of individual agricultural potential and facilitation of economic growth and commercialisation by promoting and enhancing agricultural competition among farmers (Makhura & Wasike, 2003).

2.9.8 Lack of access to financial assistance

Access to finance might refer to access to finance in terms of space/km and/or access in terms of obtaining working capital from financial institutions such as commercial banks. This section focuses on credit and risk protection institutions such as insurance service providers.

2.9.8.1 Access to credit and credit facilities

It is generally agreed that lack of credit and capital is a major obstacle to rural agricultural development particularly in the developing regions (Hanlon, 2002). This is expected to remain a major constrain on agricultural development and commercialisation in particular taking into consideration the fact that most governments in the developing regions have withdrawn from providing credit access to the resource-poor farmers (Pearce *et al.,* 2004). Adams (2000) also conceded that lack of finances among communal farmers might lead to low-input and low-output farm production strategies. Credit is a means to access required capital for farming, affords farmers to access capital for buying stock; inputs such as drugs, vaccines and supplementary feeding. Farmers who have access to credit facilities are able to break even and produce beyond subsistence means by venturing into the mainstream formal marketing (Dapaah *et al.,* 2001; Grwambi *et al.,* 2006)) which might provide a better platform for these farmers to build up assets and reduce their vulnerability (Pearce *et al.,* 2004). Clearly, farmer access to credit might enhance and accelerate agricultural development in the developing regions (Moloi, 2008).

Most critically is the fact that the majority of Africans particularly in South Africa lack access to bank credits as these banks require unaffordable collaterals from the farmers to acquire credits and loans (Mazibuko, 2010; Mbeki, 2011). It is this attitude of financial institutions that plays a critical role in constraining farmer development, productivity and their participation in the markets in most developing regions. In addition, some of these financial institutions have lack of

interest in financing rural agriculture; be it production or mainstream formal commodity marketing (Hann, 2002). Anticipated high risk on the communal farming systems as a result of natural disasters such as unpredictable weather and pests commonly associated with most developing regions were found to be some of the reasons for lack of this interest in financing communal agriculture. For example, Hanlon (2002) reported that in Mozambique, only the Banco Internacional de Mozambique (BIM) provided small lending for agricultural purposes to communal farmers. However, Hanlon (2002) further reported that there are numerous Non-governmental Organisations and development agencies in Mozambique that provided micro-credit mainly for formal traders and to a limited extent to the communal farmers.

Another crucial factor affecting credit access among communal farmers in South Africa in particular concerns lack of collateral among communal farmers (Mazibuko, 2010). Financial institutions that provide loans and credit require up-front collateral which in most cases include land title deed ownership (Mazibuko, 2010). Such collateral becomes difficult to raise particularly among communal farmers who lack individual rights on land - as land in the former homelands of South Africa is primarily owned by *chiefs* as trusts for their communities (Ortmann & King, 2007). Therefore, these farmers cannot use communally held land as collateral when applying for loans and credit. Of particular concern on farmer access to credit is that in most of these developing countries such access is still gender-based with women being the most excluded group (IFAD, 2001) particularly where women are still faced with constraints such as unclear or weak land rights, limited access to common property, cash for input purchase, credit and micro-finance, technology and education (Bonnard, 2001; Nindi, 1993).

In addition, it is imperative to note that South Africa has recorded some emergence of interest by financial institutions to finance agricultural ventures among the formerly disadvantaged groups. This development provides a significant opportunity for the communal farmers to commercialise their agricultural production systems, albeit in a small scale. According to South Africa Yearbook (2008/09: 60), there are six major credit sources for farmers in South Africa which include Banks (50.0%), co-operatives and Agri-business (12.0%), Land Bank (21.0%), other credit and financial institutions (9.0%) and private creditors (8.0%). Dapaah *et al.* (2001) reported that farmers were able to access formal credit through the Land and Agricultural Banks despite the fact that most of these farmers still lacked understanding of financial skills such as loans and interest calculations among others.

Chief among credit and loan institutions in South Africa is the Land Reform Credit Facility which is funded by the South African government, the European Union, the Danish Development Agency (Danida) programme and the Micro Agricultural Finance Institutions of South Africa (MAFISA). Apart from these institutions providing direct credit and loans to farmers, these institutions also strengthen agricultural development by introducing retail channeled credits through accredited institutions to the formerly disadvantaged communal and emerging farmer groups in South Africa (Adams, 2000; Nthakheni, 2006; Xingwana, 2008).

It is evident that most developing countries have been trying to assist the rural poor through access to farm credit. Various initiatives with regard to access to farm credit have been undertaken in most developing regions. In Ethiopia for example, communal farmers can access loans and credited from microfinance institutions and farmer cooperatives as individuals or as a group (Abera, 2009). Financial institutions in Bangladesh for example have been having major contribution in developing small-scale credit seekers as far as the 1970s (Jansson, 2011). Vermaak (2006) reported that in Bangladesh for example, there is a programme known as *Grameen* which grants credit to the rural poor on a group liability, rather than on a collateral basis. There are approximately 250 000 rural poor in approximately 5 400 villages who benefited from this programme when it started.

There are currently approximately two million rural poor in about 34 000 villages who are benefiting from the *Grameen* programme. In this programme, the loans are repaid over a year and the repayment rates were approximately 97.0% successful. It can be said therefore that the challenge may not necessarily lie with the inability of these farmers to repay the loans but the attitude of the financial institution on communal farmers. In Bangladesh and Kenya, micro-credit customers such as aspiring small-scale entrepreneurs have been proven to be reliable and able to manage their finances better particularly when assisted (Jansson, 2011). Jansson (2011) further indicated that one way of assisting micro-credit customers is to try to make them avoid being over-indebted. This proves that if well assisted, micro-credit customers and micro financial institutions might benefit from the partnership to fight poverty and develop resource-poor communities.

Ghana also has a scheme that assists rural poor to access financial institutions through a programme known as *Susu.* Mobile Bankers in rural Ghana collect money from rural dwellers on a daily basis to encourage them to save money (Vermaak, 2006). Naledzani (1992) argued that savings by the rural poor are low as a result of weak or bad government policy and insufficient

or absence of financial institutions in those areas and not necessarily low income and poor savings habits of the people. This corroborates Mbeki (2011: 18) who argued that the majority of the South African public are unbanked and also lack access to credit and loans as a result. Savings among farming households in the resource-poor areas should be encouraged because it might provide better options of financing farming especially with regard to access of farm inputs (Olaoye *et al.*, 2011). It has been trend in sub-Saharan Africa for large corporate and the private sector to discriminate against small-scale resource-poor farm borrowers therefore making savings crucial for future farm endeavours (Olaoye *et al.*, 2011).

However, lack of access to corporate credit among the resource-poor in particular is not only a challenge in sub-Saharan Africa but a widespread continental phenomenon. Charintonenko *et al.* (2004) revealed that in the Asian and Pacific regions for example, approximately 95.0% of some 180million households lack access to institutional financial services while on the other hand approximately 90.0% of the population in the developing regions worldwide also lacks access to this service. The implication is that approximately one billion resource-poor people worldwide are unable to access institutional financial services such as credit, loans and even banking (Charintonenko *et al.*, 2004). In the former Venda Bantustan in South Africa for example, government aligned agencies such as the Venda Agricultural Corporation which was established in 1982 provided credit facilities to emerging farmers. Some of their funds were sourced from the Development Bank of Southern Africa (DBSA) to support communal and emerging farmers (Naledzani, 1992). Access to institutional financial service such as credit, loans and even banking might improve the ability of the poor to increase incomes, build assets and also reduce their vulnerability to devastating economic situations. On the other hand, it might improve the farmers' ability to access on-farm capital which might make agricultural commercialisation much easier. Clearly, access to credit reduces financial constraints and also poverty among resource-poor farming households (Olaoye *et al.*, 2011).

2.9.8.2 Access to insurance

A substantial majority (91.3%) of communal farmers in some of the developing regions such as the Western Kenya districts of Kakamega and Siaya, have shown interest in accessing hypothetical farm insurance schemes despite lack of interest on these farmers by insurance institutions (Otieno *et al.*, 2006). It is lamentable however that there has been some considerable lack of such insurance facilities among these farmers. Such lack of access to farm insurance

might remain a negative factor for the communal livestock production subsector particularly with regard to production and access to the commercial mainstream formal markets. According to Mohammed & Ortmann (2005), there are several factors affecting the adoption of livestock insurance among the communal farmers in sub-Saharan Africa. In a study conducted in Eritrea, Mohammed & Ortmann (2005) found that adoption of livestock insurance is dependent on and negatively affected by factors such as poor formal education of the farmers, farmers' lack of awareness on livestock insurance, poor farming experience, poor geographical location of the farmer and lack of alternative risk management strategies among others.

In addition, it is difficult to persuade farmers to adopt farm insurance as most farmers in the developing regions lack trust in farm insurance agencies (Nwankwo & Wolfgang, 2008). It is encouraging that in South Africa, trends are beginning to change regarding communal farmers' insurance provision by insurance institutions. Ntingi (2007) reported that low-income communal livestock farmers in the Centane village in the Eastern Cape Province are currently able to access livestock volume-based farm insurance covers provided by Mutual and Federal; which is a short-term insurance arm of the Ned Bank group. This is an initiative of Old Mutual and its black shareholding investment partner, Wiphold. The idea is to provide subsistence and community-based products to the largely unemployed and less irregular incomed community. In addition, this community is also assisted on some financial management skills by these insurance institutions. Despite these positive developments on agricultural insurance in some parts of the developing regions, Nwankwo & Wolfgang (2008) reported that some farmers in the communal areas of some developing regions still dislike farm insurance and furthermore, these insurance agencies also find it difficult to convince these communal farmers to adopt farm insurance.

2.9.9 Poor marketable livestock numbers

The success of a farmer is determined by the ability of that farmer to access commodity markets and to market the commodity (Van Schalkwyk *et al.,* 2007). Apart from lack of agricultural marketing points in South Africa particularly for the communal livestock farmers (Nthakheni, 2006), other market-related factors are also crucial. For example, poor marketable livestock numbers also determine the ability of the farmer to participate in the markets. Marketable cattle numbers might refer to a percentage of the cattle sold and slaughtered as measured against the total cattle herd kept by an individual cattle farmer (Montshwe, 2006). Marketable cattle numbers among communal cattle farmers in South Africa show some significant variability depending on areas as such rates often fluctuated between 7.8% and 21.3% of a particular herd

kept by the respective farmer (Nthakheni, 2006; Stroebel, 2004). Among the communal cattle farmers of the Central Western Region of Uganda, Ruhangawebare (2010) indicated that available cattle for the market amounted to between 10 and 12.0% of the total herd *per annum* resulting into increased *per capita* meat deficits of approximately 41.2% in the Ugandan beef industry.

Several factors might contribute to poor marketable cattle numbers , which might include among others; poor off-take rates among communal cattle farmers in particular, exogenous factors such as natural disasters including drought, disease outbreaks, theft and increased mortality rates among animals (Anteneh *et al.*, 2004; Montshwe, 2006; Van den Bosch, 2008). In addition, Ruhangawebare (2010) argued that maintaining large herd of cattle among communal cattle farmers as a survival strategy particularly during possible exposure to risk has more often contributed to low cattle marketable numbers. Furthermore, it is further argued that poor adoption of livestock modern technologies among communal farmers might result in increased mortality rates among animals in the subsector contributing to the decline in the availability of marketable stock (Nell, 1998). This view is corroborated by Nthakheni (2006) who reported that high rates of neo-natal cattle mortality in South Africa contributed to lower productivity rates in the cattle subsector. Nthakheni (2006) further revealed that mortalities among young and old cattle stood at approximately 15.7% per herd in a particular year in South Africa with the highest mortality rates experienced within the calf bracket at approximately 73.3% *per annum.*

In addition, Grwambi *et al.* (2006) also reported that high livestock mortality rates are often contributed by car accidents as animals are often left grazing in open grazing spaces in most communal areas. However, Dovie *et al.* (1999) reported an improved care of animals during the night in some rural areas of South Africa where most farmers still keep their animals in rudimentary enclosures made of traditional poles and to a certain extent barbed wire. While mortality rates might have a motivational factor for farmers to sell a portion of their animals in order to minimise losses (Montshwe, 2006), they also might play a negative role by reducing the numbers of animals which might be available for the market. For example, IRIN (2008) reported that poor rainfall and droughts caused some considerable damage on cattle production in Swaziland between 2005 and 2008 with mortality rates increasing from approximately four percent in 2005 to 10.0% in 2008.

Cattle mortality is unpredictable. In addition, cattle population in Swaziland also stagnated at approximately 640 000 heads of cattle as a result of increased mortality. However, according to

Montshwe (2006), increased cattle mortality rates might provide a catalyst for market participation among communal cattle farmers. The study conducted in the Ganyesa-Mopeane area in the North West Province concluded that cattle mortality was a source of risk and therefore stimulated farmers to consider selling their animals in order to avoid further losses of their animals. In this regard, it was also probable that a significant percentage of marketable numbers be made available for the market as a result of some government interventions to minimise losses. Governments often encouraged farmers facing unavoidable risk such as extended severe droughts to sell their animals.

However, this action is not without challenges as during good seasons for example, these cattle marketable numbers might decline as the sold and slaughtered stock might not be replaced particularly among resource-poor communities in South Africa where farmers are not used to purchasing additional stocks to replace the disposed stock (Dovie *et al.*, 1999). Livestock marketable numbers might also be affected by increased incidences of animal theft which might reduce the number of animals owned by the respective farmer. When the farmer owns fewer animals, such a factor might impact on the volumes such farmer might provide for the market (Hangara *et al.,* 2011; Montshwe, 2006; Nkhori, 2004). For example, Dapaah *et al.* (2001) reported that high incidences of livestock theft in the Mopeane-Kudumane districts in North West Province have become a major risk to the productivity of the communal livestock subsector. Dapaah *et al.* (2001) further reported that approximately 44.0 % of the farmers in this region had lost cattle to theft within a period of 12 months. In addition, the study discovered that most of this theft is conducted by local people. This theft might be resulting from the fact that the grazing areas not properly fenced as animals are left to roam the area freely (Grwambi *et al.*, 2006). Furthermore, Nthakheni (2006) also argued that cattle productivity rates were very low in South Africa smallholder areas as a result of high percentage of non-productive breeding females in the herds. Smaller amounts of approximately 35.6% of cattle productivity rate had been recorded at times in South Africa which is too low for a sustainable livestock production system. Obviously, marketable surplus might be affected under these conditions and circumstances.

2.9.10 Poor government policies

South Africa finds itself in a position where it has to undo the effects and results of apartheid policies of the previous apartheid regime. Apartheid policies created by the white minority regime in South Africa effectively terminated black commercial agricultural production systems

which were still evident in the late 1800 and the beginning of the 1900s in particular (Verschoor, 2003). These segregatory policies badly affected agriculture as they created a dual agricultural system based on race and therefore divided agriculture into the commercial agricultural subsector for the whites and the subsistence subsector for the blacks (Moerane, 2008; Nthakheni, 2006; Van Schalkwyk *et al.,* 2007; Verschoor, 2003). It is evident that these biased agricultural policies created some serious imbalances between commercial agriculture and communal agriculture in terms of economies of scale and market access in particular. Policy in South Africa was used to worsen agricultural condition of the already marginalised black farmers in favour of the already advantaged commercial white farmers as argued by Nwankwo & Wolfgang (2008) that policy could be used as an instrument against agricultural development. The implication is that South Africa's dual agricultural system did not provide government support to communal farmers in particular (Mbeki, 2011: 216-219; Nthakheni, 2006; Obi, 2006; Randela, 2000; Van Schalkwyk *et al.,* 2007). This is corroborated by the argument submitted by Mbeki (2011: 212) that in doing so, the apartheid regime failed to see that agricultural productivity might enhance economic growth for this region.

Most African governments have smaller spending in agriculture and rural development; spending approximately 4.5% to 5.2% of their budgets (Cohen, 2010). In several other countries in sub-Saharan Africa, most governments also reduced agricultural financial support and subsidy due to mounting budgetary constraints among others. However, the so-called Maputo Declarations of 2003, resolved to increase public spending in agriculture to approximately 10.0% of the budget by 2010 in this region (Cohen, 2010). On taking power, the post-apartheid South African government had to develop policy that would create conditions necessary to motivate and enable communal farmers to advance from subsistence communal production to commercial production. Such conditions were expected to promote a unified agricultural economy among others (Van Averbeke & Mohamed, 2006).

The new policy shift sought to redress the race-based agricultural systems by promoting and facilitating for equal access to factors of production among farmers regardless of the sector in which they practice farming (Grwambi *et al.,* 2006; Nesamvuni *et al.*, 2003; Nthakheni, 2006). In the livestock subsector, a holistic Livestock Industry and Implementation Framework were developed in order to facilitate for the integration of this subsector (Nthakheni, 2006).The apartheid government had supplied commercial agriculture with subsidized interest rates on loans, tax concessions, price support and provision of technical support in terms of affordable

extension service and development of better road networks among others (Mbeki, 2011: 212-219; Montshwe, 2006; Nthakheni, 2006; Van Schalkwyk *et al.,* 2007). This support was not given to communal agriculture which was mainly practiced by black farmers confined to the so-called native homelands or Bantustans (Ortmann & King, 2006). These tendencies helped to keep communal farming in a stagnant environment unable to access the commercial agricultural market (Nthakheni, 2006; Randela, 2005; Stroebel, 2004).

By introducing new policies in agriculture, the South African government has thought to run a market-driven economy that would initiate socio-economic development with equitable access to opportunities for all citizens by reducing unemployment; escalating poverty levels and perpetual inequalities among others (Verschoor, 2003). New agricultural policy development is an undertaking dictated by various trends around the world. These trends might among others include increased globalization, global market liberalisation, privatization, expansion of agri-business, urbanization, HIV/AIDS prevalence, population growth, climate change and changing nature of agricultural technology which might continue to force policy-makers to develop policies which seek to address some of these challenges (Owamo *et al.*, 2006). However, development of good agricultural policies remains sub-Saharan Africa's challenge on agricultural development and mainstream formal market access by communal farmers particularly those in formerly disadvantaged areas during colonialism. It is on account of proper policy development that support communal production in the developing regions that the livestock subsector has begun to show some incredible growth with a booming economy in meat, milk and wool production in general (Köhler-Rollefson & Mundy, 2010).

However, post-colonialism and apartheid repressive regimes, most of the countries in sub-Saharan Africa in particular still have agricultural policies which are largely biased, unclear, inadequate, and inappropriate and which in addition also offer little support to research, agricultural production and development particularly on livestock production (Nthakheni, 2006). On the other hand, eradication of gender discrimination in areas such as landholding rights for women where women are denied access to land (Quisumbing & Meinzen-Dick, 2004) and rural electrification; provision of appropriate technologies and financing (Dubash, 2002; Nindi, 2003) remains unexploited policy territory in most parts of the sub-Saharan Africa region. If policy can undo the majority of these challenges, policy-makers in sub-Saharan Africa might be able to address some of the critical agricultural policy gaps affecting this region particularly for the communal subsector. This new policy development might be able to steer agriculture towards a

pro-poor path that might protect their assets, reduce their vulnerability, provide alternative risk-coping mechanisms and create conditions for agricultural growth and sustainability (Pica-Ciamarra *et al.*, 2007).

According to Nesamvuni *et al.* (2003) there are several agricultural policy gaps in South Africa impacting negatively on livestock development, productivity and sustainability. Weak policy and lack or low capacity in the Provincial Departments of Agriculture as well as limited capacities at Municipal level, weak policy that fails to address critical issues such as lack of access by communal farmers to financial resources and capital, policy that fails to deal with the need to develop on-farm agricultural infrastructure development in the provinces, policy that is silent on skills gaps promoted by poor education in areas such as resource management and lack of entrepreneurial experience by communal farmers in particular, weak coordination between research and extension service and lack of access to markets by emerging and communal livestock farmers characterised the South African policy reality in agricultural development. It is hard to run a successful agricultural commercialisation process through a cluster of flawed policy provisions while potentially competitive and proactive policy support might be critical for the development of viable market niches for communal farmers in South Africa in general (Kirsten & Van Zyl, 1998). In addition, policy has to be implemented for it to be a successful tool for agricultural development in particular on commercialisation for one of the major limitations on African policy has been the inability of the authorities to implement it.

2.10 CONCLUSION

Communal cattle farming has been a very old practice in South Africa particularly among Africans. This subsector details an important part played by cattle among the rural poor in this country. Communal cattle-production systems are characterised in general by harsher and expensive farming environment, small herd sizes, and low-inputs-low outputs production systems with poor modern husbandry practices, low productivity, high mortality and low off-take rates among others. It is therefore evident that it is a farming system highly constrained by various complexities. Among the major determinants of the constraints on the subsectors' productivity and mainstream formal market participation in particular are the farmers' demographic and endowment characteristics, poor adoption of new cattle production and marketing technologies and lack of institutional farmer support factors.

Despite these major constraints and complexities affecting the commercialisation of the subsector, there are indeed some considerable opportunities to commercialise this subsector particularly its livestock subsector. Most communal livestock farmers; with particular reference to beef cattle for the purpose of the study, resort to producing their cattle mainly for home consumption with a few of the surplus sold to a largely informal market despite the obvious opportunities provided by the enterprising and growing mainstream formal market. In South Africa, the former apartheid regime also created discriminatory policies that effectively terminated commercial agricultural production among the blacks. It is in this context that the new democratic government had to create new agricultural reform policy to redress the past apartheid injustices by commercialising communal agriculture particularly. However, it is evident that despite these policy efforts by government to commercialise communal production systems, not much has been achieved so far. This is because of the many obvious constraints that this process seems to face.

CHAPTER 3

RESEARCH DESIGN

"...we cannot deconstruct a system that we do not know or understand..." Lumumba-Kasongo (2005:1)

3.1 INTRODUCTION

This chapter outlines the research design of this study. It also elaborates on the questionnaire design and its administration. The procedures used in the sampling, data collection methods and materials, the ethical conduct of the researcher and the time schedule of this study are also comprehensively described. Pictures were also used in certain sections of the research report as a means of giving *"...an extra dimension to the written information and to further make the thesis attractive..."* (Juma, 2009). For the purpose of this study, an operational definition of the household has been used as meaning a group of people who are mostly related, ate together, sharing the same residence, household activities and livelihood resources and these people shall include those individuals who may not have been biologically related but identified by the head of the farming household or the respondent as members of the particular household (Stroebel, 2004). Taking into consideration the argument raised by Buchenrieder & Moller (2009) that it is empirically difficult to sufficiently define what a communal farmer is, for the purpose of this study, the communal cattle farmer shall refer to those individuals who keep cattle under communal land-use system with an objective and purpose of livelihood production however with a certain output surplus sold to generate needed household income.

3.2 RESEARCH METHODS

3.2.1 Orientation and planning stage

This phase started in February of 2006. The researcher met with the local extension officers in order to explain the intention of conducting this study in their area. During the consultations, the general overview of the intended study; its aims and methodology were comprehensively explained. Their support was obtained and recommendations taken into consideration. Two visits were undertaken to each participating village of this study area. The first meeting introduced the researcher to the villages' *chiefs* and the representatives of the local civic associations. At these meetings permission to conduct the study was solicited, and granted. On

second visits, those *chiefs* who had community records such as population records provided them to the researcher. It was agreed during these visits that the local extension officer be the facilitator of the meetings with the cattle farmers in this study area, to inform them and to invite them to the first meeting. Meetings were arranged in each identified village to meet the farmers and it was during these meetings where the researcher was introduced by the local extension officer. The researcher explained the study purpose, procedures and processes to the farmers. The farmers also offered their support and made some recommendations.

3.2.2 Sampling procedure, sample size and definition

Communal cattle farmers to be interviewed were selected from Maangani, Musekwa, Maranikhwe, Strathaird, Afton, Sane, Dolidoli and Khomele villages in the greater Nzhelele area. These villages are locally known as the Musekwa Valley. Individuals who owned any number of cattle as listed by the local extension officers were eligible to participate in this study. The list of all the cattle owners was provided by the local extension office at Dzanani. The list was confirmed with the farmers, farmers' village committees and the village chief of each participating village.

Fifty five (n=55) communal cattle farmers were randomly sampled for the study which amounted to a 30.0% sample size as indicated in Table 3.1. The same percentage was used to determine the number of participants from each participating village to enable a proportionally equal percentage of the participants and to avoid any form of bias as advocated by Brynard & Hanekom (2005: 41). In other words, the so-called proportional-stratified random sampling was used for the study. The 30.0% sample size was considered representative and suitable enough to provide generally acceptable results of this study taking into consideration that it is generally difficult to give precise rules on the actual sample size or its minimum percentage required for the justification of a particular study (Randela, 2005; Stroebel, 2004). Other factors such as limited resources for data collection (Uchezuba *et al.*, 2009) contributed to the decision to settle for a 30.0% sample size avoiding an over-sized sample which might result in the use of more resources than were necessary and possible. However, efforts were made to ensure that the sample size allowed a representative sample of the communal cattle farmers and ensure high quality results.

The first meetings with the farmers in each village took place at the local dipping tank on a dipping day. These meetings took longer than expected. Farmers raised sensitive and valuable

questions and discussions during these meetings. It was therefore not possible to obtain the participants during these long meetings. In each case it was agreed that a second round of meetings had to be organized. Farmers agreed to meet on the next dipping day in the particular village for the purpose of selecting the participants.

This was necessary after the farmers indicated their unwillingness to stay for long hours in a meeting. It was thought that meeting on the livestock dipping day in each participating village might assist to minimise the number of absentees. There were few farmers who failed to attend the meetings nevertheless, particularly at Musekwa (2), Dolidoli (3) and Khomele (2) villages. Substitute farmers were obtained from the other available farmers to make up the 55 farmers targeted for interviews. A simple random sampling method was used to identify the participants in each village. Table 3.1 indicates the number of farmers per particular village sampled for interview. The villages are alphabetically listed without following their geographical location.

Table 3.1 Number of cattle farmers interviewed in the Musekwa Valley

Village	**Number of cattle farmers**	**30% of the cattle farmers**
Afton	13	4
Dolidoli	33	10
Khomele	31	9
Maangani	20	6
Maranikhwe	18	5
Musekwa	46	14
Sane	05	2
Strathaird	17	5
Totals	183	55

Marked cards equal to the number of participants needed for this study in a particular village were combined with the number of unmarked cards to constitute an equal number of the present interested farmers. For example, there were 20 interested farmers present at Maangani village but only six farmers had to be interviewed. Six cards were marked to be picked by participating farmers for interview. These cards were combined with 14 other unmarked cards to make a total of 20. The cards were put in a box and mixed together for farmers to pick a card each. Those who picked up marked cards qualified for the interview. This process was repeated in all the other participating villages until a sample size of 55 farmers was obtained. This approach was successfully used by Nthakheni (2006). The list of selected farmers to participate in the questionnaire-based survey was drawn and their contact particulars also recorded.

3.3 DATA COLLECTION METHODS

Two information and data collection sources were targeted in this study, namely; primary and secondary data. The primary data targets the communal cattle farmers in the Musekwa Valley study area and their farm records while the secondary data targets other sources such as existing study reports, researchers, extension officers, traders, etc. The data collected for this study provided a framework on which to base the knowledge and understanding of the communal cattle-production systems and the farming households. The knowledge and understanding gathered in this regard is prerequisite for the deconstruction of the non-productive and profitable communal cattle production system into a viable and productive commercialised cattle production entity as corroborated by Lumumba-Kasongo (2005: 1). In order to obtain the data, three instruments were used:

3.3.1 Questionnaire-based survey for communal cattle farmers

A questionnaire using closed and open-ended questions was developed and used to interview communal cattle farmers (Annexure A). The questionnaire was developed with the assistance of the local extension officers, the study supervisors and other sources such as Marfo (2004), Mocwiri (2006), Montshwe (2006), Nell (1998), Nthakheni (2006), Randela (2005) and Stroebel (2004). The variables to be measured as indicated in Table 3.3 were selected through the assistance of the local extension officers, experts in the field of study and the study supervisors. The original questionnaire was translated into *Tshivenda* which is the local language (Annexure B). This is a departure from similar studies such as that of Juma (2009) which translated questions directly from the questionnaires during interviews. Translation of the questionnaire was conducted to minimise expected problems as it was common that farmers at this study area might have language challenges especially with regard to English as was the case with most rural communities in South Africa (Akpalu, 2005). The respondents in this study area were expected to have low literacy levels, poor multilingual background and to also have limited English vocabulary which might be constraining to them answering questions from an English questionnaire. Peil (1995: 94) argued that it becomes highly important to translate the original questionnaire into the local dialect to ensure that both the respondent and the interviewer understood both the questionnaire and the instructions well.

In addition, it also avoids misunderstandings and ambiguity of questions used in the questionnaire which could lead to poor data production due to distortions of responses when using a questionnaire which has questions in a language not properly understood by the

respondents (Douglas & Craig, 2007; Jiang *et al.*, 2006). It is crucial to also have a pre-caution to the fact that the same word might have different meanings (Temple & Edwards, 2002). During pre-testing of the questionnaire instrument, certain words were found to have different meanings for some respondents while others found them to mean the same thing in the case of this study area. For example, (ox) *phulu* and (bull) *mboho* were a bit confusing. To some respondents *phulu* (ox) meant an ox whereas for some it meant a bull. On the other hand, *mboho* (bull) meant an ox to some whereas with some it meant a bull. People of the same region and village also have different language structures and meaning. The implication is that incorrect data might be collected in this regard because it was possible that the respondents gave different responses to what they actually thought the respective question needed. For example, in the Juma (2009) study conducted among the Turkana pastoralists in Kenya, the researcher established that though both the researcher and the respondents spoke Kiswahili, they still experienced major differences that might have compromised the quality of the data. In the Juma (2009) study, the so-called direct translations and interpretations of the questionnaire were adopted during interviews without having an opportunity to verify accuracy of the interpretations. This approach might lead to distorted data being collected – especially when considering that individual interpreters might also have different interpretation of the questions. In recognition of the shortcoming of direct interpretation of data, a professional translator was obtained in order to ensure accuracy in the translations for this study. As indicated in Table 3.2, guidelines of translating questionnaires suggested by Douglas & Craig (2007); ICN (2005) were adopted.

Table 3.2: Guidelines for translating the English to *Tshivenda* questionnaire

Guideline	**Objective**
Pragmatic translation	Ensures that the content of the source language used in the questionnaire (English) is accurately communicated in the target language of the respondents (Tshivenda)
Aesthetic-poetic translation	Ensures that the moods and feelings of the source language used in the original questionnaire are maintained in the target language
Ethnographic translation	Ensures that meaning and cultural content of the translated local dialect questionnaire matched the expectations of the respondents
Linguistic translation	Ensures that the grammatical forms and equivalent meanings in the target language of the respondents were correctly presented in the local *Tshivenda* dialect questionnaire

Adapted from: Douglas & Craig (2007); ICN (2005)

A comparison of the original questionnaire and the back-translated version was conducted by a language specialist who was not involved with the original translation of the questionnaire from English to *Tshivenda*. This was done in order to detect and correct any possibility of dissimilarities between the questionnaires and to achieve high quality measurement of the questionnaire. Naotaka (1992) submitted that in order to guarantee quality of the translated versions, the back-translation technique is necessary to assist in finding a degree of congruence between the original version and back-translated transcripts. The final questionnaire of the target language was pre-tested by the local extension officers on two farmers in each participating village. It was important to conduct the pre-test to determine if the questionnaire was clear enough, unambiguous and easily understood as argued by Kyrillidou *et al.* (2003) and May (1997: 92). The objective was to have a questionnaire which is both relevant and effective (Bailey, 1987: 107; Goddard & Melville, 2001: 47).

During the pre-testing of the questionnaire, it was clear that some parts of the local *Tshivenda* dialect needed some attention as there were some notable discrepancies between the spoken *Tshivenda* and written *Tshivenda* dialect depending on the area one came from. It was therefore necessary to make use of translators who were familiar with the *Tshivenda* language as spoken within the jurisdiction of this study area as that differed to a certain extent with the same *Tshivenda* language as spoken elsewhere in the same region. These translators also had some basic knowledge on livestock production. The necessary modifications and language adjustments were conducted with the assistance of a translator and an extension officer. Some difficulties in translating some biological terminology were noted and extensive consultations were conducted with some *Tshivenda* language experts. The final Venda version questionnaire was again referred to a second language specialist who was not involved in the initial translations in order to determine the accuracy of the translated version. Minor changes were however recommended particularly on particular individual words which were thought to be confusing both to the interviewer and the interviewee. The recommended changes were implemented.

Eight volunteers who had reasonable or sufficient livestock agricultural background knowledge acted as enumerators for this study. Each participating village was persuaded to contribute with one volunteer interviewer. These interviewers also helped in administering the questionnaire instrument. The researcher trained the interviewers with the help of the local extension officer. This training was necessary to eliminate possible challenges such as inaccurate noting of

responses by enumerators among others as argued by Peil (1982: 94). The participant farmers were interviewed individually at their respective homes to allow a relaxed environment and easier access to the required information. This allowed the enumerators to verify information, control and manage time on the completion process of the questionnaire-based survey.

3.3.2 Key informant interviews

These interviews involved important stakeholders for this study. A total of 30 key informants were purposively selected for interviews as indicated in Table 3.2. The key informants were selected during community meetings known as *Khoro* in each participating village. Four community members per participating village were nominated from which to select two to be interviewed. A vote through the show of hands was then cast. The two nominees per village that received the majority votes qualified to represent the particular village. A total of 16 community representatives from the eight villages compromising the Musekwa Valley study area were confirmed for interviews as indicated in Table 3.3. Their contribution in this study might promote community participation in this study and therefore very likely to generate interest to use the results after its conclusion. In other words, the community is provided with an opportunity to actively determine its own socio-economic destiny (Swanepoel & De Beer, 2000) as this study is expected to have some effect on the daily lives of these communities (Crowther & Lancaster, 2009).

Table 3.3 Key informant interviews sample size

Category	**Total Number**
Butchers	6
By-product traders	1
Commercial farmers	2
Community representatives	16
Extension officers	2
Scholars	2
Ward councilor	1
Total	30

Butchery owners, a trader on cattle by-products, commercial farmers, extension officers, experts in the field of agriculture and the local Ward councilor were interviewed. A guideline of questions was used for the interviews (Annexure C). Some questions on the guidelines were drawn from Grwambi *et al.* (2006) while some were constructed by the researcher with the help of the extension officers. There were only six registered local butcheries listed by the Department of Health as operating in the eight villages of this study area. As a result of this

small number, efforts were made to interview all the butchers. During the interviews for the butchers and community representatives, it was revealed that there was a popular trader who frequented this study area for cattle hides. The trader's names and contacts were obtained and follow up conducted to trace the trader for interviews. The trader was located and interviewed at Louis Trichardt Town. Two locally based extension officers were interviewed at Musekwa Satellite Agricultural offices. Commercial farmers were the most difficult to interview as those approached for interviews showed reluctance citing various reasons, among others; time constraints. With much persuasion, only two reluctantly participated. Interviews were recorded as field notes, analyzed and written as supportive material and included in the main report.

3.3.3 Field work

Chapter four (4) dealing with Musekwa Valley study area's topography, soils, type of vegetation and infrastructure required an observation as a result of limited information available and/or total unavailability of immediate information available for the particular villages. The researcher conducted a site visit or the so called transect walk to all the villages of the Musekwa Valley study area observing and recording the acquired data regarding the specified variables; for example, the type of soil, vegetation and topography in the study area. These data were recorded as field notes. Data regarding type of vegetation in each village and its classification was gathered and classified with the help of a Pasture Scientist based at the Mara Agricultural Research Station and an Ethno-Botanist based at the Limpopo Department of Forestry and Environmental Affairs. Soil distribution data was gathered and classified with the assistance of the local agricultural extension officer based at Dzanani agricultural offices.

3.4 DATA ANALYSIS

There were two kinds of data to be analyzed. The descriptive data obtained from the questionnaire administered to the fifty five (n=55) communal cattle farmers in this study area and the empirical data obtained by fitting the results of the questionnaire administered to the communal cattle farmers in this study area.

3.4.1 Descriptive data

Data obtained from the questionnaire administered to the communal cattle farmers was entered into an Excel spreadsheet by the researcher and statistically analyzed using the Statistical Analysis System Software Package Version 9.2 (SAS, 2008). Data analysis included farmer typological characteristics such as gender, age, level of education, household size, farmer

experience and farmer household endowments characteristics on among others, cattle ownership and access to factors of production. Data analysis also included farmer technological and farm management skills in crucial areas such as adoption of new livestock production technologies. Correlation effects among some of these variables - perceived to might have influence on both farm productivity and market participation of the communal cattle farmers were also identified and analyzed to obtain such effects. Such coefficients were referred to throughout the presentation of the results – especially the descriptive results. The descriptive results were reported and discussed in chapter five (5) to ten (10) of the main report.

3.4.2 Empirical data

The empirical data collected in this study area had two factors to analyse; farm productivity and formal cattle market participation. Data on these factors were transported from the Excel spreadsheet and fitted into the binary logistic regression model using Statistical Analysis System commonly known as SAS (2008) to be analyzed. Each factor was analyzed on a separate model. Seventeen covariates which included data collected on farmer demographic typologies, institutional and technological factors were used for the analyses for each model as indicated in Table 3.4. These variables were selected based on some reviewed literature which had bearing on this study and also the analytical theories employed in this study. This approach has been successfully used in studies such as that of Rahji & Fakayode (2009). The results of these models were presented in chapter 11 and 12 respectively.

Table 3.4 Measured variables and expected effect (+/-) on farm productivity and mainstream formal market participation

Variable Name	Variable description	Measurement and coding of variable used	Expected effect (WEAN)	Expected effect (MCHANEL)
AGE	Age for household head in years	Actual age of household head	+_	+_
EDUCATION	Educational level of the household head	Highest formal school Grade completed by the household head. Tertiary education (1), Otherwise (2)	+	+
EMPLOYMENT	Employment status of household head	If employed (1) and if unemployed (2)	+_	+_
HHSIZE	Household size	Actual number of members in the respective farmer household	+_	+_
FARMEXP	Experience of the household head	Actual number of years the head of household has completed in cattle production	+	+
SYSTEM1	Type of production systems	If producing cattle only (1) or producing other livestock (2)	_+	_+
OWNERSHIP	Cattle ownership	If owned the cattle (1) and if not (2)	+	+
RECORDS	Farm records kept by farmer	If kept records (1) and if not (2)	+	+
SPOINT	Animal selling point	If there is a selling point (1) if no selling point (2)	+	+
DISTANCE	Farmer to market channel geographical distance in Kilometers	Three classes; 1,2,3 = near, medium, far	+_	+_
ADVERT	Method used in advertising or disseminating cattle sales information to potential traders	If adopted any advertising method (1) if not (2)	+	+
EXTENSION	Access to extension assistance not necessarily visits	Access to extension service (1) if not (2)	+	+
LOANS	Farmer's ability to obtain loans from formal institutions	If farmer access loans for on-farm activities (1) if not (2)	+	+
INCOMESELL	Income generated by farmer through cattle sales	Income by selling cattle (1) if no income through cattle sale (2)	+	+
TRANSOWN	Transport ownership by farmer	If farmer owns any transport (1) if not (2)	+	+
MEMBER	Membership in farmer organisations	If member of farmer organisation (1) if not (2)	+	+
MCHANEL	Marketing channel adopted by the farmer	1=formal; 2=informal or otherwise	+	+
WEAN	Weaning of calves in the previous 12 months	If weaned any calf in the past twelve months (1) if not (2)		+

It is hypothesised that **AGE** of the household head might either be positive or negative on the probability of the farmer being productive and participating in mainstream formal cattle marketing. It might be a positive factor as it is hypothesised that older farmers were more likely to own more cattle than younger farmers (Balagtas *et al.*, 2007). Mahabile *et al.* (2005) confirm that there are indeed a large number of older cattle farmers in most communal areas in Botswana for example than there are young farmers. However, older farmers were also likely to be wealthier and experienced than younger farmers. Their vast experience might strengthen their financial standing in farming (Jordaan & Grove, 2007). Older farmers are in addition likely to use their experience and age to improve farm productivity, decision-making and market participation through the personal contacts they might have developed over the many years of interaction with various potential marketing channels (Grwambi *et al.*, 2006; Kinambuga, 2010; Matungul *et al.*, 2002; Nkhori, 2004). Older farmer might however struggle with the demanding nature of cattle production because of the sophisticated nature of the subsector. Depending on these factors, older farmers might therefore be expected to be less productive and to struggle with the demanding mainstream formal cattle market practices (Mmbengeni & Mokoka, 2002).

EDUCATION is expected to play a positive effect on the probability of the farmer to be more productive and to participate more in mainstream formal cattle marketing. The higher the level of education is, the higher the probability of that farmer to perform highly and efficiently in agricultural production (Kawi & Rewe, 2008; Van Zyl *et al.*, 1996). Better education might also improve the farmer's probability to access and assess production and marketing information (Seyoum, 2008) and to also actively participate in mainstream formal marketing. This is because educational levels attained by the respective farmer are expected to influence cattle production and marketing behaviour of the respective farmer (Grwambi *et al.*, 2006) particularly with regard to the adoption of new agricultural innovations and technologies (Nell, 1998). This adoption behaviour might be influenced by the particular farmer's numerical and basic science skills and the subsequent understanding of these skills for example (Collier & Dercon, 2009).

EMPLOYMENT is expected to have either positive or negative effect on the dependent variable. Farmers who are employed elsewhere are expected to spend lesser times on their farming enterprises and therefore having lower farming productivity levels. In addition, these employed farmers are also expected to be passive participants in the mainstream market as a result of their wide base of income generation. This is because these farmers might not be compelled to sell their animals to raise household income as they might still access the needed

revenue for purchased household inventories from their employments or other activities. Baldwin *et al.* (2008) corroborate this view by reporting that waged communal cattle farmers in Nadungoro, Kenya were found to sell far lesser animals than what they produced and owned. On the other hand, Man & Sadiya, 2009 argued that farmer employment might also provide extra-needed cash for adoption of better technologies which the unemployed farmer might not be able to provide. The diversified income base expected from employed farmers might also reduce the risk for the farmer because such income might also improve the well-being of the household (Mazibuko, 2010).Farmers with extra cash might be able to search for market information and to also broaden their access to potential traders than a farmer who lacks such resources.

HHSIZE is expected to have either a positive or negative effect on farm productivity and formal market participation among communal cattle farmers. Larger households are more likely to provide collective labour output for the farm enterprise therefore increasing the probability of productivity for the farm enterprise as larger households were expected to be more efficient and produce surplus (Ayenew *et al.,* 2007; Jera & Ajayi, 2008; Manona, 2005; Matungul *et al.*, 2002; Ouma & Abdulai, 2009; Paudel, 2008). It is also expected to have a positive effect as larger households were expected to participate in the market to generate more capital for the expected larger needs of the households such as education, health and various other purchased inventories (Montshwe, 2006). In other words, larger households were expected to have increased cost of living and high levels of poverty (Nthakheni, 2006; Van Zyl *et al.,* 1996) that might compel them to participate in the market to raise capital. Hangara *et al.* (2011) argued that these households might have to depend on the farm for income and livelihood.

On the other hand, larger households might be discouraging to market participation as they might also opt to rather keep their animals to satisfy their household subsistence needs before deciding to sell their animals (Jari, 2009). In addition, these households might also want to retain their animals for important cultural and traditional practices such as the paying of *lobola* during marriages particularly when farmer households had a larger number of sons (Montshwe, 2006). However, larger households tend to participate more in the mainstream formal cattle market when they have pressing needs to meet. This might imply seasonal market participation.

The type of production **SYSTEM** is expected to have either a positive or negative effect on the main variable. Multi-production systems are expected to yield lesser production than single production systems. Farmers operating in the multi-production systems are expected to be more subsistence-orientated than farmers in single production systems who were expected to actively

participate in the formal market because when capital is needed to purchase drugs for example, they might have to sell their cattle whereas the farmers practicing multi-production might have to sell other lesser important livestock as options (Montshwe, 2006). However, the variable is also expected to have a positive influence on the results as diversified agricultural systems were expected to yield more returns and become more commercial as they were generally expected to offer communal farmers opportunities to reduce and managed risk probabilities than single-dimensional production systems (Francis, 2002; Mohammed & Ortmann, 2005, Pote, 2008; Stroebel, 2004).

OWNERSHIP of the animals is expected to have a positive effect on farm productivity and mainstream formal market participation. Farmers who own the animals they keep are likely to take decisions to participate in the mainstream formal market particularly when they own larger herds of cattle (Nkhori, 2004). Chawatama *et al.* (2005), Nthakheni (2006) and Schuh (1999) revealed that the majority of livestock in South Africa and Zimbabwe in particular are owned by the respective farmers either through purchase, inheritance and other means although factors such as culture, *lobola*, religion and individual socio-economic status of respective farmers in most developing regions are mostly constraints to livestock ownership, particularly on gender involvement (IFAD, 2007; Khan & Usmani, 2005; Mbiti, 1969: 50; Oladele & Monkheli, 2008; Welsh & Endicott, 2003).

The fact that cattle ownership in most developing regions is skewed towards men implies that men are likely to offer more in the market as men are expected to actively participate in both production and market processes unlike women who are generally marginalised regarding control, slaughtering and selling of livestock particularly large ruminants such as cattle (Grwambi *et al.,* 2006). Women are generally marginalised in the production and ownership of large ruminants such as cattle in particular (Javed *et al.*, 2006; IFAD, 2007; Welsh & Endicott, 2003). Of paramount importance is that cattle ownership might improve capital access in the form of credit to purchase and access of loans (Grwambi *et al.,* 2006).commercialisation index of farmers who are able to access loans is expected to be higher than with those farmers who are unable to access such loans.

RECORDS are considered crucial farm instruments (Duren, 2001; Lyimo *et al.,* 2004; Nell, 1998). In this study, the variable is expected to have a positive effect as farmers who keep records are expected to be more productive and increase their probability to participate in the mainstream market. Commercialised farm entities are expected to keep records as they are

crucial inventories particularly with regards to contractual obligations (Eaton & Shephered, 2001) and improvement of animal performance testing with regard to weaning, animal health and quality assurance among others (Duren, 2001).

SPOINT is expected to have a positive sign. Farmers who have access to animal selling point nearer their places are expected to have an incentive for increased production and market participation (Baldwin *et al.,* 2008). Availability of marketing infrastructure nearer the farmers has had some positive effect on farmer performance in the market (Hangara *et al.*, 2011). To substantiate this view, Baldwin *et al.* (2008) cite the example of communal cattle farmers in Nadungoro, Kenya who live within distance to the regional markets of DolDol whose probability to sell their animals was approximately 2.6 times more than those farmers further away from these marketing points. Lack of access to established market centres and business nodal points nearer the farmers might result in limited number of traders at village level and therefore narrowing marketing channel options available for market participation (Makhura & Wasike, 2003; Mbilinyi & Nyoni, 2000; Nthakheni, 2006). This lack of appropriate marketing infrastructure nearer the farmer's point of production might also increase marketing transaction costs (Grwambi *et al.,* 2006) which obviously in turn might be constraining to market participation among farmers (Holloway & Ehui, 2002).

DISTANCE to the market is expected to have either positive or negative sign. An increase of distance between the communal cattle farmer and the envisaged marketing channel might discourage such a farmer to produce or participate in the mainstream formal market. It is clear that proximity to the markets play a crucial decision-making for participation in the marketing of commodity (Baldwin *et al.,* 2008). Long distances might discourage production and marketing because they are generally associated with high transaction costs. This is expected to be so particularly in incidences where the value of the preferred marketing channel is outweighed by its costs (Musemwa *et al.,* 2008; Nkhori, 2004; Wynne & Lyne, 2008).

As a result of expected increased transaction costs, Matungul *et al.* (2002) argued that distance might negatively impact on commercialisation initiatives of communal agriculture in the developing regions. This might be this way because farmers are expected to consider shorter; simpler and popular informal market channels where they are able to influence and determine commodity prices for example (Nkhori, 2004). On the other hand, increased distance between the communal cattle farmer and the marketing channel might be an incentive for the respective

farmer to consider selling the animals in bulk to avoid multiple transactions which might be more costly (Nkhori, 2004).

Commercial enterprises take commodity marketing as primary for their entities. **ADVERT** is a crucial factor in commercial entities. It is expected to have a positive sign. An increased access to commodity advertising is expected to increase commodity exposure to the mainstream formal marketing channels in particular (Jari, 2009). Traders are expected to interact better when they have proper information of the product they want.

An increase in the access to **EXTENSION** services is expected to have a positive effect on farm productivity and market participation among farmers (Anim, 2010; Forstner, 2004; Matungul *et al.*, 2002; Zwane, 2009). Extension services might be a supplier of the crucial production inputs and factors such as farming skills (Anim, 2010; Forstner, 2004) and agricultural knowledge on market-related information for example (Ajieh *et al.*, 2008; Ruhangawebare, 2010). Farmers who benefit from increased access to extension services are more likely to improve both their farm productivity and participation in the mainstream formal markets (Bahta & Bauer, 2007).

Farmers who made income and profit from cattle and other by-products sales are expected to have an incentive to produce surplus for the market as they are more likely to reap the benefits of both productivity and mainstream formal market participation. Income earned from the sales is expected to improve the farmer's standard of living. Therefore **INCOMESELL** is expected to have a positive effect on farm productivity and mainstream formal market participation.

In agriculture, especially livestock production, ownership of means of transport plays a crucial role in both production and market participation (Erasmus, 2008). Ownership of means of transport might reduce transaction costs because hiring costs for transport are mostly high. Farmers with own transport are expected to reduce costs accrued through long distances accessing and in search of the preferred marketing channel. **TRANSOWN** was expected to have a positive sign. In other words, an increase in the unit of transport ownership by a farmer might result in improved productivity and mainstream formal market participation probabilities.

Farmers aspiring to be more productive and market orientated are expected to belong to various farmer organisations whereas conservative and orthodox farmers are expected to abstain from participation (Karli *et al.*, 2006). These organisations become linkage agencies to farmer support activities such as access to factors of production, provision of market related information and

improvement of farmer collective bargaining power in the market (Jari, 2009; Jera & Ajayi, 2008; Karli *et al.*, 2006). When farmers belong to farmer organisations, they are more likely to improve their access to information, knowledge and skills in farming for they are likely to learn from each other as they exchanged ideas (Nzomoi *et al.*, 2007; Wibberly, 2008). The variable **MEMBER** is therefore expected to have a positive effect on both farm productivity and mainstream formal market participation.

MCHANEL is expected to have a positive effect. Farmers with access to the formal marketing channel are expected to be more productive than farmers who lack such access. The ability of the communal farmer to run a productive enterprise lies with the ability of that farmer to wean a sizeable number of calves. **WEANING** of calves is therefore expected to increase the probability to produce more animals and to participate in the mainstream market. A positive sign is anticipated for this variable. However, poor weaning rates might be caused by non-productive breeding females in the herd and higher mortality rates among calves (Nthakheni, 2006).

3.5 MODEL SPECIFICATION

The binary logistic regression model is a reliable and dependable model which has been used by various renowned theorists such as Achaia *et al.* (2010), Agresti (1996), Bahta & Bauer (2007), Jordaan & Grove (2007) and Pote (2008) for quality results. Among the reasons for the choice of this model are the simpler mathematical structures this model uses compared to other models for example. The binary logistic regression model's simple nature of relying on binary categories in the response variable also makes it an easier model to apply and understand (Bahta & Bauer, 2007; Pote, 2008). In addition, this model is considered most suitable for probability estimates of an event occurrence particularly where the dependent or response variable is expressed in a binary way (Kalabokidis *et al.*, 2002: 3) such as Y = 1 for an occurrence and Y = 2 for a non-occurrence.

The fifty five communal cattle farmers selected for interview in this study area are faced with two choices in each model. For the farm productivity model, the farmers are asked if they have weaned any calves in the previous 12 months prior this study or not. In other words, the **WEAN** variable is selected as the dependent variable for this model. In the event of the farmers having had weaned any number of calves in the previous 12 months, the response is classified as an event occurrence (Y = 1) and in the event of the farmer having had not weaned any calves in the previous 12 months, the response is classified as a non-occurrence (Y = 2). The same procedure

is used for the mainstream formal market participation model. For this model, farmers are asked if they have sold any animals through the mainstream formal cattle marketing channels in the previous 12 months or if they sold through the informal cattle marketing channels. In other words, the **MCHANEL** variable is selected as the dependent variable for this model. In the event of the farmers having had sold any number of cattle to the mainstream formal cattle marketing channels in the previous 12 months, the response is classified as an event occurrence (Y = 1) and in the event of the farmer having had sold any number of cattle to the informal cattle marketing channels, the response is classified as (Y = 2).

The logistic regression model used in this study was expressed as:

$$Logit\ (p) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_n X_n$$

where $X_1, \ldots X_n$ were the predictor variables (**AGE, EDUCATION, EMPLOYMENT, HHSIZE, FARMEREXP, SYSTEM1, DISTANCE, OWNERSHIP, RECORDS, ADVERT, EXTENSION, SPOINT, TRANSOWN, LOANS, INCOMESELL, MEMBER, MCHANEL, WEAN**) respectively and "p" denoted the probability that the farmer weaned a calf or participated in the formal or informal cattle market; respectively. The parameter β_i refers to the effect of X_i on the log odds that $Y=1$, controlling the other $X's$. For example, exp (β_i) is the multiplicative effect on the odds of a 1-unit increase in X_i, at fixed levels of the other $X's$ (Agresti, 1996: 122).

Based on forward stepwise logistic regression procedures, the variables that are found to have no significance are eliminated from this model while retaining only those found to have had significance. In this case, if $P\ is < 0.05$, then the value of that covariate makes a significant contribution to the variance and therefore this covariate must be included in this model. Each final model was tested to determine its fitness to the data. These results of these models are discussed in chapter 11 and 12 respectively. Care was taken to ensure that standard requirements for a Chi-Square analysis were adhered to in order to avoid empirical complications. According to Agresti (1996), Chi-Square is a non-parametric test and it therefore does not require any normal distribution of the sample data as parametric tests such as the t-tests would do. However, Chi-Square assumes that the variable is normally distributed in the population from which the sample is drawn. In addition, Chi-Square should ensure that the sample is randomly drawn from the population; data is reported in raw frequencies not percentages, measured variables are

independent, categories on independent and dependent variables are mutually exclusive and exhaustive and that observed frequencies are not too small. In this case, the frequency thresholds are guided as follows: For a 1x2 or 2x2 table, expected frequencies in each cell should be at least five, for a 2x3 table, the expected frequencies should be at least two and for a 2x4 or 3x3 or larger table, if all expected frequencies but one are at least five and if the one small cell is at least 1, Chi-Square still gives a good approximation.

3.6 ANALYTICAL FRAMEWORK

A five-step approach was used to analyse and draw conclusions on the constraints and opportunities for the commercialisation of the communal cattle-production systems in this study area. This analytical framework is expected to guide and provide a research structure to this thesis that will allow this study to link its findings to the existing body of knowledge (Manèna-Netshikweta, 2007) that constitute development science, sustainable agriculture and/or agricultural economics. Firstly, this study used the so called "*whole farm evaluation*" approach to identify the constraints and opportunities for commercialisation of the communal cattle production subsector in the developing regions with particular reference to sub-Saharan Africa. The approach allowed for an analysis of the entire farming systems using a broad-based holistic approach similar to the properties of the Farming Systems Research and Development (FSRD) as advocated and highly recommended by the Draft Agricultural Policy Green Paper (1998), Laurent *et al.* (1999), Nthakheni (2006), Stroebel (2004) and Taylor (1998) for its ability to achieve, provide and promote farmer efficiency in relation to policy, strategic and project development. This approach allowed this study to evaluate among others the impact and effect of the demographic characteristics of the respondent farmer as the head of the household and those other characteristics of the individual farmer households such as household endowments on agricultural commercialisation because FSRD provides for the analysis of both socio-economic, technological and institutional environments affecting such respective farmers and their households (Nthakheni, 2006; Roets, 2004; Stroebel, 2004; Taylor, 1998). Agricultural theorists such as Anggraeni (2009), Jari (2009) and Mnenwa & Maliti (2010) have used this approach successfully before in various subfields in agriculture. The argument is that it is impossible to de-associate these farmer characteristics as they are intertwined in influencing any possible agricultural commercialisation interventions.

The general characteristics of the farming production systems and practices were also investigated in order to draw conclusions, particularly on how they might influence and impact

on commercialisation. This approach has been used for decades as a diagnostic tool to investigate and establish the strengths and weaknesses of a particular farming system in order to establish ways and means to increase both their sustainability and productivity by establishing existing constraints and opportunities on the production and commodity side of the particular agricultural production system. Despite the obvious weaknesses and limitations of this approach, it is nevertheless recommended by various whole farm evaluation theorists and experts such as Batz & Dresrusse (2000), Ellis (1992), Grwambi *et al.* (2006), Nthakheni (2006), Stroebel (2004) and Taylor (1998) among others who argued that its gains surpassed its shortcomings. This study used several selected variables as listed in Table 3.3 under materials and methods of this study. The variables were constructed from a diverse base of literature reviews and other inputs of various other sources such as experts in the field, extension officers and study supervisors to arrive at conclusions.

Secondly, the analysis of this study drew its conclusions based on the properties of the multi-disciplinary New Institutional Economics (NIE) theory (Kherallah & Kirsten, 2001) with particular reference to the so called "transaction costs" and "institutions and institutional arrangements" analyses as advocated by Dlamini (2010), Randela (2005) and Roets (2004). Transaction costs are those observable and non-observable costs associated with the enforcement and transference of property rights between two parties (Jari, 2009) which according to Matungul *et al* (2002) might be governed by informal and formal institutional laws which might be either explicit and/or implicit costs. According to Jari (2009) and Matungul *et al.* (2002), explicit costs might include transport costs among others while implicit costs might include costs encored on time spent searching and screening for new marketing partners, gathering market information and commodity transfer to its final destination among others. Therefore, the effect and impact of distance from the place of production and the market place on transaction costs formed a major part of this analysis. It is also further hypothesised that implicit costs were generally higher in a particular transaction and they were likely to become catalysts of market exit by farmers if too high (Jari, 2009). This analysis depended on literature review for its findings and did not attempt to use calculations based on the data collected for the purpose of this study. Since this study hypothesised that communal cattle farmers in South Africa faced numerous constraining factors in market participation, it was therefore possible that in most cases the results might indicate absence of any market participation. In this case, it becomes hard to calculate transaction costs since no transaction was ever conducted. In addition, this approach allowed for a comprehensive analysis of the impact and effects of institutions such as farmer

organisations, contract and traditional market practices on agricultural commercialisation. It is clear from this explanation that the NIE theory allows for a multidisciplinary approach in explaining what agricultural institutions are, how they arise, the purpose they serve in agricultural economics, how they change and how these institutions should be reformed. Above all, the NIE might also be useful in evaluating the role played by these institutions on agricultural commercialisation (Dlamini, 2010).

Thirdly, analyses are conducted using the so called "adopter-non-adopter" theory accepted and successfully used by other agricultural scholars such as Bahta & Bauer (2007), Jari (2009) and Nell (1998) among others who have successfully investigated the impact of farmer adoption or non-adoption of among others; new management technologies such as animal breeding techniques; vaccinations and use of agricultural linkage agencies and commodity marketing practices on agricultural production, productivity and commercialisation among communal farmers particularly those in the livestock subsector.

Fourthly, analyses are conducted using the so called binary logistic regression model. The idea was to measure some variables which might have some potential effect on specific outcome and identify those selected variables with the most probability to influence commercialisation on two indicators; namely, farm productivity and mainstream formal market participation. Lastly, the so called commercialisation continuum as advocated by Govereh *et al.* (1999), Randela (2005) and Montshwe (2006) was also used to analyse the commercialisation level of the communal cattle-production systems in this study area. This allowed for the determination and categorization of the various selected variables on their levels on the commercialisation continuum specifying whether they are increasingly subsistence, semi-subsistence/commercial or commercialised.

3.7 ETHICAL CONDUCT

Empirical research has to be conducted from accurate and complete facts obtained from sources that have voluntarily made submissions which have been thoroughly and well reasoned without coercion (De Vos *et al.,* 2002: 59). The researcher therefore thoroughly explained to the participants of this study the main goal of this study in order to avoid misrepresentation of facts, withholding of information and deception of the participants. Confidential submissions were also guaranteed to the participants. Contributions by colleagues, the community of farmers, sponsors of the study including the supervisors were acknowledged and respected.

CHAPTER 4

AGRICULTURAL RESOURCE INVENTORY IN THE MUSEKWA VALLEY

"...the lack of performance in the agricultural sector has been interrelated with the environmental degradation of natural resources and in particular land..." Balint (2003)

4.1 INTRODUCTION

This chapter premises that human, physical, environmental and infrastructural inventories are crucial determinant of farm production, productivity and the ability of the communal cattle farmers to produce and also actively participate in agricultural practices particularly cattle production and marketing. In other words, this inventory is expected to play a critical role in livestock development and commercialisation initiatives of the communal cattle-production systems in the study area (Rwelamira *et al.*, 2000). For the purpose of the study, this inventory is used to assess; measure and determine the probability of commercialisation of the cattle-production systems in the study area. This chapter further assumes that farming decisions among farmers are dependent on the inventory available in the study area as farming households pursue their livelihood objectives (Mapedza *et al.,* 2008). Demographic information, environmental information, infrastructure and land-use systems inventories have been measured.

4.2 DEMOGRAPHIC INFORMATION

This study area has a population of approximately 6 179 individuals as indicated in Table 4.1.

Table 4.1: Population distribution in the Musekwa Valley

Village	Households per village	Total female and Percentage	Total male and Percentage	Village Population
Afton	51	116 (56.04)	91 (43.96)	207
Dolidoli	71	218 (52.15)	200 (47.84)	418
Khomele	326	826 (53.63)	714 (46.36)	1540
Maangani	170	417 (56.04)	327(43.95)	744
Maranikhwe	164	320 (51.20)	305 (48.80)	625
Musekwa	329	831 (55.95)	654 (44.05)	1 485
Sane	82	226 (55.12)	184 (44.87)	410
Strathaird	186	440 (58.6)	310 (41.3)	750
Total	1375	3394 (54.92)	2785 (45.07)	6179

Adapted from: Statistics South Africa (2006)

The total population at Musekwa Valley study area represents approximately 8.02% of the total population of the greater Nzhelele area which has a population of approximately 77 000

(Statistics South Africa, 2006). Furthermore, this population represents only 1.24% of the total population of the Makhado Local Municipality which has a total population of approximately 495 261 people (Integrated Development Plan, 2011/12: 10; Stroebel, 2004).

Women are in the majority in the study area as they represent 54.9% of the population while men represent 45.1% as indicated in Table 4.1. The overall population composition in the Makhado Local Municipality shows that women are in the majority (54.25%) followed by men at 45.75%. Generally, women are in the majority in South Africa at 51.6% of the population (Jiyane, 2002). This women-men population distribution might be as a result of the fact that men are often migrant labourers who spend most of their time away from the study area (Integrated Development Plan, 2011/12: 10). This is in agreement with the findings of Francis-Chizororo (2008) and Jiyane (2002) in Zimbabwe and South Africa respectively. As a result of the majority of the population being women in this study area, the majority of the cattle farming households in the study area are expected to have increased poverty levels, lesser agricultural productive resources and poor educational levels. However this is expected to affect more women-headed households - as poverty is more prevalent among resource-poor women particularly in the rural areas of the developing regions (Booysen-Wolthers, 2007; Jiyane, 2002; Mutangadura, 2005).

4.3 TOPOGRAPHY

The Musekwa Valley study area is situated in the Nzhelele area. Nzhelele means "*superimposed*" in the local *Tshivenda* dialect and the name derives from the Nzhelele River which is the main river of this area. The Nzhelele area has an average altitude of approximately 903 m above sea level. The Soutpansberg mountains which cover about 140km in a West-East direction dominate the area with their elevated topography of approximately 1 561m above sea level at the Tshiendeulu mountains and 1 439m above sea level at the Thathe-vondo mountains respectively (Mabogo, 1990). These mountains influence the climate of this area particularly its rainfall (Lahiff, 1997; Nesamvuni *et al.*, 2003). The Nzhelele River is the most prominent source of water for Maangani and Musekwa villages while the Mufungudi River supplies water to Sane, Afton, Maranikhwe and Strathaird villages. Dolidoli is the only village of the study area characterised by sandy non-perennial river streams that only run during the rainy seasons in years with heavy rains. This makes this village to rely on other sources such as boreholes and windmills for water supply. Khomele village depends on the Tshishiru River which supplies water to the irrigation schemes in the village from its dam on the North East just at the border

with Tshishiru village. All these rivers drain their water into the Limpopo River which forms the South African border with Zimbabwe in the North.

4.4 SOIL TYPE

Nesamvuni *et al.* (2003) reported that the Limpopo Province is characterised by low fertility and mostly rocky adystrophic; red and yellow; well drained clayed soils of the high rainfall areas of the steep slopes of the Drakensberg and Soutpansberg mountains, the sandy and loamy red, yellow and grey soils in caternary associations generally associated with arable farming found in areas such as Thabazimbi; Vaalwater; Ellisras and Polokwane in the 300-600mm rainfall West and North Western belts of the Limpopo Province, the black and red clay soils commonly found in the Springbok Flats; Bohlabela; Settlers; Roedtan strip; Dwaalpoort and Derdepoort area in the South Western boundary of the Limpopo Province and according to Grwambi *et al.* (2006), these soils are also found in the Blouberg area with varying amounts of rock and lithosol and somc high crodability.

Dryland crops such as cotton and winter cereals grow well in these kinds of soils, the duplex and para-duplex soils characterised by low to very high erodability found in areas such as Sekhukhune; some parts of Ellisras; areas between Louis Trichardt town and Tshipise and some Eastern parts of Vhembe District and the weakly developed soils on rock commonly found in the Eastern parts of the Drakensberg Mountains, some large sections of the Mopani District of the Limpopo Province, the Eastern and Western parts of Musina area. These are rocky and shallow soils with the topsoil overlaying some resistant rocks or weathered rocks resembling original rock type they came from. They are mostly located in low rainfall, steep topography, resistant rock and youthful landscapes regions (Heys, 1995; Naledzani, 1992). They are also not utilised for arable farming (Nesamvuni *et al.*, 2003).

4.5 NATURAL VEGETATION

The inland Tropical forest of the Eastern Mountains Sourveld and Lowveld Sour Bushveld, tropical Bush and Savannah of Lowveld Arid Lowveld, springbok Flats Turf, Thornveld, other Turf Thornveld and Sweet Bushveld, Mopani Veld, Mixed Bushveld, Sourish mixed Bushveld and Sour Bushveld and the Pure Grassveld of Northeastern Highveld types and False Grassveld of the Pietersburg plateau False Grassveld are the four distinct vegetation distributions in Limpopo Province (Nesamvuni *et al.*, 2003; Webb *et al.*, 1998). The diverse vegetation distribution of Limpopo Province is as a result of the province's tropical geographical location,

the province's erratic rainfall patterns and varied physical and general climatic conditions such as the diverse temperature distribution (Nesamvuni *et al.*, 2003). The diverse vegetation might be crucial for agricultural development, farmer empowerment and household livelihood sustainability among the resource-poor households in the province – especially those farming in livestock as the vegetation might provide valuable feed resource and agro-grazing base for livestock (Cloete, 2010; Feleke, 2008; Ishaque *et al.*, 2011). In addition, in the prevailing economic hardships characterised by high levels of household poverty, unemployment and vulnerability of women and youth in most parts of rural South Africa, natural resources become considerably crucial with regard to livelihoods coping strategy and income generation among others (Shackleton, 2004).

Lahiff (1997); Nthakheni (2006) and Saidi & Tshipala-Ramatshimbila (2006) found that the Vhembe district of Limpopo Province is highly characterised by a significant distribution of the *Acacia caffra, Scelocarya caffra, galphinii spp, colophospermum mopane, bombaceae spp, Dichrostaphylus africana, Cassia petersiana, Chryphllum viridifolium, mimusops spp* and *Zeyheri spp* fairly large amount of *brachystegia spiciformis* and various *coccom savanna* woodlands species such as *syzigium cordatum; combretum molle; aphloia theiformis; vangueria infansa; albizia adianthifolia and afzelia quanzensis* trees and tall tropical grasses such as the *heteracantha spp* and *adonsonia digitata*. Apart from the fact that trees influence hydrological and climatic systems, they also have multi-purpose use for the indigenous people of the Limpopo Province as they obtain foods such as honey. Trees such as the *Berchemia discolour and Colophospermum* for example provide foods for humans.

According to Gondo *et al.* (2010) and Makhado *et al.* (2009: 921), *Colophospermum mopane* also provides Mopane worms (*Imbrasia belina*) for household food in most communities in the Southern Africa region which some of these communities even sell to generate some household income. Anthropods such as *Encosternum delegorguei* (the so-called *Haruwa* in the Bikita district, Zimbabwe) collected from local tree species have been providing foods and crucial ingredients such as protein to the populace among the Manyika and Ndau people for example (Teffo, 2006). In fact, these anthropods have been foods in most regions of the SADC since time immemorial – providing livelihoods to millions of people (Teffo, 2006). A five litre container-full of Mopane worms (*Imbrasia belina*) for example will sell at R20 000 depending on seasons in the Vhembe District, Limpopo Province. Key informant interviews however revealed that there are several tree species that also supply worms; among others *mufula* (*Anacardiaceae spp*),

mutsuma, *murungulu* and *mutobvuma* in other neighbouring areas of this study area. The worms also differ according to regional climatic and vegetational conditions – and are mostly found during December and April – provided the rains are sufficient and the temperatures are not too high when these worms are still too young to handle the heat. Some regions produce the so-called *mavhandanwa* while others produce *maduwi* type of worms. There are also several *taboos* associated with worms in this study area in general –something which is understandable because most tribal groups such as the Va-Tsonga and Vhavenda indigenous peoples who are found in large numbers in this region are known to be deep-rooted in indigenous traditions, beliefs, myths, habits and customs (Makhado *et al.,* 2009; Teffo, 2006). For example, some local Vhavenda people believe that if one places a lid on the pot – especially when the worms were still fresh from the tree when cooking them, they never occur again in the particular local area. Furthermore, these worms also hibernate during thunder and lightning. Clearly, *taboos* influence behaviour among people and the subsequent response to choices they make (Juma, 2009).

In addition, some of these communities also rely on some of these tree species for timber production, art and supply of indigenous medicines for both livestock and humans (Makhado *et al.,* 2009; Saidi & Tshipala-Ramatshimbila, 1993; Victor *et al.,* 2005). It is evident that most tree species in the developing regions serve a multipurpose function. For example, Teklu *et al.* (2010) reported that tree species such as the Lowland bamboo (*O abyssinica*) provided farming households with fuel wood, household furniture and livestock feed. Trees also play a critical role in cattle production practices in the study area for they are mainly used for animal browsing and in addition also provide animal supplementation particularly during drought periods for example. This is in collaboration with the findings reported by Teklu *et al.* (2010) who reported that cattle farmers in the Assosa Zone of Benshangule Gumnz in Western Ethiopia also used trees and shrubs as natural feed for their animals. Lack of these trees might affect animal feeding – which might have effect on both animal performance and farm productivity (Belay & Manig, 2004; Kidanu, 2010). These trees are also expected to influence among others production cost as farmers are expected to also rely on them to produce cheaper supplementation for their animals.

Table 4.2 presents a list of dominant tree species in the study area with the English and Scientific Family Name derived from Venter & Venter (2002) and Mistry (2000). Maangani village is highly populated with *Bombacaceae* and *Colophospermum mopane* particularly in the North up to the Southern part of Maranikhwe village. Some scattered *Colophospermum mopane* is also visible between Strathaird and Afton villages where vegetation starts to change into a

combination of *Fabaceae acacia, Kirkia acuminata, Combretaceae spp, Anacardiaceae spp, Acacia senegal, Dichrostachys cinerea* and some *Androstachys johnsonni* particularly on the mountains and hills. *Grewia bicolour* and *Berchemia discolour* are also common between Dolidoli and Khomele villages. *Euphorbia aeruginosa* is also visible at Strathaird village. There are also some *Schotia brachypetala* along the dry river valleys between Dolidoli and Khomele villages with some significant distribution of *Rauvolfia caffra* at Strathaird village. Wood from some of these trees might be used to construct housing structures for both humans and cattle in particular.

This is consistent with the findings of Mujeyi (1999) who reported that some households in the Mutoko District of Zimbabwe used trees such as the *Jatropha Curcas* to construct fences around their homesteads. Key informant interviews at the Dolidoli village revealed that a shrub locally known as *Muxwatu* – (so far its botanical name is unknown) - was mainly used by the locals to treat fresh wounds on humans using the watery substance squeezed out onto the fresh wound and therefore causing blood clotting. Fresh wounds heal quicker. Key informant interviews revealed that some of the tree species in this study area are fundamental suppliers of medicinal coping strategies. Some of the locals also sell some tree bucks and roots collected from the local bushes to interested buyers from elsewhere in the region – especially those who sell these medicinal collections in their vending and *muthi* businesses in the region (Moeng, 2010).

Table 4.2: Dominant trees of the Musekwa Valley

Indigenous Name	English Name	Botanical Name	Domestic use
Mubvumela	White syringe	*Kirkia acuminate*	Animal supplementation
Mudzwiri	Ironwood	*Combretum imberbe*	Firewood
Mufula	Marula	*Anacardiaceae spp*	Food (Fruit); animal supplementation (browsing)
Mukhalu	Buffalo thorn	*Ziziphus mucronata*	Food (fruit)
Mulubi	Tree Fuchsia	*Schotia brachypetala*	No known use
Munadzi	Quinine Tree	*Rauvolfia caffra*	Art
Munanga	Monkey, Black monkey, Camel, Sweet, Knob, Scented , Umbrella thorn trees	*Fabaceae Acacia*	Firewood and animal supplementation (seed).
Munie	Brown Ivory	*Berchemia discolour*	Food (seed)
Muonze	Tamboti	*Spirostachys Africana*	Human medicinal
Mupani	Mopane	*Colophospermum mopane*	Food (Mopani worms)
Murabva	Bastard raisin	*Grewia bicolour*	Food (fruit)
Murenzhe	Sickle bush	*Dichrostachys cinerea*	Firewood
Musimbiri	Lebombo ironwood	*Androstachys johnsonii*	Firewood
Mutanzwa	Blue Sour Plum	*Ximenia microphylla*	Food (Fruit)
Muthobi	White-stem	*Boscia albitrunca*	Food (Fruit)
Mutswiriri	Red-bush, Russel bush, Leadwood Willows	*Combretaceae spp*	Firewood
Mutwari	Lowveld cluster leaf	*Terminalia prunioides*	Firewood
Muukhuthu	Velvet Corkwood	*Commiphora edulis*	Firewood and art
Muungathudwa	Fever tree	*Fabaceae acacia*	Animal supplementation (Seed)
Muungathudwa	Slender Three-hook thorn	*Acacia Senegal*	Animal supplementation (Seed)
Muvhuyu	Baobab	*Bombacaceae spp*	Food (Fruit)

Adapted from: Venter & Venter (2002); Mistry (2000); Saidi & Tshipala-Ramatshimbila (1993) and Victor *et al.* (2005).

Table 4.3: Common grasses of the Musekwa Valley

Grazing Value	Indigenous Name	English Name	Botanical Name	Use by the local villagers
A	Dangula Mukumbi	Blue Buffalo	*Cenchrus ciliaris*	Animal feed
A	Dangula Mukumbi	Signal Grass	*Urochloa mesambicensis*	Animal feed
A	Khonde	Rooigras (Afrikaans)	*Themeda trianda*	Animal feed
A	Mufhafha	Buffalo Grass	*Panicum maximum*	Animal feed
A	Muhulani	Sand Quick	*Schimidtia pappophoroides*	Animal feed
A	Pfukwi	Finger Grass	*Digitaria eriantha*	Animal feed
A	Tshitanzhela	Couch grass	*Cynodon dactylon*	Animal feed
B	Dupulasimbe	Nine awn	*Enneapogon spp*	Animal feed
B	Fundwi	Spear Grass	*Heteropogon contortus*	Thatching and animal feed
B	Luswielo	Curley leaf	*Eragrostis rigidior*	Construction of brooms
B	Lutshipatholo	Lehman's love grass	*Eragrostis lehmanniana*	Animal feed
B	Mbuwane	Red top	*Melinis repens*	Animal feed
B	Musenga	Yellow thatching	*Hyperthelia dissolute*	Animal feed
B	Tsetse	Saw-tooth love Grass	*Eragrostis suprba*	Animal feed
C	Bjang ba Barwana	Bushman Grass	*Stipagrostis uniplumis*	Use not known
C	Luswielo	Tassel Three Awn	*Aristida congesta*	Construction of brooms
C	Luswielo	Gum grass	*Eragrostis gummiflua*	Construction of brooms
C	Luswielo	Long awn grass	*Aristidastipitat spp*	Construction of brooms
C	N/A	Herringbone grass	*Pogonarthria squarosa*	Use not known
C	Tshinukhwa	Carrot-seed grass	*Tragus barteronianus*	Use not known

Adapted from: Mmbi (2009) and Van Oudtshoorn (2006)
Legend: A= Good value for grazing, B= Average value for grazing, C= Poor value for grazing

Table 4.3 presents the common grasses of the study area. Most of these grasses grow in combination particularly under trees. Most of these grasses have high production leaves and high palatability values particularly when grazed before their flowering period as flowering reduce grass production of the leaves (Mmbi, 2009). In addition, it is evident that the majority of these tree species are useful for animal browsing as indicated in Table 4.3. The most common grasses are the *Cynodon dactylon, Themeda triantha, Digitaria eriantha, Heteropogon contortus, Eragrostis gummiflua* and *Tragus barteroniannus*, the rest are mostly found in scattered patches in the study area. The *Eragrostis gummiflua/supraba/lehmanniana* grows mostly in overgrazed environments and is generally grazed by donkeys as a result of its hard culms (Mmbi, 2009; Victor *et al.*, 2005).

Most of these grass species are also found in other parts of the Limpopo Province in general (Webb *et al.*, 1998). A transect walk undertaken in August 2007 revealed that there is also evidence of some bush invasion by alien plants such as *Cacti spp* especially at Strathaird and Dolidoli villages. However, it is evident that households in the study area tend to benefit from this diverse tree species both as food or/and for animal production. *Cacti spp* for example, supplies a fruit which is food consumed by the locals, and in addition, some – such as women, children and the unemployed also sell to generate household income. It is common that communities benefit from their natural resources in sub-Saharan Africa where some communities have had economic and livelihood returns from some of these resources – especially trees that produce timber, firewood, fruit, medicines and herbal remedies for humans (Mujeyi, 2009). For example, women in particular in this study area collect firewood from the bush which they use in their households and also sell surplus to generate income.

4.6 LIVESTOCK INVENTORY

According to Nesamvuni *et al.* (2003), cattle in the Limpopo Province are mainly produced in the Waterberg (28.94%), Mopani (22.33%) and Vhembe (14.38%) districts whereas Capricorn and Sekhukhune districts produced a combined 34.35% of the cattle. Table 4.4 indicates total population of selected major livestock in the Musekwa Valley study area per village.

Table 4.4: Number of farmers and livestock in the Musekwa Valley study area

Village	Farmers	Cattle	Goats	Sheep	Donkeys	Total Livestock	Percentage
Afton	13	96	280	-	16	392	6.34
Dolidoli	33	671	420	18	16	1125	18.20
Khomele	31	502	250	18	12	782	12.65
Maangani	20	355	550	10	10	925	14.96
Maranikhwe	18	260	472	15	28	775	12.54
Musekwa	46	469	660	08	34	1171	18.94
Sane	05	62	120	22	08	212	3.43
Strathaird	17	237	526	07	28	798	12.91
Total	183	2652 (42.91%)	3278 (53.04%)	98 (1.58%)	152 (2.45%)	6180	100

Adapted from: Limpopo Department of Agriculture (2007)

Table 4.4 evidently indicates that there are generally more goats (3278 or 53.04%) than there are cattle (2652 or 42.91%) in the study area. There is a sharp contrast between livestock farmers in Northern Kordofan of the Sudan and those of this study area because cattle in the Sudan are only 4.0% of the livestock population whereas in this study area, a huge majority (42.91%) is cattle. Also, Gibreel (2002) further revealed that large ruminants such as camels only made a mere 5.0% of the livestock population in this part of the Sudan. Comparatively, it is clear that large ruminants are less popular in this part of the Sudan while they are more popular in this study area of South Africa. However, the number of goats kept by communal cattle farmers in this study area is consistent with those reported by Gibreel (2002) among livestock farmers in the northern Kordofan State of the Sudan which revealed that approximately 55.0% of the livestock in the region are goats. This might indicate that goats are an integral part of resource-poor communal livestock farmers in several other places of sub-Saharan Africa. On the one hand, the minimum and maximum number of cattle in the study area is between 62 and 671 heads per village which differs significantly with cattle numbers per village in the Pondoland area in the Eastern Cape Province, South Africa where Manona (2005) reported that cattle herds per village indicate minimums and maximums of approximately 92 and 590 heads. Sheep are also found but in smaller numbers (98). Although sheep might be cheaper to acquire than cattle key informant interviews revealed that they are fewer in number because they are difficult to maintain and look after. Sheep are easy targets for predators. Goats are cheaper to acquire and they also adapt well in the local environmental conditions in the study area. Goats are also easier to feed as they can feed on a variety of plant species of the study area as compared to other livestock such as sheep and cattle in particular (Webb *et al.,* 1998). Goats might also provide a viable alternative for provision of foods such as milk and meat and also provide quicker access to emergency household income as they might sell faster than large ruminants such as cattle — especially

among resource-poor households. It emerged during key informant interviews that goats also sold faster and more often in the study area as they were in demand particularly by those who buy them for traditional and cultural rituals.

All the villages in the study area have a significant number of donkeys. This might be as a result of donkey's ability to tolerate the harsh local environmental and climatic conditions of the study area. Donkeys are also crucial to provide draught power and other means of transportation as corroborated by Jones & Maroge (2007). They are also cheaper to acquire and maintain particularly for resource-poor households who find it difficult to afford automobiles. There are no records on pigs as there are no households keeping any pigs at the time of this study. This is in contrast with the situation in the Monze and Mudzi districts in Zambia and Zimbabwe respectively where most farming households keep a number of pigs – especially the indigenous breeds (Mashatise *et al.*, 2005; Mubaya, 2010). Key informant interviews revealed that pigs are less tolerant to the harsh local environmental and climatic conditions of the study area. On the other hand, religious taboos among the majority of communal residents in South Africa keep the number of pigs very low. Such taboos are common in the former Venda homeland in particular where the so-called Lemba ethnic group is concentrated (Mwanza, 2007). Poultry such as chicken are kept by almost all residents particularly cattle farming households. However, the number of chickens is not provided in this typology as there are no proper records on them also.

4.7 INFRASTRUCTURE

Table 4.5 provides the typology of the infrastructure found within the Musekwa Valley.

Table 4.5: Infrastructural distribution in different villages in the Musekwa Valley

	Identified infrastructure											
Village ↓	Agric. Stations	Butcheries	Boreholes	Churches	Clinics	Dipping Tanks	Grazing Camps	Grocery Shops	Police Stations	Post Office	Spaza Shops	Windmills
Afton	0	0	0	0	0	0	1	0	0	0	1	0
Dolidoli	0	0	5	2	0	1	4	1	0	0	1	1
Khomele	1	1	3	2	1	1	2	2	0	0	4	0
Maangani	0	0	0	2	0	1	3	1	0	0	1	0
Maranikhwe	0	0	0	0	0	1	1	1	0	0	0	1
Musekwa	1	1	0	3	0	1	1	2	1	0	1	0
Sane	0	0	0	0	0	1	2	1	0	0	2	0
Strathaird	0	1	1	2	1	0	2	1	0	0	3	1
Total	**2**	**3**	**9**	**11**	**2**	**6**	**16**	**9**	**1**	**0**	**13**	**3**

Infrastructure is crucial for agricultural development and commercialisation in the developing regions (Makhura & Wasike, 2003). It is evident that there is poor infrastructural development in this study area which might negatively affect agricultural development and commercialisation in particular. This poor development of infrastructure might have been resulting from lack of attention in terms of service delivery – especially infrastructure development among smaller villages by government in South Africa — which seems to have been the case over the years in the Limpopo Province in general (Masekoameng *et al.*, 2005). Also, the fact that villages in the developing regions seem to be sparsely distributed might also affect infrastructural development (Makhura & Wasike, 2003). For example, there are no formal schools at Afton and Maranikhwe villages – and children from these two villages have to attend both primary and secondary school at neighbouring Sane and Strathaird villages. This might result in poor school attendance and increased drop-out rates among children of school-going age because of the expected long distances they have to travel to attend school. In addition, there is also no Post Office in the study area and the nearest Post Office is found at Dzanani town; some 60km away from Khomele village for example. This might affect communication in the study area. Furthermore, all the villages in the study area are serviced by only two clinics located at Khomele and Strathaird villages making it increasingly difficult for the people to receive timeous health care service. Seven of the eight villages in the study area have grocery shops except Afton village which relies on the neighbouring villages for household necessities. However, this village has a small *spaza* shop that provides small items such as salt and bread to the public.

Lack of on-farm infrastructure might also become a major constraint of farm performance and agricultural commercialisation. Kidanu (2010) corroborates this view when arguing that lack of drug stores among communal cattle farming households in the Atsbi-Wenberta and Alamata Woredas, Tigray in Ethiopia for example, had resulted in poor animal performance in these regions because farmers could not provide treatment of diseases on their animals. In the case of this study area, only two agricultural satellite stations as indicated in Table 4.5 provide extension service to the communal cattle farmers. The satellite stations were located at Khomele and Musekwa villages.

It is evident that the Limpopo Department of Agriculture might have sought to decentralise agricultural extension service by bringing such service nearer to the farming communities by locating these service centres in these areas. It becomes easier, cheaper and convenient for the communal farmers to access extension service nearer their villages. However, it might not be

feasible and cost-effective to have extension service centres located in each village. All the villages had some windmills and boreholes at a certain stage but most of them are at present in a state of disrepair. However, this researcher discovered during transcend walk that at Dolidoli village infrastructure was only vandalised prior to the introduction of the Comprehensive Agricultural Support Programme (CASP). The new infrastructure built with an assistance of the Comprehensive Agricultural Support Programme (CASP) was still intact. The villagers have developed a mechanism to manage and control vandalism in the village. In addition, the Comprehensive Agricultural Support Programme (CASP) has assisted the farmers – especially at Dolidoli village in restoring some of the vandalised and dilapidated infrastructure – especially boreholes, grazing camps and windmills among others.

Clearly, infrastructure mostly vandalised included water supply systems such as boreholes and windmills. Water supply remains a constraint of on-farm activities under these conditions — and most of the communal cattle farmers in some villages such as Maangani, Maranikhwe and Musekwa resort to using local rivers for water supply. The use of rivers for livestock and household water supply among communal livestock farmers is very common in most areas of the SADC. Nanja (2010) reported of similar strategies adopted by communal farming households in the Mujika area of Monze District in Zambia. It is crucial for farmers to continuously receive and have access to local climatic information because such information might be vital for agricultural decision-making among farmers (Nanja, 2010).

According to Mubaya (2010) and Nanja (2010), this information might assist the communal farmers to device suitable coping strategies to deal with the expected harsh climatic conditions of their area. It has been argued that environmental and climatic conditions might have dire effects and consequences on the performance of an agricultural production systems — especially in arid and semi-arid regions such as this study area – where such conditions might have influence on the availability of indigenous pasture among others. There are five Agrometeorological stations — Levubu-Citimba, Louis Trichardt-Levubu, Mara-Soutpansberg, Musina-Proefplaas and Sigonde that provides climatic information and service the inhabitants of this study area (Nesamvuni *et al.*, 2003) although these facilities are not necessarily located within proximity of the study area. This infrastructure is expected to play a crucial role in determining agricultural commercialisation capacity of the study area as argued by Jari (2009) that such infrastructure can provide commercialisation constraints or opportunities because farmers are able to improve their farming activities based on information gathered from the

infrastructure. It is vital for communal farmers to continuously forge working relationships and interactions with environmental workers such as climatologists, meteorologists, agrometeorologists and agricultural extension workers to promote sharing of information. Nanja (2010) cites an example of the Zambia Meteorological Department (ZMD) which provides farmers with climatic information.

From this infrastructural typology, it is evident that the study area has serious need in terms of the development of its infrastructure. As a result of increased disrepair to most infrastructure particularly that infrastructure which might have implications for commercialisation, it is expected that a considerable budget has to be sourced from government and other stakeholders. With poor and insufficient government financial resources, it is expected that infrastructural development in the study area might result in an extended constraint for commercialisation. Poor infrastructural development as a result of subsequent high costs might however be critical to commercialisation of this subsector as it might lead to poor economic rehabilitation, weakened commercialisation initiatives, poor investment in livestock production and the decline of productivity in this subsector. On the other hand, improvement on this infrastructure might encourage, enhance and improve competition in cattle trading for example (Cuellar *et al.,* 2006; Makhura & Wasike, 2003; Mangwiro, 2007; Musemwa *et al.,* 2008; Mwabu & Thorebecke, 2001; Nqgangweni & Delgado, 2002; Satyasai & Viswanathan, 1997).

4.8 CONCLUSION

The agricultural resource inventory of the study area revealed serious limitations which might influence cattle production, productivity, sustainability and the ability of the communal cattle farmers in the study area to be productive and to access the mainstream formal cattle markets in particular. There are massive shortages of crucial on-farm and off-farm infrastructure such as service-social infrastructure such as schools, grazing camps, livestock watering facilities and sufficient roads among others. These constraints need to be removed in order to facilitate proper conditions for effective, efficient, productive and sustainable cattle production and mainstream formal marketing systems in the study area. For example, some roads, water supply and telecommunication infrastructure need extensive improvement in order to stimulate an active cattle production and marketing system in the study area that might attract potential cattle traders. Most notably however is the fact that some infrastructure is well developed in this study area. This might provide crucial opportunities which could be exploited – especially among the resource-poor to provide crucial platform for agricultural commercialisation in this study area.

CHAPTER 5

GENERAL CHARACTERISATION OF COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"...It is in the interest of both men and women to move away from existing unequal relations of gender..." Jha & Kelleher (2006)

5.1 INTRODUCTION

This chapter describes and presents the results of the study on general household characteristics among communal cattle farmers in the study area. The general characteristics measured included among others household headship, age of the members of the cattle farming household, educational levels of household members, household gender distribution, household size and farming experience in years. The main objective of this chapter is to show how these farmer demographic characteristics can provide opportunities for the commercialisation of the communal cattle-production systems in the study area. In addition, to also show how these characteristics can be constraining to this process.

5.2 GENERAL CHARACTERISATION OF COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

5.2.1 Distribution according to gender

The results of the study revealed that 81.8% of the communal cattle farmers in the study area are men and 18.2% are women as indicated in Table 5.1.

Table 5.1: Gender distribution among communal cattle farmers in the Musekwa Valley

Gender	Frequency	Percentage
Men	45	81.8
Women	10	18.2
Total	55	100

These results are in contrast with the general population distribution in the study area which shows that the majority of the population is made up of women (54.92%) followed by men (45.07%). The implication is that despite the fact that women were generally in the majority in the study area, only a few of them are involved in cattle farming. Therefore the results of the

study revealed that those in numerical minority dominate those who are in numerical majority; a factor which should receive fundamental interest in terms of gender transformation — especially in a country such as South Africa where women had been socially and economically marginalised for so many years. The results of the study indicate that cattle farming practices among the communal cattle farmers in the study area is still biased against women.

What is important however is the fact that these results corroborate those of Mudau (2010) who reported that approximately 87.0% men and 13.0% women are involved in crop communal farming in the Nzhelele area, Limpopo Province of South Africa. Jagwe (2011) reported a gender distribution of 80.0% men to 20.0% women in the banana production subsector in Burundi, Congo (DRC) and Rwanda. Nthakheni (2006) found that 89.8% communal livestock farmers in the Thohoyandou area, Limpopo Province of South Africa are men and only 10.2% are women. A similar trend has been reported in Botswana where Nkhori (2004) reported that 92.0% of communal cattle farmers are men and only 8.0% are women.

It is evident from these findings that there are more men who farm on cattle in communal cattle-production systems than there are women in most of the SADC countries and the sub-Saharan region in general. However, the female-male distribution in communal cattle farming differs from region to region as it is evident that some regions have higher numbers of women communal cattle farmers than others, and *vice versa*. However, the gender distribution also varies between sectors as reported by Jagwe (2011) and Mudau (2010). This disparity translates into obvious gender-bias against women in communal agriculture in most areas of sub-Saharan Africa – and in communal cattle production in South Africa in particular. It is evident that this pattern might further create an economy that is characterised by dualism based on class and gender where women continue to be marginalised as most of the factors of economic equity and equality are totally skewed and removed from these women.

Compromised socio-economic equity might negatively reverse the gains made for the democratisation of this region as women are made subordinates of both the economy and household activities (Lumumba-Kasongo, 2005: 78-80) in what Lakwo (2006) called "*...gendered development... allowing men to loot the benefits of development...*" This assertion is further corroborated by Oluwatayo & Oluwatayo (2012) who argued that "*...even when women live in the same household with men...*" , women were most unlikely to receive the benefits of access to agricultural productive resources, let alone to own productive assets such as land and large ruminants which men mostly access and own. Marginalisation, exclusion, subjugation and

socio-economic devaluation of women in most of these developing regions lead to what Friedman (2005) calls "*...feminisation of poverty...*" In view of this skewed gender-based economic practices — especially in poor communities of Southern Africa — Rwelamira (1999) argued that agricultural economies in the developing regions especially where women continue to be sidelined as a result of gender ideologies that promote and emphasise male-female differences and inequality (Oladele & Monkheli, 2008; Welsh & Endicott, 2003) have to begin integrating these women into their economic systems — especially mainstream livestock production and marketing. This is because women are also important role-players of mainstream formal agricultural practices as food producers, custodians of household food security and productive agricultural labour particularly in livestock production (Topouzis, 1999). Clearly, inclusive labour and agricultural development might pull together diverse socio-economic aspects of society which might result in inclusive development among resource-poor farmers.

Integration of women into the agricultural economic systems might be achieved by removing gender blindness and related patriarchal tendencies that prohibit women from owning large ruminant livestock such as buffalo, camels and cattle among others because failure to do so means that women might continue in the low-income agricultural market (Javed *et al.*, 2006; IFAD, 2007; Oladele & Monkheli, 2008; Welsh & Endicott, 2003). It is encouraging to note that in other countries such as Ecuador, women have long been treated as equal partners with men on farming decision-making — both at household and national level. This proves that if attempted, joint and equal farming decision-making among all gender groups among communal farmers might be workable, productive and empowering — especially for women. To prove workability, productivity and empowerment of women through joint decision-making on farming activities, Hamilton *et al.* (2001) reported that in the Central Ecuadorian Sierra for example, ownership of productive resources such as land is non-discriminatory as approximately 80.0% of women owned land either through inheritance or joint-partnerships with their husbands. In addition, women have equal say in farming decisions regarding — especially utilisation of land and its management because most of the Ecuadorian households operate on what Hamilton *et al.* (2001) referred to as "*Dos Cabezas*" or "*intra-household decision-making*" In this arrangement, both spouses have equal farming decision powers — especially on financial matters; management and budgeting specifically providing valuable opportunity for agricultural commercialisation to become an all-gender inclusive process where women and men both benefit. Integration of women into mainstream market will ensure a non-discriminatory commercilisation process that values the contribution of women in mainstream agriculture.

5.2.2 Household headship

The results of the study further revealed that men (81.8%) also dominated household headship among the communal cattle farming households against women (18.2%) in the study area as indicated in Table 5.2. The results of the study revealed similar patterns with various other studies conducted in some regions in sub-Saharan Africa. For example, Gemeda (2009) reported male-female headed households among communal cattle farmers in Ethiopia as 94.4% and 5.6% respectively. On the other hand, Musemwa *et al.* (2010) found that men household headship among communal cattle farmers in the Eastern Cape Province of South Africa ranged between 64.0% and 91.0% depending on regions in this province.

Table 5.2: Household headship among communal cattle farmers in the Musekwa Valley

Household head	**Frequency**	**Percentage**
Men	44	80.0
Women	10	18.2
Child-headed	1	1.8
Total	55	100

Considering the findings of these other studies conducted in other regions of sub-Saharan Africa, and compare the findings with the results of this study, it is evident that men still dominate household headship in most communal cattle-production systems in most areas of the Southern Africa region. However, the intensity and degree of household headship distribution vary from region to region depending on circumstances affecting the particular region. Headship of households dominated by men might provide men with more control on economic, asset ownership, control of other members of the household such as women and children and making crucial decisions on production and market participation among others (Arisunta, 2010). This corroborates the findings by Juma (2009) who reported that major farming decisions are often the responsibility of the male household head especially with regard to supervision of farming activities, management of the enterprise and slaughtering of animals - which can mostly be authorised by the male head of the household.

This system of farm management however might further create what Arisunta (2010) calls "*unequal power relations*" which might continue the alienation and marginalisation of women — especially with regard to commercial decisions and ownership of productive resources such as land and livestock among others. However, poor women participation in farming decisions has become almost endemic in most agricultural subsectors — not only in livestock production.

For example, Machete *et al.* (2004) reported that women participation in decision-making in the crop subsector in some communal areas of South Africa has been low even when women farmers were in the majority in the subsector. It might be that decision-making is viewed as a men's responsibility in terms of cultural practices in most indigenous communities. Some marginalisations of women point to the weakness of social policy which fails to direct interventions promoting the well-being of women – especially with regard to poverty and inequality reduction (Gumede, 2012).

However, women-men household headship in the Kopanong area in the Free State Province of South Africa, Lupane District and lower Gweru in Zimbabwe (Jooste *et al.*, 2006; Mubaya, 2010) for example, revealed some contrasting patterns with the results of the study. These authors found that the majority of households in these areas are headed by women whereas in the Musekwa Valley study area men head the majority of the communal cattle farming households. According to Francis-Chizororo (2008) and Nayenga (2008), contrasts such as these might be as a result of a larger number of men migrating to affluent towns; cities and neighbouring countries in search of better socio-economic opportunities — especially paid employment and better standards of living with particular focus on access to education and health facilities among others. This is supported by Raditloaneng (2009) who reported that heads of resource-poor households particularly from Namibia, Zambia, Zimbabwe and South Africa were flocking into Botswana in search of better opportunities.

It is regrettable that these migrations might further perpetuate gender disparities and inequalities among the poor. This is because the women who are likely to remain in the rural areas as men migrate for better opportunities are further excluded from active participation in mainstream formal economic practices that might improve their livelihood, well-being and access to productive resources. Migration of heads of household has been a major factor determining socio-economic practices all over the world, not only in sub-Saharan Africa. For example, Talib (2007) reported that migration of men for employment in particular has become widespread in Malaysia where men from China and India have continued to flood the Malaysian mines and rubber producing plantations in particular.

5.2.3 Women-headed households

Headship of women among rural households is historical in Southern Africa region – especially in South Africa where the apartheid-era forced labour migration played a critical role in forcing

rural men to seek for employment in the urban areas – leaving their spouses as heads of household (Atanda, 2011). As a result of migration of men in particular, all over the world, women involuntarily become *de facto* heads of household in the impoverished rural areas where industrial capacity remains non-existent or low, and in addition, increasingly characterised by poor and weak service and tertiary sectors (Pote, 2008). Increased women headship of households in most developing regions is also accelerated by the continuous migration of the men who do so in order to access better employment opportunities in the urban areas (Doss, 1999). Pender *et al.* (1999) also found that low agricultural potential and poor market access were major causes of migration among the youth in some areas of the Ethiopian Highlands – especially where they lacked secured land tenure rights. Factors such as these result in a reduction of the work-force and a depleted labour-output system in the rural areas – especially where healthy and resourceful men are involved (Doss, 1999).

Key informant interviews revealed that younger men particularly those who still have households to feed and children to send to school leave the study area to seek for employment opportunities in affluent urban areas. This is consistent with the findings reported by Maponya (2008) who found that persistent poverty and income inequality in most communal areas of South Africa often pushed the male population out of the resource-poor communal areas to the factories and mines in the urban areas. Migration is prompted by the prospects of the younger generation not able to find employment around the study area as the area is also increasingly remote, and lacking in resources and infrastructure. The prospects of increased higher returns in remunerable employment in the urban areas promote migration (Doss, 1999).

In addition, it is clear that migration of youth might result in loss of skills and expertise in agricultural production as younger and better skilled personnel leave the area. Consequently, migration and loss of potential skills to the urban areas might have adverse influence on agricultural commercialisation. For example, agricultural commercialisation might need the receptivity and responsiveness of the youth with regard to response to farm risk, mental activities and some scientific orientations (Butt *et al.,* 2011). It might be argued therefore that the better- educated and -skilled youth that leave the study area for better opportunities elsewhere in the affluent areas might have been providing a platform for the lesser-educated and -skilled older farmers to learn from them (Mazibuko, 2010). Their migration might be counter-productive —especially when considering the fact that South Africa has a long history of neglecting communal farmers in terms of skill development (Dlamini, 2010). To substantiate

this view, Masekoameng *et al.* (2005) reported on a village known as Nkomo in the Limpopo Province, South Africa - where the majority of the population is composed of mature and old-aged women who are faced with increasing lack of service. In view of increasing migration of the youth to other industrialised areas, Butt *et al.* (2011) argued that it therefore becomes increasingly crucial for the authorities to develop a vibrant agricultural industry in the communal areas that might provide employment to these youth so that they stay in these areas as the "*future*" of agriculture in the communal areas.

In addition, Nayenga (2008) further found that there has been a considerable decline of the male population in rural sub-Saharan Africa of late as a result of wars, sickness and deaths from the HIV/AIDS pandemic. High HIV/AIDS prevalence among poor households in the developing regions might also be ascribed to increased migration particularly among the sexually active groups and precarious financial and social statuses of unmarried young women who are particularly vulnerable to increased social, economic and cultural inequalities in relation to access to employment opportunities, poor access to education and information among others (Topouzis, 1999). According to Mavhandu-Mudzusi, (2011), high HIV/AIDS incidences might significantly impact on (agricultural) skills - especially on the cattle production and marketing skills among resource-poor communities particularly when this affects the skilled younger generation.

Of great concern though is the fact that women-headed households in most sub-Saharan Africa regions in particular are expected to be poorer than men-headed households (Adams *et al.*, 1999; Booysen-Wolthers, 2007; Mapedza *et al.*, 2008; Mubaya, 2010; Oettle *et al.*, 1998; Raditloaneng, 2009; Zuwarimwe & Kirsten, 2011). In South Africa, this is expected to be most likely particularly in the so-called former black homelands (Mmbengwa, 2009) where approximately 60.0% of these women are reportedly living below the poverty line (Booysen-Wolthers, 2007). Comparatively, the number of women living under the poverty line in South Africa is significantly higher than the general poverty line in the Southern Africa Development Community (SADC) in general where approximately 45.0% of the population lives below the poverty line (Mukute, 2010). For example, the majority of women-headed households (67.5%) in Bloemfontein, South Africa, received a monthly income of less that R750 per month whereas a mere 42.5% of male-headed households were in this income category (Venter & Marais, 2006). In this case, more women earn lesser than men. This corroborates the findings reported by Lakwo (2006) who found that although women produced approximately 67.0% of the

world's working hours and 60.0% of global labour out, they can only access a mere 10.0% of global income and only 1.0% of global productive resources and assets.

This is one factor that might curtail efforts to reduce global men-women income inequalities. This trend is also similar with that of South Africa, despite the efforts put by government to narrow the men-women inequality gap (Maponya, 2008). This view is corroborated by Smallhorne (2011) who reported that remuneration gap among the employed women and men in South Africa is still too wide at approximately 29.0% in favour of men. This is in line with the argument by Mung'ong'o (2003) who found that in most cases in the communal areas of Tanzania for example, women's job output was far more than that of men but women continue to receive far lesser rewards than men, and hence their poor access to productive assets such as land and credit. Venter & Marais (2006) further revealed that women-headed households in the same area of Bloemfontein also revealed high incidence of unemployment (64.9%) and low educational levels (62.9%) among others. This might lead to increased vulnerability among women-headed households particularly with regard to access to basic needs such as housing, access to productive assets and food insecurity among others (Maponya, 2008; Venter & Marais, 2006). The situation of vulnerability of women might persist longer in South Africa when considering the fact that women-headed households are increasing and the fact that gender issues have largely received less policy attention (Venter & Marais, 2006).

This increased vulnerability and marginalisation of women might corroborate the fact that women are at the receiving end of poverty and socio-economic inequality in the majority of the developing regions particularly in sub-Saharan Africa where economic activities remain gender-based, and largely in favour of men (IFAD, 2007; Javed *et al.,* 2006; Mutangadura, 2005; Oettle *et al.,* 1998; Oladele & Monkheli, 2008; Welsh & Endicott, 2003). For example, du Toit (2003) found that unemployment among the younger generation in South Africa is highest among young women (56.4%) than young men (43.6%) and the majority being young Africans (89.7%) than the other racial groups such as coloureds and whites (10.3%). Clearly, unemployment and vulnerability of women in South Africa are basically race and also gender-based. In fact, according to Leibbrandt *et al.* (2010), race-based income has been historical in South Africa – traceable as far back as 1917 during which time fundamental race-based income gaps existed with whites earning approximately R13 069 to R1 184 for the blacks *per annum* per person. The same author further reported that race-based income in South Africa persisted to the late 2008 where white income was still higher (R75 297) than that of the blacks (R9 790) *per annum* per

person. On the other hand, Venter & Marais (2006) argued that gender issues especially with regard to provision of basic human rights such as housing among others were largely ignored while massive attention was given to poverty alleviation, racial and inequality debates. These authors furthermore argued that housing provision in South Africa was basically inadequate for women as an example.

It should be further stressed that high unemployment rate among women might deny them an opportunity to access crucial agricultural productive resources such as land and credit among others which might make it easier for them to become increasingly dependent on relatives or friends for livelihood (Mung'ong'o, 2003). Marginalisation of women and their continuous exclusion from the economic value chain practices and access to formal education make them under-developed (Jiyane, 2002) reducing them into recipients of development, and not active participants of developmental initiatives. This might be common particularly in South Africa where women are reduced into some small-scale sellers of some insignificant products at local markets just to raise enough income to hold their households together (Booysen-Wolthers, 2007) without providing any opportunities for economic growth and improved productivity among women (Nambinga, 2007). Smallhorne (2011) reported that women had lower employment rate, were practically more involved in low earning informal or vulnerable formal employment and also have inadequate social protection among others. Evidently, women lack access to crucial agricultural productive assets and services such as extension service, political power and returns for their labour output despite the fact that they are in the majority in the population (Jiyane, 2002) and also do approximately 71.0% of all agricultural work compared to men's 19.0% and children's 9.0% (Mung'ong'o, 2003).

It is evident that inequality between men and women and persistent marginalisation of women in particular might further undermine any attempts by government to develop gender-sensitive policies that also promote women involvement and their active participation in mainstream formal agriculture particularly large ruminant farming. In addition, discrimination of women is also increasingly rife in some sub-Saharan African countries such as Ethiopia, Malawi and Zimbabwe where access to crucial agricultural resources such as land and farming service is still increasingly gender-based and biased against women (Arisunta, 2010; McIntryre *et al.*, 2009; Tewodros, 2008; Urama *et al.*, 2009). For example, Urama *et al.* (2009) reported that only 46.0% of women in Malawi can access agricultural extension service compared to 54.0% of men. Furthermore, the same author reported that the agricultural budget in Malawi also reaches

only 48.0% of women farmers compared to 52.0% of men farmers. In collaboration of these findings, Stroebel (2004) found that approximately 70.0% of the poor in mixed farming systems in South Africa are women. This marginalisation and exclusion of women from agricultural economic involvement particularly in cattle production is unfortunate because the success of this subsector might depend on their involvement particularly as owners of the means of production and mainstream formal cattle marketing activities (Idasa, 2009).

The implication of this marginalisation of women is that commercialisation of the communal production systems might also be gender-biased and largely in favour of men who dominate economic activities. It is evident that women are surrounded with pressing inability to purchase means of production as corroborated by the findings reported by Chawatama *et al.* (2005) who argued that the majority women in Zimbabwe's communal areas were unable to afford large ruminant livestock such as cattle because of lack of capital. These women are therefore pushed into ownership of cheaper and affordable livestock such as chicken, donkeys, goats, pigs, sheep and other small ruminants for livelihood and small household income generation (Starkey & Fernando, 1998). It is evident that agricultural commercialisation might have to contend with some difficult constraints particularly among women-farmers in most of the developing regions in sub-Saharan Africa in particular considering the economic statuses of women in these areas. This is expected to be the case considering the fact that women are generally placed in a weaker position in terms of access to productive resources and economic participation in particular.

5.2.4 Child-headed households

In addition, child-headed households (CHHs) are also expected to be poorer than adult-headed households because children are also expected to lack access to productive resources such as land and livestock among others (Zuwarimwe & Kirsten, 2011). Their lack of these resources might be as a result of dispossession and deprivation of property by greedy and desperate relatives mostly at the death of the parents of these orphans (Francis-Chizororo, 2008; HIV and AIDS Strategic Plan for South Africa, 2007). Arisunta (2010) and Francis-Chizororo (2008) further reported that property dispossession particularly farming land and other productive assets such as cattle and agricultural tools among widows and orphaned children was very common in most regions – especially in rural Zimbabwe - the Zvimba District mostly. Topouzis (1999) reported that widows in most of the sub-Saharan communal communities tended to become increasingly poorer as they often lose valuable productive resources such as land, inputs, credit access and other supportive services which they normally accessed through their husbands. The

main culprits of dispossession of property among widows and orphans particularly in rural Zimbabwe are brothers of the deceased spouses (Arisunta, 2010).

Children who lack property and other resources often become vulnerable to other socio-economic challenges which might contribute to these children becoming the most poor and vulnerable group in society (Dinbabo, 2011). With poverty in South Africa mostly concentrated among blacks (Woolard, 2002), black children were the worst affected of poverty – relying mostly on income from grandparents and related government grants in particular (Leibbrandt *et al.,* 2010). It is crucial to note that the vulnerability of children to poverty and other social challenges might retard their ability to sustain themselves despite the fact that these children have displayed some considerable competence and capabilities to socially and economically compete within their circumstances (Francis-Chizororo, 2008). Evidently, the forfeiture of productive resources among these vulnerable groups might increase their dependency on other members of their households or community who are expected to assume responsibility over them (Topouzis, 1999).

If indeed children, particularly the orphaned, are to be economically empowered, it will be crucial for government authorities in sub-Saharan Africa region to begin to make productive resources such as land accessible to these children because every agrarian reform will have to make access to land a prerequisite (Arinsuta, 2010). Access to productive resources such as land might improve the opportunities for these disadvantaged groups to participate in mainstream formal agriculture and in addition generate crucial household income which might in turn improve their socio-economic well-being (Maponya, 2008). It is evident that cattle production and mainstream formal market participation practices of communal farmers in the study are might be a catalyst for the local population to enhance their livelihood strategies and to also achieve household and regional food security. This confirms the argument submitted by Pote (2008) who viewed agriculture and in particular cattle production as a multi-functional tool for development in the developing regions in particular.

Crucially, Amollo (2006) found that girl-children are the worst victims of discrimination and property dispossessions in most regions of sub-Saharan Africa in particular. This view is corroborated by Ainslie (2003) who found that girl-children are mostly excluded when distributing cattle from their deceased fathers. For example, in the Turkana District, Kenya (Juma, 2009) and the Peddie area of the Eastern Cape Province, South Africa (Ainslie, 2003), elder boys are generally preferred to inherit their deceased fathers' livestock - especially cattle.

In addition, girl-children were found to be mostly abused, violated and traumatized particularly in the Eastern Cape Province, South Africa where these girls are exposed to cultural practices such as *ukuthwala.* According to Malan (2011: 1-3), *ukuthwala* is practiced by the Xhosa tribe where young girls are abducted and forced into marriage particularly orphaned girl-children and those from the poor family backgrounds. Malan (2011: 3) further argued that these abductions mostly result in increased school drop-outs and exposure to HIV/AIDS pandemic among these young girls. This practice might translate into a possible future generation of women who are already disadvantaged in terms of access to productive resources making gender equity transformation difficult. Gender disparity is not only a factor with regard to agricultural performance in South Africa. It affects several other human practices. For example, Ramani & Malema (2012: 41) corroborate this view by revealing that perpetual gender disparity in South Africa impacted on among others university education where men were advantaged than women – especially with regard to postgraduate participation. In addition for example, in Sierra Leone, poverty is mostly concentrated among children and youth aged between 15 and 35 years of age as a result of their inability to access productive resources and lack of integration and active participation in the mainstream formal market systems (Government of Sierra Leone, 2010). To further exacerbate the challenge of youth marginalisation is the fact that economic development of the youth in most sub-Saharan Africa never got to receive any major consideration post-independence (Chigunta, 2002).

In the study area, the results revealed that 1.8% of the child-headed households might as well be exposed to some of these socio-economic challenges such as poverty and lack of access to agricultural productive resources. Mapedza *et al.* (2008) found the rate of child-headed households in Limpopo Province to be approximately 1.0%. Comparatively, the study area has more child-headed households in the Limpopo Province than what has been reported by Mapedza *et al.* (2008). However, the results of the study revealed that there were lesser child-headed household in the study area than those reported by Foti *et al.* (2007) who found that in the Mashonaland Central region in Zimbabwe there were approximately 11.2% child-headed households. This might suggest that comparatively there were more child-headed households in Zimbabwe's communal areas than in South Africa. This might be explained by the fact that most adults in communal Zimbabwe were likely to be absent from their households as they move to different areas of the country and other neighbouring countries seeking for improved opportunities particularly on formal employment and livelihood. In addition, there might be some fewer deaths of adult household heads in the study area as compared to Zimbabwe.

It is evident that the challenge of increasingly higher numbers of child-headed households and the subsequent socio-economic challenges facing these households might remain a major socio-economic challenge in sub-Saharan Africa for a much longer period. This is further compounded by the fact that there are indeed increasing numbers of orphaned children for example as a result of the increasing HIV/AIDS pandemic casualties particularly in the rural areas of sub-Saharan Africa. Rooth (2005) reported that there were approximately 336 300 under 18 years of age children in South Africa by 2002 who were directly affected by the aftermath of HIV and AIDS. Widespread political violence in some parts of sub-Saharan Africa and emigration and migration of adult household heads to seek for better job opportunities in urban and industrialised areas (Arisunta, 2010; Francis-Chizororo, 2008; Mapedza *et al.,* 2008) are also factors increasing child-headed households in sub-Saharan Africa. Migration of adults to the urban areas might also result in increased urban populations of diverse and inequitable household income (Kamuanga *et al.,* 2008) while the increasing HIV and AIDS mortalities among the adults might lead to declining life expectancy among the working group and furthermore to increased number of orphans and their subsequent dependence on government social grants for survival (Rooth, 2005).

It might be expected that child-headed households continue to rise particularly in South Africa where the number of orphaned children seems to be alarmingly increasing *per annum.* Dinbabo (2011) reported that approximately 700 000 new orphans were added in South Africa between 2002 and 2007 for example, with the largest number of orphaned children registered in the Eastern Cape and KwaZulu-Natal provinces. Dinbabo (2011) further revealed that the highest number of increase in orphans in South Africa is among African (4.0%), coloured (2.0%) and white (0.5%) children and the majority of these children (77.0%) are still of school-going age of seven years and above. Evidently, African children are more vulnerable to socio-economic challenges than coloured and white children. Child vulnerability is therefore still racially skewed and against black children in particular.

However, it is common that most communities in sub-Saharan Africa control and manage the escalation of child-headed households among their communities by sending these children to stay with relatives and other interested individuals such as grandparents and aunts (Jooste *et al.,* 2006). In other words, child fostering might provide another coping strategy to manage the ever-growing child-headed households challenge. However, child fostering might not provide the best long-term coping strategy as it is evident that it might promote unsustainable increased

dependency which might also create further household challenges such as sharing of already strained resources, increase of malnutrition; illness; early school drop-out; abuse; sexual exploitation and household food demand and expenditure among others (Jooste *et al.,* 2006). This is likely to further weaken the well-being of these potentially large households. The weaker the well-being of the farming household members the more constraints such households might experience with regard to agricultural commercialisation. If communities want to do better, they will have to invest more in child development because their future economic contribution depends on the preparation done on them at an early stage of development (Dinbabo, 2011).

Empowerment of children particularly among those who are heads of household should be prioritised in sub-Saharan Africa particularly when realising the fact that child-headed households might become a long-time factor among resource-poor communal populations in most of the so-called developing regions particularly sub-Saharan Africa. Francis-Chizororo (2008) reported that child-headed households have been traced as far back as the early 1980s in the Rakai District in Uganda and Manicaland in Zimbabwe in the 1990s affecting children as young as 10-12 years of age for example.

On the other hand, a large number of men owning cattle and heading the majority of the households might impact on decision-making processes on cattle production and marketing in particular. For example, this might increase the probability of increased farm production, productivity and farmer participation in the mainstream formal cattle market. Men are expected to use their influence to take appropriate decisions to increase cattle production and to participate in the mainstream market in the study area (Arisunta, 2010). In addition, female communal cattle farmers might have to rely on their migrant spouses for farm decisions which might constrain and exclude them from increased farm productivity and mainstream formal market participation among others (Webb & Mamabolo, 2004) making commercialisation of this subsector among women particularly difficult.

5.2.5 Household size

Household size is a critical determinant of farm productivity and mainstream formal market participation because it provides valuable labour for the farming enterprise. It is on this assertion that polygamy becomes a serious cultural factor among most rural dwellers in sub-Saharan Africa in particular because it is believed among those communities that marrying multiple wives would grow the household – and the larger household would provide needed labour for

herding and protecting the livestock (Juma, 2009). The average household membership among the communal cattle farming households in the study area is 6.4 members per household. These results are a bit higher than those of Moloi (2008) who reported an average of 5.9 members per cattle farming household in other communal areas of South Africa where households had memberships of between one and seventeen members.

However, some areas in South Africa have cattle farming household membership of between seven and ten members per household (Hosegood & Timaeus, 2005; Nthakheni, 2006; Rwelamira *et al.*, 2000). Households in the study area are expected to have larger numbers of members because most of these households also keep foster children from their relatives who have either moved to other places for employment reasons or are deceased. The larger household sizes in the study area are consistent with those in Kenya (Gachimbi *et al.*, 2004). In addition, in some communal areas of Zimbabwe, household members among cattle farming households are between eight and 11.9 members per household (Barrett, 1991).

The results of the study confirm that sizes of cattle farming households in communal Southern Africa vary from region to region. Crucially however for the study area is the fact that the issue of larger households might persist for a long time because of high rate of teenage pregnancy in the study area (Manėna-Netshikweta, 2001). In addition, multiple spouses among some of the heads of household promote large households (Tewodros, 2008). This has been found to be the case in the Monze District, Zambia (Mubaya, 2010) and among the Turkana tribe of Kenya (Juma, 2009) where polygamy was considered a cultural prestige. Clearly, high teenage pregnancy rate — especially among school-going teenagers might further promote Africa's growing problem of increased school drop-out, non-school attendance rates and other related socio-economic challenges (Lumumba-Kasongo, 2005: 30; Manena-Netshikweta, 2007).

On the other hand, larger farming households can be of advantage in terms of providing farm labour (Juma, 2009; Tewodros, 2008) to the farm enterprise — especially where older farmers are to be replaced or assisted by younger farmers as a result of retirement or old age (Ayenew *et al.*, 2007; Jera & Ajayi, 2008; Manona, 2005; Moloi, 2008; Montshwe, 2006). Children and wives from larger households are mostly used as source of cheap farm labour (Mubaya, 2010) – and Juma (2009) argued that this might contribute to increased productivity of the farming enterprise and the well-being of the farming household because larger households were likely to diversify their livelihood, increase their wealth and have insurance at critical times of food crisis.

Younger children can also assist their parents with required labour as indicated in Figure 5.1 where a young school boy assists the father after school or during school holidays. This practice of children assisting with farm activities is corroborated by Nengovhela (2010) Nthakheni (2006) who reported that some household members such as young boys might assist in livestock related activities such as herding of cattle and taking care of other small ruminants such as goats and sheep among others. To substantiate this assertion, Ishaque *et al.* (2011) and Ketema (2007) reported that in some parts of rural Pakistan and Ethiopia, children as young as 15 years old and old relatives provided labour in livestock systems – especially herding and watering. These authors reported that herding (45.8%) and watering (45.6%) of the flock were activities mainly handled by young boys. However, in this study area, herding of cattle by children is not so common because the majority of them attend school. However, school children do assist with some activities after school, weekends and/or during school holidays as indicated in Figure 5.1.



Figure 5.1: A young boy tends his father's goats at Dolidoli village, Limpopo Province

Therefore, the majority of farm labour particularly herding of cattle is sourced from hired adults who are paid in kind or given some animals after a while. To corroborate this finding, the results of the study revealed that 25.0% of the cattle herders are paid in kind. Of these cattle herders who are paid in kind, all of them receive an animal as payment for their labour. It emerged during key informant interviews that at least one successful cattle farmer at Dolidoli village built

his large cattle herd from the animals he was paid by those he herded cattle for – especially those migrant workers who would not be able to keep their animals. However, larger households are also expected to experience increased cost of living on food and schooling of children in particular (Nthakheni, 2006; Swanepoel & De Beer, 2000; Van Zyl *et al.*, 1996).

It is expected however, that larger households might also want to satisfy themselves with crucial household endowments and other important inventories and services before engaging in on-farm activities (Moloi, 2008; Nthakheni, 2006; Randela, 2005; Togba, 2009). This assertion is corroborated by Hangara *et al.* (2011) who argued that decision making among communal cattle farmers is highly dependent on the farmer's satisfaction of households needs. This might constrain such farming households from increased cattle production and mainstream formal market participation because increased spending on household inventories and services might decrease household cash surpluses for on-farm activities such as access to farm inputs. According to Mubaya (2010), it is highly probable of farming households to stop using their limited resources for on-farm activities such as purchasing of inputs citing an example of farmers in the Monze District of Zambia. Lack of financial options might however force some of these cattle farmers to opt for other capital-raising means such as adoption of loans as alternatives to fund some important on-farm activities. Some of these farmers might also opt for selling some of their animals to raise disposable capital (Mathijs & Noev, 2002).

On the one hand, some farming households might also seek for additional capital from loan institutions and organisations. This view is corroborated by the results of this study which revealed a positive and significant correlation coefficient (0.0381) between household size and adoption of loans as indicated in Annexure E. In other words, household size has effect on adoption of loans among some of the communal cattle farming households in this study area. It is expected that larger households might have to consider improving their access to surplus income through loans. This result means that an addition of a unit (one member) of household members into the household membership might increase the probability of the respective cattle farming household to adopt loans as an alternative strategy to fund some of their on- and off-farm activities. This assertion is understandable because an additional member in the household might increase the demand for food and other related purchased inputs and services therefore compelling the farming household to seek for other capital-raising alternatives. However, in the study area, it is expected that farmers seeking for loans might find it difficult to raise such loans because of the difficult conditions attached to loan access — especially by formal institutions as

they are generally reluctant to fund communal agriculture – especially in South Africa where hefty collaterals are required to guarantee loans (Mazibuko, 2010; Mbeki, 2011).

5.2.6 Marital statuses of heads of household

Figure 5.2 indicates that the majority the cattle farming adults in the study area are married (78.2%), single who never married (9.1%), widows or widowers (10.9%) or divorced (1.8%).

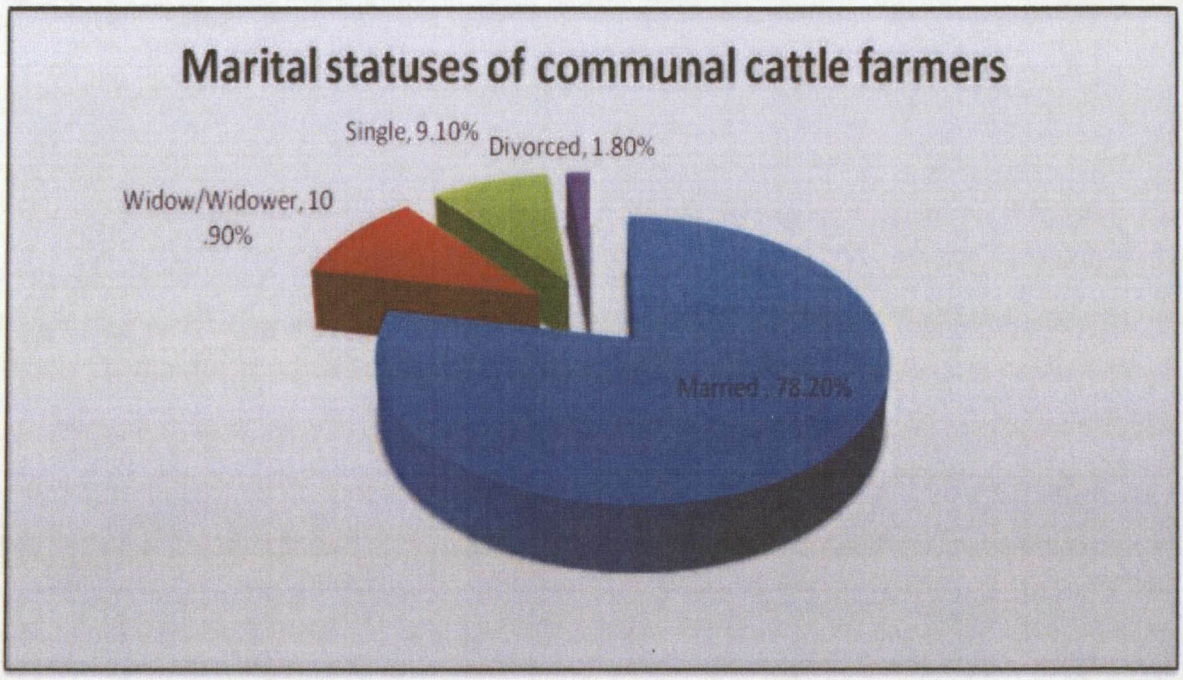


Figure 5.2: Marital statuses of communal cattle farmers in the Musekwa Valley

The marital status of the farmer might also have a bearing in the commercialisation of the cattle-production subsector in the study area. For example, married adults particularly women might have increased probability to access extra income from remittances provided by their migrant labour spouses. This extra income might be directed to some on-farm cattle production activities such as access of inputs — especially vaccines and drugs — unlike the unmarried, widowed and the divorced adults. In addition, those married adults might have combined larger income from sources such as government grants particularly where both spouses receive such income.

5.2.7 Age

In Figure 5.3, the results of the study further revealed that 56. 4% of the heads of household are older than 65 years of age, 23.6% are between 55 and 64 years of age, 7.3% are between 45 and 54 years of age, 10.9% between 35 and 44 years and 1.8% between 25 and 34 years of age.

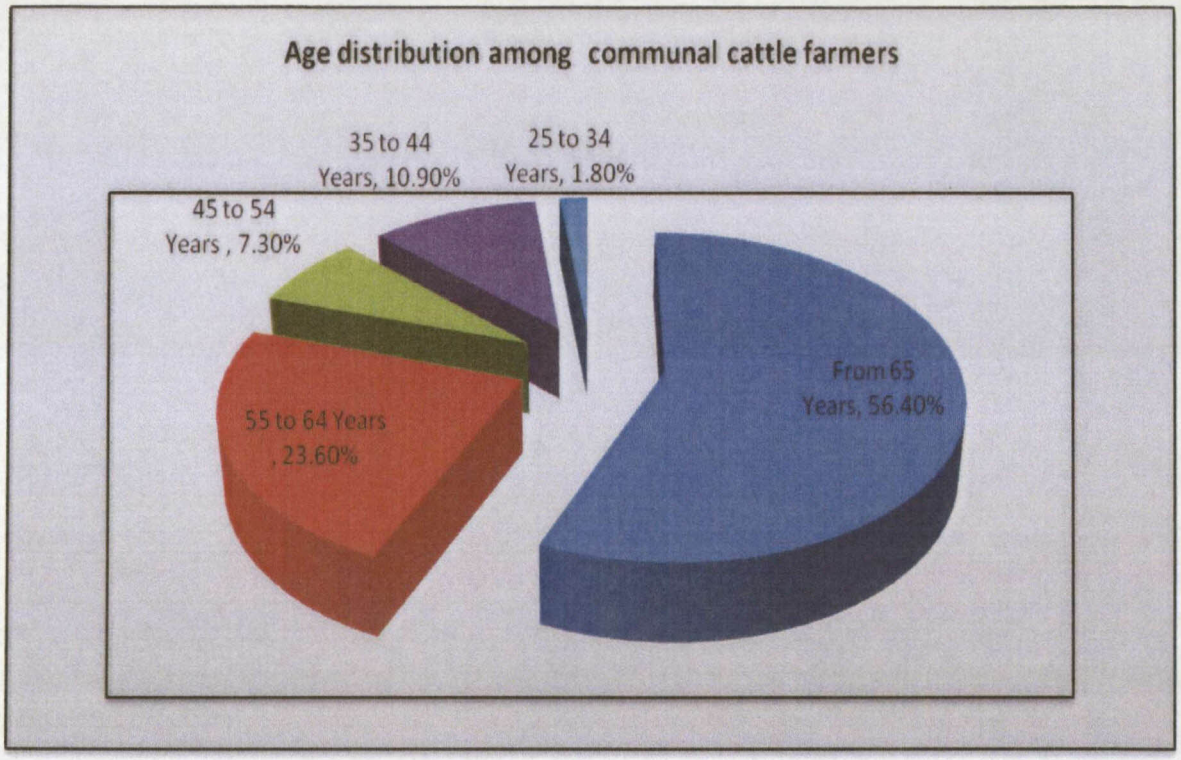


Figure 5.3: Age distribution among the communal cattle farmers in the Musekwa Valley

These results suggest that the majority of the communal cattle farmers in the study area are old. These findings are in line with those of Moloi (2008) who reported that 65.9% of communal farmers in some communal areas of South Africa are between 50 and 65 years of age whereas youth aged between 16 to 24 years of age are only 1.5%. This age distribution trend indicates that communal farming in South Africa is dominated mainly by older farmers (Grwambi *et al.*, 2006; Mahanjana, 2009; Maine, 2007; Mudau, 2010; Musemwa *et al.*, 2010; Musemwa, 2008; Rwelamira *et al.*, 2000). For example, 48.0% of the communal cattle farmers in the Eastern Cape Province are aged 65 years and older (Ainslie, 2003). Musemwa (2008) also reported that between 80.0% and 84.0% of cattle farmers in the Eastern Cape Province are above 50 years of age depending on regions.

This age trend is also similar in other subsectors such as crop farming. For example, Mudau (2010) found that approximately 38.0% of subsistence farmers in the field crop production subsector in some communal areas of South Africa are older than 60 years of age. Farmer age distribution in South Africa is in sharp contrast with those reported by Bawa *et al.* (2009) who found that approximately 64.1% of farmers in some parts of rural Nigeria are 40 years of age or less. This means that the majority of farmers in some parts of rural Nigeria are younger and able-

bodied for the physically demanding agricultural sector – especially livestock production. Old age among cattle farmers in the study area is expected to impact on the cattle production and mainstream formal marketing performance of the communal cattle farmers in this study area. Older farmers are expected to lack appropriate physical strength - especially with regard to cattle production - which mostly requires hard labour (Mmbengeni & Mokoka, 2002).

This might become a constraint to farmer participation in cattle production and mainstream formal cattle marketing activities (Nthakheni, 2006; Randela, 2005) because it might create some dependency of the older generation of farmers who might need assistance by the youth from time to time (Mazibuko, 2010). This dependency might be problematic as Mudau (2010) argued that most of the physically-able younger generations in South Africa are not keen on farming and therefore migrate from the communal areas to the urban areas in search of better employment and educational opportunities. This is also corroborated by Quisumbing & Niven (2005). The situation in the study area is in sharp contrast with the findings of Mathijs & Noev (2002) who reported that in countries such as Bulgaria and Romania, the majority of the active farmers are from the youth with an exception of Albania where the majority of the farmers are from the older generation. Taking into consideration of the Bulgarian and Romanian set-up, it might be argued that it is possible to encourage the younger generations in South Africa to remain in agriculture in the rural areas provided proper conditions are put in place.

Furthermore, the old age of the farmers might also affect their farming decision-making (Grwambi *et al.,* 2006; Nkhori, 2004). The results of the study corroborates this view as they revealed that there is a negative and significant relationship (0.0724) between age of the cattle farmer and adoption of membership in farmer organisations among the communal cattle farmers in the study area as indicated in Annexure E for example. These results revealed that when the age of the farmer decreased, the probability of the farmer to participate in farmer organisations increased among the communal farmers in the study area. The implication of these results is that farmers who participate in farmer organisations in the study area might be those from the younger generation. Their educational superiority might play a major role in the understanding of farmer organisations and the role they play in the development of agriculture – especially commercialisation.

In addition, age of the farmer might affect the farmer's decision to adopt or not to adopt new cattle production technologies and innovations; new cattle marketing strategies and also the development of advanced modern skills in cattle production; training and management among

others (Enete & Igbokwe, 2009; Mahanjana, 2009; Mmbengeni & Mokoka, 2002; Montshwe, 2006; Nell, 1998; Schwalbach *et al.*, 2001). This might corroborate the argument that older farmers are known to be skeptical of innovations, resistant to change and lack desire to adopt new agricultural technologies because the majority of these farmers are known to be more concerned of farm risk among others (Karki & Bauer, 2004). Clearly, possibility of exposure to farm risk has effect on farmer decision making on the enterprise (Sebina & Düvel, 1998). Furthermore, older farmers might also rely on their farming experience which might be counter-productive in some instances - especially where experience makes them less receptive of new cattle farming technologies.

In contrast to the negative effect of old-age among these cattle farmers, it might be reasonably expected that these older farmers might add some value in this subsector mainly because older farmers mostly own most of the animals, are also expected to be financially more secure and wealthier than younger farmers, are more matured in terms of cattle production skills and cattle marketing activities compared to younger farmers, are expected to have improved capacity to adopt new cattle production technologies such as forward pricing, (Balagdtas *et al.*, 2007; Grwambi *et al.*, 2006; Jordaan & Grove, 2007; Matungul *et al.*, 2002; Mudau, 2010; Nkhori, 2004). According to Balagtas *et al.* (2007) cattle ownership among communal cattle farmers is also determined by the age of the heads of household in the Savane Province of northern Cotê d' Ivoire – where older heads of household kept more animals than the younger generation.

In addition, older farmers are expected to bring into this subsector some valuable experience because old-age is closely associated with high farming experience – especially in South Africa where the majority of farmers are older (Randela *et al.*, 2000). Financial institutions also prefer to lend money to older farmers because they are considered matured and also able to handle loans unlike younger farmers (Rahji & Fakayode, 2009). On the other hand, younger members among the other members of the household might be crucial for the performance of the farming enterprise; its productivity and market output. For example, younger household members might be able to provide extra farm labour or completely abstain from involvement in the farm enterprise. The results of the study (Table 5.3) revealed that the majority of the communal cattle farming households in the study area might be facing farm continuity constraints (D'Silva *et al.*, 2009).

Table 5.3: Household member age distribution among communal cattle farmers in the Musekwa Valley

Age per Group (Years)	<10	11-18	19-30	31-40	41-50	51-60	>61
Frequency per age group	63	63	82	46	29	28	35
Percentage per age group	18.2	18.2	23.6	13.3	8.4	8.1	10.1
Mean per age group/household	1.14	1.14	1.49	0.83	0.52	0.50	0.63

This is because the majority of the household members among the communal cattle farmers in the study area are a youth of less than 40 years of age (73.3%) who might not want to get involved in cattle farming activities but opt for migration to the urban areas for better employment and social opportunities (Randela, 2005). It is common in rural South Africa for the youth to abstain from active agriculture preferring to take other opportunities (Christoforakis, 2008).

5.2.8 Educational levels

On the other hand, the level of education achieved among the communal cattle farmers might also be a key factor in determining the success of agricultural commercialisation for education might provide a platform for any socio-economic development initiatives (Tewodros, 2008). This is corroborated by Butt *et al.* (2011) who argued that education might develop and improve knowledge, wisdom and other desirable qualities of the respective individual. Poorly educated farmers might also be materially poor as education might be a crucial determinant of the quality of human capital (Juma, 2009) – and this might have influence on any agricultural development initiatives (Ssekibuule, 2010). Education might provide a platform to reduce poverty, while poor education on the other hand might reflect weak incomes and opportunities among resource-poor farmers in general (Booysen-Wolthers, 2007).

The results of the study revealed that the majority of the household heads among the communal cattle farmers in the study area have acquired some formal school education (61.8%) with most of these farmers having had completed primary school education (34.5%) and secondary education (27.3%). Clearly, the majority of communal cattle farmers in this study area are functionally literate. These results are a bit different from those reported by Mmbengeni & Mokoka (2002) who showed that cattle farming households in some parts of communal Limpopo Province have acquired primary (62.0%), secondary (35.0%) and tertiary (3.0%)

education. In KwaZulu-Natal Province, Mazibuko (2010) reported a secondary education rate of approximately 43.3% which is significantly higher than at the study area. Compared to Kenya, the results of the study revealed that cattle farmers in the study area in particular and Limpopo Province in general might be less educated than their Kenyan counterparts who revealed some superior formal school education; primary education (65.0%), secondary education (37.0%) and a further 8.0% of tertiary education (Gachimbi *et al.*, 2004).

The lower number of farmers who have attained secondary level of education might be resulting from the impact of HIV/AIDS pandemic on affected households, an inefficient school system which is highly characterised by poorly remunerated and demoralized educators (Chigunta, 2002; Nesane, 2008), high drop-out rates of learners at all levels, low school attendance among learners with attendance rates being lower among Africans (97.0%) and Coloureds (94.0%) compared to Indians (99.0%) and Whites (99.0%), and/or repetition of grades in primary school level in particular (Mbeki, 2011: 100; Mirugi-Mukundi, 2009) among others. To substantiate high drop-out rates among school learners in South African schools, Pedra (2011) reported that by January 1999 for example, approximately 1.4 million learners registered for primary education, but by the year 2010, approximately 46.0% of these learners had dropped out leaving only 600 000 of these learners reaching the final year of high school education. These numbers further reduce at this final year of high school education because of increased failure rates of learners at this level (Adu-Damoah, 2009).

O'Connell (2011) further argued that South African high school learners also drop-out of university education in large numbers arguing that these learners who drop-out mainly do so due to poor preparation at high school because some of these learners fail to cope with the required high university academic standards. This is substantiated by Kahn (2011) who argued that most South African high school learners are not ready, suitable and competent enough to make worthy university students particularly for post-graduate programmes such as doctoral degrees because of the poor state of education at pre-university level. It is unlike in countries such as Brazil where prospective university students are made to sit highly competitive entrance examinations to qualify for university education.

Adu-Damoah (2009) argued that the fact that the quality and readiness of the South African prospective university student are only evaluated at Grade 12, might be another hurdle to deal with to ensure quality students enter university. Furthermore, Kahn (2011) argued that the South African government should provide necessary resources for universities in order to attract more

staff particularly competent post-graduate supervisors, and also remove exorbitant university tuition fees to attract more students to university. Increased numbers of university students among rural dwellers particularly the youth in South Africa might enhance the probability of increased farming skills in respect of production and mainstream formal market participation. This might obviously enhance the opportunities for successful commercialisation.

However, the results of the study revealed some close pattern with the findings reported by Stroebel (2004) who revealed that 68.0% of communal cattle farmers in other communal parts of South Africa have acquired some formal education. Whereas the results of the study revealed that 38.2% of the communal cattle farmers in the study area have no formal school education, the findings reported in the Eastern Cape Province were a bit lower than these results as they revealed that approximately 36.0% of these farmers lacked any formal school education (Mapedza *et al.,* 2008). Nthakheni (2006) found that the majority (54.0%) of communal cattle farmers in other parts of rural South Africa also lacked proper formal education.

This might suggest that cattle farmers in the Musekwa Valley study area and the Eastern Cape Province might reasonably be better educated than their counterparts in other parts of communal South Africa. This is an amazing result taking into consideration that both Limpopo and the Eastern Cape provinces are the most poorest among all the provinces in South Africa (Mapedza *et al.,* 2008), and yet these provinces still manage to have a fair number of communal famers who show a fair amount of formal education. In addition, this might further reveal that formal educational levels among the South African communal communities differed from region to region depending on different factors.

As a result of varying educational levels, these farmers might also respond differently to cattle production and marketing practices because the level of education attained by a particular farmer might be crucial in determining the farmer's behaviour in terms of agricultural production and marketing in particular (Mahanjana, 2009). For example, increased level of education among farmers might have influence on agricultural performance as educated farmers are expected to perform better in agricultural activities than less and non-educated farmers who are expected to struggle (Moloi, 2008; Van Zyl, 1996) — especially with regard to farming skills such as increasing of sales in the mainstream formal markets and basic cattle production among others (Mathijs & Noev, 2002). Ruhangawebare (2010) conceded that higher educational levels among communal cattle farmers might also improve such farmer's technological adoption levels in

crucial production skills such as cattle husbandry among others. Better education might also improve prospects for regional socio-economic development (Mazibuko, 2010).

5.2.9 Education and skills among other household members

Poor education among heads of household might also become more complex as a result of poor educational levels among other key household members such as children and spouses of the respective cattle farmers in the study area. For example, the results of the study revealed that 48.1% of the spouses of the communal cattle farmers in the study are have no formal school education with some few having achieved the primary level (38.5%) and secondary school level (13.5%) only. In addition, children of the communal cattle farmers in the study area also lacked formal school education (39.6%) whereas only 38.3% have primary and secondary education (22.1%) only as indicated in Table 5.4.

Table 5.4: Educational profile of household members among communal farmers in the Musekwa Valley

Category	**No.**	**Frequency Schooling**	**Primary Education**	**Secondary Education**	**Post-School Education**	**Total Percentage**
Respondent	55	21 (38.2)	19 (34.5)	15 (27.3)	0	100
Spouse	52	25 (48.1)	20 (38.5)	7 (13.5)	0	100
Children	217	86 (39.6)	48 (38.3)	83 (22.1)	0	100
Other	22	0	11 (50.0)	11 (50.0)	0	100
Total	346	132(39.6)	98 (27.5)	116 (32.9)	0	100

Lack of parental involvement in the education of their children and poor understanding of the education system currently in place in South Africa might also compound the problem of poor formal education among children (Govender, 2007; Rambiyana & Kok, 2002). This might be constraining the farming enterprise particularly where these children have to assist the parent farmer. In addition, those other members of the farming household other than the spouses and children of the communal cattle farmers residing with the communal farmers have either primary (50.0%) or secondary school (50.0%) education. In the absence of the incumbent communal cattle farmer or inheritance of the farm enterprise, the spouse might be exposed to serious limitations if the spouse has no formal school education particularly in terms of cattle production decisions, adoption and understanding of some new technological factors among others. Of particular interest is the fact that there are no household members in the respective communal farming households in the study area who have attained any tertiary education. These results are

in sharp contrast with those reported by Nthakheni (2006) who found that approximately 3.1% of the communal farmers in some rural areas of South Africa have attained some tertiary education. Among the AmaZizi of the Drakensberg in KwaZulu-Natal, Mazibuko (2010) found that approximately 2.3% of the population had attained some tertiary education. It is evident that there is a considerable difference between the population in the study area and that of some other parts of rural South Africa in general in terms of tertiary education attainment.

The results of the study revealed that the population in the study area has inferior tertiary education when compared to the other rural areas in South Africa. This might be an indication that communal cattle farmers in the study area are unable to send their children for tertiary education in particular for several reasons. The results reported by Nthakheni (2006) also reveal that access to tertiary education among communal livestock farmers particularly in the Limpopo Province of South Africa vary from place to place depending on various factors. In the study area, cattle farmers might be faced with un-affordability of tertiary education because the majority of these farmers have little income based on informal and unreliable sources and some small old age government social grants in particular. In addition, institutions of higher learning such as universities and colleges are also situated far from the study are which might result in increased unaffordable expenditure for these farmers.

This view is corroborated by Maphalla & Salman (2002) who argued that exorbitant school fees, poverty, un-affordability of education in South Africa in general particularly where parents have to provide transport for their children to school, lack of resources such as schools and long distances travelled by the children to school particularly in the study might be some of the causes of poor education and increased school drop-out rates in the rural areas. In addition, Black (2011: 20) argued that the historical systematic undermining of black education by the apartheid regime in South Africa might also have resulted in the poor education and shortage of skills among the resource-poor communities. This might have negative implications for agricultural and socio-economic development of individuals particularly for a province such as Limpopo which is generally characterised by low literacy levels among its population particularly women (Booysen-Wolthers, 2007; Jaleta *et al.*, 2009). Better education levels among farming households might improve their skill levels in areas such as farm risk management among others (Mohammed & Ortman, 2005).

Lack of tertiary education in the study area is a cause for concern taking into consideration the findings of Dibetle *et al.* (2009) who revealed that there was an increase of university learners in

most regions of South Africa. Poor formal education — particularly at post-school level — among the farmers and their immediate household members in the study area might comprise farmer knowledge on livestock production and mainstream formal market participation. This might result in these farmers having to rely on other sources to acquire such knowledge which might include media technology and extension services. This might increase transformational and transaction costs for the communal farmers. This might force farmers to opt for cheaper means of information access such as fellow farmers and friends among others (Kormawa *et al.*, 2004; Musemwa *et al.*, 2010).

However, Nell (1998) and Nthakheni (2006) reported that there are 7.0% and 3.1% of communal cattle farmers respectively with tertiary education in other parts of rural South Africa. This means that educational levels of members of communal farming households in South Africa differ considerably due to different reasons. This factor is expected to play a major role in the development of the communal farm enterprise in future. In the case of these household members becoming owners of the farm enterprises through inheritance or otherwise, these members are expected to struggle regarding livestock production and mainstream formal market participation. An educated youth might be of great value for the future of the farm enterprise particularly when such youth are to inherit the farm enterprise at a later stage. Grooming the youth in agriculture particularly cattle production might develop the future generation of farmers assuming inheritance of the farm enterprise by these youth (Randela, 2005).

In addition, as a result of low formal school educational levels among the communal cattle farmers and their immediate household members, the results of the study revealed that it might have effect on their ability to access information, for example. Therefore, communal cattle farmers in the study area depend largely on livestock extension officers (83.7%), farmers' meetings and workshops (9.1%) and self learning short skills programmes (7.3%) to access information and knowledge on cattle production and marketing. The results of the study revealed a sharp contrast with those of Musemwa *et al.* (2010) who found that communal cattle farmers in the Eastern Cape Province of South Africa for example mostly accessed information and cattle-related information and knowledge from friends (2.7%), neighbours (14.5%) and visiting traders (2.7%) with a vast majority of these farmers (80.0%) unable to access any information at all. Furthermore, the general poor educational background among communal cattle farmers and their immediate household members in the study area might have dire implications on cattle production, productivity and mainstream formal cattle marketing as it might increase

transformation costs in production, transaction costs in information searching, screening and market bargaining ability among others (Randela, 2005). Higher levels of education might improve technical knowledge in cattle farming among these farmers (Rahji & Fakayode, 2009: 95). This is corroborated by Wynne & Lyne (2003) who argued that increasing education among farmers might reduce commodity transaction costs as increased commodity transaction costs can affect economic growth of the respective communal cattle farmer and also prevent agricultural transaction from happening.

5.2.10 Farmer perceptions on skills related to cattle-production and -marketing

The results of these study revealed that farmer skill levels in crucial areas are still very low among the communal cattle farmers in this study area. However, it has been widely reported that South African communal farmers have little, limited and inadequate farming skills (Dlamini, 2010). Figure 5.3 revealed that only 21.8% of the cattle farmers in the study area are good in cattle marketing, budgeting (41.8%), financial management (38.2%) and risk management (25.5%). Clearly, the farm administrative competence of the communal cattle farmers in this study area shows that it might be seriously constrained as a result of poor skill proficiency. Dlamini (2010) corroborates this assertion when reporting that most communal farmers in rural South Africa lack farm administrative skills. In the case of farmers in this study area, lack of these crucial skills makes it evident that low educational levels might be the crucial cause of this lack of skills among these farmers. Evidently, these results reveal that cattle farming among communal cattle farmers in the study area might not offer sufficient grounds for farm productivity and sustainability due to lack of these critical basic cattle production, farm management and marketing skills which might be crucial for a market-orientated, productive and sustainable cattle farming enterprise.

It is within this context of lack of farming capacity and lack of proper farming skills among communal farmers that Mmbengwa *et al.* (2011) argued that farmer training and skills development should receive utmost priority — especially where farming is targeting increased commercialisation. Skills development might be a key factor for sustainable socio-economic practices of a country — and has been earmarked as an important strategy to realise the targets of the so-called Millenium Development Goals (MDG) (Van Niekerk, 2005). However, there has been a major challenge in improving farmer skills among communal farmers in communal South Africa in crucial aspects of farming such as agricultural technology and management because of poor involvement of State agencies, NGOs and other development agencies in farmer

support and training for example (Christoforasis, 2008). Mmbengwa *et al.* (2011) are of the view that increasing agricultural extension service among communal farmers might be crucial in farmer skills development in South Africa.

The results of this study therefore suggest that priority in terms of farmer skills development among communal cattle farmers in the study area should mainly be focused on livestock production, cattle marketing, farm risk control and management, financial management and budgeting among others. It is clear from the results of this study that these skills areas of the farmers in this study area still reflect some poor level of development. Groenewald (2004) is of the view that increased efforts on farmer training and development of these skills among emerging mainstream formal farmers in South Africa might enhance the probability of these farmers to be more productive and sustainable. Furthermore, the results of this study are corroborated by the findings and the recommendations made by Mmbengeni & Mokoka (2002) who revealed that poor skills in areas such as financial management, farm engineering and veterinary management among others still show some serious deficiency, and are yet to receive adequate focus with regard to their development among communal cattle farmers in some parts of the Limpopo Province in particular. In addition, basic arithmetic skills such as division, multiplication and subtraction also have to be prioritised as revealed in Figure 5.4.

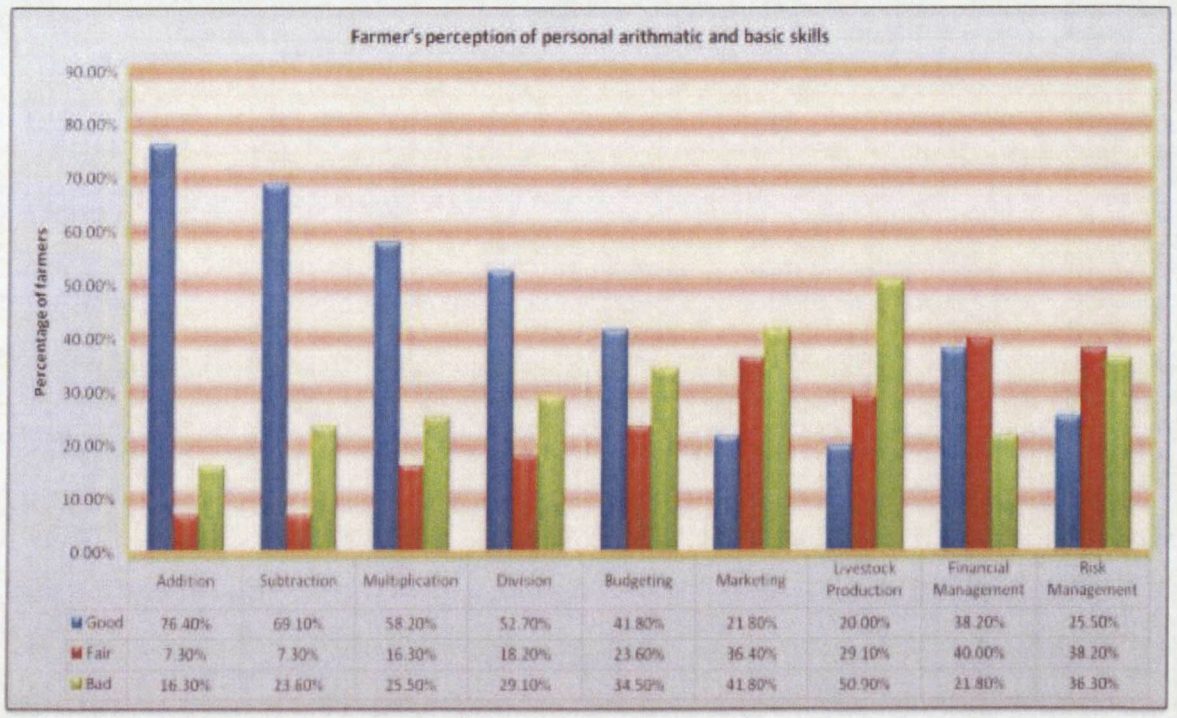


Figure 5.4: Communal cattle farmer's own perception of basic arithmetic and technological skills in the Musekwa Valley

It might be crucially important of the farmers and the South African authorities to maximise the opportunities provided by the so-called Adult Basic Education and Training (ABET) programme to develop some of these skills among communal cattle farmers in this study area. This programme might incorporate vocational skills training in achieving its numeracy and language objectives to improve income generation and livelihood strategies among the adult cattle farming population (Aitchison & Alidou, 2009; Larney, 2006; Naminga, 2007). Govereh *et al.* (1999) and Terblanche & Willemse (2009) argued that it is imperative for cattle farmers to demonstrate some ability to read, write and to add, to demonstrate some basic knowledge on bank interest rates, loan-able amounts and the mode of repayments for example. Lack of these basic skills might impact on the farmer's ability to attend to basic farm management skills (Govereh *et al.,* 1999) — especially with regard to farm risks such as disease and cattle mortality, limit the farmer's entrepreneurial performance and effectiveness, affect the farmer's interpretation of crucial livestock production technologies, understanding of market information and understanding of modern farming practices among others (Collier & Dercon, 2009; Nell, 1998; Seyoum, 2008; Wynne & Lyne, 2004).

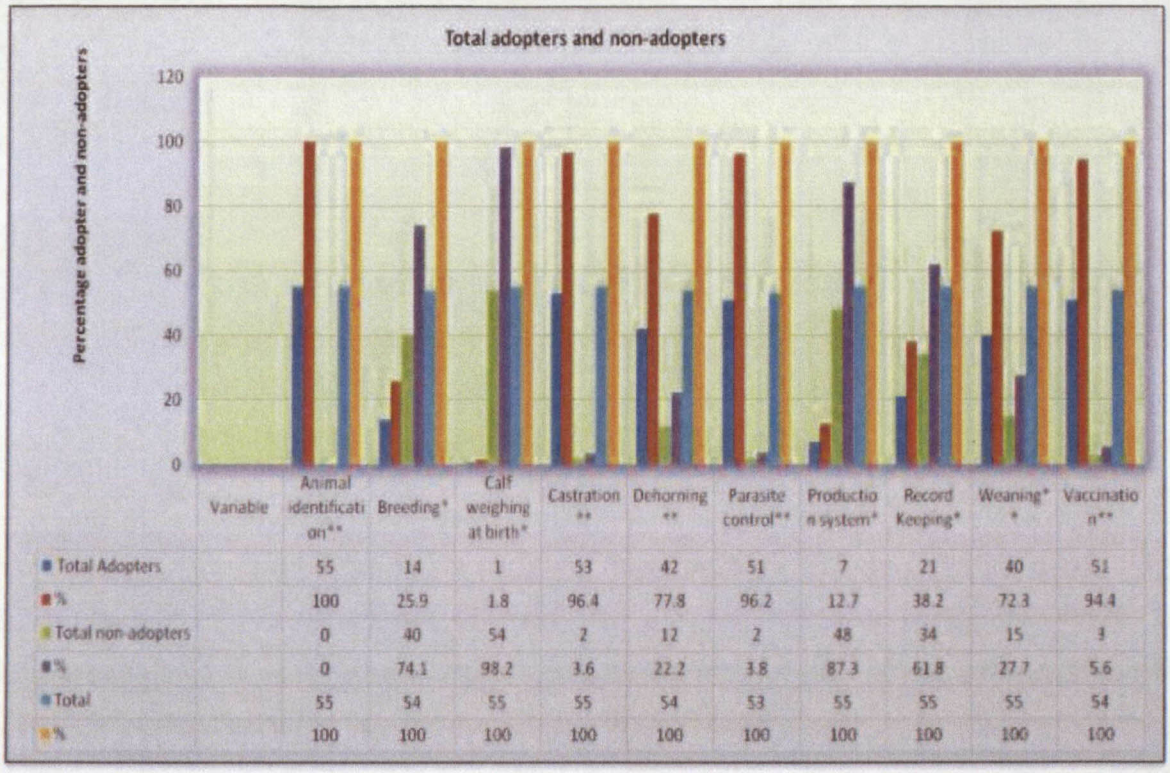
Furthermore, the absence of these crucial farm skills among farmer might result in increased farm transaction costs while in addition negatively influencing the intensity of agricultural commercialisation (Govereh *et al.,* 1999; Jari, 2009). It is the view of this chapter that improving and increasing farming skills levels among the communal cattle farmers in this study area with regard to the identified poorly developed skills aspects might also improve the entrepreneurial development of the farmers — which might make commercialisation of the subsector much easier to attain. Mmbengwa (2009) concurs that entrepreneurial development of farmers might lead to these farmers running their farming as business which might reduce the risk of collapsing as has been the case with most communal farming entities.

In addition, as a result of lack of formal school education, basic arithmetic and lack of new technological skills in cattle production and mainstream formal cattle marketing, communal cattle farmers in the study area are expected to opt for shorter; simpler and more convenient subsistence-orientated cattle production practices and adoption of the informal marketing channels as alternatives for cattle sales in particular (Musemwa *et al.,* 2008; Nell, 1998). The implication might be that less adoption of modern technologies might increase dependency on the communal strategy of cattle production and marketing. According to Oduro & Osei-Akoto

(2007), such dependency might constrain the productivity of the farm; limit both cattle off-take rates and mainstream market participation in particular.

Clearly, lack of proper skills in crucial aspects such as animal production including animal nutrition; feed supplementation and animal breeding techniques, farm management including management of grazing systems and other resources among others are significantly poor in the study area. According to Kahi & Rewe (2008), lack of these skills and knowledge among the farmers might constrain farm productivity and commercialisation initiatives. This might also be aggravated by a large amount of these communal cattle farmers who have no formal training in agriculture — especially cattle production but only relying on informally acquired skills and experience. It is evident that training of cattle farmers with regard to animal husbandry skills might have to form one of the major priorities of cattle production practices in the study area.

This is corroborated by the submission made by the World Health Organisation (2002) which argued that increased farmer training on animal drug use for example, might reduce animal mortalities and possible microbiological and toxicological risks among others. As a result of lack of proper farming skills, communal farmers in the study area resort to indigenous production approaches where crucial basic cattle production technologies are ignored. The limitation of indigenous cattle production practices particularly on the adoption of drugs remains the fact that indigenous knowledge is generally unknown to official experts (Acharya & Acharya, 2006). It is evident that poor skills in this regard might constrain farm productivity and mainstream formal market participation among these farmers (Hangara *et al.*, 2011). For example, 1.8% of the farmers weigh their calves at birth, 25.9% of the farmers practice controlled and programmed animal breeding and only 38.2% of the farmers keep farm records as indicated in Figure 5.5.



Variable	Animal identification**	Breeding*	Calf weighing at birth*	Castration**	Dehorning**	Parasite control**	Production system*	Record Keeping*	Weaning**	Vaccination**
Total Adopters	55	14	1	53	42	51	7	21	40	51
%	100	25.9	1.8	96.4	77.8	96.2	12.7	38.2	72.3	94.4
Total non-adopters	0	40	54	2	12	2	48	34	15	3
%	0	74.1	98.2	3.6	22.2	3.8	87.3	61.8	27.7	5.6
Total	55	54	55	55	54	53	55	55	55	54
%	100	100	100	100	100	100	100	100	100	100

Figure 5.5: Adoption/non-adoption of basic cattle production on technologies among communal cattle farmers in the Musekwa Valley

This non-adoption of these technologies among the farmers in the study area might suggest that these farmers lack incentive to adopt the technologies because farmers mostly adopt new technologies when convinced such actions result in increased output (Doss, 1999). In addition, non-adoption of new technologies might also suggest that the communal cattle farmers in this study area are yet to commercialise their farming systems. What is also crucial is the fact that non-adoption of these crucial basic cattle production technologies might result in an unproductive cattle farming system characterised by physically, genetically and poorly conditioned animals which might lack competence in the markets (Montshwe, 2006; Phillip *et al.*, 2009). For example, Marfu (2008) argued that uncontrolled breeding and indiscriminate cross-breeding have often lead to numerous non-descript crosses in the cattle herd. However, Figure 5.5 revealed that 74.1% of the communal cattle farmers in the study area practice controlled animal breeding. This result is low compared to those reported among communal cattle farmers in the Ethiopian Bure Woreda where approximately 90.54% practiced uncontrolled natural breeding of animals (Feleke, 2008). Comparatively, communal cattle farmers in South Africa are better adopters of controlled animal breeding than Ethiopian farmers.

In addition, the results of the study further revealed that only a small number of the communal cattle farmers (1.8%) in the study area weighed their calves at birth. This shows poor skills in animal husbandry among these farmers. Farmers in the commercialised systems are expected to weigh their calves at birth in order to keep proper records of such animals which might be very crucial in animal husbandry particularly in measuring the performance of the calf (Mapekula, 2009; Phillip *et al.*, 2009). Weighing of calves at birth might assist the farmer to understand that calf weight at birth depends on breed type and sex of the calf which might eventually be crucial in monitoring the growth path of the calves and in addition determining the profitability of the farm enterprise (Mapekula, 2009).

Furthermore, Nell (1998) and Oduro & Osei-Akoto (2007) argued that farmers who adopt new technologies are expected to acquire increased production and achieve higher marketable output than those farmers who resort to non-adoption tendencies of new cattle production technologies generally associated with the communal production systems. The results of the study also revealed that there are indeed some fundamental opportunities in commercialising the cattle-production systems in the study area. There are several crucial cattle production technologies which are correctly adopted by the communal cattle farmers in the study area such as animal identification (100%), bull calf castration (96.4%), dehorning (77.8%), parasite control (96.2%), controlled calf weaning (72.3%) and animal vaccination (94.4%).

The adoption of these new cattle production technologies might be very crucial in determining the development and growth of the cattle production subsector as argued by Abera (2009) that "*...with the adoption of improved technologies and modern techniques, access to agricultural inputs and investment in infrastructure, rapid growth in agricultural income is achievable in Africa...*" It is in this view that Abera (2009) concluded that commercialisation and intensification of the communal agricultural subsector might be a fundamental policy strategy to achieve poverty reduction among resource-poor farming households of the developing regions. Adoption of new cattle technologies such as controlled breeding, parasite control and animal vaccination are expected to improve the genetic and physical quality of the animals and reduce cattle diseases and mortality rates particularly taking into consideration the effects of gastrointestinal parasites on animal production and growth if not properly controlled among animals (Mapekula, 2009). On the other hand, increased adoption of controlled weaning of calves is expected to increase marketable surplus, farm productivity levels and mainstream

formal market participation among communal cattle farmers in the study area in particular (Stockey *et al.*, 2000).

5.2.11 Farmer experience

Another crucial factor revealed by the results of the study concerns farmers' experience in cattle production. Farmer experience might include skills and knowledge acquired by the communal farmer through informal means, indigenous training, formal scientific training and social meetings among others (Montshwe, 2006; Van Zyl, 1996; Wibberly, 2008). The average farmer experience in cattle production in the study area is 20 years, with minimum farming experience ranging between two and 30 years per communal farmer. These results are a bit higher than those of Van Zyl (1996) who reported that communal farmers in some parts of South Africa have an experience of approximately 17 years. The relatively high farming experience among the communal cattle farmers in the study area is expected to be an opportunity for increased commercialisation of the cattle production subsector. This is because of the fact that experienced farmers are expected to perform better in both livestock production and market participation particularly since they are expected to already have established contacts with long time marketing channels among others (Matungul *et al.*, 2002; Montshwe, 2006; Mudau, 2010; Van Zyl, 1996).

However, unexpected results were obtained in the study regarding the impact of farming experience and the performance of the farmer for example. The results of this study revealed that farming experience indeed has some effect – especially with regard to farmer output. For example, the results revealed that farming experience correlated with the farmer's adoption of farm record keeping among others. The results revealed a negative and significant (0.0038) relationship between farming experience and adoption of farm records by the farmer as indicated in Annexure E. However, these results were unexpected because under normal circumstances farmers with higher farming experience are expected to know and understand the value of keeping farm records and therefore expected to keep farm records more than lesser experienced farmers. The implication of the results of the study revealed that when farming experience decreases, communal cattle farmers in this study area increased their keeping of farm records. Therefore, lesser experienced farmers among the communal cattle farmers in the study area are expected to keep farm records more than those cattle farmers who are more experienced. This is an unexpected result. However, despite the fact that these results are unexpected, they are nevertheless meaningful as less experienced younger cattle farmers in the study area are

expected to have more understanding of the value of keeping farm records than older farmers. Younger farmers are expected to understand adoption of farming records better than older farmers because of their expected superior education which might assist younger farmers in understanding the importance and value of keeping farm records. In addition, the results of the study might be revealing lack of understanding of the importance and value of farm record keeping among the older farmers. However, the effect of farming experience on adoption of farm record keeping among communal cattle farmers in this study area might be too modern, complex and cumbersome for most of these farmers to understand. Farm record keeping might be a new farming technological approach particularly in livestock production which older and more experienced farmers might find difficult to understand as records are known to also be cumbersome. These results do not reflect well for commercialisation initiatives because the majority of these farmers in the study area are likely to be more unproductive as a result of poor keeping of farm records. For example, the positive and significant (0.0792) relationship between farming experience and cattle mortality rates in the study area might suggest that cattle mortality in the study area increased with farming experience and poor adoption of farm records.

The implication of this result is that experienced cattle farmers in the study area might be poor adopters of modern cattle production technologies and innovations. New technologies and innovation might require record keeping – especially with regard to animal health issues which might aid sufficient animal disease management and control measures resulting in decreased mortality rates among others. In this case, opposite is the case. Because older and more experienced cattle farmers are expected to lack such innovation and technological adoption, Mwanza (2007) reported that it was therefore common for communal livestock farmers in South Africa to resort to poor technologies such as the use of old motor oil to treat parasites such as ticks for example. These farmers adopt some of these measures as coping strategies to compensate their lack of adoption of new technologies and innovation such as record keeping and animal health control measures. These practices may not be sufficient to deal with troublesome animal parasites and therefore increasing the probability of their livestock from high mortality exposure. Farmers who dream of commercialising their production systems are expected to be receptive of new innovations and technological change (Jari & Fraser, 2009). However, adoption of new agricultural technologies among communal farmers has often been a slow process — especially in South Africa.

5.3 CONCLUSION

It is evident from these results that farmer household demographic factors form an important inventory in the determination of farmer ability to access crucial production inputs, increase farm productivity and improve probability of the communal cattle farmers in the study area to actively participate in the mainstream formal cattle market. In other words, farmer demographic factors have proved to be crucial constraints to the commercialisation of the communal cattle-production systems in the study area. Among others, age of the communal cattle farmer plays a critical role in terms of the ability to perform physically difficult cattle production practices, adoption of critical modern cattle production technologies and market participation.

Farmers in the study area show that they are old and lacking in terms of quality education as the majority of them mostly have primary or no formal school education at all. It is expected that as a result of old age, generally poor education and lack of basic skills in crucial production and market participation technologies, communal cattle farmers in the study are faced with increased level of constraints in terms of farm productivity and mainstream formal market participation. In addition, cattle production activities in the study area are constrained by among others; lack of youth participation which might affect continuity in the case of the incumbent farmer's discontinuation of the farming either through old age; retirement or inheritance. However, farmers in the study area have shown increased levels of adoption of new technologies in some crucial areas such as cattle identification, parasite control and disease control and management, animal supplementation and controlled calf weaning among others which might be good opportunity for the commercialisation of this subsector in the study area.

Furthermore, it is evident that women remain largely excluded from mainstream formal cattle production and marketing activities as a result of their marginalisation from access to productive resources. This might be an indicator of a need to look at commercialisation models that recognize this factor. Furthermore, child-headed households also revealed increased vulnerability to poverty and other socio-economic inequalities which might require commercialisation initiatives to consider models that seek to empower this group. This chapter concludes that it is imperative that commercialisation of this subsector recognize the impact of farmer demographic characteristics on commercialisation. Obviously, other farmer characteristics such as those on household endowments are also expected to be critical for commercialisation of the communal cattle production systems in the study area. Therefore such inventory has to also be investigated.

CHAPTER 6

HOUSEHOLD ENDOWMENTS AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"...it is obvious that a household's well-being depends not just on its average income or expenditures, but that risk plays an important role too..." Fischer & Buchenrieder (2010: 1279) and that *"...severe and longer droughts, crop failures, livestock diseases, prevailing land tenure, population growth, isolation, and unemployment are all referred to as shocks and trends that make the poor even more vulnerable to poverty..."* Mazibuko (2010)

6.1 INTRODUCTION

Chapter five discussed the demographic characteristics of the communal cattle farmers. This chapter briefly describes household endowments among the communal cattle farmers in the study area focusing mainly on the general income, household expenditure and access to general off-farm and on-farm infrastructure of the communal cattle farmers in the study area. The main objective of this chapter is to investigate the impact of endowments on the commercialisation of the communal cattle-production systems in the study area. This is premised on the views expressed by Guirkinger *et al.* (2007) — that productivity of farmers and agricultural production systems might be influenced by access of farmers to proper endowments among others.

6.2 GENERAL HOUSEHOLD INCOME PATTERN AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

Household income patterns are greatly associated with the employment status of the respective household members in this study area. For example, the majority of cattle farming households in the study area are headed by unemployed (80.1%) persons as indicated in Table 6.1.

Table 6.1: Employment status of the communal cattle farmers in the Musekwa Valley

Employment category	Frequency	Percentage
Unemployed	44	80.1
Private companies	2	3.6
Government	2	3.6
Other well-off local villagers	2	3.6
Commercial farms	1	1.8
Undisclosed status	4	7.3
Total	55	100

It is evident from these results that the majority of these communal cattle farmers are therefore without any formal employment. The reasons of this high unemployment rate among these farmers might differ from farmer to farmer. For example, most of these farmers might be old and lacking in formal school education which might be crucial for sourcing employment — especially in the private sector and government where better skills are expected. As a result of high unemployment, farming households are deprived chances of accessing crucial household income which might be used to access purchased household and on-farm inputs among others.

In addition, high unemployment among some of these farmers — general household income is expected to be low in some of the households in this study area. It emerged during key informant interviews that some of the unemployed communal cattle farmers in the study area engage in odd-job activities such as cutting and selling of firewood to earn a living. As a result, it is therefore evident that deforestation might become a serious environmental challenge in the study area. In addition, some of the unemployed communal cattle farmers also engage in small construction work to earn a living. During the key informant interviews, it emerged that some of the unemployed majority of farmers also use their donkeys to carry goods for some members of the community at a fee. Donkey carts and wagons are a common sight in most of the villages in this study as people use them to generate supplementary household income on daily basis.

At Maranikhwe, Musekwa, Strathaird villages, some of these unemployed communal cattle farmers engage in fish selling — which they catch from the Mufungudi and Nzhelele rivers respectively — as a coping strategy for lack of proper formal employment. Fish is a coping livelihood strategy in Monze District, Zambia (Mubaya, 2010) and several other poor communities in Nigeria (Olaoye *et al.,* 2011). As it is evident that the majority of these communal cattle farmers are not formally employed neither full-time farmers — it is expected that these farmers might spend some considerable time away from their farming activities searching for supplementary livelihood strategies in order to diversify their income opportunities. This approach is similar to what Manona (2005) reported among livestock farming households in Pondoland, Eastern Cape Province of South Africa where farming households engage in diverse land based and non-land based livelihood strategies such as cattle rearing and formal employment to earn their living. In such cases, the productivity of the farming enterprise and market participation among farmers might be seriously constrained.

On the other hand, farmers who are part-time and also display a combination of livelihood strategies are classified by Mmbengwa (2009) as being the so-called *micro-farmers*. The same author argued further that — it becomes common that such farmers would independently farm, have improved access to bank accounts and also be eligible for bank loans because such farmers might be able to raise collateral required by banks for loans — which might present an opportunity to increase the productivity of the farming enterprise, and furthermore the probability to participate in mainstream formal cattle marketing. However, the assertion by Mmbengwa (2009) is clearly in contrast with the situation among the farmers in this study area.

With regard to formal employment, most of these farmers might not be formally employed because such employment opportunities remain very scares for most of the population particularly in the so-called former homelands where Bantustan leaders benefitted themselves in patronage for political support and massive corruption at the expense of the general populace (Francis, 2002). The results of the study are in collaboration with those reported by Grwambi *et al.* (2006). However, the results of the study further revealed that 12.6% of these farmers are formally employed. Of the farmers who are formally employed, those providing employments among these communal cattle farmers are private companies (3.6%), government (3.6%), other well-doing villagers (3.6%) and commercial farms (1.8%) as indicated in Table 6.1.

Employment statuses of communal farmers in most sub-Saharan Africa vary from region to region (Manona, 2005) as confirmed by Gachimbi *et al.* (2004) who found that approximately 13.0% of communal farmers in Kenya have some off-farm employment to generate some needed household disposable income. In addition, Nthakheni (2006) reported that approximately 33.2% of livestock farmers in some communal areas of South Africa generated their household income from salaries and wages. Manona (2005) reported that vulnerable groups such as women generated their household income from manufacturing and selling of handicrafts such as plant-based food baskets, mats and traditional dishes particularly in the Pondoland area in the Eastern Cape Province of South Africa.

This strategy of employment creation is corroborated by Mazibuko (2010) who found that some resource-poor communities in communal South Africa also provided valuable household income from similar practices as reported by Manona (2005). According to Mazibuko (2010), communities closest to tourism spots and destinations are most likely to rely on this strategy to create employment for themselves. Any source of income might be crucial for commercialisation among communal farmers as corroborated by the findings reported by

Govereh *et al.* (1999) who indicated that communal land-use cotton farmers in the Gokwe District in Zimbabwe used income earned from cotton (53.0%), maize (20.0%) sales and wage savings (18.0%) to acquire draft cattle.

Govereh *et al.* (1999) further reported that the higher the gross *per capita* crop income increased among these farmers, the more these farmers increased their access to commercialised land tillage service. The prospects of the cattle farmers in the study area to increase access to cattle production service and marketing remains increased because of their ability to access income from formal employment and other small-scale private jobs they do for income. However, Hangara *et al.* (2011) is of the view that access of extra household income among communal cattle farmers might negatively influence their willingness to participate in cattle marketing as farmers might already be self-sufficient, and therefore not see any necessity to participate in mainstream formal marketing of cattle.

While commercial farming is a major source of employment among communal livestock farmers in other parts of South Africa (Francis, 2002); the results of the study revealed a sharp contrast as the commercial farming subsector only employs a mere 1.8% of the farmers in the study area. Poor working conditions and low wages for farm workers in the commercial agricultural subsector particularly in South Africa might be contributory factors for lack of interest in farm employment among these farmers. In addition, the agricultural sector in South Africa has also been shedding a considerable number of jobs in the past decade due to new government labour legislation particularly on labour control and management which has become very difficult for commercial farmers to handle (Siimbi & Aliber, 2000).

In addition, the fact that the vast majority of cattle farmers in the study area are not formally employed might be a catalyst for increased farm productivity and mainstream formal market participation. These unemployed farmers might need to raise the much needed income for various household purchased inventories and other on-farm inputs by engaging in cattle marketing. It is common for communal farmers to sell their livestock in order to raise needed income for their daily livelihoods, however avoiding exploitative marketing channels (Mahanjana, 2009; Musemwa *et al.,* 2008; Mtetwa, 1978; Omiti *et al.,* 2006). For example, the results of the study revealed that a decrease in the income generated through cattle selling motivated these farmers to increase cattle selling points in their area to attract more traders.

This is corroborated by the negative and significant (0.0880) relationship between income generated through cattle sales and cattle selling point as indicated in Annexure E. This proves that income generation has become an integral part of cattle production activities among the communal cattle farmers in the study area. The high unemployment rate among the communal farmers in the study area might be resulting from the area's geographical remoteness from business points, limited opportunity to access wage employment and poor access to government employment as a result of high illiteracy rates as better education might determine the employability of individuals (Rambiyana & Kok, 2002) and so is lack of required skills. In addition, the increased lack of participation of these farmers in off-farm remunerative employment might indicate poor involvement of government, Non-Governmental Organisations, international development agencies and development practitioners in facilitating for such opportunities in the study area.

Employment status among communal cattle farmers in the study area seems to be having a major influence on cattle farming activities. For example, the results of the study revealed some exciting results as it is evident that when formal employment decreases among these farmers, the higher the probability of these farmers to keep farm records in the study area becomes. This is revealed by the negative and significant relationship between farmer employment status and keeping of farm records (0.0421) as indicated in Annexure E. The implication is that keeping of farm records increased with the decrease of formal employment among the communal cattle farmers in the study area. In other words, full-time communal cattle farmers might be more commercialised than formally employed cattle farmers in the study area with regard to keeping of farm records. This might be indicating that formally employed farmers might have their priorities on their formal employment than cattle farming activities while those who are full-time cattle farmers might have their priorities in cattle farming activities. As proper keeping of farm records might determine the productivity and performance of the farmer, it is expected therefore that unemployed cattle farmers in the study area become more productive and better performers than the formally employed. Apart from cattle sales, the majority of the communal cattle farmers in the study area revealed that government child support grant (23.6%), old age pension (14.6%); retirement pension (25.5%), crop sales (23.6%) and other undisclosed sources (12.7%) are the most popular means of household income sources among resource-poor cattle farming households in the study area as indicated in Figure 6.1.

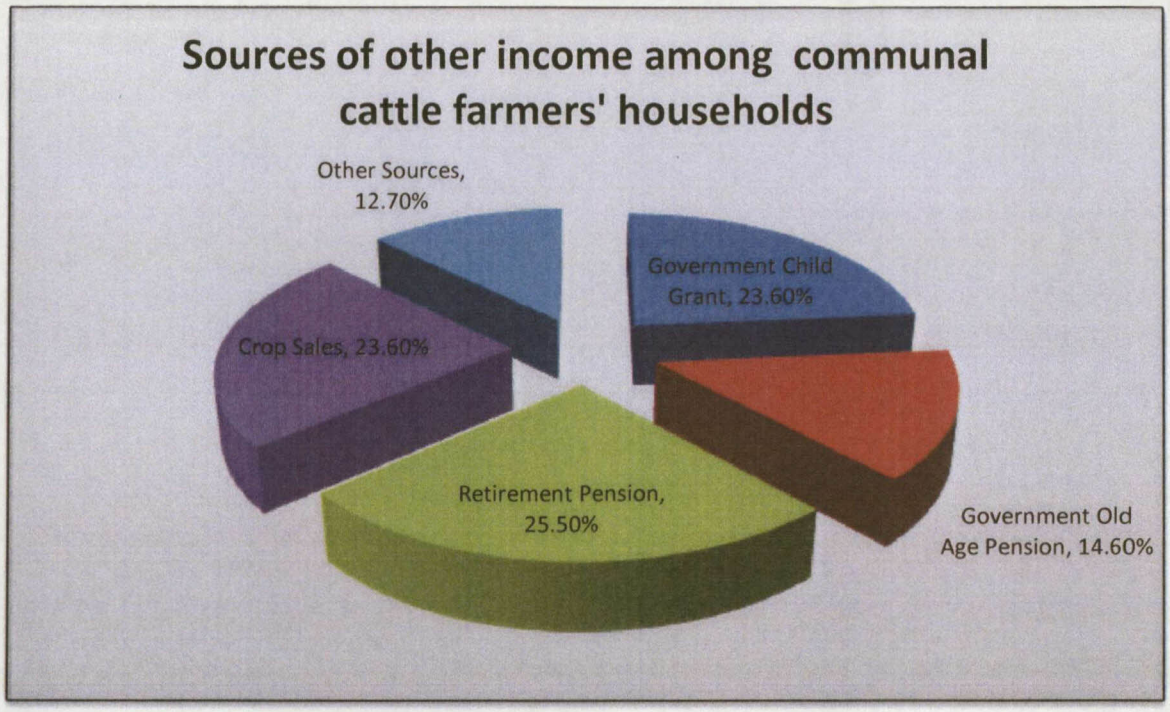


Figure 6.1: Other sources of household income among communal cattle farmers in the Musekwa Valley

This means that approximately 40.0% of household income among these households is generated from government sources; a result which concurs with the findings reported by Mazibuko (2010) when reporting on income sources of the AmaZizi community in KwaZulu-Natal Province, South Africa where approximately 62.0% of households depended on government grants for household income. It is evident that the South African government has an increased social spending on household grants and income to the vulnerable groups such as the elderly, people with disability and children as corroborated by the reliance of these groups on these government grants for household income as indicated in Figure 6.1. This government social grant approach for the socio-economically disadvantaged and vulnerable might assist to reduce the high poverty levels and social inequalities among the South African resource-poor population (Diale, 2009; Mutshaeni, 2009) by reducing hunger, promoting nutrition, improving school attendance and increase health outcomes among the designated vulnerable groups (Pedra, 2011). In a way, the increased reliance of the disadvantaged and less privileged groups on the government social grants might be pointing to the view expressed by Turok (2011: 18) that government social grants are fast replacing other means of income such as remittances among these groups.

This is corroborated by Dinbabo (2011) who reported that approximately 13 million of the 46 million South Africans are currently on government payroll for various social grants. This means that approximately 28.3% of the population depends on government grants for household income. This therefore raises a crucial question however as to the sustainability of these grants which seem to be increasing from time to time. By 2010, the Minister of Finance in South Africa reported that approximately R89 billion was budgeted for various grants for the 2010/2011 government financial year. Clearly, since the inception of government social grants which was introduced in 1928 in South Africa as a State Old Age Pension to fight poverty among elderly whites – and evolved over time to include blacks, the South African government has relied on this approach for decades to address household income issues (Leibbrandt *et al.*, 2010).

For the purpose of this study, better endowed households might perform better in their cattle farming practices because they might use part of these government grants to access farm inputs and cattle market information among others. At least the majority of the farming households in the study area are guaranteed some kind of household income either through old age pension and disability grant (R1080) and child support grant (R250) per month (Dinbabo, 2011). However, this income might not be enough to provide surplus for farming activities let alone for these households to access the basic necessities such as decent shelter and economic assets such as land and livestock – and the majority of these farming households remain "*trapped*" in poverty (Oluwatayo & Oluwatayo, 2012).

The results of the study as revealed in Figure 6.2 are in line with those of Altmann *et al.* (2009), Anteneh *et al.* (2004), Barrett (1991), Bonti-Ankomah (2001), Dapaah *et al.* (2001), Enete & Igbokwe, 2009; Grwambi *et al.* (2006), IFAD (2001), Ortmann & King (2007), Taylor (2007) and Van der Westhuizen & Van Zyl (2002) who reported that government grants and other off-farm activities such as crop sales are the main sources of income in most parts of rural Southern Africa region in countries such as South Africa and Zimbabwe, the Near East, North and West Africa regions in particular. Crop sales contribute approximately 74.0% of the total income among communal farmers in Zimbabwe as compared to 23.6% of the same in some parts of communal South Africa (Barrett, 1991). The same author revealed that meat and milk sales contribute approximately 14.0% of the income among communal farmers in Zimbabwe depending on regions. Increased dependence on off-farm income sources such as government's grants among cattle farmers in the study area might be suggesting that cattle farming activities

are non-viable, profitable and non-sustainable as they are unable to generate enough surplus income for the farm enterprise and household requirements (Man & Sadiya, 2009).

What is also increasingly interesting is the fact that a considerable number of farmers in the study area could not disclose their employment statuses (7.3%). These non-disclosures of household sources of income might be as a result of fear of victimization among these farmers by government authorities. Some of these farmers conceal their other sources of income for fear of forfeiting their government welfare grants in particular. Mazibuko (2010) also reported that illegal and criminal practices such as earning household income from dagga sales for example have also been causes of non-disclosures of income sources in some communities in some parts of South Africa such as in the AmaZizi area of the Drakensberg region in KwaZulu-Natal. Some households in these communities in this part of South Africa sold dagga to raise household income for example.

These non-disclosures of income sources are despite all the efforts and assurances indicating that the study has nothing to do with government decisions particularly on welfare grants. It is must be emphasised that non-disclosure of household income by some of these farmers might frustrate government efforts to assist these farmers as it becomes hard to determine the farmers' household and farming actual needs among others. However, Nanja (2010) discovered that communal farmers have a tendency of being privy with information to strangers. According to Nanja (2010), a communal farmer in Zambia remarked *"...do not give them information they will sell the land..."* Non-disclosures also results from mistrust of both strangers and kinsmen particularly on disclosing the number of cattle the farmer owns (Juma, 2009) and privileged indigenous knowledge especially on medicines as experienced by Mwaura (2008) in a study conducted in Swaziland.

It is evident that the results of the study revealed that communal cattle farmers in the study area have multiple sources of income. Farmers with multiple sources of income are expected to have increased probability to reduce income uncertainties and household poverty, increase farm production, access better cattle production and marketing technologies and also to actively participate in the mainstream formal markets as they might have surplus cash to spend and invest on acquiring farm inputs and other formal market-related activities such as access to market information for example (Man & Sadiya, 2009; Nthakheni, 2006; Oduro & Osei-Akoto, 2007). In addition, the results of the study revealed that the vast majority of the communal farmers in the study area (83.6 %) generate less than R10 000, 10.9% generate between R11 000, only

1.8% of the farmers generate between R21 000 and R30 000 *per annum* and 3.6% generate between R31 000 and R40 000 *per annum* from cattle sales as indicated in Table 6.2.

Table 6.2: Household annual income from cattle farming among communal cattle farmers in the Musekwa Valley

Income range	**Frequency**	**Percentage**
<R10 000	46	83.6
R11 000- R20 000	6	10.9
R21 000- R30 000	1	1.8
R31 000-R40 000	2	3.6
Total	55	100

These findings are slightly lower than those reported by Schwalbach *et al.* (2001) who found that 41.8% of communal cattle farmers in the Free State Province in South Africa have income ranging between R12 000 and R24 000 *per annum*, 23.0% have income of approximately R6 000 and approximately two percent having income ranging from R6 000 or less *per annum*. Mthembu (2008) reported incomes of less than R10 000 (37.0%) and no incomes (38.6%) *per annum* among communal farmers' households in the Ingwe Municipality in KwaZulu-Natal Province in South Africa. It shows that the majority of farming households in most South African communal areas have low income. The fact that most communal cattle farmers in the study area largely depend on government grant sources for income means that the average income among them is between R3 000 for an ordinary child support grant and R12 960 for the old age and disability grant *per annum* in terms of the general standards of government grants in South Africa (Dinbabo, 2011; Gordhan, 2010). The differences in income patterns among communal livestock farmers as reported by Nthakheni (2006), Schwalbach *et al.* (2001) and those of the results of the study suggest that income distribution in South Africa varies from region to region depending on circumstances and conditions of the respective farmers particularly their access to other means of income sources apart from government sources. These income patterns also give credence to the argument that most poor rural areas in sub-Saharan Africa in general are generally characterised by low incomes for the majority of the population particularly those formally employed in the commercial farming subsector which is characterised by low wages and abuse of workers (Aina *et al.*, 2004; Poulton *et al.*, 2006; Simbi & Aliber, 2000).

In addition, farming households with lesser income are expected to have less money available to spend on household goods and services. This is particularly expected in the study area where

cattle farmers have to also take care of significantly larger extended households with sizes averaging between one and 17 members per household. Most of these household members are unemployed adults, school-going youth or/and old pensioners. When the money available to spend is relatively low and insufficient to sustain the farming household, the cattle farmer has less money available to save or invest in agricultural activities particularly production and mainstream formal market participation. Under these conditions, communal cattle farmers might find it difficult to acquire important farm inputs such as more breeding animals, vaccines and drugs as these inputs might become increasingly unaffordable (Stroebel, 2004). Those farmers with better income are most likely to have surplus cash to improve their living standards through improved access to housing; sanitation; electricity and water supply, spend on acquiring purchased cattle production inputs such as animals, vaccines, drugs, animal forage and other on-farm inputs than those farmers with less income (Ligthelm, 2007; Nthakheni, 2006; Stroebel, 2004). Better endowed communal cattle farmers are also expected to be able to address various agricultural marketing transaction costs in among others; market searching, access to information and access to means of transport. For example, as indicated in Figure 6.2, a vast majority of the communal cattle farmers in the study area (67.0%) are unable to access crucial inputs such as animal vaccines as a result of poor financial capacity. For example, the results of the study revealed that only 33.0% of the communal cattle farmers in the study area are unable to vaccinate their animals as a result of other limitations apart from un-affordability. Lack of knowledge on animal vaccination is the next crucial factor among these farmers.

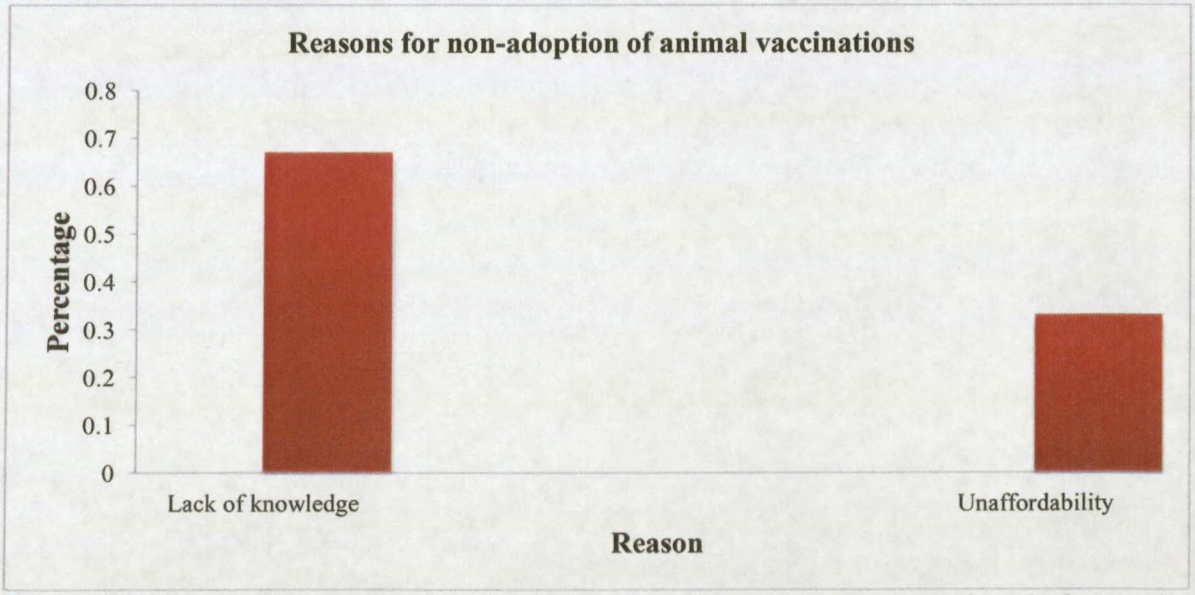


Figure 6.2: Reasons for non-adoption of animal vaccinations among communal cattle farmers in the Musekwa Valley

The large number of the communal cattle farmers who are unable to adopt animal vaccination as a result of financial incapacity for example, might be discouraged from increased cattle production and mainstream formal market participation. These farmers might opt to remain in the communal cattle-production systems where inputs and other on-farm resources are provided for mostly by governments and the output consumed internally (Boughton *et al.*, 2007). Some cattle farmers are also expected to totally move out of agriculture particularly cattle farming rather than move from subsistence to commercial mode of production where inputs and products are purchased and output sold off-the-farm (Boughton *et al.*, 2007; Eskola, 2004; Montshwe, 2006; Ngqangweni & Delgado, 2002).

6.3 GENERAL OFF-FARM AND ON-FARM HOUSEHOLD EXPENDITURE

The results of the study revealed that the majority (61.1%) of the communal cattle farmers in the study area spend an average of R10 084 per farming household *per annum* on off-farm activities. This amount is a bit above the average household income of approximately R10 000 *per annum* per communal cattle farming household in the study area. This means that communal cattle farming households in the study area spend almost every income they generate *per annum* without having any surplus. The reason might be that cattle farmers in the study area generate little income from their different sources which they use to acquire and access expensive off-farm goods and services. Household expenditure among the communal cattle farmers' households is distributed among provision of food (65.4%), education of the children (25.5%), household health (7.3%) and transportation (1.8%) as indicated in Table 6.3.

Table 6.3: Household expenditure distribution among communal cattle farmers in the Musekwa Valley

Item	Frequency	Percentage
Food	36	65.4
Education	14	25.5
Household health	4	7.3
Transport	1	1.8
Total	55	100

It is common that food expenditure might be as high as 60.0-80.0% of the total household income among low-income farming households in South Africa (Baiphethi & Jacobs, 2009) as farming households are known to priorities food provision particularly purchased foods of

animal origin than education, health and transport among others (Bonnard, 2001). These results are in line with those of Altman *et al.* (2009) who reported similar results in other communal areas of South Africa. Oluwatayo & Oluwatayo (2012) revealed that in Southwestern Nigeria, communal livestock farmers prioritised household expenditure from income earned from their farming activities on the major areas; school fees (42.0%), medical bills (10.4%) and house rent (10.0%). Key informant interviews conducted for the purpose of the study among communal cattle farmers in the Musekwa Valley revealed that foods such as porridge, meat and milk are the most popular among the communal cattle farming households in the study area. These foods are locally produced and therefore cheaper to acquire in the study area. Farming households in the developing regions always try to have some diversified food production and provision strategies for their households particularly from locally-found alternatives (Maruo, 2002). These alternatives allow them to cut on household food costs.

Cheaper foods might result in decreased food expenditure therefore resulting in household income surplus which might be directed to other household needs and on-farm activities such as access to livestock drugs. In addition, communal cattle farmers in the study area are expected to opt for these locally produced foods as a result of distances travelled to distant areas to acquire such foods. Towns and business nodal points which can supply these foods over-the-counter are located between 20 and 60km away from the nearest village in the study area. This pattern is consistent with the findings by Makhura & Wasike (2003) who reported that communities in rural South Africa are mostly located in far flung areas away from towns and business nodal points making it very difficult for some of these villagers to access important inventories.

Long distances associated with increased transport transaction costs might be constraining to the access of on and off-farm inventories and farm inputs which might seriously constrain increased farmer cattle production and participation in the mainstream formal cattle market in particular (Montshwe, 2006; Musemwa *et al.*, 2008; Nthakheni, 2006; Satyasai & Viswanathan, 1997; Van Schalkwyk *et al.,* 2007). On the other hand, shorter distances to business nodal points might increase access to services which might result in increased production, productivity and mainstream formal market participation among farmers as was the case in the cotton production subsector in Mozambique and Zimbabwe for example (Govereh *et al.,* 1999). It is evident that increased transaction costs might result in weakened farm productivity and market inefficiency (Suzuki & Sexton, 2005).

In Ethiopia, communal farmers solve the problem of distant service by providing alternative village farm input shops which supply harvesting materials and farm implements particularly in the coffee production subsector to the local farmers (Tolemariam, 2010). This corroborates Van Schalkwyk *et al.* (2007) who argued that bringing the buyers closer to the farmer might increase market participation among communal farmers. In addition, the expenditure in education and household health in the study area is consistent with the findings of Apili (2001) who reported that child education in rural Uganda for example is mainly funded by income generated from agriculture, particularly livestock production. On the other hand, the results of the study further revealed that the majority of the communal cattle farmers in the study area (58.2%) spend a minimum of R1 000 and a maximum of R76 000 per household *per annum* on on-farm activities while 41. 8% spend between R150 and R900 per farming household *per annum.*

These results are a bit lower than those of Nthakheni (2006) who reported farm expenditures on on-farm activities among communal cattle farmers in some communal areas of South Africa of between R360 to R1 700 per farming household *per annum* particularly on the least spending farmers. This shows that expenditure patterns in the study area vary from farmer to farmer depending on different factors. However, the cattle farmers in the study area might be spending lesser in on-farm inputs as a result of their dependence on indigenous methods of animal disease control and management as revealed during key informant interviews. Furthermore, the results of the study area further revealed that the communal cattle farmers in the study area spend the most in animal health (47.2%), animal feeds (29.1%), acquisition of farm equipment and inputs (16.4%) and buying of more cattle stock (7.3%) as indicated in Table 6.4.

Table 6.4: On-farm expenditure among communal cattle farmers in the Musekwa Valley

Source of expenditure	**Frequency**	**Percentage**
Animal health	26	47.20
Animal feeds	16	29.10
Acquisition of farm equipment and inputs	9	16.40
Buying more stock	4	7.30
Total	55	100

These results are in line with those of Nthakheni (2006) who reported increased expenditure patterns among most livestock farmers in medicines (61.2%) and dip (16.2%) purchases. As a result of this increased expenditure, resource-poor communal cattle farmers might resort to the

use of indigenous livestock production practices (Mwanza, 2007) which might compromise animal production quality among others. However, the fact that some of these farmers can afford to spend so much of their income on animal health might be indication that some are willing to adopt new technologies in animal production. The results of the study further revealed that animal supplementation is very crucial in cattle production. A significant number (29.1%) of communal cattle farmers in the study area also spend significantly on purchased forage for the animals. This might be as a result of the increased exposure of the cattle production practices in the study area to natural disasters such as droughts which force these farmers to rely on purchased forage.

In addition, cattle farmers might also increase spending on acquiring supplementary animal forage in order to increase and sustain milk production which is critical for household consumption and sales among communal cattle farmers particularly in the rural areas of the developing regions (Barrett, 1991). This strategy is also corroborated by Tangta *et al.* (2002). The mean expenditure amount for on-farm activities in the study area is R4 974 per communal cattle farmer *per annum*. This expenditure might be the result of increased prices on farm inputs or government's withdrawal of assistance in terms of inputs supply such as the purchase of dip chemicals among others resulting in increased expenditure on the side of the farmers. Those communal cattle farmers who spend more on on-farm inputs in the study area might be discouraged to increase cattle production and to participate in the mainstream formal cattle market due to high transformation costs which might impact on profit making.

6.4 HOUSEHOLD ACCESS TO TECHNOLOGICAL RESOURCES

6.4.1 Access to telecommunication technology

Of the total communal cattle farmers in the study area, there are 76.4% of these farmers who are able to access telephones while 23.6% have no access to telephones. The majority of these telephones are mobile phones (76.3%), community pre-paid phones (14.6%) and private cable telephones (9.1%). Baloyi (2010) found that approximately 85.0% of farmers in other regions of Limpopo Province have access to mobile telephones. Olubode-Awosola (2006) reported that approximately 80.9% of these farmers in the Free State Province in South Africa have access to telephones particularly mobile. Mobile phones might be multifunctional instruments among communal farmers which might be used for communication and as calculators in many respects allowing farmers to conduct some valuable farm calculations (Braidotti, 2011). Access to

telephones might be crucial for the access of important cattle production and market information among these farmers. Increased access to information might also improve the farmer's prospects for increased income as the farmer might be able to reach more potential traders (Nwankwo & Wolfgang, 2008). Better endowed farmers with regard to telephones might also use text messages to communicate which might be cheaper than making a call. In addition, most mobile handsets are advanced to an extent that users might also be in a position to access internet for crucial cattle production and market information.

This view is supported by the submission presented by Ahuja & Redmond (2001) in a study that focused on access of market information and participation of farmers in the market who went on to use a quotation by a village woman farmer and market participant to illustrate the importance of access to market information among farmers. This woman said *"...I always sell eggs to middlemen. Before, whatever prices they offered I accepted because I had no idea of the going prices. Last week the middleman came and wanted to pay me 12 taka for a hali (four units). Keeping him waiting, I rushed to check the prices on the village phone and a hali was selling for 14 takas in nearby market. I came back and refused to sell, and after some haggling we agreed on 13 takas a hali..."* Based on this story, it is evident that access to correct market information played a major role in determining the decision of this woman farmer. In view of this, it might be argued that a better resourced farmer in terms of telecommunication technology is a better empowered farmer for the market. Technological empowerment of farmers might significantly reduce the dominance of traders over these farmers in terms of price bargaining which might also substantially increase the farmer's returns and profit over sales. In most developing regions particularly among communal farmers, agricultural traders have had too much monopoly and power over the farmers resulting in serious exploitation of farmers and loss of profit (Suzuki & Sexton, 2005). As a result, some farmers get discouraged and stop participating in the markets.

In addition, as indicated in Ahuja & Redmond (2001), this woman farmer was able to avoid exploitation by the middleman, and also improved her chances of negotiating for a better deal in return. Access to the village phone was very crucial because it made her access correct market information quicker and easier. It is also evident that access to information also assisted this farmer to have knowledge and information of current market issues in her area. It also assisted this farmer to negotiate the transaction from an empowered and strong position for a better price. The fact that a large majority of farmers in this area have access to mobile phones might increase the probability of most of these farmers in the study area to increase their chances to access

crucial cattle production and market-related information. These farmers might therefore be able to take informed decisions. It is evident that access to information is empowering to a farmer (Ahuja & Redmond, 2001) which might also provide an incredible opportunity for commercialisation.

However, key informant interviews clarified that households with access to other public telephones in the study area are only able to access such service at business nodal points situated in far flung areas with distances ranging between 20 and 60km outside these villages. This means that public telephone service is not available in the respective villages of the study area. This is consistent with the findings by IFAD (2001) which reported similar conditions in developing countries such as Bangladesh among others. To solve such constraints, authorities in Bangladesh introduced what is known as the Village Pay Phone Service which provides leased cellular phones to the villagers particularly women. This project aims at improving communication between potential agricultural traders and the farming rural communities. Access to landline and mobile telephones facilities is expected to provide incentives for these farmers to participate more in mainstream formal cattle production, improve the standard of living of the communal farmers and their households, improve integration of farmer subsistence production systems with those of the mainstream formal market systems and to subsequently accelerate agricultural productivity; development and commercialisation among others (Kanyenze *et al*, 2007). In addition, poor or lack of access to communication facilities such as telephones might escalate information transaction costs which might eventually discourage these farmers from actively participating in agricultural activities particularly mainstream formal marketing.

6.4.2 Access to transport

Transport is crucial for effective farm production and mainstream formal market participation particularly where farmers are faced with long distances to access farm inputs and the mainstream formal markets in particular (Baloyi, 2010; Van Schalkwyk *et al.*, 2007). Remoteness from the markets might result in reduced farm-gate prices; increased transaction costs and reduced incentives for market participation (Tewodros, 2008). Inadequate transport has been a major constraint of commercialisation among communal farmers in countries such as Namibia for example (Hangara *et al.,* 2011). In the study area, the results revealed that public transport (94.5%) and personal transport (5.5%) are the major means of these farmers to access both on and off-farm service as depicted in Figure 6.3.

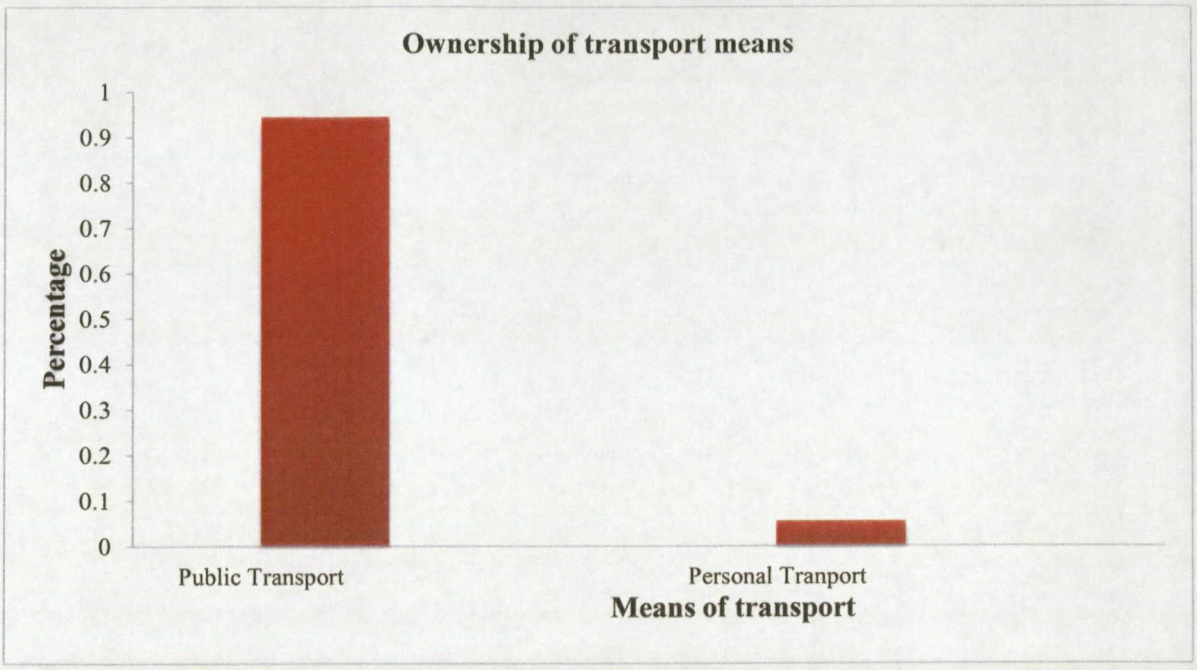


Figure 6.3: Ownership of transport among communal cattle farmers in the Musekwa Valley

It is evident that the majority of these farmers do not have personal means of transport particularly vehicles. Aklilu *et al.* (2002) and Niewoudt & Groenewald (2003) corroborated this finding by reporting that the vast majority of communal farmers in the developing regions do not own vehicles as means of personal transport. In most cases, resource-poor farming households in the communal areas of the developing regions especially in sub-Saharan Africa that lack transport means particularly vehicles resort to the use of draught animals such as cattle, donkeys, horses and mules for transport (Jones & Maroge, 2007; Nengomasha *et al.,* 2000). Of major interest is that lack of personal transport ownership among communal cattle farmers in the study area might be most common among the older group of these farmers.

The results of the study confirm this view by revealing that there is a negative and significant relationship between transport ownership and farming experience for example. The implication is that personal transport ownership decreases with an increase of farming experience among these farmers. As a result, older and more experienced cattle farmers are expected to be the most affected group by increased transportation costs than younger and lesser experienced cattle farmers. This lack of access to personal means of transportation among communal cattle farmers particularly the more experienced group in the study area might expose these farmers to increased transport transaction costs. This view is corroborated by Mthembu (2008) who found that lack of transport ownership among resource-poor farmers might result in increased transport

transaction costs. Furthermore, increased transport transportation costs might further be compounded by the long distances between the farmers and the mainstream formal marketing points in the study area.

With the results of the study revealing that 44.1% of these cattle farmers depend on hired transport for the market, it is expected that transport transaction costs among these farmers in the study area might become a considerable constraint to mainstream formal market participation among farmers. The results of the study corroborate the view that transport transaction costs in the study area might be a constraining factor for mainstream formal market participation. For example, a significant number of these farmers walked their animals (50.9%) as a response strategy to reduce, control and manage costs to the distant formal cattle marketing points. This strategy has been adopted among communal cattle farmers for decades in the developing regions (Bailey *et al.*, 1999). This is despite the fact that this strategy might compromise on the physical quality of the animals as walked animals are expected to have shed some considerable weight by the time they arrive at the marketing point (Montshwe, 2006). As a precaution of this factor, and alternative to walking the animals to the marketing point, some of these farmers sell their animals in bulk to avoid multiple trips to the markets. Some sell at farm-gate despite the fact that they might be exploited and lose some profit (Mthembu, 2008; Nkhori, 2004).

Lack of personal transport ownership among farmers has resulted in these farmers to abstain from active participation in the mainstream formal markets to an extent of opting for the cheaper, faster and less complex informal marketing options (Musemwa *et al.,* 2008; Nesamvuni *et al.*, 2003; Nkhori, 2004; Nthakheni, 2006). Key informant interviews also revealed that those farmers who opt to abstain from cattle market participation are discouraged by lack of personal transport ownership, long distances to the marketing points and increased transport transaction costs. In addition, some of these farmers have less stock to sell which makes it even more difficult to participate in the mainstream formal market in particular because these farmers have to sell more animals in order to make some profit.

It is evident that lack of personal transport ownership, long distances to the marketing points and increased transport transaction costs are intertwined factors that might have some considerable negative effect on commercialisation efforts of the communal cattle-production systems in the study area as argued by Komarek (2010). The results of the study are in sharp contrast with those of Waithaka *et al.* (2007) who found that transport ownership among subsistence farmers in Kenya is as high as 47.0% per communal farmer. Comparatively, it shows that access to

ownership of personal transport among communal farmers in Kenya and South Africa in particular differs considerably. However, the results reported in Kenya might not necessarily be exclusive to automobile ownership but other forms of transportation such as animal-drawn wagons among others for most resource-poor communities in the developing regions worldwide make use of animal-drawn wagons for transport (Jones & Maroge, 2007).

On the other hand, transport ownership among communal cattle farmers in the study area is expected to reduce transaction costs. Transport ownership is also expected to make long distances to the mainstream formal cattle marketing points less significant. In other words, a communal cattle farmer with personal transport is expected not to be affected by distance to the mainstream formal marketing point. In addition, transport ownership might also offer the cattle farmer some greater depth in accessing diverse mainstream formal cattle marketing options (Jari, 2009; Matungul *et al.,* 2002). This view is corroborated by Musemwa *et al.* (2010) who argued that communal cattle farmers in the Eastern Cape Province of South Africa who have access to personal transport actively participate in mainstream formal cattle marketing activities than those cattle farmers who lack personal transport for example.

The mainstream formal cattle marketing points in the study area are located in distances averaging between 20 and 60km from the communal cattle farmers' villages. This is a long distance compared to distances averaging approximately 3km in some parts of Kenya where selling farmers have decreased transaction costs (Ouma & Abdulai, 2009). Pedrosa & Do (2009) argued that extended distances are associated with increased production and transaction costs in terms of farm production and mainstream formal market searching which might be discouraging to the farmers, forcing them to opt for the perceived cheaper and affordable subsistence means of production. Farmers with shorter distances are expected to have increased participation in the mainstream formal marketing activities. For example, the results of the study revealed that a decrease of distance between the farming point and the mainstream formal marketing point might increase the income of the communal cattle farmer generated through cattle sale. The negative and significant (0.0512) relationship as indicated in Annexure E between distance and income variables attests to this finding.

6.4.3 Access to health facilities

The communal cattle farmers in the study area are generally healthy as a mere 7.3% of the total communal cattle farmers spend their household income on general household health service as

indicated in Table 6.3. A healthy population is more likely to divert its financial resources to agricultural development priorities such as cattle production and formal market searching and participation. This is because such households are generally expected to have surplus disposable income to spend than those other households exposed and experiencing serious health challenges. Healthy farmers and their household members are therefore more likely to actively participate in agricultural activities particularly livestock production which is expected to be more physically demanding.

On the other hand, poor health among farmers might be a constrain to agricultural commercialisation and development because diseases such as HIV/AIDS and Malaria among others in most parts of sub-Saharan Africa might have dire effects on crucial production and marketing factors such as labour supply as a result of instability of the household and loss of crucial members particularly those of working age, household income, access to inputs and agricultural technological attainment and competence among others (Arisunta, 2010; Bekele, 2007; Francis-Chizororo, 2008; Handley *et al.,* 2009; McIntryre *et al.,* 2009). This might be from the fact that some of these diseases mostly affect the labour-supply groups of young, able-bodied and middle-aged adults in particular who end up having reduced life expectancy; which is very common in regions such as the sub-Saharan Africa where HIV/AIDS has become devastating (Arisunta, 2010; Bekele, 2007; Francis-Chizororo, 2008; Handley *et al.,* 2009).

Another major short-coming among communal cattle farmers in the study area remains the fact that the study area has a large population of approximately 6 179 people who are served by only two clinics. The majority of these people have to walk or use public transport to access the health facilities which are located some long distances away at Khomele and Strathaird villages. This situation is in line with the findings of a study conducted in Ghana where subsistence farming households are expected to reach health centres situated approximately 20km away, for example (Oduro & Osei-Akoto, 2007). Transport fare to reach the health facilities is expected to be unaffordable for the majority of these farmers and their households in the study area because of their low income levels. This way, the well-being of the farming households is seriously compromised, and commercialisation under these circumstances might be highly constrained.

6.4.4 Access to banking and financial support

The majority of the communal cattle farmers in the study area do not keep bank accounts (52.8%) while only 47.2% keep bank accounts. This corroborates Mbeki (2011: 18) who

reported that the majority of South Africans do not have bank accounts. This means that the majority of cattle farmers in the study area are unable to formally save money. This might be as a result of high unemployment rates among these cattle farmers in the study area, high household expenditures on crucial inventories such as food, lack of banking facilities close by and/or unprofitable cattle farming practices in the study area.

Long distance to the banking facilities might also be a constraint of banking among these cattle farmers. For example, the results of the study revealed that the majority of the cattle farmers (81.8%) are located approximately 21km away from their banks. Only a small number of cattle farmers (18.2%) have their banks less than 20km away. Unlike in countries such as Ghana where distant villages are assisted by the commercial banks by sending support teams to pick monies from the farmers to encourage them to save (Vermaak, 2006), communal cattle farmers in the study area continue to face increased transaction costs travelling to the banking points. It emerged during key informant interviews that farmers pay approximately R40 per visit to the nearest banking institution located at the Dzanani Town while those whose institutions can only be accessed at the Makhado Town part with approximately R60 per visits. It is evident that transport costs for banking might discourage these farmers from banking because they are too high and unaffordable. In addition of the costs, the study area has very bad gravel roads which discourage transport operators from operating in this area. Transport is also scares.

Furthermore, lack of banking among these farmers might also be as a result of weak or bad government policy and insufficient or absence of banking service facilities in the rural areas which has been common in South Africa in general over the years (Naledzani, 1992). In addition, lack of banking among communal cattle farmers in the study area might suggest that these cattle farmers in the study area might still be operating their cattle farming activities on a subsistence-based approach because commercialised farmers are expected to make use of banks. Abaru *et al.* (2006) further argued that commercialised farmers are expected to be successful on premise that they have ability to save. The ability of these farmers to save with the banks might improve the farmers' production, productivity, sustainability and market commercialisation of the enterprise while absence of banking might be viewed by the banks as being risky for investment among these farmers (Van Schalkwyk *et al.*, 2007).

In response to lack of access to formal banking, key informant interviews revealed that the majority of these farmers prefer to keep cash in their houses than with the commercial banks. This result from the long distances these farmers make to the banks to access savings which

often increase transport transaction costs in particular. In addition, communal cattle farmers in the study area also lack proper awareness and banking knowledge particularly on bank financial charges for example. This makes these farmers reluctant to bank money for fear of loss of their investments. As a result, it becomes difficult for financial institutions to provide financial assistance to these farmers who lack proper banking history, track record and proof of financial income and management capacity in particular (Hanlom, 2002; Togba, 2009). With increasing costs of living and decrease in the ability to access purchased inputs due to poor financial resources and surplus funds, farmers might find themselves having to seek for loans and credits from financial institutions (Tagra *et al.*, 2010).

However, lack of interest and assistance by banking institutions in communal agriculture in South Africa in general and in the study area in particular might compromise the ability of the communal cattle farmers in the study area to access bank assistance to fund their cattle farming activities. For example, the results of the study revealed that a vast majority of the communal cattle farmers in the study area are unable to access bank loans (92.7%) and only a few of such farmers are able to access the loans (7.3%). However, the inability of these cattle farmers in the study area to access bank loans might also be resulting from the unwillingness and reluctance of financial institutions to grant loans to communal farmers preferring to provide such loans to the affluent and established commercial farmers (Mbeki, 2011: 20; Nthakheni, 2006). This attitude might have been adopted from the apartheid policy which deliberately excluded black people from active agricultural economics — thereby among others — undermining their economic performance and independence (Francis, 2002). Effectively, race-based cultural, social and economic exclusivity was meant to remove black equalisation and competition in South Africa. Machete *et al.* (2004) found that communal farmers in South Africa are faced with unaffordable interest rates, poor accessibility of the financial institutions, and lack of information on financial products and complicated credit and loan application process which farmers find very cumbersome. As a response strategy to poor access to much needed farming capital, farmers are forced to remedy the situation by obtaining these loans and credits from various sources — most of which are informal.

Figure 6.4 indicates that community clubs (67.3%), informal money lenders (10.9%), commercial banks (9.1%) and other undisclosed sources (12.7%) are the main sources of loans among the communal cattle farmers in the study area. It is evident that the majority of the loan-seeking farmers mainly rely on informal lenders such as community clubs. Informal community

organisations such as savings club, stokvels and burial societies have been critical potential agencies of community development widely used among poor communities in South Africa as instruments of fighting poverty, isolation and vulnerability (Mazibuko, 2010). The fact that some farmers declined to identify the institution from which they obtained their loans might be pointing to the fact that such institutions are inferior and mostly operating without proper authorisation.

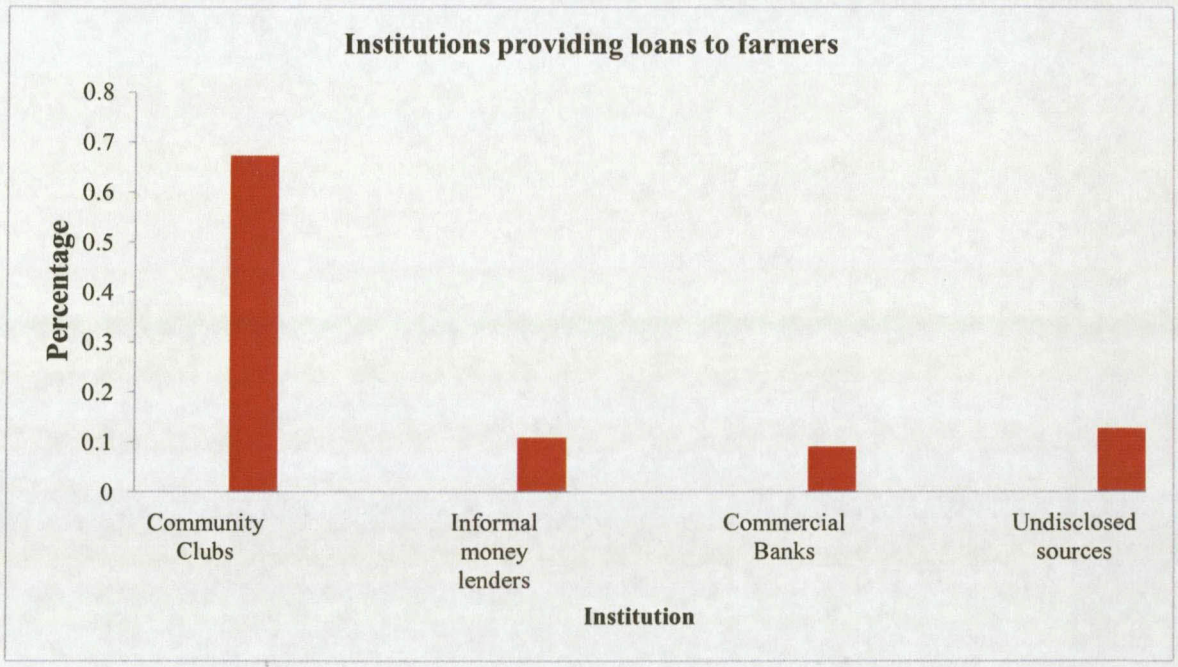


Figure 6.4: Institutions providing loans to communal cattle farmers in the Musekwa Valley

The results of this study are corroborated by those of Gachimbi *et al.* (2004) who reported that Self Help Groups (43.0%), co-operatives and Churches (18.0%), commodity producers (14.0%), community groups (10.0%) and commercial banks (14.0%) are the major financiers of communal farmers in Kenya. It is evident that farmers in Kenya mostly rely on informal financiers for loans. In addition, Togba (2009) found that communal farmers in Nigeria for example derived credit and loans from informal sectors (88.7%), banks (6.8%) and other formal institutions apart from banks (4.4%). These observations suggest that the majority of loan providers among communal farmers in most sub-Saharan Africa countries are informal and mainly social networking groups. This might mean that finding a loan from formal loan institutions for farming activities in sub-Saharan Africa might be increasingly difficult. This is corroborated by the findings revealed by Oluwatayo & Oluwatayo (2012) based on a study conducted among communal small-ruminant farmers in Southwestern Nigeria. It is also crucial

to note that while informal loan institutions assist farmers in need of financial assistance; these organisations are not exclusively providing such loans to these cattle farmers only — but to a wide base of other community members. As a result, farmers have to compete for these loans with other members of the community. This competition might make the availability of these loans increasingly difficult— and largely unguaranteed to obtain.

Most crucially, the fact that there is a heavy dependence on informal means of access to loans among communal cattle farmers in the study area in particular suggests that cattle farming are still largely informal and also un-entrepreneurial. Poor adoption of formal loans among communal cattle farmers in the study area might be as a result of long distances the farmers have to travel to access the formal financial institutions that provide such loans. This is corroborated by the negative and significant relationship (0.0321) between the variables *distance* and *loans* as indicated in Annexure E. In other words, had distances between the farmers and the loan providers been a unit less (1 km) in the study area, the number of farmers who adopt loan as an alternative strategy to raise on-farm capital would probably increase by approximately 3.21%. These results are corroborated by the findings of Kiiru (2007) who argued that rural farmers who have shorter distances to business nodal points where most of the formal loan institutions are likely to be based would have increased probability of adopting loans as an income strategy for on-farm activities.

In addition, the results of the study further suggest that farmer access to loans might also result in increased commercialisation of certain factors of the cattle-production systems in the study area. This is because the results of the study as indicated in Annexure E also revealed some positive and significant relationship between farmer adoption of loans and crucial commercialisation indicators such as cattle sale advertising (0.0014) and distance to business nodal points (0.0321); which might imply better opportunities for the farmers to access loan institutions — for example. It is estimated that the increased adoption of loans by these farmers by at least a unit (one farmer) might increase the probability of adoption of product advertising among these farmers by approximately 0.14% whereas on the other hand, reduced distances to the business nodal point where formal loan providers are likely to be located might also improve adoption of loans among communal cattle farming households by approximately 3.21%.

To deal with their incapacity to access loans, Vatta *et al.* (2008) found that some communal farmers in other parts of South Africa such as KwaZulu-Natal have shown some increased dependency on the government for on-farm financial assistance. The same authors further

argued that it showed some increased lack of farmer innovative entrepreneurship in cattle farming in particular when farmers abstain from adopting loans as a strategy for raising farming capital. The same behaviour might also be expected among the communal cattle farmers in the study area as it has been revealed that these farmers also lack innovation in sourcing for disposable on-farm finances particularly formal loans. For example, the results of the study revealed that a large number of these farmers (78.2%) have not attempted to adopt formal loans as an alternative strategy to raise on-farm capital for over a period of a year. Only 7.3% of these cattle farmers in the study area have obtained informal loans within the previous year cycle, the other 10.9% could not recall any specific period when they last obtained any loans. On the other hand, only 3.6% of these cattle farmers have adopted formal loans as an alternative strategy to raise on-farm capital most recently. This is in contrast of advanced cattle farming entrepreneurs who are expected to develop formal relationships with formal loan institutions in order to obtain loans for their farming activities.

The other crucial constraint to adoption of loans concerns the response of the loan institutions on farmer loan requests. For example, the success rate of approved loan requests is also very low at only 23.6%. On the other hand, 76.4% of these requests are not successful. The reasons for the non-approval of the loan requests vary from farmer to farmer. The majority of loan requests are rejected on account of inadequate reasons for the request for the loan (76.4%) and inability of the farmer to guarantee the capacity to repay the loan (21.8%). Inadequate reasons for the request of the loan might indicate that farmers also lack proper business plans on how they would want to use the money sourced from loans while — among others — incapacity to repay such loans might be pointing to a poorly organized farming entity which lacks income diversification in case of risk. This is obviously revealed in the study area by the fact that the majority of the farmers derived most of their income from off-farm activities such as government social grants which financial institutions might not even consider as reliable income to guarantee the ability of the respective farmer to repay the loan. In addition, 1.8% of the farmers in the study area could not divulge the reasons for their loans being declined. This is understandable because farmers often find it difficult to disclose some of their financial circumstances and information — especially to strangers (Stroebel, 2004).

These results are in line with the findings of IFAD (2003), Nell (1998) and Rahji & Adeoti (2010) who argued that formal loan institutions such as commercial banks in particular — are known to be reluctant to grant loans to communal farmers in most developing regions on

account of high risk associated with these farmers. In addition, communal farmers also lack collaterals. These results indicate that the farmers' ability to access loan capital to conduct agricultural business is increasingly poor and weak (Gachimbi *et al.,* 2004). It is on these reasons that the majority of the communal cattle farmers in the study area are expected to resort to and maintain communal cattle production practices. These farmers might consider this system more convenient, affordable and appropriate given their circumstances. It is evident that lack of access to loans and credit by these cattle farmers in the study area might have some adverse effects on the total performance and output of this cattle production system which might impact on its probability of commercialisation (Guirkinger & Boucher, 2007). Key informant interviews revealed that apart from commercial banks, there are no other formal institutions or organisations such as linkage agencies or agricultural contractors providing loan and credit assistance to the communal cattle farmers in the study area. These results are contrary to those of Hanlom (2002), Turok (2010: 49) and Vermaak (2006). All these authors reported that in Bangladesh, Mozambique and some parts of the communal areas of South Africa particularly in the Eastern Cape Province have some formal private institutions that provide funding assistance to communal farmers. This situation is in sharp contrast to what is happening in the study area where the government-sponsored Comprehensive Agricultural Support Programme (CASP) is the only alternative providing project funding assistance to the communal cattle farmers.

The results of the study revealed that the Comprehensive Agricultural Support Programme (CASP) however has only provided such assistance to a small percentage of farmers (17.7%) in only one village (Dolidoli) of the total eight villages in the study area. In addition, the Comprehensive Agricultural Support Programme (CASP) funding assistance in this regard is not to the individual farmer but to the entire farming community particularly those who are beneficiaries of the land reform and some selected cases of agrarian reform programmes in South Africa (Hall & Aliber, 2010). This is because the Comprehensive Agricultural Support Programme (CASP) does not necessarily provide financial support but mainly provides group assistance to farmers in terms of farmer training and capacity building, commodity marketing, business development, access to agricultural information and knowledge management and provision of on-farm physical infrastructure such as grazing camps and water reticulation facilities among others (Nthakheni, 2006; Van Schalkwyk *et al.*, 2007). However, the Comprehensive Agricultural Support Programme (CASP) has some limitations and weaknesses such as lack of timeous delivery, poor implementation and inefficiency and incapacity of the Department of Agriculture's operational system which often results in farmers having to wait

extended periods for assistance (Nthakheni, 2006). In conclusion, lack of financial assistance among the communal cattle farmers particularly in the study area might lead to stagnation of this subsector as farmers are expected to struggle to access crucial production inputs and to improve their mainstream formal market participation (Bonaglia *et al.*, 2008; Grwambi *et al.*, 2006).

6.4.5 Access to insurance

Agricultural insurance is highly recommended for any aspiring agricultural business entity to protect the producer from existing risks on the farming activities because farmers continuously face many types of danger and risk in their farming enterprises (Fischer & Buchenrieder, 2010). Communal cattle farmers in South Africa are mostly confronted with various risks which might be constraining to production and commercialisation (Montshwe, 2006; Nthakheni, 2006). As a result, agricultural insurance is crucial (Ntingi, 2007). The results of the study revealed that none of the communal cattle farmers in the study area have access to any form of agricultural insurance. These results are in line with those of Nwankwo & Wolfgang (2008) who found that most communal farmers in the developing regions are generally skeptical of adopting agricultural insurance as a strategy to control and manage risk in agriculture.

Balint (2003) argued that agricultural insurance is unaffordable for most resource-poor farmers particularly those who are doing their farming in the communal production systems. Key informant interviews in the study area revealed that communal cattle farmers are skeptical with agricultural insurance. The majority of these key informants have a perception that agricultural insurance is only for large-scale commercial farmers particularly white commercial farmers. In addition, lack of interest in agricultural insurance in the study area might also be as a result of poor formal school education among the communal cattle farmers in the study area, lack of insurance awareness, poor farming experience which lacks provision of alternative strategies to farming risks and also lack of interest on communal farming practices by insurance institutions in the developing regions in general (Mohammed & Ortmann, 2005; Otieno *et al.*, 2006).

With the communal cattle farmers in the study area so prone to several risk factors such as environmental challenges; persistent droughts, shortage of animal feed, animal diseases, theft and high animal mortality rates particularly during the dry seasons, the risk is too high for livestock development agencies such as financial institutions and intermediaries such as Contract farming (CF) agencies to engage themselves in communal cattle farming in the study area for fear of losses. This is contrary to the findings of Otieno *et al.* (2006) who reported that

communal farmers in Kenya are well aware of agricultural insurance and they also show some willingness to participate in agricultural insurance schemes. However, in the study area, key informant interviews revealed that farmers always tried to have some risk coping mechanisms to deal with disasters such as droughts and disease outbreaks among their animals because they lack insurance. Farmers prefer to sell some of their animals during droughts in order to reduce the risk of increased mortalities. Fischer & Buchenrieder (2010) also agree that livestock farmers who lack insurance in countries such as Vietnam also sold their animals to control and manage risk. In addition, farmers in the study area also revealed that they also relied on government disaster farmer assistance programmes which are strategies for covariate shocks particularly during droughts, floods and disease outbreaks. This strategy is also consistent with the findings reported by Fischer & Buchenrieder (2010).

6.4.6 Access to infrastructure

Most of the countries in sub-Saharan Africa are characterised by inadequate on-farm and off-farm infrastructure — especially roads. Poor access by communal farmers in the developing regions to both on-farm and off-farm infrastructure and equipment might be constraining to agricultural development, productivity and commercialisation as it might impact on both production and mainstream formal market access and participation (Mangwiro, 2007; Dapaah *et al.*, 2001; Jari, 2009; Musemwa *et al.*, 2008; Mwabu & Thorbecke, 2001). Poor infrastructure might also result in wastage of valuable by-products such as hides because they need special infrastructure such as storage facilities. Clearly, poor infrastructure might reduce the productivity of the farmer (Tagra *et al.*, 2010).

Farmers therefore improvise in order to minimise wastage by drying hides on trees. This might lead to product damage and loss of crucial income. In view of the wastage and damage of crucial by-products and also economic losses suffered by farmers, Abera (2009), Gibreel (2002) and Govereh *et al.* (2009) argued that improvement of infrastructure in the communal areas of the developing regions might improve agricultural transformation from low productivity subsistence to high productivity commercial system. This section gives the results of the study in terms of farmer access to infrastructure such as housing, water supply, electricity and road networks in particular. Proper access of this infrastructure indicates that the particular farmer has some improved endowments which might influence the productivity of the farming enterprise (Guirkinger & Boucher, 2007). The objective is to evaluate how infrastructure affects agricultural commercialisation in the study area.

6.4.6.1 Access to housing

The results of the study revealed that 74.6% of the communal cattle farmers in the study area own brick houses, 21.8% own African traditional houses such as mud huts while 3.6% stay in temporary or shack houses as indicated in Table 6.5. These results corroborate Grwambi *et al.* (2006) who reported that approximately 69.7% of communal cattle farmers in other parts of South Africa own brick houses, African traditional huts (18.9%), informal shacks (7.5%) and rented or joint houses (3.9%).

Table 6.5: Type of house structure used by farming households in the Musekwa Valley

Type of house	**Frequency**	**Percentage**
Brick house	41	74.6
Traditional house	12	21.8
Temporary or shack house	2	3.6
Total	55	100

These results indicate that among communal farmers in South Africa, housing patterns differ depending on different factors. For example, formal housing in the Free State Province of South Africa is still very low at approximately 29.2% (Olubode-Awosola, 2006) whereas there are no communal cattle farmers in the study area renting houses while approximately 3.9% and 4.0% of the farmers and other rural dwellers in other parts of South Africa rent houses (Grwambi *et al.*, 2006; Nethengwe, 2007). The fact that all the communal cattle farmers in the study area own the houses they live in means that such farmers are most likely to have better well-being and improved general conditions of living and therefore might also have improved cattle productivity and marketing capacity (Aina *et al.*, 2004). This might be a positive factor for agricultural commercialisation as it is expected to be easier to commercialise farmers that are advanced in terms of crucial infrastructure such as housing.

6.4.6.2 Access to water

From those who are able to access clean water, the majority of them accessed it from communal taps (85.5%), communal boreholes (10.9%) and individual stand pipes (3.6%) as indicated in Figure 6.5.

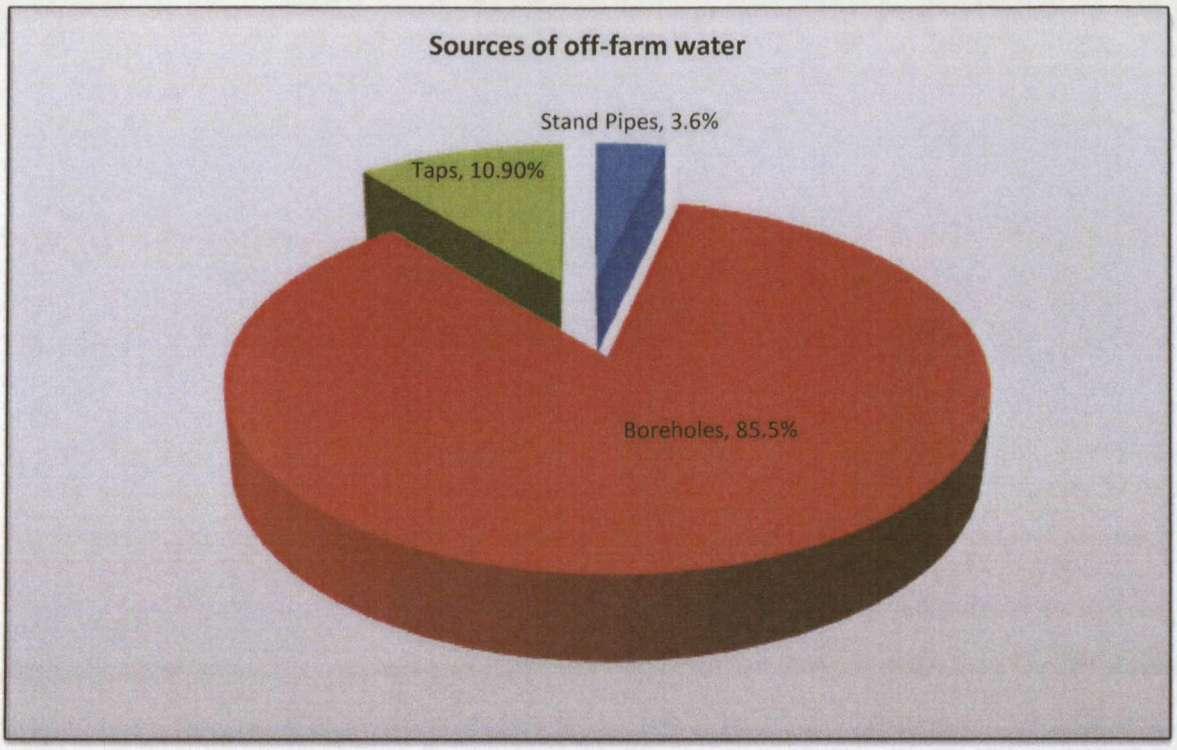


Figure 6.5: Sources of off-farm water supply among communal cattle farmers in the Musekwa Valley

Olubode-Awosola (2006) reported that approximately 60.1% of rural dwellers in the Free State Province can access piped water. Oettle *et al.* (1998) reported that some crop-livestock farmers in some parts of South Africa accessed water from boreholes and dams (5.0%). Comparatively, farmer households in the study area have better access to clean water and over short distances than those in the Free State and elsewhere in the country. Water is Africa's greatest constraint to agricultural development as most of this continent is very dry (Mbeki, 2011: 141). The majority of the communal cattle farmers in the study area (74.5%) are able to access clean water for off-farm purposes. These results are different from those of Gachimbi *et al.* (2004) who reported that communal farmers in Kenya largely rely on water wells (33.3%), roof catchments (33.3%), rivers and streams (26.7%) and tap or piped water (6.7%). The difference in terms of water sources in Kenya and South Africa suggests that water supply among communal farmers in the developing regions vary depending on different factors. Key informant interviews revealed that farmers in the study area shared their water supply sources between domestic and agricultural purposes particularly livestock as a result of scarcity of water in their villages.

For on-farm water supply, the results of the study revealed that 61.8% of the farmers water their animals from nearby rivers and boreholes while 38.2% use communal taps. It is evident that

rivers and borehole still play a crucial role in the supply of on-farm water in the communal areas of South Africa. These results are in line with those of Nthakheni (2006) who reported that communal cattle farmers in some parts of South Africa water their animals from rivers and communal boreholes. However, rivers in the study area are located in distances ranging from 5.8km resulting in the farmers walking the animals to the water points. The implication is that the animals might have to spend some days without getting some drinking water as a result of the long distances they walk to the rivers. Cattle breeds such as the cross-breeds are expected to suffer most under these conditions (Tangta *et al.*, 2002). In addition, watering of the animals might also be a constraint in the study area because this area is prone to frequent droughts just like any other arid and semi-arid areas in South Africa (Vetter, 2009). This means that during dry periods and particularly in drought years, cattle farmers in the study area are most likely to struggle getting water for the animals as local rivers depend on good rains for water. This might result in serious consequences such as loss of animal weight and increased animal mortality in particular (Masike & Urich, 2008).

6.4.6.3 Access to household energy

The majority of communal cattle farmers in the study area have access to electricity (96.4%). This is understandable because the majority of people in South Africa (73.0%) have access to electricity (South Africa Yearbook, 2009/10: 118). Only 3.6% of the farmers in the study area have no access to electricity. Pre-paid electricity is used by the majority of the farming households (72.7%), 25.5% use metered electricity while 1.8% uses other sources such as diesel generators and solar energy for power. In the Free State Province of South Africa, Olubode-Awosola (2006) reported lower rates of access to electricity as only 31.2% and 52.7% of communal farmers have access to electricity for cooking and lighting. In the study area, those farming households who are unable to access conventional electricity opt for other sources such as candles (52.7%), firewood (30.9%), solar (10.9%), other sources (3.6 %) and Bio-oils (1.8%) as indicated in Table 6.6.

Table 6.6: Energy generation strategies among communal cattle farming households in the Musekwa Valley

Source of energy	Frequency	Percentage
Candles	29	52.7
Firewood	17	30.9
Solar	6	10.9
Other	2	3.6
Bio-oils	1	1.8
Total	55	100

Firewood is used for cooking and warming particularly during harsh winters. The substantially higher rates of communal cattle farming households who depend on firewood for household energy supply might expose the study area to destructive deforestations and environmental degradation as a result of trees being cut down for firewood particularly when there are no plans to plant other trees to replace those that are cut down. Rural communities in South Africa are known to be dependent on trees for firewood for alternative energy supply (Makhado *et al.*, 2009). This is very common in the semi-arid regions of sub-Saharan Africa in particular where communities lack electricity for energy supply (Esenjor, 2004). This might lead to poor availability of alternative feed supplementation for the animals particularly when considering the fact that the majority of farmers in the study area depend on natural trees for animal supplementation and browsing during seasons of poor availability of animal feed.

6.4.6.4 Road network

This study area is characterised by a bad gravel road network as indicated in Figure 6.6. Poor road infrastructure characterises most rural areas in South Africa (Mmbengwa, 2009). Like in the rest of rural South Africa, the road network in the study area is also increasingly bad particularly during rainy seasons. It becomes very difficult to travel particularly for motorists who are using smaller vehicles. This might have serious implications for cattle marketing in this area as most traders might find the area highly inaccessible.



Figure 6.6: The gravel road between Strathaird and Dolidoli villages

This is consistent with the findings of Ouma & Abdulai (2009) who reported that road infrastructure in the communal areas of Kenya was also poor and bad, needing approximately US$1.2billion to reconstruct and maintain (Njenga, 2003). Poor and inadequate road networks might be effective constraints of agricultural commercialisation and mainstream formal market participation in the developing regions (Dapaah *et al.*, 2001; Jari, 2009). In the study area, the roads are generally maintained only twice a year resulting in bad road networks. As a result of road conditions, transport is expected to pose a serious challenge to agricultural development and commercialisation in particular in the study area in terms of access to mainstream formal marketing points and active participation in this market by the communal cattle farmers.

Cattle traders are expected to be discouraged to trade in this area as a result of poor road infrastructure (Mthembu, 2008). This might result in the decreased of cattle marketing options for these farmers. For example, key informant interviews revealed that a particular cattle skin trader who operated in the study area pulled out as a result of poor and bad roads. In addition, bad roads might force the local farmers to depend on distant marketing channels for trade which might result in increased transaction costs either as a result of expected high transportation costs when taking the cattle to the distant marketing points or searching for the particular mainstream formal marketing channels. The long distances between the farm and any marketing point might be a major barrier to formal market participation among communal farmers (Pedrosa & Do,

2009) which might in addition be a barrier to agricultural development and commercialisation. In this regard, communal cattle farmers in the study area are expected to be discouraged from engaging in commercial activities; opting to stay in the subsistence subsector instead.

6.4.6.5 Cattle enclosures

The results of the study revealed that infrastructure such as cattle enclosures is popular with the majority of the farmers as 98.2% keep their animals in such enclosures as compared to 1.8% of the farmers who do not have such cattle enclosures. There is a wide contrast between communal cattle farmers in this study area and those in the Ethiopian Bure Woreda for example who only have a few (46.09%) of the farmers keeping their animals indoor while the majority (53.01%) kept them in the open (Feleke, 2008). This contrast might be suggesting that risk against the animals is lesser in the Ethiopian Bure Woreda than in this study area. Traditional open roof enclosures made of poles as indicated in Figure 6.7 are the most popular in the study.



Figure 6.7: A typical cattle kraal at Dolidoli village, Limpopo Province of South Africa

The reason for resorting to these kinds of enclosures might be that they might be easily constructed and also affordable because the construction wood is locally found. The results of the study revealed that 98.2% of the farmers in the study area prefer such enclosures while only 1.8% of the communal cattle farmers could not disclose how they housed their animals. These

results are in line with those of Dovie *et al.* (2006) who reported that cattle farmers in most communal areas of South Africa keep their animals in enclosures made of poles particularly at night. Apart from risks such as livestock theft, farmers in the study area revealed that they also keep their animals in these enclosures to protect them from predators that might attack the animals particularly at night. In addition, these farmers also keep the animals in these enclosures as a result of animals colliding with cars particularly at night when these animals are left roaming the streets. These are popular risk challenges affecting most communal cattle farmers in most communal areas of South Africa where animals often stray into roads particularly at night (Montshwe, 2006). Furthermore, these animals are also kept in these enclosures particularly at night to increase manure production. Manure might be of benefit in terms of crop production and sale to other locals such as crop farmers (Barrett, 1991).

6.5 CONCLUSION

The results of the study revealed that communal cattle farmers in the study area are still faced with severe lack of financial agricultural assistance and income shortages. Communal cattle farmers in the study area are heavily reliant on government sources for income generation as the majority of these farmers neither keep any formal employment nor run a profitable formal cattle marketing cattle farming business. Farmers find it difficult to access crucial purchased cattle production inputs as a result of inadequate formal credit facilities in the study area. However, it is evident that the availability of these formal credit facilities might provide increased cattle production and mainstream formal cattle market access and participation opportunities among these farmers.

This chapter also revealed that there is a severe shortage of other infrastructure in the study area such as landline cable telephones although telecommunication shows high technical advancement in terms of accessibility, because of the fact that the majority of these farmers are able to access some mobile telephones for example. This is expected to improve market searching and engagement ability and sourcing for mainstream formal cattle marketing information which might have a positive effect on the commercialisation efforts of this subsector in the study area. However, other infrastructure such as road networks, transport, health facilities, public schools and retail shops are in need of some drastic improvement in order to facilitate and stimulate commercialisation of this subsector in the study area. Crucially important would be to examine the cattle production systems in order to establish its characteristics which are expected to have impact on commercialisation.

CHAPTER 7

GENERAL CHARACTERISATION OF THE COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

"...I conceive that land belongs to a vast family of which many are dead, few are living and countless yet unborn..." A Nigerian Chief before a British Colonial Land Commission in 1912 quoted in Gutto & Teffo (2011: 15)

7.1 INTRODUCTION

This chapter identifies and describes the general characteristics of the cattle-production systems in the study area. The focus is on landholding systems and farmer access to grazing land, cattle ownership and numbers, herd composition and numbers and the risk facing communal cattle farmers in the study area. The main objective of this chapter is to evaluate the effect of the production systems in the study area on the probability of the communal cattle farmers in the study area to improve cattle production, productivity and mainstream formal market participation among the communal cattle farmers in the study area.

7.2 CATTLE-PRODUCTION SYSTEMS AND PRACTICES OF COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

Of the communal cattle farmers who practice subsistence cattle production in the study area, the majority also practice crop farming (67.3%) whereas 32.7% practice cattle production only. It is evident that crop-livestock production system dominates agricultural practice in the study area. These results are in line with those of Feleke (2008), Kaoma-Sprenkels & Mwenda (1999), Kawonga (2009), Montshwe (2006), Nesamvuni *et al.* (2003) and Stroebel (2004) who reported that most subsistence farmers in the communal areas in the Ethiopian Bure Woreda and in countries such as Malawi, South Africa and Zambia for example produce both livestock and crops. In addition, Guvele (2001) found that the majority of these farmers have no particular specialization on their farming activities. This suggests that the majority of these farmers prefer agricultural diversification between livestock and crops which might be targeting improvement of their farm income growth, poverty reduction, employment creation for the rural poor in

particular and spreading of potential farm risks particularly during droughts periods among others (Barghouti *et al.*, 2004; Delgado & Siamwalla, 1997; Mohammed & Ortmann, 2005; Pote, 2003; Thawer, 2008).

It is also evident from the results of the study that livestock-crop farming systems are major agricultural production systems in the Southern African region in particular. Livestock provides these farmers with long-term investment and immediate household livelihood while crops on the other hand also provide immediate household food and crop residue for the animals particularly after the harvest (Chibssa, 2006; Nthakheni, 2006; Stroebel, 2004). This view is corroborated by Barrett (1991) who argued that cattle production is closely interrelated with crop production in most Southern African countries in particular. It is in this context that crop-livestock production systems continue to play a major socio-economic role among communal farmers in this region providing valuable livelihood and guaranteed food security to the majority of the population. For an example, Köhler-Rollefson & Mundy (2010) presented a supportive statement by one Mool Singh Sodha who is a communal camel producer in India who hinted that *"...if a camel dairy is set up, we can earn income of 500-1000 rupees per day and we will no longer be poor..."* when arguing that crop-livestock communal farmers have income and livelihood benefits from these production systems.

Evidence exists that communal farmers perceive the crop-livestock production systems as most desirable to them taking into account their socio-economic circumstances in particular. For example, the results of the study revealed that there is a positive and significant (0.0228) relationship between cattle ownership and the type of the cattle-production systems adopted by the communal cattle farmers in the study area as indicated in Annexure E. This result might suggest that an increase of farmers willing to maintain the livestock-crop production system in their farming practices might increase the probability of such farmers in the study area to increase ownership of cattle by approximately 2.28% of their cattle herd.

The most interesting point in this regard is that the results of the study further revealed that an increase in a unit of ownership of cattle among these farmers might also increase weaning of more calves by approximately 8.89% as revealed by the positive and significant (0.0889) relationship between cattle ownership and calf weaning among the communal cattle farmers in the study area as indicated in Annexure E. These factors might suggest that these farmers find cattle production under crop-livestock production systems in the study area more desirable, profitable, productive and rewarding. In view of this, Stroebel (2004) argued that it is

imperative for livestock development agencies to acknowledge the fact that livestock development initiatives should always employ pro-poor strategies to safeguard this interest.

Apart from cattle, the majority of the communal cattle farmers in the study area produce maize (78.4%) and African corn (21.6%). Although the intensity of producing maize in communal areas of South Africa varies from region to region, it is evident that maize is one of the alternative crops preferred by the majority of livestock-crop farmers for domestic human consumption. For example, Akpalu (2005) found that approximately 85.3% of communal livestock farmers in some parts of the communal areas of South Africa also produced maize. The focus on maize and African corn points to the fact that both these crops are staple foods in the majority of indigenous households in South Africa in general and in this study area in particular.

In addition, after these crops have been used for home consumption, they might later-on be used as crop residue for most of the livestock such as cattle, goats and sheep. However, key informant interviews revealed that if farmers in this study could maximise the use of corn for cattle feeding, it might provide an alternative for feed supply. Corn is good for feeder cattle (Velez, 2006). However, the types of crops which are produced in the study area differ depending on environmental adaptability of the particular crop on local conditions, farmer preferences and household needs among others. Multiple production systems provide a positive practice for livestock production in general particularly in a country largely dependent on imports of livestock feeds as a result of poor manufacturing skills of modern supplements among livestock farmers (Vink & Van Rooyen, 2009). This integrated production system allow for inter-dependence between crops and livestock where the crops supply feed to the animals as crop residues while the animals supply among others manure to the crop system that rehabilitates the soils (Fakoya, 2007; Hazell, 2007; Stroebel, 2004). Table 7.1 indicates the different animal species kept by communal cattle farmers in the study area.

Table 7.1: Livestock species kept by communal cattle farmers in the Musekwa Valley

Livestock species	**Frequency**	**Percentage**
Goats	34	65.3
Donkeys	8	15.4
Chicken	7	13.5
Sheep	3	5.8
Total	52	100

These results revealed that communal cattle farmers in the study area mainly keep goats (65.3%), donkeys (15.4%), chicken (13.5%) and sheep (5.8%) in addition to cattle. It is evident from these results that goats are more popular than the other small ruminants in the study area. This might be because goats are regarded as the poor man's cattle in most South African communal areas and are generally cheaper and affordable for most of the poor than cattle (Mwanza, 2007). In addition, goats provided insurance against drought for the farmers; financial security; adapt well in smaller land areas particularly those of marginal farmers and can cope in a wide range of environmental diversity (Ketema, 2007; Stroebel, 2004).

These results might further be revealing that the communal cattle farmers in the study area also practice an interactive multi-livestock production system in which small ruminants dominate and also form an integral part of an increasingly extensive livestock production system in the study area in order to diversify their farming practices. Uchezuba *et al.* (2009) corroborate this assertion by arguing that single livestock systems are actually rare among communal farmers in the developing regions because farmers always opted for diversification to their farming systems in order to spread and manage farm risk. In addition, it is generally a common practice among rural dwellers in most communal areas in South Africa that households would own or keep a combination of livestock particularly the small ruminants. For example, Dovie *et al.* (2006) found that approximately 64.0 % of rural dwellers in South Africa keep livestock among other animals. This diversification might be crucial in terms of farm stability and security particularly during increased risk such as droughts and volatility of the markets (Balint, 2003).

Of the rural dwellers who keep livestock, Dovie *et al.* (2006) further reported that approximately 34.0% keep cattle only, 49.0% goats only and a further 17.0% keep both cattle and goats. According to Adams *et al.* (1999), 24.0% and 34.0% of communal farmers in the Eastern Cape Province of South Africa keep cattle and goats respectively. In addition, Gachimbi *et al.* (2004) also reported that small-scale livestock farmers in mixed farming systems in Kenya also keep a combination of cattle, goats and poultry in particular. Chibssa (2006) also revealed in a study conducted in Ethiopia that multi-production agricultural systems are the lifestyle of most communities in sub-Saharan Africa. It is also imperative to note that both donkeys and pigs are also highly preferred in the Eastern Cape Province of South Africa, however in smaller quantities (Musemwa, 2008). In some parts of Zimbabwe, donkeys are kept by approximately 35.0% of the livestock-crop farmers (Barrett, 1991).

This illustrates the importance of donkeys in the Zimbabwean rural livestock economy. Jones & Maroge (2007) argued that donkeys might become serious contenders of transport provision in resource-poor communities in the developing regions worldwide. These authors also indicated that donkeys have also provided income among resource-poor households where such households would use their animals to carry goods for others at a cost. This makes donkeys a crucial stakeholder of rural economies. It is only that stereotypical tendencies and *ad hoc* mechanisation of rural economy by policy-makers in the developing regions is fast eroding the significance and contribution of donkeys in local economic activities (Jones & Maroge, 2007). Despite all these denials of their role, Jones & Maroge (2007) contend that donkeys remain an integral part of rural economic systems globally. According to Dovie *et al.* (2006), communal livestock farmers practice multiple farming systems for various reasons which might include among others changing environmental regimes, economic reasons and socio-cultural use. For example, in the study area, key informant interviews revealed that goats are popular as a result of the favourable environment for their production, their affordability to acquire and their low maintenance requirements as compared to large ruminants such as cattle. On the other hand, key informant interviews further revealed that donkeys are also very popular among the communal cattle farmers in the study area as a result of their value in terms of provision of transportation and general traction purposes.

In addition, donkeys are also expected to be cheaper to acquire and maintain particularly in rural South Africa (Jones & Maroge, 2007). Unlike in other communal areas in South Africa, where Nthakheni (2006) reported a considerable number of pigs (13.8%) and no record of donkeys among communal cattle farmers, the study area has no record of any pigs but a considerable number of donkeys as 15.4% of the communal farmers keep donkeys. This might suggest that livestock ownership vary in South Africa depending on different factors which might include among others; needs of individual farmers, differences in culture, socio-economic status of individual farmers as livestock generally increases with improved socio-economic status of farmers and environmental diversity (Khan & Usmani, 2005).

The results of the study indicate that cattle in particular play a major role among communal farmers in the study area. This is in collaboration with the findings of Mapekula (2009) and Swanepoel *et al.* (2000) who argued that animal husbandry remains an essential socio-economic activity in most African farming systems. The reason for increased interest in livestock production in general and cattle in particular among communal farmers in South Africa in

particular might be the fact that South Africa has marginal land space which is barely suitable for cropping among others (Nthakheni, 2006; Stroebel, 2004). This might be as a result of the erratic rainfall and high incidences of droughts in South Africa therefore making livestock the best option for livelihood provision of this country (Musemwa *et al.* 2010). For example, the majority of the communal cattle farmers in the study area use their cattle for income generation by selling them to various marketing channels (69.1%) to the general public, food production (27.3%), and for other social requirements such as slaughtering during various ceremonies such as funerals and traditional rituals (1.8%) and also for draught power (1.8%) as indicated in Table 7.2.

Table 7.2: Reasons for keeping cattle among communal cattle farmers in the Musekwa Valley

Reason	**Frequency**	**Percentage**
Generation of income	38	69.1
Food production	15	27.3
Ceremonies and rituals	1	1.8
Draught power	1	1.8
Total	55	100

This study area has a limited number of cattle farmers who use their animals for draught power – something which is in contrast with farmer behaviour in communal areas such as Sanyati in Mashonaland West District in Zimbabwe where a large majority of cattle farming households use their animals for draught power (Pedersen & Madsen, 1998). Although the main focus of cattle use among communal farmers in this study area seems to be generation of household income, it is also evident that some communal cattle farmers in the study area do also keep cattle for religious festivals, traditional rituals and provision of draught power among others. These results corroborate those of Mapekula (2009), Musemwa *et al.* (2008), Nthakheni (2006), Saha (2001) and Swanepoel *et al.* (2000) who reported that communal cattle farmers in some parts of South Africa keep cattle for various reasons such as obtaining manure, meat, milk and traction power in particular. However, the large population of small ruminants such as goats and sheep owned by some communal cattle farmers in the study area might discourage these farmers from increasing cattle production and mainstream formal market participation in particular. This is because communal cattle farmers who also keep these smaller ruminants might exercise other options of selling these smaller animals during cash emergencies rather than selling their cattle (Nkhori, 2004). On the other hand, single-livestock production systems might not provide the options of the multi-livestock production system in terms of spreading production, market risk and livestock marketing options as argued by Mohammed & Ortmann (2005) and Pote (2008).

The small number of cattle farmers who keep cattle for draught power purposes in the study area might be that communal cattle farmers in the study area rely on other cheaper and commonly available means of transport and traction such as donkeys; which are popular in the study area. In addition, the results of the study area also revealed that most of these farmers are basically inclined to cattle farming for marketing reasons than subsistence reasons and therefore their use of cattle for traction purposes might not be desirable or required. This is because using these animals for traction purposes might compromise the animals' mainstream formal market desirability and value. The fact that some communal cattle farmers in the study area show mainstream formal market orientation, willingness and readiness to participate in this market might provide the desired opportunity to commercialise the communal cattle production system in the study area with reduced constraints than with conservative and unwilling farmers.

7.2.1 Landholding systems and farmer access to grazing land among communal cattle farmers in the Musekwa Valley

All the communal cattle farmers in the study area farm in communal lands held in trust for the particular communities by traditional leaders called *chiefs*. These results are in line with those of Clatworthy (1985), Kawonga (2009), Maine (2007), Montshwe (2006), Makobo & Mosimanyana (1985), Munthali & Dzowela (1985), Nkhori (2004), Taljaard (2003) and Walker (2004) who found that livestock production among communal livestock farmers in the majority of Southern Africa region is mainly conducted in communal lands where farmers lack individual land tenure rights. The tenure rights are ceded to these traditional *chiefs* — and only locals who are under the administration of the respective traditional chief can be allocated farming land and to also farm in the area (Nell, 1998). It is historical in sub-Saharan Africa for land to be distributed to members of the specific community by village leaders. In the Northern Kordofan State of the Sudan, Gibreel (2004) found that approximately 12.0% of farm land was allocated to the village farmers by village leaders for example. However, in some cases communal land tenure rights have lead to ownership uncertainty of land — especially in South Africa. Lack of certainty of ownership of land might be discouraging for both public and private investment in livestock production service in the communal production systems (Adams *et al.*, 1999).

However, various studies (Davies, 2008; Montshwe, 2006; Nthakheni, 2006; Stroebel, 2004) have proven that despite lack of land tenure rights among these communal communities, these communities continue to be active in agriculture particularly livestock production. These communities keep large numbers of ruminant livestock (70.0%) which mainly include cattle,

goats and sheep apart from cattle — despite land tenure limitations (Kadzere, 1999; Morgan & Tallard, 2006; Swanepoel *et al.*, 2000). Livestock production becomes the most common form of livelihood strategy among communal communities simply because these communities have no access to alternative land suitable for other forms of agriculture such as cropping. This is because land reserved for these communities is in most cases marginal and poor for cropping agriculture as a result of erratic and fluctuating rainfall (Gibreel, 2002), high run-off resulting in increased soil water losses and high incidences of droughts in these areas (Musemwa *et al.*, 2010; Olaoye *et al.*, 2011). This might corroborate the fact that the majority of land (80.0%) in South Africa — especially in the communal areas is better suited and used for extensive livestock farming than crop farming (Adams *et al.*, 1999; Mapekula, 2009). In addition, Naledzani (1992) reported that farming households in these homelands are provided with small patches of land which they use mainly for household food production while the other land is communally used for grazing purposes. As a result of lack of land tenure rights among these communal cattle farmers in South Africa and in the study area in particular, accessing livestock financial assistance through financial institutions is therefore severely impeded for most farmers because of lack of collaterals and guarantees to secure credits and loans from these financial institutions under communal land tenure arrangements (Ortmann & King, 2007).

Despite significant improvement on land ownership transformation that has been taking place in South Africa after apartheid in 1994 (Howard, 2002; Kariuki, 2003) through various programmes such as land restitution, land tenure reform and land redistribution (Kirsten & Van Zyl, 1999; Miller & Pope, 2002; Nesamvuni *et al.*, 2003; Nthakheni, 2006), very little reform has taken place in terms of communal land holding rights which have continued under customary custody of the traditional *chiefs*. Traditional *chiefs* are known to be resistant to the transfer of communal landholding rights from customary custody to private ownership fearing loss of power among others (Mulolwa, 2002; Turok, 2010: 45; Walker, 2004). Some of the delays in the land reform process might be ascribed to the general lack of service delivery, lack of capacity and inefficiency by government in South Africa (Nthakheni, 2006). Failure of the communal farmers to acquire personal landholding rights might affect agricultural performance since under these circumstances farmers are incapable of using customary land as collateral to access financial assistance. This is a factor which might impact negatively on agricultural productivity, market access and agricultural commercialisation in the developing region in particular (Rahji & Adeoti, 2010; Mahaliyanarachchi, 2004). Land tenure insecurity has led to poor access and availability of grazing land among others resulting in extensive over-stocking

and overgrazing in the communal areas in particular. This might be as a result of poor control and management of the grazing land as no individual farmer is directly responsible over such lands (Francis, 2002; Kawonga; Nesamvuni *et al.*, 2003).

This is evidenced by the results of the study which further revealed that the majority of the farmers in the study area lack well-demarcated grazing camps for their animals which might make proper control of grazing very difficult. According to Van de Pol & Jordaan (2008), lack of properly demarcated grazing camps might lead to veld degradation which has been fundamental in South Africa where approximately 60.0% of the veld is bad, intermediate (30.0%) and good (10.0%). This makes cattle production a heavy task as it challenges production and productivity. However, these assertions are found to be contrary to those advanced by Davies (2008) who argued that communal land use rights remain mostly relevant to rural agriculture in the developing regions considering the prevailing circumstances facing farmers in such areas. Davies (2008) further argued that any alternative from communal to private land ownership might in fact promote extended inequality and marginalisation of the poor. This is because only a few rural poor might afford to purchase land under current economic set-up in the developing regions; the implication being that land might therefore remain in the hands of the few.

7.2.2 Cattle ownership and numbers among communal cattle farmers in the Musekwa Valley

As indicated in Table 7.3, the results of the study revealed that the majority of the cattle farmers in the study area are men (80.0%), women (18.2%) and children (1.8%). It is evident that cattle ownership among these farmers in the study area is still biased against women as only a few women own cattle. Cattle ownership biases against women might lead to socio-economic disparities between men and women.

Table 7.3: Cattle ownership among communal cattle farmers in the Musekwa Valley

Designated group	**Frequency**	**Percentage**
Men	44	80.0
Women	10	18.2
Other	1	1.8
Total	55	100

However, these biases and disparities are particularly common in the developing regions such as South Asia, Southeast Asia, Latin America and Africa where values; traditions and norms are still embedded in systems which privilege men over women (Friedl *et al.*, 2003; IFAD, 2007;

Taylor, 2010). Equitable access to these valuable assets might promote economic production and also reduce poverty among men and women (Mubaya, 2010). Quisumbing *et al.* (2004) argued that there should be policy reforms in the developing regions to eradicate gender discrimination and biases against women in agriculture particularly in livestock production. Eradication of such discrimination might create conditions that promote among others; women access of crucial agricultural inputs such as ownership of livestock, credit and land. On 9 May 2009, the South African government inaugurated the Ministry for Women, Children and people with disability to promote equality of this group with the rest of the South African public and to further advance and promote their socio-economic interests (Xingwana, 2011: 63).

The results of the study illustrate well the prevailing gender discrimination and biases against women among communal cattle farmers in the study area in terms of cattle ownership in particular. For example, key informant interviews conducted in the study area revealed that most women in the study area lack the resources to acquire cattle as it is common that lack of money for example, has always been a crucial factor determining the ability of individuals to purchase large ruminant livestock (Akpalu, 2005). This is corroborated by the findings of Chawatama *et al.* (2005) who reported that in Zimbabwe for example; most communal cattle women farmers inherit their animals either from their deceased husbands or fathers as they lack resources to purchase these animals. However, these women continue to face threats such as attempts by relatives to dispossess their property (Arisunta, 2010). As a result of lack of women ownership of cattle in the developing regions in general and the study area in particular, a lesser number of women are expected to participate in the economic value chain. This might be constraining to their active participation both in production and mainstream formal market participation particularly in livestock production. Of primary importance is that the majority of the cattle in the study area belong to the respective farmers who keep such animals (85.5%) whereas 14.5% of the farmers are keeping the cattle for other people such as relatives (100%). Manona (2005) and Sikhondze (2008) also reported that keeping livestock for other people such as migrant workers is common in the Southern African region in particular.

Manona (2005) further reported that approximately 14.7% of households keeping livestock in the Eastern Cape Province of South Africa keep them for other people such as relatives who are migrant workers. This relatively high number of cattle belonging to other people in the study area might have implications indecision-making particularly with regard to participation in the mainstream formal markets. Under these conditions of animal ownership, the decision to sell

these animals might not depend on those farmers keeping the animals on behalf of others but might be on the owners of the animals. This might make such market participation decisions difficult. On average in the study area, the results of the study revealed that between two and seven animals per household kept by the communal farmers belong to other people other than the farmer keeping such animals.

The results of the study revealed that the mean cattle herd among communal cattle farmers in the study area is six heads per household. These results are a bit lower than those of Swanepoel *et al.* (2000) who reported a mean of eight animals per communal cattle farmer in some parts of South Africa. Gibreel (2002) reported nine heads of cattle per cattle farming households in Ethiopia where cattle owners mostly inherited the animals. In addition, it also emerged that farmers at Musekwa Valley study area have lower animal numbers as compared to the findings of Schwalbach *et al.* (2001) who reported that communal cattle farmers in the Free State Province of South Africa keep between five and 149 heads per communal farmer against farmer animal ownership of between one and 48 heads of cattle in the study area. This means that the number of cattle ownership among communal farmers in South Africa vary depending on different factors and regions as argued by Adams *et al.* (1999). This might imply that participation of communal cattle farmers in South Africa might also differ from region to region because farmers with increased numbers are expected to actively participate more in the mainstream formal market than farmers with fewer animals (Montshwe, 2006). On the other hand, the lower mean of cattle kept by communal cattle farmers in the study area might affect cattle off-take rates. This is because these farmers are expected to be cautious of selling their small number of cattle particularly to the mainstream formal markets. It is important to note that total herd size might influence the communal cattle farmer's decision to participate in the mainstream formal markets. For example, Montshwe (2006) argued that communal cattle farmers with larger herds might have surplus to sell than the communal cattle farmer with a smaller herd of cattle.

In addition, the ability of the farmer to participate in the mainstream formal market might also be determined by the type of animals the farmer keeps in the herd. For example, those farmers keeping more steers might participate in the market more than those keeping more cows who might want to keep them for breeding purposes. The type of animals the farmer keeps is therefore expected to reflect the needs and circumstances of the particular farmer. For example, the results of the study revealed that communal cattle farmers in the study area keep a

combination of calves on foot (30.0%), young heifers (28.9%), oxen aged from three years and under (18.4%), females aged from three years and under (13.0%) and bulls (9.6%) as indicated in Table 7.4.

Table 7.4: Number of cattle herd among communal cattle farmers in the Musekwa Valley

Category of the animals	**Total heads of cattle**	**Percentage**
Females > three years	344	13.0
Young heifers	766	28.9
Oxen > three years	487	18.4
Calves on foot	803	30.1
Bulls	252	9.6
Total heads of cattle	2 652	100

These results revealed some considerable diversity and contrast with those of Musemwa *et al.* (2010), Nthakheni (2006), Stroebel (2004) and Swanepoel *et al.* (2000) as indicated in Table 7.5.

Table 7.5: Cattle herd composition among communal cattle farmers in selected areas of South Africa

Species	Musemwa *et al.* (2010)	Nthakheni (2006)	Stroebel (2004)	This Study
Bulls	4.0	14.5	15.3	9.6
Calves	21.0	0.0	20.0	30.0
Cows	36.0	55.0	44.4	13.0
Heifers	18.0	0.0	36.0	28.9
Oxen	10.5	13.0	0.0	18.4

Of all the areas indicated in these studies, cattle farmers in the Musekwa Valley keep more calves (30.0%), heifers (28.9%) and oxen (18.4%). It is also evident as indicated in Table 7.5 that communal cattle farmers in the study area also keep the lowest number of cows (13.0%). This result is in contrast with other farmers in other communal areas of South Africa where farmers kept huge numbers of cows in their cattle herds ranging between 36.0% and 51.0% respectively (Musemwa *et al.*, 2010; Nthakheni, 2006; Stroebel, 2004; Swanepoel *et al.*, 2000). On the other hand, when asked which species of animals the communal cattle farmers in the study area usually buy from other local cattle farmers, young heifers (58.2%), breeding females (23.6%), calves on foot (12.7%) and 5.5% of other unspecified species emerged more popular.

The dominance of heifers and breeding females among these farmers might reveal that these farmers might be more interested and concerned with replacement animals. It is evident that cattle herd structures and distribution in the study area reveal that communal cattle farmers generally prefer younger animals than older animals as 59.0% of the animals preferred by these

farmers for the market comprise of a combination of young heifers (28.9%) and calves on foot (30.1%) in particular. This might be an indication that farmers in the study area are aware of the necessity to replace lost stock and older unproductive females in particular. In a sharp contrast, Whitbread (2010) reported that emerging black farmers in northern Limpopo did not keep any heifers and steers in their cattle herds. In addition, when these farmers also buy from the other local farmers, it increases the market options and their value in the cattle production and market chain as these farmers become active producers, buyers and sellers. In other words, these farmers also create and provide their own market notwithstanding the fact that this market might however be informal. The emergence of an informal cattle market might provide a possible counter-option to the envisaged commercial market, and therefore become a major constraint for commercialisation of the cattle market among these farmers in the study area.

In addition, the high percentage of calves on foot in the study area might be an indication that there is increased birth rate in the cattle herd which might increase the cattle herd structure among communal cattle farmers in the study area. Larger cattle herd structures might increase the market off-take rates among communal cattle farmers in the study area which might provide good marketable surplus at a later stage (Montshwe, 2006). Furthermore, the results of the study also revealed that there is relatively high number of oxen/steers (18.4%) in the study area as compared to bulls (9.6%). In other studies such as Musemwa *et al.* (2010), in most communal areas of South Africa, communal cattle farmers keep more steers (13.0%) than bulls (4.0%). These results might suggest a higher popularity of steers among the farmers as a result of the popularity of steers within the mainstream formal marketing channels.

These results are in line with those of Mach *et al.* (2008) and Lane *et al.* (1996) who argued that most mainstream formal traders such as butchers and abattoirs in the developed regions in particular for example, prefer to buy steers as a result of their expected good meat among others. In addition, the same authors also found that unlike bulls, steers might also prevent unwanted pregnancies among the heifers particularly in areas where farmers practice uncontrolled inbreeding. The results of the study revealed that there are more steers than bulls in the study area which is also consistent with general patterns in South Africa as revealed in Montshwe (2006), Nthakheni (2006) and Stroebel (2004).

The results of the study further revealed that the majority of young heifers (52.7%) in the study area calf for the first time at the age of 36 months, others between 24 and 30 months (21.8%) and also at 42 months of age (3.6%). The calving intervals among the majority of the cows in the

study area are 12 months (38.2%), 30 months (23.6%) and 36 months (29.1%). However, Nthakheni (2006) and Stroebel (2004) found that calving intervals among cows in some communal areas in South Africa is approximately 24 months in some cases. These results reveal general trends in the beef production subsector in the developing regions in general and South Africa in particular where farmers are predominantly faced with low calving percentages and extended calving intervals as a result of factors such as type of cattle breed kept by the farmers, poor nutritional management on animals, poor animal fertility and environmental factors among others (Labuschagnè , 2001; Messine *et al.,* 2007; Nthakheni, 2006; Stroebel, 2004).

However, in the study area, calving intervals among cows might improve as a result of the type of cattle breed kept by the communal cattle farmers. The majority of these cattle farmers in the study area keep the Nguni breed which is known for its high fertility, increased reproductive performance and early mating which might result in improved and shorter calving intervals among cows as compared to the other type of cattle breeds such as the *Bos indicus* (Bayer & Alcock, 2003; Mabunda, 2008: 1-2; Nkhori, 2004; Okonno-Adhiambo, 2002; Otieno *et al.,* 2006; Weltz, 2008). However, IRIN (2007) and Stroebel (2004) argued that the relatively long calving intervals in the communal cattle farming subsector in the Southern African region in particular might be resulting from poor animal fertility, uncontrolled animal breeding and poor weaning strategies among the communal cattle farmers.

The results of the study indicate that 52.5% of the communal cattle farmers in the study area wean their animals and the other 47.5% do not wean their animals. This means that 47.5% of the communal cattle farmers in the study area leave their animals to wean voluntarily. Voluntary weaning of the animals might prolong calving intervals among cows; result in poor milk yields and poor calving rates among others. This is corroborated by the fact that the majority of communal cattle farmers in the study area wean a maximum of 13 calves *per annum* while some farmers wean between one and eight calves over the same period. Low calving rates among communal cattle farmers in the study area might constrain farm sustainability in terms of production, productivity and mainstream formal cattle participation as cattle farmers in the study area are expected own fewer animals as a result of poor weaning rates. Cattle ownership and numbers might also be determined by mortality rates among the animals. The results of the study revealed that 57.4% of communal cattle farmers in the study area have experienced animal mortality in the previous 12 months prior the study whereas only 42.6% did not experience such mortality. This is a substantial number of mortality rates which might impact on cattle ownership

and numbers. Inadequate and poor management of health issues among cattle might lead to increased mortality rates (Razzaque *et al.*, 2009).

7.2.3 Herd composition and numbers among communal cattle farmers in the Musekwa Valley

As indicated in Figure 7.1, the results of the study revealed that the most popular cattle breeds among communal cattle farmers in the study area are the Nguni (49.1%), Cross breeds (29.1%), Afrikaner (14.5%) and other (7.3%). Other cattle breeds include Bonsmara, Brahman and Tuli. These results are in line with those reported in the South Africa Yearbook (2009/2010: 52) which indicated that the Afrikaner, Nguni and the locally-bred Bonsmara are the main cattle breeds among communal cattle farmers in South Africa. Stroebel (2004) affirmed these results.

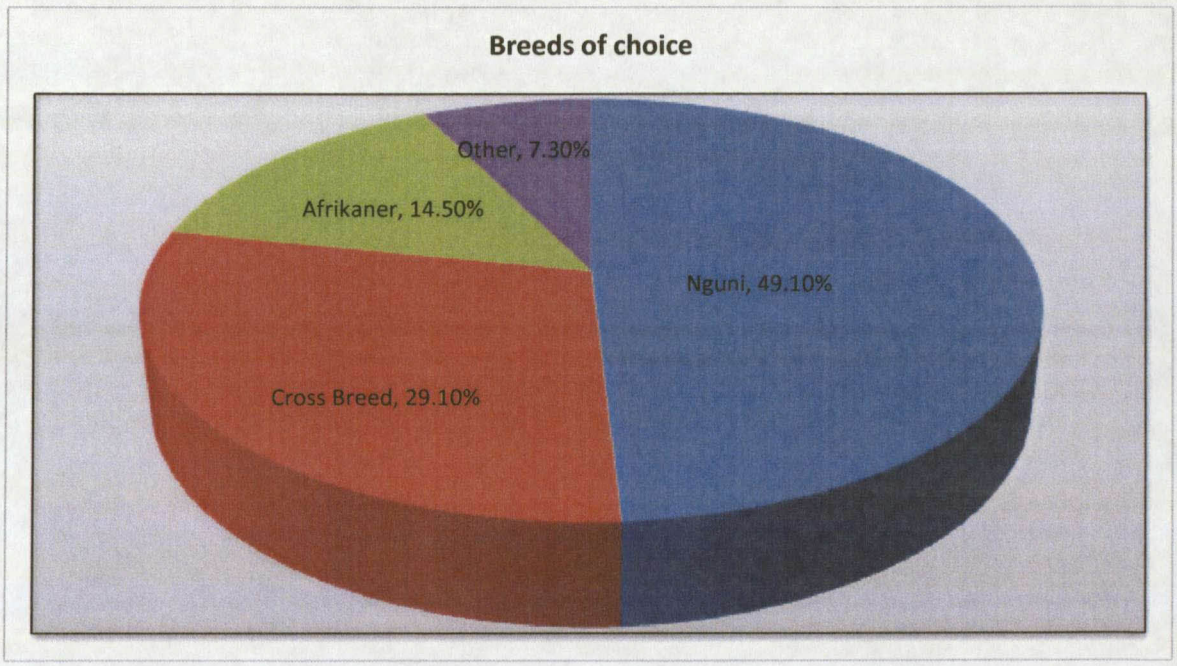


Figure 7.1: Type of cattle breeds among communal cattle farmers in the Musekwa Valley

In addition, FAO (2009), Kiptarus (2005), Moyo *et al.* (1996), Msubuka (2011), Nkhori (2004) and Tariku (2006) found that most communal cattle farmers in the sub-Saharan Africa region in particular keep a number of indigenous cattle breeds such as the Afrikaner, Kyankwanzi, Mashona, Nguni, Red Bororo, Tswana or the so-called Western Sanga, Tuli, White Fulani and Zebu among their cattle herds. The results of the study revealed that 63.6% of the cattle kept by communal cattle farmers in the study area are mainly indigenous breeds of a combination of Nguni (49.1%) and Afrikaner (14.5%) breeds. Reasons for keeping larger herds of indigenous cattle breeds include among others; their environmental adaptability to the local harsh

conditions, their resistance to local diseases, low maintenance cost, easily found, good frame size, fewer calving complications, high fertility, good temperament, some good quality carcass, high yields of milk and quality meat, likeable colour and traction utility of these breeds among others (Mabunda, 2007; Moyo *et al.,* 1996; Musemwa *et al.*, 2008; Nthakheni, 2006). In addition, the Nguni breed also produces high quality hides that are pliable and not easily damaged by tick bites (Mapiye *et al.,* 2007). In other words, farmers might keep these breeds as a risk coping strategy against both environmental hazards and genetic performance challenges.

Despite the popularity of the indigenous cattle breeds in most communal areas of the sub-Saharan Africa region, these animals also have their limitations. For example, Zulu (2008) found that these breeds are currently threatened by diseases and indiscriminate breeding to an extent of extinction. The same author cites an example of the so-called Amabowe indigenous cattle breed in Zimbabwe that has almost become extinct as a result of an outbreak of the Rinderpest disease. In view of this, Rege (1999) and Zulu (2008) both argued that it has to be a priority in cattle production in sub-Saharan Africa to conserve and also safeguard indigenous cattle breeds. Furthermore, cattle farmers raising exotic breeds are likely to incur increased production costs as these breeds are generally more expensive to keep than indigenous breeds. Exotic breeds might require increased feeding requirements and labour output among others (Musemwa, 2008; Tangka *et al.,* 2002). It is evident from these results that the choice of breeds among communal cattle farmers in the study area is highly influenced by the individual farmer's production objectives which might include among others; milk, meat, capital generation and availability of grazing land among others.

7.2.4 Grazing land space

Communal cattle farmers in most sub-Saharan Africa regions in particular South Africa graze their cattle under communal land-use rights. These land spaces are characterised by lack of well-demarcated areas particularly in the former homelands (Mapekula, 2009; Naledzani, 1992). Makepe (2006) and Naledzani (1992) further argued that lack of properly demarcated grazing camps in these regions have resulted in major constraints such as degradation of the environment in livestock production in particular. Two decades after these findings, this constraint still persists particularly in the communal areas of South Africa.

The results of the study revealed that all the communal cattle farmers in the study area practice their cattle production activities in communal land areas where they do not hold any individual

land tenure rights. This might make control and management of the grazing area very difficult resulting in vandalism of the grazing camp infrastructure for example. This result is in contrast with the findings reported by Claude (2010) who found that commercial farmers in the Eastern Cape Province of South Africa have clearly demarcated farms with exclusive rights. The implication is that these farmers might be able to control and manage their grazing activities in such a way that they reduce ecological challenges and over-grazing on the other hand (Ainslie, 2002).

The results of the study revealed that a small number of cattle farmers (18.0%) in the study area have access to well-demarcated grazing camps in their respective villages while the majority of these farmers (82.0%) lack such access. Only cattle farmers at the Dolidoli village have access of well-demarcated and fenced cattle grazing camps. Farmers in the other seven villages which comprise the study area lack such infrastructure. The reason might be that farmers at Dolidoli village received assistance through the Comprehensive Agricultural Support Programme (CASP) which provided these farmers with improved on-farm infrastructure. In addition, communal cattle farmers in this village also have village committees that monitor vandalism of on-farm infrastructure.

Perpetrators of vandalism are brought before the village court at the chief's kraal and fined. This might assist in reducing the cost of rebuilding vandalized infrastructure particularly grazing camps and water supply resources among others (Scoones & Wolmer, 2007) which might further provide an incentive among the farmers to manage grazing activities properly (Ainslie, 2002). On the other hand, lack of proper grazing camp infrastructure might also increase farm risk among the communal cattle farmers in the study area through stock theft, accidents on animals, overgrazing, overstocking and uncontrollable environmental degradation such as soil erosion among others. For example, the results of the study revealed that all the communal cattle farmers in the study area keep their animals indoors particularly at night to minimise some of these risks. Commercialised cattle farmers are expected to strive to manage this kind of risk.

7.3 CONCLUSION

The results of the study revealed that there were various intertwined factors constraining communal cattle farmers in the study area regarding cattle production, productivity and mainstream formal market participation. It is evident that these farmers prefer multi-dimensional farming systems that include mainly livestock and crop production. Livestock such as cattle,

goats, sheep and donkeys are the most important species of production in the study area in particular. However, the majority of farmers produce both cattle and crops such as maize and African corn in particular. These crops provide food to these farmers' households whereas cattle in particular provide among others; different foods such as milk and meat, income on sale, financial security and other cultural and religious guarantees. It is evident that lack of proper landholding and land-use rights, increased tick-borne diseases among animals, skewed cattle ownership that marginalises women in active participation in cattle production, small cattle off-take rates among these farmers in the study are some of the constraining factors of cattle production, productivity and mainstream formal cattle market participation. On the other hand, the fact that the majority of these cattle farmers in the study area keep appropriate cattle breed suitable for their local environmental conditions and other needs in particular might be a great opportunity for commercialisation. As much as this might reduce farm risk among communal cattle farmers in this study area, it is imperative that the study probes further any probability of farm risk which might impact on commercialisation initiatives of this subsector in this study area because obviously, every farming enterprise is always faced with exposure to risk. Critically, the study has to establish the risk faced by these farmers, the approach of the farmers to its management and control and the impact of such risk on commercialisation.

CHAPTER 8

CONTROL AND MANAGEMENT OF FARM RISK AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"...in most of the developing countries the death or illness of even a single work animal may be a tragedy for a family...an epidemic among such animals may be national catastrophe..." Macpherson (1995: 37) and ***"...the tragedy is that multitude of the livestock of the world which could supply the animal protein so urgently needed by mankind are themselves suffering from malnutrition and diseases..."*** Curthbertson (1970: 91) cited in Randela (2000)

8.1 INTRODUCTION

Farmers are faced with production and market risks in communal livestock production systems (Chilonda & Huylenbroek, 2001). The same authors further argued that farmer response to risk affects decision-making because such response influences the perceptions and benefits associated with the decision made by the respective farmer. The farmer's decision determines adoption of farming innovations and the measures to diversify the effect of the risk the farming system is exposed to. Communal farming in the developing regions is highly characterised by increased risk on agricultural production — which affects farm productivity and sustainability of the subsector particularly in regions prone to long-term droughts and dry spells. What is challenging however is that farm risk affects farming production and mainstream formal marketing decision-making — especially among communal farmers in the developing regions (Olubade-Awosola, 2006). For example, risk-prone communal farmers in the developing regions often become reluctant to invest in new innovations and technologies even-though such innovations might increase their farm productivity and also improve general livelihoods of the communal farmers in general. The communal cattle subsector in most developing regions is faced with high animal mortality rates, tick-borne diseases among cattle, persistent droughts, and shortage of pasture and animal theft among others. Most communal areas in sub-Saharan Africa are prone to most of these challenges. It is in this context that the performance of the cattle farmers in this subsector might have to largely depend on the ability of the respective farmers to respond, control and manage such risks. This chapter investigates the farm risk affecting the communal cattle farmers in the study area— and the farmer coping strategies. Furthermore, the

chapter investigates how such farm risk constrains the commercialisation of cattle-production systems in the study area. In addition, communal cattle farmers in the study area need to understand the farm risk facing them and also the benefits of proper control and management of such risk.

8.2 RISK CONTROL AND MANAGEMENT STRATEGIES

The results of the study revealed that droughts (70.9%), animal diseases (16.4%), veld fires (12.7%) affect the majority of the communal cattle farmers in the study area. The fact that the study area is located in a semi-arid region makes it increasingly prone to harsh drought periods because of the areas' exposure to harsh temperatures — especially during summer periods. In addition, extreme temperatures might also result in late summer veld fires — especially in the Southern Africa region. Furthermore, it is imperative to understand that increased risks such as extended drought periods might play crucial role in determining mainstream formal market participation among livestock farmers in general and cattle in particular. However, while drought is a constraint for livestock production, it is also common for it to become a catalyst of mainstream formal market participation among communal livestock farmers. This is because livestock/cattle farmers exposed to extensive drought periods usually opt to sell some of their animals as a risk-coping strategy to minimise expected mortalities and loss (Akpalu, 2005). On the other hand, communal cattle farmers in the study area also face production and market constraints such as socio-related risks such as cattle theft — which are also common in the study area. The results of the study revealed that 72.7% of the communal cattle farmers in the study area lost their animals through cattle theft. This might negatively affect off-take rates for the markets (Musemwa, 2008). In addition, the results of the study also revealed that in the 12 months period prior to the study, deforestation (39.6%), overgrazing (30.2%), soil erosion (11.3%) and other unspecified factors (18.9%) as indicated in Table 8.1 were the most common risk factors that have affected the majority of the farmers in the study area.

Table 8.1: Environmental risk affecting communal cattle farmers in the Musekwa Valley

Factor	**Frequency**	**Percentage**
Deforestation	21	39.6
Overgrazing	16	30.2
Other	10	18.9
Soil erosion	6	11.3
Total	53	100

It is clear from the results of the study that deforestation is a major environmental factor affecting the majority of communal cattle farmers in this study area. This might be as a result of high number of households in this community who are unable to access household electricity — and therefore resort to cutting of trees for firewood. Cutting of tree threatens livestock production (Stroebel, 2004) because trees are important vegetation providing key natural pasture (Tajebe *et al.,* 2011) for animal browse and therefore a pillar of communal livestock production systems (Juma, 2009). Overgrazing might be resulting from uncontrolled stocking rates which might be higher than the grazing areas are capable of handling. In addition, as a communal area, control and management of the grazing camps becomes difficult because farmers graze their animals as they wished. It is expected that soil erosion might become a challenge in this study area — especially taking into consideration the fact that the study area is a semi-arid and arid region which might be easily prone to soil erosion.

8.2.1 Animal diseases

Animal diseases have resulted in poor livestock production and major disasters such as increased livestock mortalities in Southern Africa and other parts of the developing regions for many years, and they are still a major concern in the livestock industry to date (Nel *et al.,* 1999; Razzaque *et al.,* 2009; Sibanda, 2008). Sibanda (2008) and Tajebe *et al.* (2011) further argued that livestock diseases and parasites might be serious constraints to the development of the communal cattle subsector in sub-Saharan Africa — especially with regard to the production, productivity and participation of the region in international livestock marketing and benefits in the so-called "livestock revolution". For example, in South Africa in the 1890s, Rinderpest nearly wiped off cattle to extinction until the South African government devised a strategy to import exotic breeds to control the resultant cattle shortages (Moraka, 2000). The results of the study revealed that 16.4% of the communal cattle farmers in the study area have lost their livestock to various animal diseases. Loss of the livestock might prevent farmers from achieving optimal animal production, productivity and marketing (Kaumbutho *et al.,* 2000; Tajebe *et al.,* 2011).

Chibssa (2006) reported that cattle diseases such as the Foot and Mouth Disease (FMD) and lumpy skin disease (LSD) have been major constraints of cattle production among pastoralists in Ethiopia — at times with serious economic losses. In fact, Feleke (2008) reported that lumpy skin disease has caused cattle mortalities as high as 18.7% in the mixed crop-livestock production systems of the Ethiopian Bure Woreda in bad periods. On the other hand, Sibanda

(2008) reported that Zimbabwean communal cattle farmers have experienced major economic losses as a result of the Foot and Mouth Disease (FMD) in the country. Razzaque *et al.* (2009: 97) also reported devastating consequences of animal disease in the dairy subsector in Kuwait. Animal diseases might have some devastating economic consequences resulting in poor milk yield, poor animal growth, hide damage, infertility and mortality (Budeli *et al.,* 2009; Carn & Kitching, 1995).

Increased mortalities might be further compounded by lack of access to veterinary services; drugs and vaccines by farmers as a result of unaffordability of these drugs and vaccines among resource-poor communal cattle farmers particularly after the withdrawals of government subsidies on these crucial inputs by most African governments due to budgetary constraints (Bryceson, 2002; Chawatama *et al.,* 2005; Kaumbutho *et al.,* 2000). Apart from economic consequences on the individual farmer, cattle disease have been major contributors to reduced foreign earnings due to trade restrictions which are normally imposed on meats from areas with cattle disease outbreaks (Scoones & Wolmer, 2007; Sibanda, 2008).

The results of the study further revealed that 65.7% of the communal cattle farmers in the study have experienced the so-called lumpy skin disease (LSD) among their cattle in the 12 months prior to the study. However, far contrasting results have been recorded among pastoralists in the Ethiopian communal areas where approximately 3.4% of the farmers have had an experience of this dreadful disease (Chibssa, 2006). This disease is a member of the *Capripoxvirus genus* of the *Poxviridae* family which is very common in sub-Saharan Africa region, the Middle East and Madagascar particularly during wet summer and autumn though incidences of such disease were also recorded in Egypt during winter (Ahmed & Zaher, 2008; Animal Health Australia, 2009; El-Kholy *et al.,* 2008; Luseba & Van der Merwe, 2006; Osuagwah *et al.,* 2007; Thomas, 2002).

In addition, this disease is very common among cattle particularly cows of young age as approximately 36.9% infections were recorded among this age group in countries such as Egypt since the late 1980s (Ahmed & Zaher, 2008). According to Animal Health Australia (2009) exotic cattle breeds such are more susceptible to this disease than the indigenous breeds such as the Zebu which are generally more tolerant and resistant to this disease. The high rate and spread of this disease among the animals in the Musekwa Valley study area might be the results of biting anthropods, stressful and poor animal management conditions, inferior immune status of the animals, saliva of the infected animals which normally share watering facilities with those animals which are not infected, drinking of milk from infected cows particularly by sucking

calves and buying of infected animals from other regions (Ahmed & Zaher, 2008; Animal Health Australia, 2009; Bagla, 2005; Tamam, 2006; Thomas, 2002).

This study area is prone to biting insects such as mosquitoes which might be a transmitter of this disease as these insects might also transmit Tana pox virus (Carn & Kitching, 1995). In addition, animals in the study area often share facilities such as those on watering as cattle farmers in the study area lack such facilities. This might increase infection possibilities among the animals particularly when these animals share drinking facilities but ordinary contact between animals cannot transmit this disease (Carn & Kitching, 1995). It is evident that this disease might risk productivity of the cattle farming enterprise as it can also lower the fertility of the animals particularly bulls and cows, promotes ovarian inactivity among females, lowers breeding potential among animals, increases abortion, damage animal hides, lowers milk yield and loss of body condition among others (Ahmed & Zaher, 2008; Bagla, 2005; Carn & Kitching, 1995; Tamam, 2006; Thomas, 2002).

However, as a corrective measure to the outbreak of this disease, the majority of the farmers revealed that they seek help from government veterinary programme (80.0%) whereas some farmers preferred to use indigenous risk coping strategies to manage and control this disease. In addition, some of these farmers also sold some of their animals during stressful periods as risk coping strategy. This is consistent with the findings of Fisher & Buchenrieder (2010). The results of the study confirm the findings of Mzileni (1999) who found that communal farmers in the Eastern Cape Province of South Africa for example, still resort to indigenous risk coping strategies in managing and controlling cattle disease outbreaks in particular the lumpy skin disease (LSD).

Apart from the LSD, the results of the study further revealed that 34.3% of the communal cattle farmers in the study area also experienced tick-borne diseases such as heart water in the 12 months period prior to the study. These results are in line with those of Baloyi (2010), Morgan & Tallard (2006), Musemwa *et al.* (2008), Nell & Schwalbach (2002), Nesamvuni *et al.* (2003), Nthakheni (2006) and Randela (2000) who reported that high tick-borne disease prevalence among cattle in the communal areas of the developing regions in particular South Africa remains a major constraint for cattle production, productivity, sustainability and mainstream formal market participation among communal cattle farmers. According to Marufu (2008), *Hyalomma marginatum ufipes, Rhipicephus appendiculatus, Phipicephalus evertis evertsi, Amblyomma hebraeum, Boophilus decolouratus, hyalomma truncatum* and *Phipicephalus simus* are the most

common ticks found in several parts of the communal areas of South Africa particularly in hot-wet seasons. These ticks cause serious cattle production challenges among communal cattle farmers in South Africa in general.

In addition, TBDs such as babesiosis, anaplasmosis and heart water are expected to cause major economic losses among communal cattle farmers in Southern Africa in particular in terms of increased animal infertility, mortality among animals, reduction in hides; skins; meat and milk yields and increases in the prices of cattle-related products to consumers (Kaoma-Sprenkels & Mwenda, 1999; Marufu, 2008; Phillip *et al.,* 2009; Randela, 2000; Swanepoel *et al.,* 2000). These challenges are expected to remain persistent in most developing regions particularly in the Southern Africa region for much longer. Limited research work on ticks among the communal cattle farmers, increased costs in tick control and management, reduction of veterinary support by government, lack of proper infrastructure such as animal dipping tanks and the fact that communal cattle farmers in Southern Africa generally regard animal disease control and management as a routine responsibility of government only which often lead to farmer under investment in this subsector in particular (Backx, 2002; Mngomezulu, 2010; Randela, 2000; Swanepoel *et al.* 2000) further constrain tick-borne disease control and management in these areas.

The National Department of Agriculture (2000) further argued that animal disease control and management in South Africa is also constrained by under utilisation of vaccines among communal cattle farmers in particular, total mismanagement of the infected animals, lack of knowledge on animal disease control and management and prioritisation of other farming activities more than animal disease control and management. Cattle disease need to be well controlled and managed as it might result in several economic consequences (Kaoma-Sprenkels & Mwenda, 1999) particularly during drought periods when diseases prevalence were expected to increase (Mubaya, 2010). However, communal cattle farmers in the study area show some degree of improved innovation in animal disease control and management measures as the results of the study revealed different coping strategies applied among these farmers to control and manage animal diseases.

These results revealed that a vast majority of these cattle farmers (94.2%) vaccinate their animals while 83.0% control and manage internal parasites among their animals. Backx (2002) also indicated that communal livestock farmers in some Southern Africa countries also dip their animals, administer the so-called Acaricides through hand sprays; pour-ons and tick grease to

control ticks which might cause dreadful tick-borne diseases among their animals in particular. This might justify the fact that only a small percentage of disease-induced mortalities among the cattle in the study area has been recorded despite the areas' vulnerability to animal diseases in particular the LSD and tick-borne diseases.

Furthermore, the results of the study also revealed that there are 66.7% of the communal cattle farmers in the study area who do not vaccinate their animals as a result of unaffordability of the vaccination drugs. On the other hand, 33.3% of the farmers do not vaccinate their animals as a result of insufficient knowledge on animal vaccination. According to Randela (2000), reduction of animal disease rates among communal cattle farmers in the developing regions by at least 6.0% might increase food availability to approximately 250 million extra people in these regions. Therefore, effective disease control and management risk coping strategies among communal cattle farmers in the study area are primary requirements for cattle development, production, productivity and commercialisation.

8.2.2 Droughts and animal pasture

The results of the study revealed that 70.9% of the communal cattle farmers in the study area rate drought as the most constraining cattle production and mainstream formal market participation among communal cattle farmers in the study area. In addition, 39.9% of the cattle farmers were directly affected by drought in their cattle farming activities in the previous 12 months prior the study. However, the Limpopo Department of Agriculture has the so-called drought relief programme to provide assistance to livestock farmers during such periods (Nesamvuni *et al.,* 2003; Nthakheni, 2006). This might relieve the farmers of consequences related to droughts. Drought is generally unpredictable, imminent and might also affect the availability of animal pasture among others (Grwambi *et al.,* 2006) – especially in arid areas where farmers depend on native grasslands, trees and shrubs for livestock feed (Teklu *et al.* 2010). Farmers have to have copying strategies for droughts because "*...drought is a part of (Africa's) climate and not apart from it...*" (Juma, 2009). In other words, drought will always remain part of the farmer's life and all farming practices as it may not be possible not to have drought at some point of farming. There are several coping strategies that communal cattle farmers employ to respond to drought stress and other related risks in the developing regions.

According to Grwambi *et al.* (2006), some cattle farmers in other parts of the communal areas in South Africa sell their animals particularly old animals; animals with poor reproductive records;

heifers which have not calved and oxen, some farmers use specific areas of grazing reserved for emergencies and some choose to adopt crop-residue supplementation and other strategies to assist their animals in terms of nutrition. For example, animal supplementation among the communal cattle farmers in the study area is a crucial drought-coping strategy. Animal supplementation improves weight of the animal and also its quality (Pedersen & Madsen, 1998). In response to drought risk, the results of the study revealed that communal cattle farmers in the study area resorted to animal supplementation particularly during droughts (47.3%), winter periods (34.6%), and summer months (10.9%), throughout the year (5.4%) and other (1.8%) such as periods when animals are pregnant as indicated in Figure 8.1.

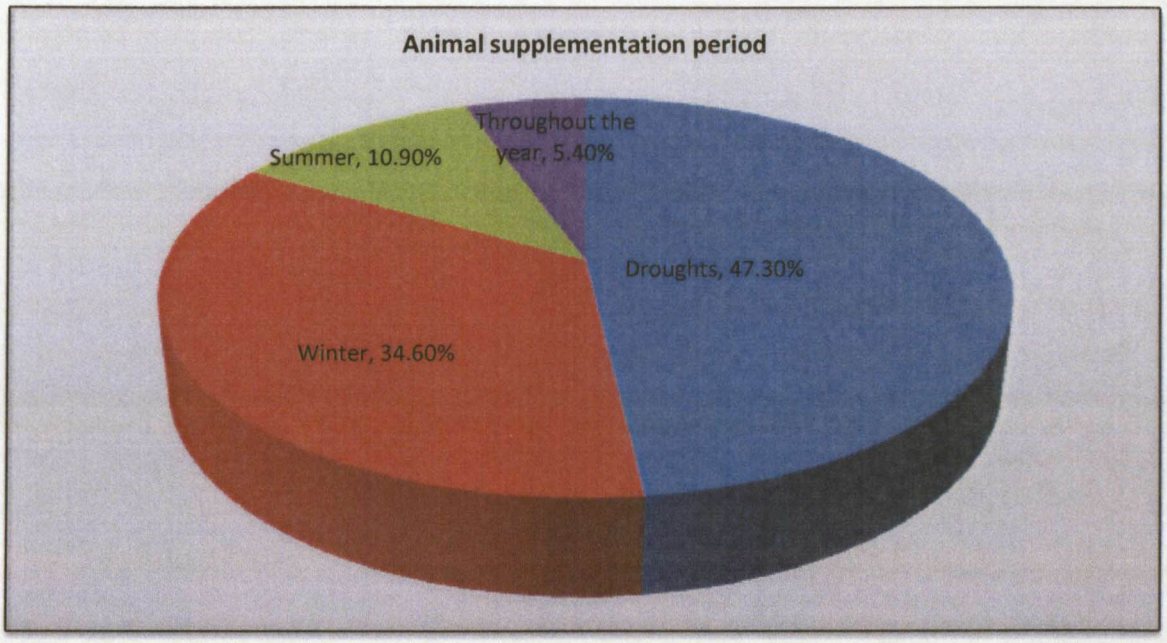


Figure 8.1: Animal supplementation periods among communal cattle farmers in the Musekwa Valley

There are however two groups of cattle farmers in this regard depending on circumstances and affordability. The first group is for those cattle farmers who supplement their animals using indigenous means such as the use of crop residues and various tree species found in the study area. This is in collaboration with cattle farming practices in the Assosa Zone of Benshangule-Gumnz in Western Ethiopia where communal cattle farmers supplemented their animals using natural feed such as trees, shrubs and crop residues – including groundnut (Arachis *Villosulicarpa*) and Sorghum (*Sorghum virgatum*) among others (Teklu *et al.*, 2010). The second group of cattle farmers is those who supplement their animals using new cattle production innovations and technologies such as the use of protein licks among others. Locally found grass

species such as *Panicum maximum*, *Digitaria eriantha*, *Cenchrus ciliaris*, *Cynodon dactylon*, *Urochloa mesambicensis*, *Themeda trianda* and *Schimidta pappophoroides* are widely used as supplements among the communal cattle farmers in the study area particularly during summer when plenty of such grass species are available and still palatable to the animals.

Key informant interviews revealed that grass species such as the *Heteropogon contortus* and *Enneapogon spp* are also preferred by animals particularly when the other palatable grass species are either dry or overgrazed. The animals also browse on local trees such as *Anacardiaceae spp*, *Kirkia acuminate*, *Boscia albitrunca*, *Berchemia discolour*, and *Grewia bicolour* and to a certain extent *Colophospermum mopane* and thorny tree species such as *Fabaceae acacia.* Feeding the animals on different tree species is in line with the results reported by Kawonga (2009) who revealed that communal cattle farmers in Malawi also supplement their animals through the use of groundnut tops, cereal straw, lopping from various tree species such as *Faidherbia albia* and *Acacia spp* for example. This shows that communal cattle farmers in Southern Africa in particular have relied on these animal supplementation strategies for a long time. The idea is to make use of affordable local resources as most communal farmers are resource-limited.

However, communal cattle farmers in the study area are expected to experience various constraints regarding animal supplementation. For example, as a result of the study area's high density savannah, the study area is expected to experience bush encroachments which might result in the thickening and invasion of the bush by alien plants. These invasions and bush encroachments might drastically reduce the capacity of the grazing land area and space resulting in increased demand of bush advanced control and management (Pienaar, 2006). The challenge in this regard remains the fact that 23.1% of the communal cattle farmers in the study area revealed that they often do not solve the problems they face in their farming activities. This might make bush invasion and encroachments control very unlikely. In addition, veld fires are also a major test on fodder supply in the study area which has affected 12.7% of the cattle farmers in the previous 12 months prior the study.

In addition, the key informant interviews revealed that cattle farmers in the study area also use fresh or dry seeds of the *Fabacea acacia* (*Munanga), Fabacea senegal* (*Muungathudwa)* and *Dichrostachys cinerea* (*Murenzhe) as indicated in* Figure 8.2. This figure indicates fresh seeds which animals can browse from the tree or the farmers cut and carry to feed the animals while Figure 8.3 indicates dry seeds which could be fed to the animals.

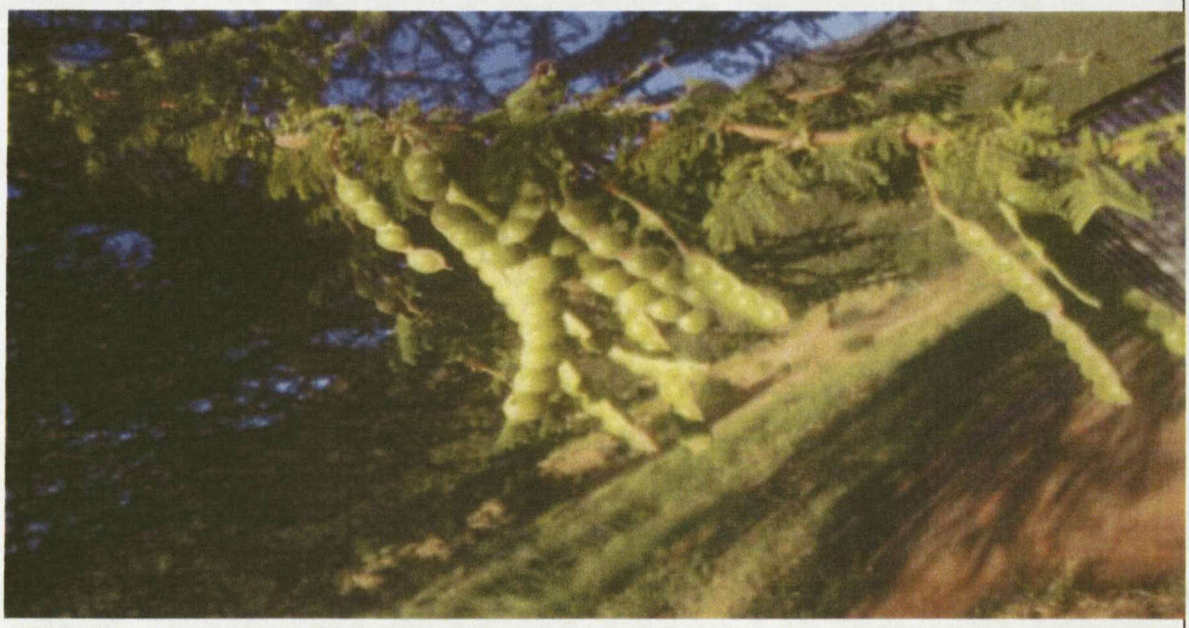


Figure 8:2: Fresh seeds of the *Acacia senegal* used for animal browsing in the Musekwa Valley



Figure 8.3: Dried seeds of tree species used by communal cattle farmers as animal supplements in the Musekwa Valley

Legend: A. Fabacea Acacia seeds B. Fabacea Senegal seeds C. Dichrostachys Cinerea seeds

These seeds are carried from the bush to supplement the animals particularly during winter when communal cattle farmers in the study area have limited availability options on the palatable grasses and tree species which are mostly common in summer periods. The results of the study also revealed that communal cattle farmers in the study area resort to these unconventional supplementation methods as a result of unaffordability of modern supplementation strategies. This is corroborated by Wanapat *et al.* (2007) who found that communal livestock farmers in the developing regions find it expensive to access new innovations in animal supplementation. This indigenous practice of animal supplementation is also common in other communal livestock production systems in the developing regions. Noug seeds, oil seeds, groundnut, sorghum, sunflower and sesame seeds have been used for animal supplementation in countries such as Ethiopia (Teklu *et al.,* 2010; Tsegaye, 2009) while cassava tubers are widely used in Thailand for example (Wanapat *et al.,* 2007). It is crucial for communal cattle farmers in the developing regions to investigate any existence of risk in terms of feeding their animals using indigenous supplementation particularly the use of seeds.

For example, in countries such as Ethiopia and Thailand, intensive research has been conducted to investigate chemical composition and nutritional content of the seeds, their effect on animal health and production among others that communal farmers use to supplement their animals (Teklu *et al.,* 2010; Wanapat *et al.*, 2007). In addition, the same authors reported that communal farmers in Thailand in particular are being trained in proper skills of producing locally-preferred livestock supplements from cassava tubers for example. Such research is yet to be conducted in the study area in particular. The implication is that the seeds used in the study area might be detrimental to animal health or a wasted resource which might be scientifically improved to play a productive role in animal supplementation if similar research with that of Ethiopia and Thailand might be conducted in the study area also.

In South Africa, Nkosi (2010) conducted a study on potato hash (PH) – a by-product of potato food producing industry – in the sheep farming subsector to ascertain the scientific nutritional value as animal feed. In addition, the majority of communal farmers in the study area also produce maize and African corn in summer which they use as crop residue to supplement their animals. Farmers in the study area send their animals to feed on the crop residues after harvesting in the dry seasons. These results corroborate Rege *et al.* (2006) and Stroebel (2004) who reported that communal livestock farmers in resource-poor areas in South Africa also make use of crop residues for livestock supplementation. These results also revealed that agriculture in

the study area is practiced in an integrated mixed crop-livestock production system where there is inter-dependence of crop and livestock (Fakoya, 2007; Hazell, 2007).

Furthermore, the results of the study also revealed that there are farmers in the study area who are able to provide modern methods of animal feeding and supplementation as indicated in Figure 8.4. For example, the results of the study revealed that modern cattle feeding innovations, strategies and technologies such as mealie concentrates (63.6%), salt licks (14.6%), protein licks (12.7%) and mineral licks (9.1%) are commonly used among communal cattle farmers in the study area. The adoption of these cattle supplementation strategies might indicate some readiness among these farmers to adopt modern animal feeding technological approaches (Tewodros, 2008).

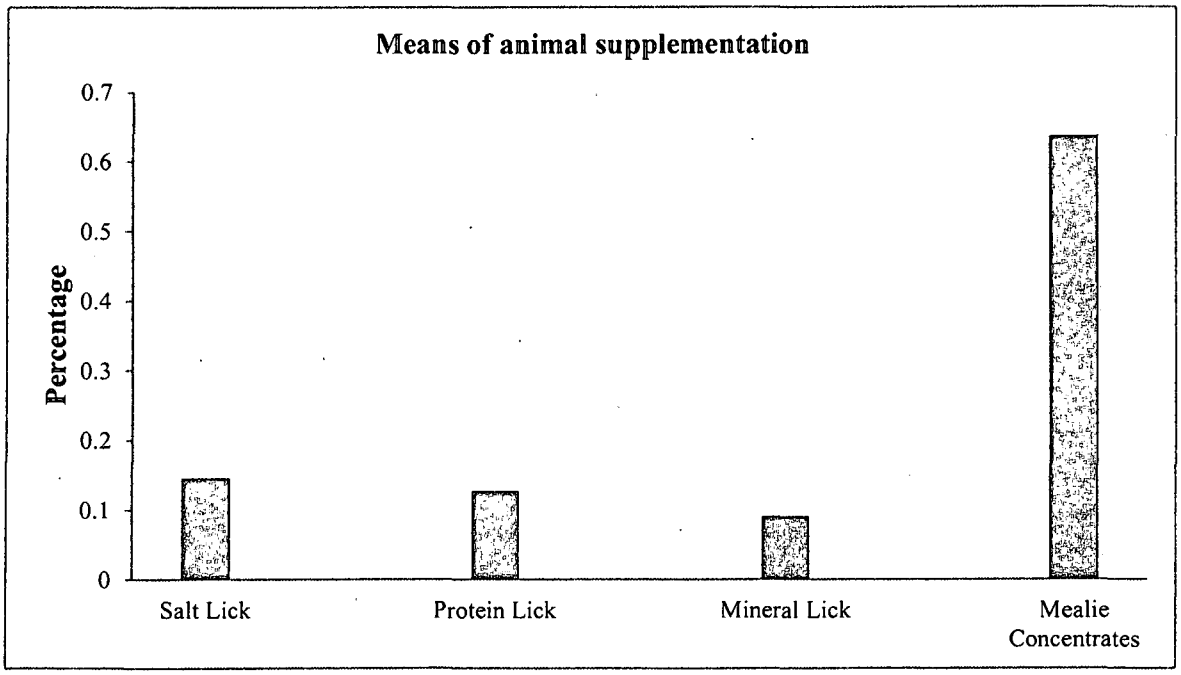


Figure 8.4: Methods of cattle supplementation used by communal cattle farmers in the Musekwa Valley

This might increase farm production capacity, productivity and also increase the probability of the communal cattle farmers in the study area to actively participate in the mainstream formal cattle market as the strategy guarantee animal safety. However, the limitation of this kind of animal supplementation among communal cattle farmers remains the fact that South Africa relies on imports of most of the modern animal feeds as local farmers particularly the commercial farmers are not competitive in the production of these feeds (Vink & Van Rooyen,

2009). As a result, animal feeds are expected to be expensive and unaffordable with most of the farmers particularly in the communal subsector.

8.2.3 Animal mortality rates

The results of the study revealed that the majority of animals in the study area die of tick-borne diseases (63.7%), traps set by poachers (12.1%), road accidents (3.0%) and other unspecified causes which might include diseases such as LSD (21.2%) as indicated in Figure 8.5.

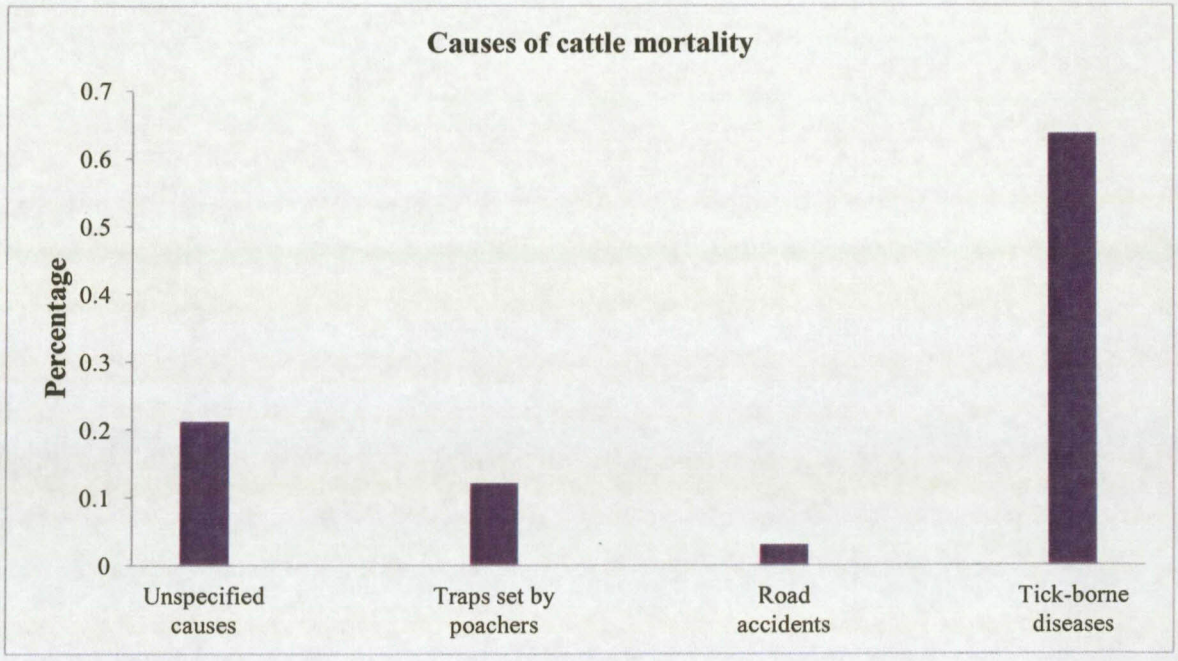


Figure 8.5: Causes of cattle mortality among communal cattle farmers in the Musekwa Valley

In addition, these results further revealed that animal mortality is highest among cows (43.7%), heifers (25.0%), and calves (18.8%) and steers (12.5%) as indicated in Figure 8.6.

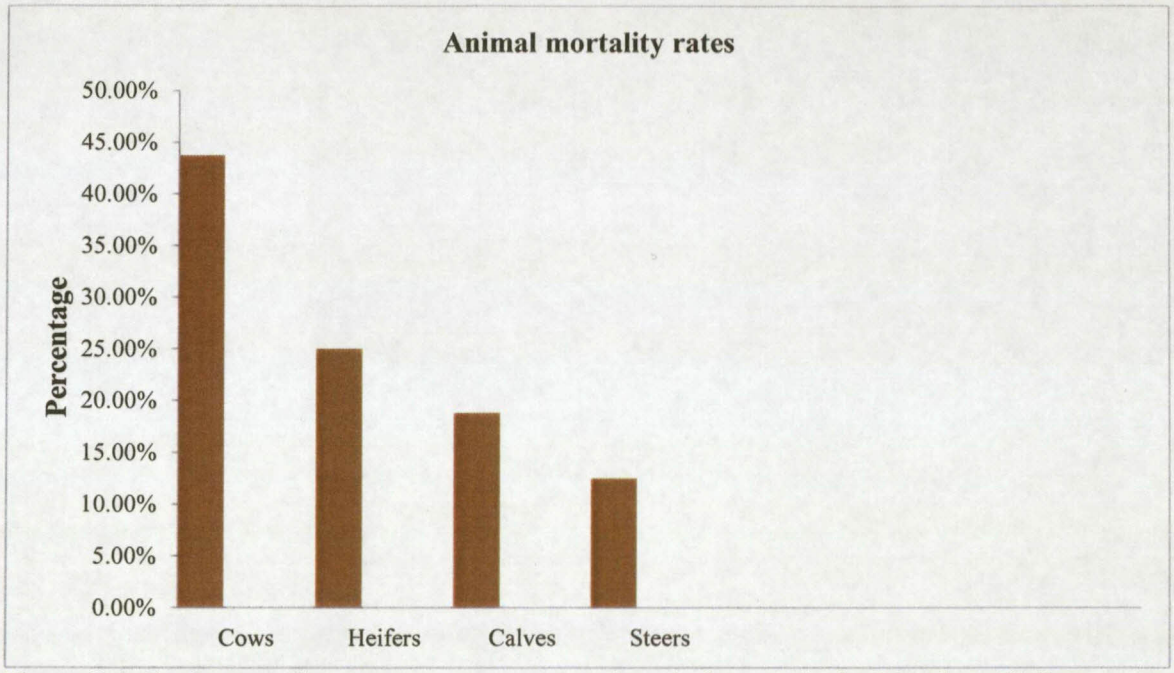


Figure 8.6: Cattle mortality rates among communal cattle farmers in the Musekwa Valley

This might be a major production and commercialisation constraint among these farmers. These results are in line with those of Swanepoel *et al.* (2000) who found that cows (44.0%) are in the majority in terms of animal mortality in some other communal areas of South Africa and 40-50.0% in Kenya for example. Furthermore, the same authors found that calf mortality rates in some parts of communal South Africa are approximately 75.6% and those of the general herd being 45.1%. Comparatively, the results of the study revealed that calf mortality rates in the study area are significantly lower than in other communal areas of South Africa. This might suggest that cattle farmers in the study area might have adopted some better strategies in terms of controlling and managing calf mortality rates among their animals. On the other hand, the high mortality rates among the general animal population in the study area might be as a result of increased disease prevalence among the animals and/or poor management of issues of cattle diseases by farmers. Increased cattle mortality rates might be detrimental to off-take rates, which might result in poor participation of these farmers in the mainstream formal market. For example, in the Monze district of Zambia, cattle corridor diseases reduced cattle numbers from 300 000 to approximately 77 000 in the 1980s (Kaoma-Sprenkels & Mwenda, 1999). This shows that cattle farming are inherently a risky business without guarantees of none risk.

In addition, increased cattle mortality rates might be caused by lack of adoption of new technologies in cattle production among communal cattle farmers particularly among the most

experienced cattle farmers who tend to be less enthusiastic and conservative regarding adoption of change in terms of cattle production activities. For example, the results of this study revealed that cattle mortality probability rates increased with an increase of farming experience among the communal cattle farmers in this study area as indicated in Annexure E. This is corroborated by the positive and significant relationship (0.0792) between cattle mortality rates and farmer's experience in the study area. However, controlling cattle mortality rates might result in positive developments in cattle production in general in the study area. For example, the results of the study further revealed that a decrease of cattle mortality rates by a unit (one herd) among the communal cattle farmers in the study area might result in the increase of record keeping by approximately 0.0033 (0.33%); cattle selling points by 0.0663 (6.63%) and advertising of cattle sales by 0.0101 (1.01%). This is corroborated by the negative and significant relationship between cattle mortality rates and record keeping and advertising and in addition the positive correlation of cattle mortality rates and cattle selling points as depicted in Annexure E.

8.2.4 Animal theft and security

Cattle theft is a major risk among communal farmers in South Africa as it might reduce farm margins and also discourage farm investment (Omiti *et al.*, 2006). As indicated in Figure 8.7, the results of the study revealed that cattle theft is also a major factor affecting most of the communal cattle farmers in the study area with major incidences among cows (42.0%), heifers (21.0%), calves (16.0%), steers (10.0%) and bulls (11.0%).

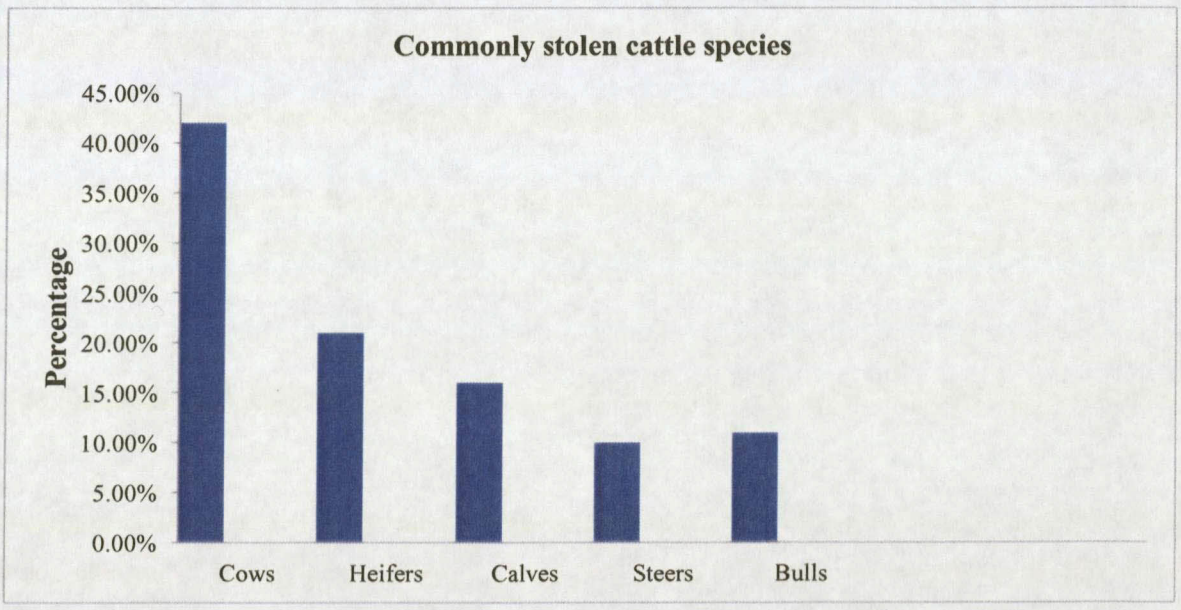


Figure 8.7: Animals frequently stolen among communal cattle farmers in the Musekwa Valley

Cattle theft is a common constraint of cattle production and commercialisation in the communal areas of South Africa in general. For example, Dapaah *et al.* (2001) found that approximately 44.0% of the communal cattle farmers in the Mopeane-Kudumane district of the North West Province in South Africa have lost their animals to cattle thieves. The same authors also revealed that most cattle theft in this area is done by local community members.

The high rate of cattle theft particularly among the female animals and calves might indicate that thieves are stealing the animals to increase their cattle herds or to sell to interested breeders. This might affect off-take rates among the communal cattle farmers in the study area which are already expected to be low and insufficient particularly for the mainstream formal market. Cattle off-take rates among communal cattle farmers in South Africa are approximately between 5.0 and 10. 0% compared to 25.0% in the commercial subsector of the total cattle owned by the respective cattle farmer (Musemwa *et al.,* 2010; Swanepoel *et al.,* 2000). It is evident that cattle theft in the study area might reduce off-take rates and therefore impact on the commercialisation of this subsector. In addition, as a result of increased animal theft in the study area, animal insurers are expected to be reluctant to operate in the study area. Animal insurers demand high security standards such as electric fencing and alarm systems among others to protect the insured assets (Doyer, 2010). On the other hand, reluctance of insurers to get involved in cattle insurance provision among the communal cattle farmers in the study area might also be complicated by unaffordability.

Finding risk coping strategies to deal with emerging challenges in livestock production has been a long-time practice among communal livestock farmers particularly among resource-poor communities in the developing regions. According to McDemott (2003), in Uganda for example, community-based initiatives have formed the backbone of livestock risk coping mechanisms. Farmers organize themselves into self-help groups to deal with these livestock challenges as they emerge. For example, the farmer-based tsetse fly control is a community initiated programme in partnership with the District Veterinary officers and private sector companies such as the Cooper (U) Ltd; a Kampala-based veterinary drugs company meant to control tsetse fly outbreaks. It is evident that cattle farmers in the study area are also faced with serious challenges which also require some control and management measures. Cattle theft is a major challenge in the communal cattle production subsector, and there is a need to come up with a meaningful strategy to deal with this challenge.

The results of the study revealed that the majority of the communal cattle farmers in the study area rely on the police (52.5%), cooperation with other farmers (35.0%) and community crime prevention units (12.5%) to control and manage cattle theft as shown in Figure 8.8. Key informant interview with these farmers revealed that farmers took the decision to adopt multiple strategies to combat cattle theft because they were losing many animals to criminals. It was further revealed that these animals are stolen by people who come from other villages outside the study area. This result is in contrast with those reported by Montshwe (2006) who reported that cattle theft in the North West Province was mainly committed by local people.

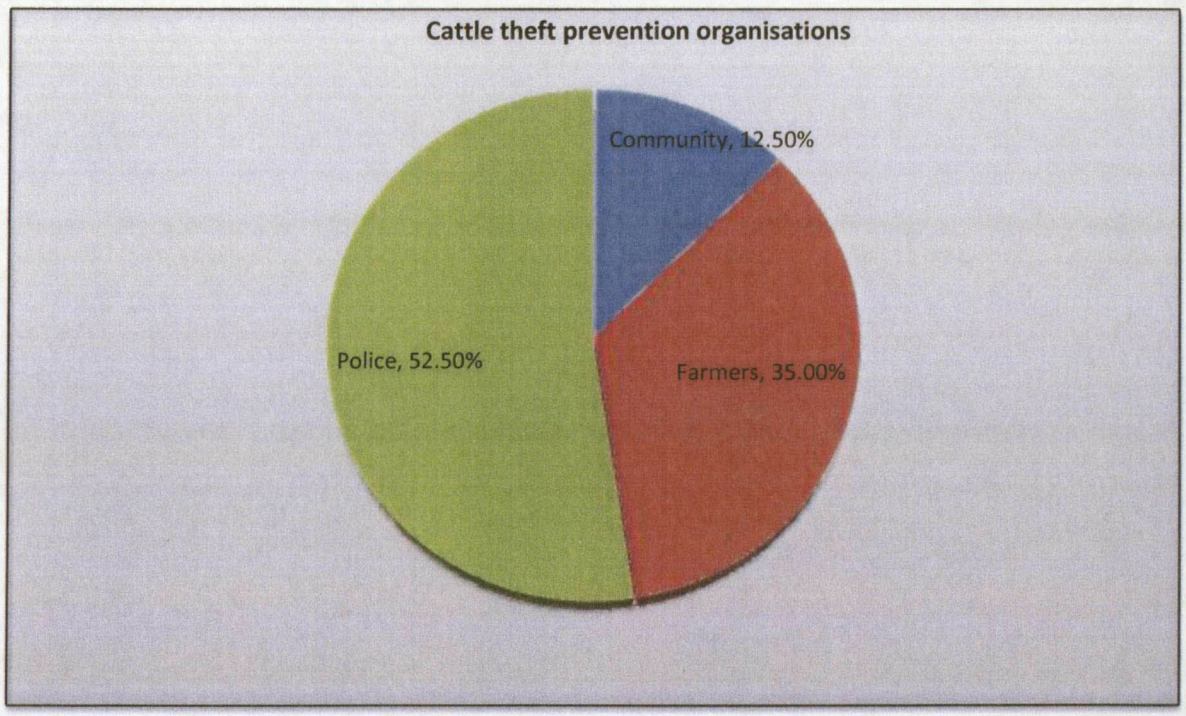


Figure 8.8: Cattle theft prevention measures among communal cattle farmers in the Musekwa Valley

With the unreliability of the police to provide timeous service when needed, cattle theft is expected to continue pose a serious constraint for commercialisation. While more advanced enterprises might also prevent cattle theft through new technologies in animal forensics using protein technologies and DNA which might assist in animal identification, ownership tracing, and identification of animal parentage and tracing of the origin of the species (Rege *et al.,* 2006), communal resource-poor farmers in the study area resort more to preventative measures than recovery measures by using cheaper and affordable alternative strategies to provide security to their animals. The results of the study found that 98.2% of the communal cattle farmers in the

study area provide shelter such as kraals for the animals to minimise risk particularly at night. They use locally found simple materials to construct such cattle enclosures.

These results are in line with those of Gachimbi *et al.* (2004) and Kawonga (2009) who reported that communal cattle farmers in Kenya and Malawi among others have cattle kraals in which they house their animals for security reasons particularly at night. Provision of night shelter for the animals suggests that communal cattle farmers at the study area are aware of the risk facing their farming activities particularly on their cattle. Cattle kraals are a risk coping strategy among these farmers. In addition, provision of shelter for the animals promotes health and also improves manure quality as confined cattle have protection against exposure to environmental challenges such as bad weather. These animals might also produce more manure for the farmer than the cattle which are not kept in enclosures (Gachimbi *et al.*, 2004).

8.2.5 Poor physical and genetic conditioning of the animals

Quality on animal production should be ensured particularly when producing for the mainstream formal markets. Poor conditioned animals in terms of physical and genetic attributes are likely to face stiff competition from better conditioned animals particularly those from the commercial subsector as traders are expected to demand quality on the animal being offered for sale (Montshwe, 2006). Animal physical and genetic quality depends on several factors which might include among others poor animal breeding (Bletzinger, 2000; Boyazuglu, 1997; D'Leteren & Kimani, 2008; Irwin, 2004; Musemwa *et al.*, 2008; Neelson & Colson, 2002-2003; Stookey *et al.*, 2000; Viltrop *et al.*, 2002; Weary, 2000; Wright & Pruitt, 2005).

Poor animal breeding is expected to affect cattle physical and genetic quality in the study area as the majority of the cattle farmers in the study area practice uncontrolled breeding on their animals. It is evident that cattle farmers in the study area are unaware that programmed breeding of animals which includes animal performance recording; planned mating and genetic evaluation is an important strategy for ensuring animal genetic quality particularly where the animals are exposed to indiscriminate inbreeding (Rewe *et al.*, 2008). The results of the study revealed that 76.9% of the communal cattle farmers in the study area do not practice neither controlled nor programmed breeding on their animals. Only 23.1% of the communal cattle farmers in the study area follow a controlled breeding programme.

Lack of knowledge (52.4%), unaffordability of controlled breeding practice (26.19%) and lack of breeding resources (21.4%) are the main reasons for not having controlled breeding programmes among the communal cattle farmers in the study area. As a result, 64.0% of the communal cattle farmers in the study area practice indiscriminate cattle inbreeding with no special bull. A mere 36.0% of the farmers in the study area have special bulls for breeding purposes. These results are consistent with the findings of Chintsanya *et al.* (2004) and Okonno-Adhiambo (2002) who reported that uncontrolled inbreeding characterised by inferior bulls and absence of controlled breeding programmes are major constraints of cattle production, productivity and cattle market commercialisation in East Africa in general and in Malawi in particular. One other practical breeding constraint result from lack of breeding bull ownership among these farmers. For example, the results of the study revealed that 50.0% of the communal cattle farmers in the study area depend on other farmers' bulls for breeding. The other 50.0% have personal breeding bulls among their cattle herd although the quality is not tested. However, selection of the bull for breeding purposes among those farmers who practice controlled and managed breeding is based on the quality of the bull (77.4%), availability of the bull (16.0%) and the ability of the respective farmer to keep the preferred bull (5.7%).

Of major constraint for controlled and managed breeding is that relying on other farmers' bulls for breeding is unreliable as the bull might only be available on the willingness of the owner farmer. This might force the farmer to use available bulls for breeding which might not guarantee the expected quality and therefore increasing the probability of risky indiscriminate breeding. Indiscriminate selection of breeding bulls and lack of proper breeding programmes and mechanism in the study area might in addition expose these farmers to high risk of producing genetically inferior animals characterised by occasional physical deformation of off-springs; low productivity; poor fertility rates with increased possibilities of low calving rates which might impact negatively on the stocking rates and low animal desirability by cattle traders among others (Montshwe, 2006). However, various strategies exist among these farmers to minimise breeding constraints. For example, the majority of these farmers (75.0%) in the study area make use of extension officers for professional assistance in animal breeding while 25.0% use privately hired veterinary surgeons. In this regard, the communal cattle farmers in this area are expected to minimise indiscriminate inbreeding risk among animals. The challenge in relying on extension officers lies with the fact that they are not frequently available in the study area.

8.3 CONCLUSIONS

It is obvious that there are several risks affecting cattle production activities among communal cattle farmers in the study area. Droughts, diseases, stock theft and veld fires are the major risks affecting farmers in the study area. Diseases such as tick-borne and LSD result in increased animal mortality rates which obviously affect both production and the probability of the farmers in the study area to actively participate in the mainstream formal cattle market. Farmers in the study area have adopted various risk-counter-strategies to deal with farm risk. In view of the farmers' response to risk, commercialisation remains a strong probability. However, farming is a collective which becomes even more productive when the farmer cooperates with others.

CHAPTER 9

MEMBERSHIP AND PARTICIPATION OF COMMUNAL CATTLE FARMERS IN FARMER ORGANISATIONS AND GOVERNMENT FARMER ASSISTANCE PROGRAMMES IN THE MUSEKWA VALLEY

"...for the average communal cattle farmer (businessman), the biggest problem is the lack of someone to take him by the hand and help him develop..." adapted from du Plessis in Vollgraaff (2011:11) and *"...an eaglet that does not know that it is an eagle may live like a chicken until an eagle descents and hovers over it to make it aware it is an eagle and it can fly..."* Diale (2009)

9.1 INTRODUCTION

Farmer organisations might include farmer associations, federations, unions, cooperatives owned and controlled by those farmers who have become members, agricultural chambers having a general assembly elected by member farmers and community farmer groups (Stockbridge *et al.*, 2003). A good example of a farmer organisation in South Africa is the NAFU which particularly represents the interests of the previously-disadvantaged black farmers - and also lobbies for farmer access to on-farm resources among others (Moloi, 2008). According to Calkins & Ngo (2005), farmer organisations might emerge as a result of lack of commodity markets and government's incapacity to provide agricultural inputs; output and social goods in an efficient and effective way. Diale (2009) argues that farmer organisations might be catalysts of farmer awareness and conscientisation of their ability, power and contribution with regard to their socio-economic transformation and those of their communities should they improve membership in farmer organisations and agricultural commercialisation.

Membership of farmers in these organisations is expected to improve farmer access to production inputs, increase farm production; productivity and mainstream formal market participation which might improve profit maximisation among the communal cattle farmers among others in particular (Balasubramanian, 2004; Eaton & Shepherd, 2001; Gura, 2008; Jacinta *et al.*, 2010; Sartorious *et al.*, 2006). It is highly desirable that communal farmers affiliate with farmer organisations in South Africa - considering the constraints faced by communal

farmers with regard to lack of entrepreneurial mentorship especially in mainstream formal cattle production and marketing among others (Mmbengwa, 2009). The main objective of this chapter is to investigate and describe how farmer membership or/and lack of it in farmer organisations impede or presents opportunity for the commercialisation of the communal cattle-production systems in the study area. In other words, this chapter supports the assertion that there is indeed a need to assist the vulnerable communal farmers to organize themselves into some collective action groups in order to deal with production and marketing circumstances and conditions affecting their farming practices (Diale, 2009).

9.2 MEMBERSHIP OF FARMERS IN FARMER ORGANISATIONS

Farmer organisations are an integral part of modern mainstream formal agriculture — and have been a major tool in organizing farmers for collective action and access to inputs for decades in most developing regions (Machete *et al.,* 2004). Farmers have adopted farmer organisations for ages both in the developing and developed regions such as Malawi, the Philippines, Zimbabwe and also in some selected areas of South Africa for example (Chirwa *et al.,* 2005; Cramb, 2004; Diale, 2009). Diale (2009) also presented a farmer support group in the Sorghum subsector in the Limpopo Province of South Africa who partnered themselves through a village cooperative to access farming inputs, information sharing and other farming goals as an example of farmer initiative to organize themselves. The target is increased farm productivity and the market.

It is evident that farmer organisations are expected to facilitate collective delivery and co-ordination of agricultural services such as access to production and mainstream formal marketing information, engagements in the mainstream formal markets, reduction of commodity transaction costs by encouraging risk sharing, adoption of new technologies, vocational training of farmers and facilitate for increased access to productive resources among resource-poor communal farmers in particular (Braja, 2008; Calkius & Ngo, 2005; Diale, 2009; Francesconi & Ruben, 2007; Holloway & Ehui, 2002; Jacinta *et al.,* 2010; Jera & Ajayi, 2008; Kumwenda & Madola, 2005; Moloi, 2008; Poulton *et al.*, 2006; Uchezuba *et al.*, 2009; Wickramasinghe, 2009). For example, Mathijs & Noev (2002) argued that the majority of farmers in countries such as Bulgaria and Romania who actively participate in the mainstream formal markets are those farmers who are members in farmer organisations.

In South Africa, communal farmers have received valuable assistance from different organisations including business, NGOs and government parastatals such as the ESKOM and

Independent Development Trust (IDT) including private companies such as Kynoch and the W.K. Kellogg among others. These organisations provide communal farmers with farming managerial support, influencing of the organisational structures; conduct and performance of the livestock mainstream formal marketing channels, access to financial capital and provision of farmer technical support among others (Bailey, 1999; Manona, 2005). However, the results of the study revealed that only 20.0% of the communal cattle farmers in the study area are members and also actively participate in small informal farmer organisations. This means that 80.0% of the communal cattle farmers in the study area neither belong nor participate in any farmer organisation of any kind — formal or informal. It was common in most developing regions that communal farmers opt to conduct their production and marketing activities without belonging to farmer organisations — especially where there are no incentives to do so (Baloyi, 2010; Boas & Goldey, 2005). The results of the study are in line with those of Moloi (2008) who reported that farmer membership in organized farmer organisations in South Africa varies from subsector to subsector and region to region.

For example, in some communal areas of South Africa, only 5.0% of communal livestock farmers are members of the so-called NAFU while only 10.0% of the farmers in the communal horticulture subsector are members of the same organisation. In the tomato farming subsector in Limpopo Province, Baloyi (2010) found that approximately 54.0% of the communal farmers were members of a farmer organisation. In addition, Bawa *et al.* (2009) reported that the majority (54.0%) of the communal farmers in some parts of Nigeria are members of some farmer organisations such as cooperatives. It is premised that access to increased extension service among these farmers might have contributed to the awareness of these farmers on farmer organisations resulting in increased numbers of farmer members in these organisations.

This is because agricultural extension service might assist farmers to access and acquire imperative farming information (Mmbengwa *et al.,* 2011) — especially with regard to membership in farmer organisations. In contrast of the findings by Bawa *et al.* (2009), the results of the study further revealed that poor farmer participation in farmer organisations is a common practice among communal farmers in the study area. Chief among the reasons for poor membership in these organisations concerns lack of information on farmer organisations and their role in farmer and agricultural development and for commercialisation in particular. An unexpected result as revealed in Table 9.1 is that a decrease of a unit on membership of farmers by at least five percent in farmer organisations among communal cattle farmers in the study area

might also increase the probability of such farmers to also increase ownership of cattle among the farmers by approximately five percent.

Table 9.1: Correlation coefficients of selected variables

Variable	OWNERSHIP	RECORDS	MORTALITY	SPOINT	DISTANCE	ADVERT	EXTENSION
INCOMESELL	0.04309	0.05702*	0.10631	-0.23220	-0.26425	0.14045	-0.17647
	0.7548	0.6793	0.4398	0.0880**	0.0512**	0.3064	0.1975
TRANSOWN	0.09910**	-0.18877	0.11154	0.31774	-0.00564	-0.19612	-0.15131
	0.4716	0.1675	0.4175	0.0181*	0.9674	0.1513	0.2702
FARMEXP	0.10036	-0.38375	0.23873	-0.18388	-0.07820	-0.19862	0.18388
	0.4660	0.0038*	0.0792**	0.1790	0.5704	0.1460	0.1790
MEMBER	-0.30943	0.35553	0.07332	-0.09449**	0.10566	0.14845	0.00000
	0.0215*	0.0077*	0.5947	0.4926	0.4427	0.2794	1.0000
WEAN	0.23159	0.56530	0.02993*	-0.15430	0.41217	-0.21212	-0.07715
	0.0889**	<.0001*	0.8282	0.2607	0.0018*	0.1200	0.5756

Significant at * 5.0% and **10.0%

This result is corroborated by the fact that there is a negative and significant relationship (0.0215) between membership of the communal cattle farmers in farmer organisations and cattle ownership among communal cattle farmers in the study area. This result suggests that farmer organisations in the study area might not be contributing much on cattle production skills and knowledge transfer among member communal cattle farmers. Therefore the skills transfer is not assisting the farmers to grow their cattle herds. It is common that farmer organisations among communal farmers have diverse member interest and unorganized management — which might lead to their poor performance (Mmbengwa *et al.,* 2011). The resultant effect of this therefore is that these farmers might not gain the expected skills necessary for increased cattle ownership. This result makes sense because the majority of these cattle farmers who have membership in farmer organisations are actually in informal organisations which might lack proper knowledge on cattle-production skills to assist these farmers.

This is corroborated by the argument cited by Tolemariam (2010) who reported that farmer organisations in other parts of the sub-Saharan Africa such as Ethiopia are mostly weak and lacking in farmer entrepreneurial orientation among others. Boas & Goldey (2005) also emphasised this view by reporting that farmer organisations similar to those adopted by farmers in the study area were largely characterised by poor leadership and misdirected objectives which often result in the failure of these organisations. Mmbengwa *et al.* (2011) also corroborate this view. However, it might not be entirely unfamiliar that belonging to a farmer organisation has some negative implications. In a study conducted in the Irish dairy farming, Breen (2007) also

found that farmers who belonged to a farmer organisation known as the Rural Environmental Protection Scheme (REPS) for example had reduced milk production, lower stocking rates and lower gross output per hectare among their dairy animals compared to their counterparts.

In addition, the positive and significant relationship between membership of the communal cattle farmers in farmer organisations and farm record keeping in the study area as revealed in Table 9.1 for example might suggest that encouraging these farmers to join farmer organisations might improve their probability to keep farm records. The results of the study revealed that an increase of a unit of farmer membership in formal farmer organisations among the communal cattle farmers in the study area might lead to an increase of farm record keeping by 0.0077. It is therefore in the context of these results that communal cattle farmers in the study area have to be encouraged to form; belong and actively participate in farmer organisations, particularly formal organisations. Their membership and active participation in these organisations might increase their probability to access the benefits that arise from being members in these kinds of organisations — especially formal organisations (Uchezuba *et al.*, 2009).

In view of the importance of farmer organisations, the South African government initiated the formation of the so-called Broadening Agricultural Service and Extension Delivery (BASE) programme to encourage farmer membership in farmer organisations among communal farmers (Grwambi *et al.,* 2006). According to Ouma & Abdulai (2009), in countries such as Kenya, communal farmers organise themselves through farmer cooperatives (4.0%), family welfare groups (29.0%), informal social farmer groups (27.0%), Micro Finance Institutions (2.0%), women groups (35.0%) and other unspecified groups (3.0%). The same authors revealed that these farmers also use these groups to access agricultural extension advice, rotational savings, and purchase of income-generating equipments and pooled labour service — especially on rotational basis. This is because these groups mostly act as support initiatives and facilitators for local development, economic growth-tool and improved socio-economic welfare (Mmbengwa, 2009) — especially in areas where governments show incapacity to render and provide such services (Netswera, 2004). Organized farmers might grow their confidence, credibility and performance with regard to production and mainstream formal market participation among others (Machete *et al.,* 2004). Government programmes also are crucial for farmer organisation in South Africa— the so-called CASP being one of the many farmer-support programmes assisting mainly communal farmers in the rural areas — especially in the former Bantustans.

9.3 PARTICIPATION OF COMMUNAL CATTLE FARMERS IN THE CASP

In addition to farmer organisations, the results of the study revealed that government-initiated Comprehensive Agricultural Support Programme (CASP) is the only functional farmer support programme in the study area. The results of the study revealed that 30.9% of the communal cattle farmers in the study area actively participate in this programme. Fewer communal cattle farmers participate in this programme because it has only been introduced by the Limpopo Department of Agriculture in only one village (Dolidoli) in this study area. Of these communal cattle farmers who participate in the Comprehensive Agricultural Support Programme (CASP), only 18.2% have participated for a period of between one and five years, less than one year (14.6%), over five years but less than ten years (45.5%) undisclosed participation period (3.6%) as indicated in Figure 9.1.

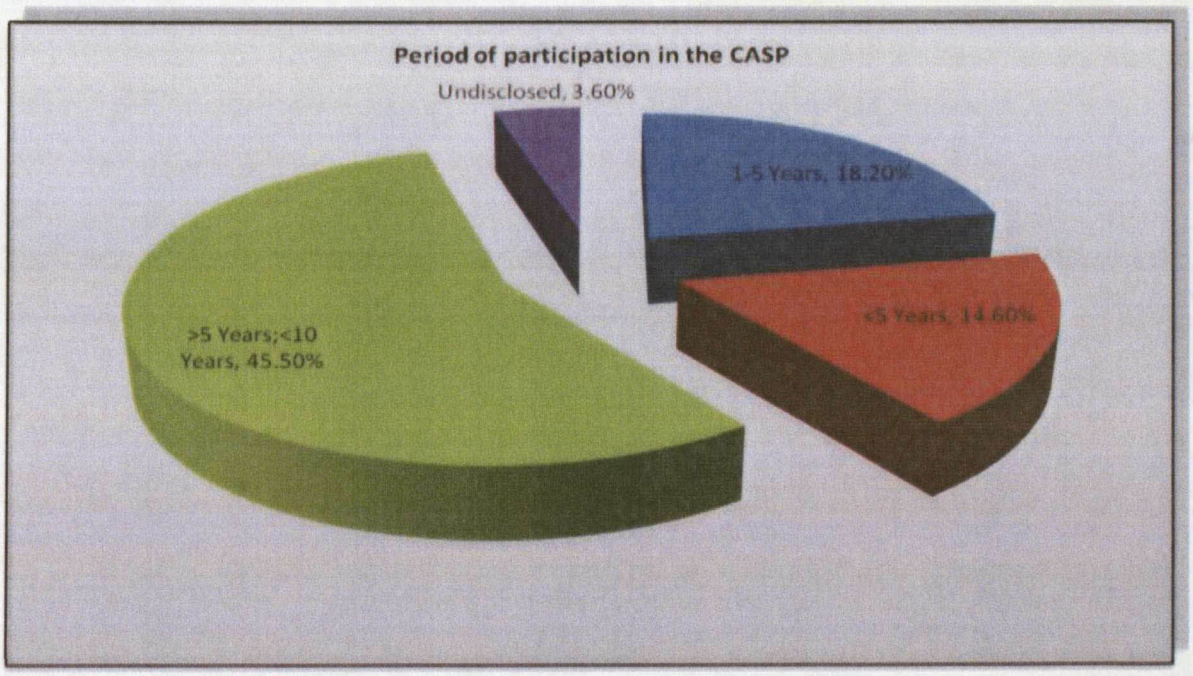


Figure 9.1: Farmer participation period in farmer organisations among communal cattle farmers in the Musekwa Valley

However, what is constraining farmer participation in the Comprehensive Agricultural Support Programme (CASP) remains the fact that the majority of the communal cattle farmers in the study area (76.4%) are not yet familiar with this programme. In other words, these farmers might be lacking in the access of proper information on this programme. The fact that the majority of these farmers are not familiar with this programme makes it difficult for some of these farmers to actively participate in this programme. The implication is that those farmers who are not yet

familiar with this programme might miss out on this crucial farmer support initiative — especially with regard to on-farm infrastructural development, access to cattle farming information; farmer training, financial access and commodity marketing which this programme is meant to provide (Hall & Aliber, 2010).

However, it is mostly common for communal farmers to lack proper awareness, knowledge and understanding of farmer organisations and government programmes operating in their areas in South Africa — especially where the mechanisms to popularize such programmes among farmers remain largely limited and inaccessible. For example, Baloyi (2010) found that approximately 52.0% of the farmers in the tomato farming subsector in the Limpopo Province neither knew nor understood how the Limpopo Tomato Growers Association operated. This might be emanating from the fact that most of these farmers joined the organisation only at the advice of the extension officers rather than their own initiatives. Beneficiaries of farmer organisations respond better when they are the main actors in terms of identifying and prioritising their needs (Mazibuko, 2010). In this case, these farmers might be feeling that they were not the owners of the organisation – and hence their lack of participation.

The implication of this unawareness of farmer support programmes and organisations is that crucial agricultural support initiative which might have been very crucial in assisting the communal cattle farmers in the study area to access crucial production factors and improvement of their mainstream formal marketing opportunities is seriously compromised. Reasons for non-participation in the Comprehensive Agricultural Support Programme (CASP) in particular varied from farmer to farmer. For example, 52.7% of the cattle farmers in the study area lack valid reason for their non-participation, 27.3% do not participate because they were never invited to participate, 10.9% lack interest and 9.1% have other unspecified reasons for not participating as indicated in Table 9.2.

Table 9.2: Reasons of non-participation in the CASP among communal cattle farmers in the Musekwa Valley

Reason	**Frequency**	**Percentage**
Do not have valid reason	29	52.7
Never invited to participate	15	27.3
Lack of interest in the CASP	6	10.9
Unspecified reasons	5	9.1
Total	55	100

High illiteracy levels among some of the communal cattle farmers in the study area might also be a crucial factor affecting commercialisation of this subsector. For example, as a result of high illiteracy levels among some of the communal cattle farmers in the study area, some communal cattle farmers find it difficult to recall some of the details such as the periods of their participation in the Comprehensive Agricultural Support Programme (CASP) in particular. It is evident that the majority of the communal cattle farmers in the study area have participated in the Comprehensive Agricultural Support Programme (CASP) for shorter periods. This might be pointing to the fact that it is difficult for illiterate and resource-poor farmers with limited access to information on important programmes to have time to contribute to agricultural development activities and initiatives (Ahmad & Talib, 2011). As a result, this might compromise their well-deserved government assistance.

In addition, according to Jera & Ajayi (2008), communal farmers who participate in farmer organisations and government farmer assistance programmes for longer periods are expected to increase their benefits particularly in terms of access of production inputs, access of mainstream formal market information and adoption of new technologies among others. The fact that the majority of the communal cattle farmers who participate in the Comprehensive Agricultural Support Programme (CASP) in the study area have done so for shorter periods might also have some negative implications. These farmers might compromise their access to crucial benefits for being members in this programme. The reasons for these farmers to participate for only shorter periods in this programme might vary.

Poor government communication and publicity on this programme and in addition lack of confidence among the farmers on this programme might also contribute to shorter periods of participation. Furthermore, participation for shorter periods in this programme might be caused by the ineffectiveness of this programme to meet the expectations of farmers particularly those who participate in this programme. This might result in those other farmers outside the programme getting discouraged. In addition, organisational challenges within the Comprehensive Agricultural Support Programme (CASP) might also play a crucial role in terms of non-participation decisions of the farmers in this programme. These factors corroborate the findings of Stockbridge *et al.* (2003) who argued that lack of organisational leadership in farmer organisations and programmes might render such programmes and organisations ineffective and inefficient which might discourage non-member farmers to consider participation in such programmes and organisations. The perceptions of communal cattle farmers in the study area on

how they value and regard the Comprehensive Agricultural Support Programme (CASP) revealed mixed reactions among farmers. For example, only 20.0% of the communal cattle farmers in the study area regard the Comprehensive Agricultural Support Programme (CASP) as a good programme, 45.5% as just fine — whereas 34.5% regard programme as bad as indicated in Table 9.3.

Table 9.3: Rating of the CASP by communal cattle farmers in the Musekwa Valley

Rating of the CASP	**Frequency**	**Percentage**
Just fine	25	45.5
Bad	19	34.5
Good	11	20.0
Total	55	100

However, these perceptions might largely indicate some poor judgment of this programme by the majority of these farmers based on the lack of proper information and knowledge on this programme. As a result of lack of proper dissemination of information between government and rural farmers in particular, it is common that farmers have misconceptions on government programmes (Parikh, 2007). Farmer misconceptions on government programmes with regard to the Comprehensive Agricultural Support Programme (CASP) in particular might negatively affect the intended objectives of the Comprehensive Agricultural Support Programme (CASP) among the communal farmers in this study area.

One crucial factor which might play a major role in determining participation and improvement of positive perception on the Comprehensive Agricultural Support Programme (CASP) in particular concerns the programmes' leadership structures. It is generally agreed that people often participate well in organisations where they actively take leadership roles in particular. However, in the case of the study area, the results of the study revealed that a mere 7.3% of the communal cattle farmers in the study area are in the management structures of the Comprehensive Agricultural Support Programme (CASP) whereas 92.7% do not take part in the management structures of the Comprehensive Agricultural Support Programme (CASP). On the other hand, those farmers who have understanding of the CASP have considerable expectations of this programme. The majority of these cattle farmers want the Comprehensive Agricultural Support Programme (CASP) to assist them to access on-farm infrastructure such as grazing camps (70.9%), animal weighing scales (21.8%) and building of dipping tanks (7.3%) as indicated in Table 9.4.

Table 9.4: On-farm infrastructure from the CASP expected by communal cattle farmers in the Musekwa Valley

Infrastructure	Frequency	Percentage
Grazing camps	39	70.9
Animal weighing scales	12	21.8
Dipping tanks	4	7.3
Total	55	100

Most of these infrastructure and equipments in the study area have been vandalized — and are derelict or in a state of total disrepair. Despite the obvious need to have better infrastructure among these farmers, it is also imperative to understand that development of infrastructure in most developing regions is often constrained by high costs (Satyasai & Viswanathan, 1997) which might result in poor agricultural productivity, poor economic rehabilitation among the rural poor and stalled commercialisation initiatives among others (Cuellar *et al.,* 2006; Mangwiro, 2007; New Agenda, 2007).

Improved infrastructure on the other hand might encourage, enhance and improve competition and investment in agricultural trading particularly livestock production among remote-based farmers particularly those in the communal areas (Makhura & Wasike, 2003; Musemwa *et al.,* 2008; Mwabu & Thorebecke, 2001; Ngqangweni & Delgado, 2002). In addition, in terms of general farmer support, communal cattle farmers in the study area expect the Comprehensive Agricultural Support Programme (CASP) to assist them access on-farm infrastructure (23.6%), farmer training (18.2%), acquisition of breeding bulls (25.5%), financial access (9.1%), dissemination of mainstream marketing information (7.3%) and other unspecified needs (16.4%) as indicated in Table 9.5.

Table 9.5: Expected assistance from the CASP by communal cattle farmers in the Musekwa Valley

Assistance	Frequency	Percentage
Breeding bulls	14	25.5
Farmer training	10	18.2
Infrastructure	13	23.6
Financial assistance	5	9.1
Marketing	4	7.3
Other	9	16.4
Total	55	100

It is understandable that most communal cattle farmers would want the CASP to assist them acquire breeding bulls as the majority of these farmers lack bulls of their own. In the Free State Province of South Africa, Rege *et al.* (2006) reported that communal cattle farmers were mainly interested in farmer training (36.4%), technical advice (33.6%), financial support (16.8%) and improved market access (13.2%). It is evident that interests of farmers differ from region to region depending on needs and circumstances of the farmers. For example, the results of the study revealed that farmers in the study area are largely concerned of animal production as indicated by the kind of infrastructure and productive resources they would want the CASP to assist the with — infrastructure such as grazing camps, productive resources such as breeding bulls and skills such as financial management among others. It might be that these farmers are highly entrepreneurial in their thinking — something which is mostly lacking among communal cattle farmers in most regions of sub-Saharan Africa (Mmbengwa, 2009).

However, it is clear that the desire to improve the marketing side of cattle-production practices among the communal cattle farmers in the study area is still low as compared to those reported by Rege *et al.* (2006) among communal farmers in the Free State Province, South Africa. For example, only a few cattle farmers in the study area would like to access mainstream formal marketing information technologies and related infrastructure development among others — which are the main focus of the communal farmers in the Free State Province. The implication is that commercialisation might have to especially be considered first on the inputs side before it might be on the market side in recognition of the interest of the communal cattle farmers in the study area. However, commercialisation is under normal circumstances expected to take place simultaneously on the inputs and outputs side.

9.4 CONCLUSION

A vast majority of the communal cattle farmers in the study area are not members of any formal farmer organisation. This might deny these farmers considerable opportunities to access new cattle farming innovations in production and mainstream formal marketing in particular. However, there are a few farmers who are active members of some informal farmer organisations. Younger farmers are more active in these organisations than older farmers. Farmer organisations are crucial intermediaries between farmers and markets. For communal cattle farmers to become increasingly commercialised, it also depends on the type of cattle marketing channels they are able to access — and hence the focus of this study on the choice of cattle marketing channels used by farmers in the study area.

CHAPTER 10

CHOICE OF CATTLE MARKETING CHANNELS AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"....livestock systems are characterised by long marketing chains featuring great distances, numerous phases of weight gain and feeding regimes, multiple levels of traders and transactions, a multitude of steps and stages of processing, and a variety of employment creating services and inputs..." Shiimi *et al.* (2010)

10.1 INTRODUCTION

Davies (2008) argued that livestock marketing in sub-Saharan Africa existed long before the dawn of colonial regimes in the region because Africans had been by their nature active traders and participants in the exchange economy prior to their isolation and colonisation. Davies (2008) further contends that subsistence agriculture and lack of active involvement of the African indigenous farmers in mainstream formal economy were not common even in the so-called "*primitive Africa*". The notion of indigenous Africans being subsistence farmers and not active participants in economic transactions is based on stereotypical distortions of agricultural market practices of the indigenous Africans that sought to create a primitive image of these indigenous African farmers as peasantry only erking out a living from agriculture. Thriving mercantile agricultural economies with established markets, coinage and international trading were in existence in some regions of the African continent as far back as the ancient and medieval empires – even in pre-colonial Ethiopia, Ghana and Zimbabwe among others. It is therefore historical that livestock marketing has been a core agricultural practice factor of indigenous African farmers for decades – and should therefore be enhanced, promoted and consolidated – especially in current dispensation in which "*...African farmers often stand with one foot in subsistence and one in the market...*" (Davies, 2008).

This chapter premises that mainstream formal livestock marketing has been and still is an integral part of livestock production systems in sub-Saharan Africa – especially in this study area. However, the chapter acknowledges that mainstream formal livestock marketing activities among communal farmers in the developing regions are currently generally weak and inefficient.

Poor, weak and inefficient marketing of livestock is also very common in sub-Saharan Africa countries such as Ethiopia and Uganda among others (Ruhangawebare, 2010; Tolemariam, 2010). The main objective of this chapter is to therefore identify and discuss the reasons for the adoption of various marketing channels among the communal cattle farmers in the study area. This chapter investigates both the informal and mainstream formal cattle marketing channels adopted by the communal cattle farmers in the study area. A clear understanding in the adoption and choice of a particular cattle marketing channel among the communal cattle farmers in the study area requires a proper understanding of the reasons for cattle production among the communal cattle farmers in the study area. The behaviour and conduct of the communal cattle farmers in the study area are expected to be influenced mainly by the reasons for cattle production in particular. However, demographic and endowment typologies of the farmers are expected to critically influence household behaviour with regard to marketing decisions. For example, well-endowed households might find it easier to participate in both markets whereas poorly-endowed households might find the informal market more affordable and easier to access.

10.2 REASONS FOR CATTLE PRODUCTION AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

This study revealed that 89.1% of the communal cattle farmers in the study area actively participate in cattle marketing. It is only a few of the farmers (10.9%) in the study area who do not participate in cattle marketing. Key informant interviews revealed that farmers who do actively participate in cattle marketing activities have different reasons which include among others; lack of sufficient numbers of animals, high marketing transaction costs while others prefer to keep their animals to produce food such as milk and meat. It is surprising result because generally, the Limpopo Province has a large number of cattle marketing outlets and abattoirs in particular where cattle farmers might sell their animals (Oloo *et al.*, 2010). It is imperative to find the reasons for this anomaly in the study area.

The results of the study revealed that those farmers who participate in cattle marketing activities do so in order to raise some disposable cash (90.9%), control and manage overstocking (7.3%) while some participate when there are available cattle traders offering to buy their animals (1.8%). Raising household disposable income from livestock sales has been a common practice in most regions of sub-Saharan Africa – especially among communal farming households. Approximately 78.0% of household income in these communities is generated through livestock

trading (Ashley *et al.*, 1999). In addition, the results of the study revealed that the majority of the communal cattle farmers in the study area have most importantly associated their animals with food production (65.5%), savings (21.8%), creation of wealth (10.9%) and personal status (1.8%) as indicated in Table 10.1. Among the Turkana tribe of Kenya, wealth and prestige dominate (Juma, 2009).

Table 10.1: Reasons for cattle production among communal cattle farmers in the Musekwa Valley

Reasons for cattle production	**Frequency**	**Percentage**
Food production	36	65.5
Savings	12	21.8
Creation of wealth	6	10.9
Personal status	1	1.8
Total	55	100

Juma (2009) substantiated the assertion that the Turkana tribe in Kenya mainly kept their cattle for wealth and prestige as hinted by one Lokichar villager in Turkana District who said *"...the Turkana know each individual animal. It is all they do. They don't build houses, they don't drive motor cars – they just have animals. Their life is animals..."* It is clear from this statement that the Turkana tribesmen value their animals more than other material gains like houses and cars. This practice is in contrast with the conduct of the farmers in this study area as clearly shown by the results of this study which revealed that while the cattle farmers in the study area are more concerned with food production, they also participate in cattle trading and marketing activities in order to generate needed income to take care of other important purchased household inventories.

Participation in the marketing of cattle in this study area among the communal cattle farmers might improve household income which might further increase the probability of these cattle farmers increasing cattle production and participation in cattle marketing activities (Oduro & Osei-Akoto, 2007). Increased productivity and market benefits might provide a valuable incentive for the communal farmers to invest and improve their production systems (Alfaro, 2004). However, the results of the study revealed that 50.9% of the communal cattle farmers in the study area who sell some of their animals do not consider market trends when selling. Lack of proper information and complicatedness of the information might be playing a role in lack of market trend investigations because key informant interviews revealed that accessing market information is extremely difficult among the farmers. In addition, where the information is

available, it is often published in English or Afrikaans – languages which most of the farmers have poor understanding. Lack of market research prior to selling might result in huge losses of potential income and profit through exploitation by the cattle marketing agents such as speculators and auctioneers for example (Uchezuba *et al.*, 2009). However, on the other hand, what is most importantly good for commercialisation of this subsector in the study area is that the results of this study revealed that 49.1% of the communal cattle farmers in the study area show some level of understanding of the mainstream formal cattle marketing issues by considering market trends prior to selling their animals. The adoption of market trend investigations by some of these cattle farmers in the study area might result in profitable and sustainable cattle farming enterprises – with an ultimate incentive of making more farmers to sell to the formal marketing channels.

10.3 DISSEMINATION OF CATTLE MARKETING INFORMATION AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

Farmers depend on different information sources for commodity marketing. The results of the study indicate that word of mouth (47.3%), community meetings (36.4%), radio (9.0%), other unspecified agents (5.5%) and farmer magazines (1.8%) as indicated in Table 10.2 are widely adopted by cattle farmers in the study area to disseminate market information activities. In the Central Western Uganda, the communal cattle farming households also rely on fellow cattle farmers (58.7%), traders (21.7%), family members (10.9%), Farmer organisations (4.3%) and radio (4.3%) to access information (Ruhangawebare, 2010). This shows that cattle marketing forms part of the communal cattle farmers in most parts of sub-Saharan Africa region.

Table 10.2: Source of information used in cattle marketing among communal cattle farmers in the Musekwa Valley

Source of information	Frequency	Percentage
Word of mouth	26	47.3
Community meetings	20	36.4
Radio	5	9.0
Other	3	5.5
Farmer magazine	1	1.8
Total	55	100

These results are in line with those of Grwambi *et al.* (2006) and Jacobs (2008) who found that communal cattle farmers in some communal areas of South Africa adopted some of these information dissemination sources in their cattle marketing strategies. In addition, the same

authors reported that mobile phone text messages, extension officers, organized farmer meetings, networking with white commercial farmers, early-morning radio shows broadcasting in local languages and postal mail also are popular cattle marketing information dissemination sources. Furthermore, the results of the study are also in agreement with those reported by various other researchers in the Eastern Cape Province in South Africa, India and Nigeria among others (Abaru *et al.*, 2006; Kormawa *et al.*, 2004; Musemwa *et al.*, 2010). For example, in some parts of the Eastern Cape Province of South Africa, Musemwa *et al.* (2010) found that friends, neighbours and traders are the major sources of information among communal farmers. It is evident that informal information sources are mostly ineffective and unreliable to disseminate information. This might be the result of a large number of farmers in the Eastern Cape Province who are unable to access information as a vast majority of these farmers (80.0 %) are reportedly unable to access such crucial information.

On the other hand, Kormawa *et al.* (2004) found that farmers in countries such as India and Nigeria preferred fellow farmers as source of agricultural information. According to Abaru *et al.* (2006), these information dispensing sources link the communal farmers with the potential marketing channels. Access to information might reduce market searching and other transaction costs (Randela, 2005) resulting in improved marketing opportunities and mainstream formal market participation in particular (Enete & Igbokwe, 2009) particularly among those cattle farmers targeting the mainstream formal marketing channels who might also increase production and output commercialisation (Oduro & Osei-Akoto, 2007). In addition, Musemwa (2008) argued that access to information might also promote rational, relevant decision-making on cattle marketing issues while strengthening the ability of the cattle farmer in terms of negotiations with potential traders. This efficient marketing system might stimulate increased production in particular (Enete & Igbokwe, 2009).

However, the results of the study further revealed that communal cattle farmers in the study area also depend on unreliable and inconsistent means to disseminate cattle marketing information particularly with regard to the mainstream formal market. The most popular information dissemination strategies used by the communal cattle farmers in the study area confine information within the local villages with limited access option for the mainstream formal marketing channels in particular. However, the extension officers tend to be more reliable and effective as the empirical results of the study revealed that a unit increase of access to extension service among the communal cattle farmers in the study area might lead to an increase in the

number of cattle selling points by at least 0.0581 for example. This suggests that extension officers use their superior skills to create extensive cattle marketing bases for the cattle farmers. However, in contrast, Dlamini (2010) expressed doubts on the effectiveness and reliability of extension service as source of information dissemination among communal farmers in South Africa – arguing that it has not been effective in regions such as KwaZulu-Natal in South Africa. Recognising the fact that extension service in communal areas remains crucial for information dissemination – especially in this study area might be positively crucial for the commercialisation of the cattle-production subsector in the Musekwa Valley. In addition, the results of the study also revealed that a decrease in access to extension service might lead the cattle farmers in the study area to increase and rely on advertisement for their sales as indicated in Annexure E. This might suggest that less access to extension service and officers makes cattle farmers in the study area increase their sales advertisement in order to create a reliable and quicker mainstream formal cattle marketing base. In other words, reduced access to extension service among the communal cattle farmers in this study area has effect on advertisement of sales. This result is corroborated by Ajieh *et al.* (2008) who showed that agricultural extension still dominate as information source among communal farmers especially in the developing regions. Access to their information might improve farmer performance while reduced access might lead to farmers having to seek for other alternative means such as advertising.

Apart from extension service, the key informant interviews revealed that cattle farmers in the study area however still lack proper access to information dissemination tools such as television, newspaper, agricultural magazines, journals and periodicals in particular. This lack of access to these important information dissemination tools results in the dearth of usage of these tools among cattle farmers in the study area to disseminate cattle market information to potential traders. In this regard, cattle farmers in the study area opt for convenient, cheaper and quicker social network means to disseminate cattle market information to potential marketing channels. As a result, communal cattle farmers intending to sell some of their animals in the study area are more likely to reach mostly the small local informal marketing channels more than the mainstream formal marketing channels which are basically not targeted through these marketing strategies.

It is therefore expected that communal cattle farmers in the study area might lack the necessary incentive to participate in the mainstream formal cattle market. These farmers are expected to choose to sell some of their animals from home or at farm gate as mainstream formal market

participation is generally increased by improvement of marketing opportunities which might also increase production and promote output commercialisation (Oduro & Osei-Akoto, 2007). Cattle farmers in the study area have identified market information dissemination as a crucial factor affecting their performance particularly with regard to mainstream formal market participation. This is corroborated by the results of the study which revealed that a vast majority of the communal cattle farmers (95.5%) in the study area need assistance with access to mainstream formal cattle marketing information particularly auction dates (36.4%), cattle market prices (38.1%) and available mainstream formal marketing channels (27.5%). Baloyi (2010) corroborated these findings when reporting that access to information on product pricing, availability of mainstream marketing channels and correct times of selling the animals remain very difficult to access among communal cattle farmers in most parts of communal South Africa. As a result of this high number of willing cattle farmers in the study area to access mainstream formal cattle marketing information, the probability of these cattle farmers to participate in the mainstream formal cattle marketing remains more likely to increase. In addition, cattle farmers in the study area want to access mainstream formal cattle marketing information on monthly basis (45.5%), daily basis (27.3%), weekly (14.6%) and at least twice in a year (12.7%).

Access to mainstream formal cattle market information might improve the bargaining powers of these farmers when engaging in the mainstream formal cattle marketing activities among others (Montshwe, 2006). These results indicate that the majority of the cattle farmers in the study area are interested in receiving mainstream formal cattle market information timeously. This means that the majority of these farmers might be able to plan for the mainstream formal markets, participate and to take informed decisions on these markets unlike those cattle farmers who are only willing to receive mainstream formal cattle market information after some long periods.

10.4 MARKETING CHANNELS AMONG THE COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

The results of the study revealed that some communal cattle farmers in the study area did not participate in the market whereas those who participated adopted two prominent cattle marketing patterns. Those who participated in the marketing of cattle sold their animals to the informal and formal marketing channels. Cattle marketing practices among the communal cattle farmers in the study area corroborates the findings reported by Davies (2008) who hinted that "*...African farmers often stand with one foot in subsistence and one in the market...*" In the Central Western Region of Uganda's communal cattle farming area, Ruhangawebare (2010) also reported that

there were two main cattle marketing channels; the informal and formal marketing channels. The results of the study revealed that the majority of the farmers in the study area mainly sell their animals to the informal marketing channels (56.4%) as indicated in Figure 10.1.

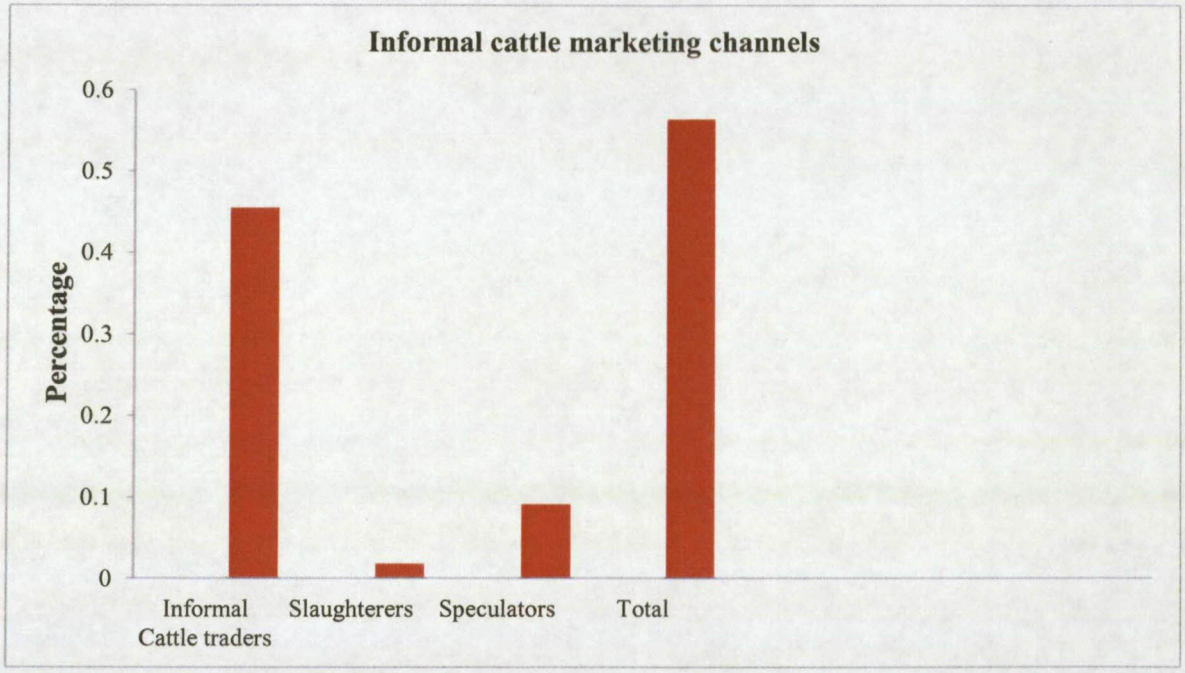


Figure 10.1: Informal cattle marketing channels among communal cattle farmers in the Musekwa Valley

These results are in line with those of Jari (2009), Montshwe (2006) and Musemwa *et al.* (2008) who reported that some communal cattle farmers in South Africa sell most of their animals through the informal cattle marketing channels in particular. However, the results reported by Ruhangawebare (2010) in the Central Western Region of Uganda are in contrast with those of the study as the majority of the cattle farmers in Uganda's Central Western Region mainly sell their animals to abattoirs (56.0%) and butcheries (10.0%) with only a few selling to fellow cattle keepers (16.0%) and the local informal buyers (18.0%). Comparatively, these results revealed that communal cattle farmers in the Central Western Region of Uganda are more commercialised in terms of cattle marketing while their South African counterparts particularly at the study area are still lagging behind, doing much of their business in the informal market.

This pattern of cattle marketing in the study area might be as a result of lack of incentives among these cattle farmers to produce beyond subsistence means and lack of alternative marketing channels among others (FAO/WFP, 2007). This might be corroborated by the submission of

Ruhangawebare (2010) who further reported that communal cattle farmers are often compelled to sell their animals to the informal marketing channels as a result of poor institutional infrastructure, poor road networks, high transaction costs, poor quality of their animals, lack of market information and poor marketable numbers among others. Of these cattle farmers who sell their animals to the informal marketing channels at the study area, the majority sell to informal private cattle traders (45.5%), speculators (9.1%) and slaughterers (1.8%) as indicated in Figure 10.1. These results are corroborated by Randela (2000) who found that approximately 44.0% of the communal cattle farmers in the former Lebowa homeland in South Africa sold their animals to private cattle traders such as those buying for weddings and funerals among others.

On the other hand, the results of the study revealed that 43.6% of the cattle farmers in the study area sell their animals to the mainstream formal cattle marketing channels such as auctions (7.3%), butcheries (30.9%), cooperatives (3.6%) and abattoirs (1.8%) as indicated in Figure 10.1. In contrast, approximately 66.0% of communal cattle farmers in the Central Western Region of Uganda sell their animals to the mainstream formal marketing channels; mainly to abattoirs (56.0%) and butcheries (10.0%). The results of the study confirm that the majority of communal cattle farmers in Southern Africa in particular sell their animals to speculators and private buyers; particularly those buying for weddings and other social functions (Bailey *et al.*, 1999; Jari, 2009; Musemwa *et al.*, 2010; Musemwa, 2008; Nkhori, 2004 and Nthakheni, 2006).

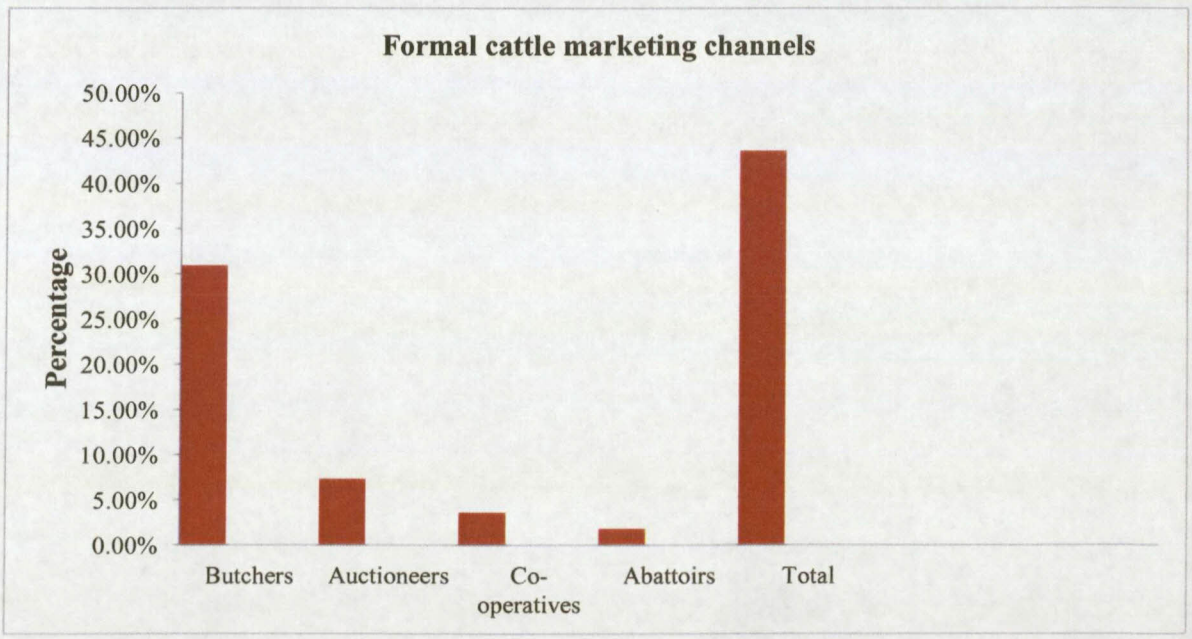


Figure 10.2: Formal cattle marketing channels among communal cattle farmers in the Musekwa Valley

These marketing strategies revealed that varying and multiple cattle marketing channels preferences and options are employed by communal cattle farmers in South Africa in general as corroborated by Guvele (2001). For example, in the Kwamasele village and Amatole basin in the Eastern Cape Province of South Africa, the majority of cattle farmers sell their cattle to the mainstream formal cattle market as between 40.0% and 60.0% of the communal cattle farmers sell their animals through the mainstream formal marketing channels. This might suggest that communal cattle farmers in these areas are highly commercialised in terms of the choice of cattle marketing channels. However, the fact that the informal marketing channels are the most popular among the communal cattle farmers in the study area might be a reflection that communal farmers in the study area mostly prefer faster, cheaper and easily accessible marketing channels. These marketing channels might be preferred as a result of their perceived ability to provide these farmers with an option to determine prices of their animals without having to negotiate their transactions through complicated strategies such as cattle grading and commodity standardisation as is mostly the case in the mainstream formal cattle markets for example (Nkhori, 2004).

In addition, key informant interviews revealed that butchers in the study area do not buy local cattle for slaughtering as their customers prefer meat from butcheries and abattoirs from the local towns. These customers consider this meat to be of better quality than locally produced meat. These results are in line with those of Sones *et al.* (n.d) who argued that meat from the communal areas in South Africa is of poor quality. When the local butchers abstain from cattle market activities in the study area it might however further weaken potential market availability for these cattle farmers. The weakening of the local market might imply that farmers have to consider selling their animals to distant markets which might result in extended distances, searching costs and decreased profit margins. It might be discouraging for farmers to engage in cattle market activities in the long term.

Furthermore, the key informant interviews revealed that the butcheries in the study area also have a limited customer base that only needs small quantity of meat. Local butcheries therefore buy pieces of meat from the nearby towns to resell to the locals. Butcheries that buy cattle for slaughter from the study area therefore come from distant areas which might negatively impact on the market opportunities among the communal cattle farmers in the study area. In addition, these distant cattle marketing channels do not guarantee a sustainable marketing base as they are more likely to withdraw from the market in the study area due to erratic roads and long distances

which might result in reduced market options at village level (Mbilinyi & Nyoni, 2000; Mthembu, 2008).

The choice and preference of the cattle marketing channels among the communal cattle farmers in the study area differ from farmer to farmer depending on different factors. Factors such as farmer's geographical location, demographic characteristics, farmer endowments, available mainstream formal market information and technologies, availability of the mainstream formal marketing channels, price and distance are some of the factors which determine the choice of the marketing channel adopted by farmers (Jari, 2009; Montshwe, 2006; Musemwa *et al.,* 2008; Nkhori, 2004). For example, 47.2% of the cattle farmers in the study area sell some of their animals to the most popular trader, 25.5% to traders who guarantee a good price, 12.7% to the only available marketing channel, 9.1% to traders who guarantee faster transactions and 5.5% to traders who guarantee reduced transaction costs as indicated in Table 10.3.

Table 10.3: Reasons for the choice of the cattle marketing channels among communal cattle farmers in the Musekwa Valley

Reason	**Frequency**	**Percentage**
Most popular trader	26	47.2
Guarantee of good price	14	25.5
The only available channel	7	12.7
Guarantee of faster transaction	5	9.1
Guarantee reduced transaction costs	3	5.5
Total	55	100

This is understandable because the farmer's ability to engage in a market transaction is largely dependent on the ability to guarantee reduced transaction costs as such sale transactions might eventually be profitable and competitive in the long run (National Department of Agriculture, 2005). What is crucial however is that the results of the study also revealed that an increase on the exposure to risk such as cattle mortality tends to diversify and increase the probability of the farmers' cattle marketing options. The positive and significant (0.0002) relationship between choice of marketing channel and cattle mortality as indicated in Annexure E corroborates this assertion. These results suggest that when cattle mortality rates increase among these farmers, the probability of these farmers to increase their cattle marketing options also increases. These farmers might increase their marketing options in order to manage perceived mortality risk. In addition, the results of the study further revealed that cattle marketing channels in the study area

are reasonably reliable as 65.4% of these cattle farmers receive cattle traders throughout the year and only 34.6% receiving these traders intermittently.

Lack of transport ownership among the farmers in the study area plays a crucial factor in terms of mainstream formal cattle market participation. The majority of these farmers (63.6%) walk their animals or hires transport to take their animals to the cattle selling points due to factors such as lack of valuable infrastructure such as transport and other related infrastructure in their local villages or nearer these villages. The results of the study revealed as indicated in Annexure E that an increase of a unit of access to transport ownership among these cattle farmers might increase the options of these farmers to sell their animals at broader-based selling points. These results suggest that farmers might have increased options to also sell to distant markets. Musemwa (2008) reported that cattle farmers located in the remote areas in communal areas of South Africa are usually faced with lack of physical and institutional infrastructure. These farmers therefore transport or walk their animals to these long distance markets which might be counter-productive as this strategy is expected to impact on the physical conditioning of the animals (Shiimi *et al.,* 2010).

On the other hand, transportation of animals for long distance to the market might result in increased transaction costs (Mthembu, 2008). This might discourage these cattle farmers from active mainstream formal market participation. According to Pedrosa & Do (2009) this might become a major constraint to cattle production practices and market commercialisation. In addition, cattle farmers in the study area determine the prices of their animals during sales out of impulse as there are no animal weighting scales. This might result in massive losses of income and profit. Loss of income and profit might constrain productivity, sustainability and commercialisation of the farming enterprise. Figure 10.3 evidently shows that those traders buying cattle from communal cattle farmers in the study area for funerals (83.7%), weddings and other social functions (10.9%), to increase their stock (3.6%) and for undisclosed reasons (1.8%) are the most popular cattle marketing channels among the communal cattle farmers in the study area.

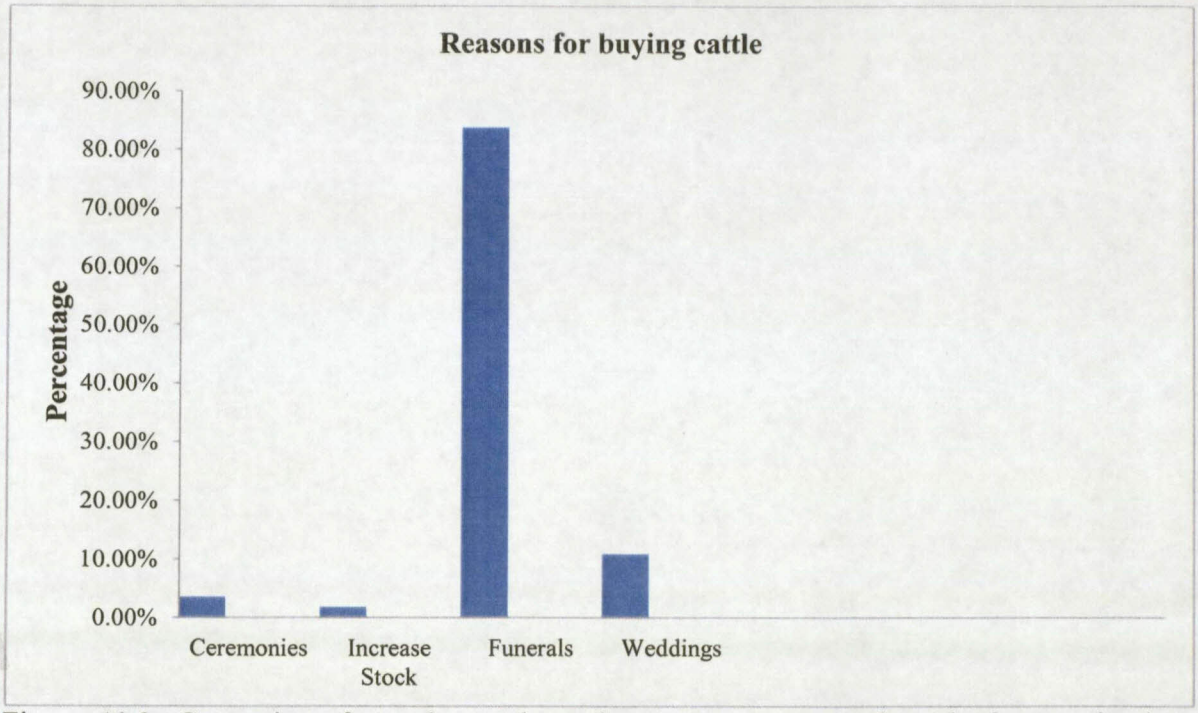


Figure 10.3: Categories of popular cattle traders among communal cattle farmers in the Musekwa Valley

The funeral market in the study area is expected to be more consistent because funeral buyers visit this area to buy cattle for slaughter in a weekly basis. This marketing channel might provide guaranteed sustainability of the informal cattle market which might become a constraint for the mainstream formal market. As a result of a strong funeral market, farmers might opt to abstain from active participation in the mainstream formal market, and therefore derailing the commercialisation initiatives.

10.5 SALE OF CATTLE BY-PRODUCTS AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

Apart from live animals, the majority of cattle farmers in the study area also sell milk (75.5%), manure (10.2%), other undisclosed cattle by-products (6.1%), hides (4.1%) and fresh dung (4.1%) as indicated in Figure 10.4.

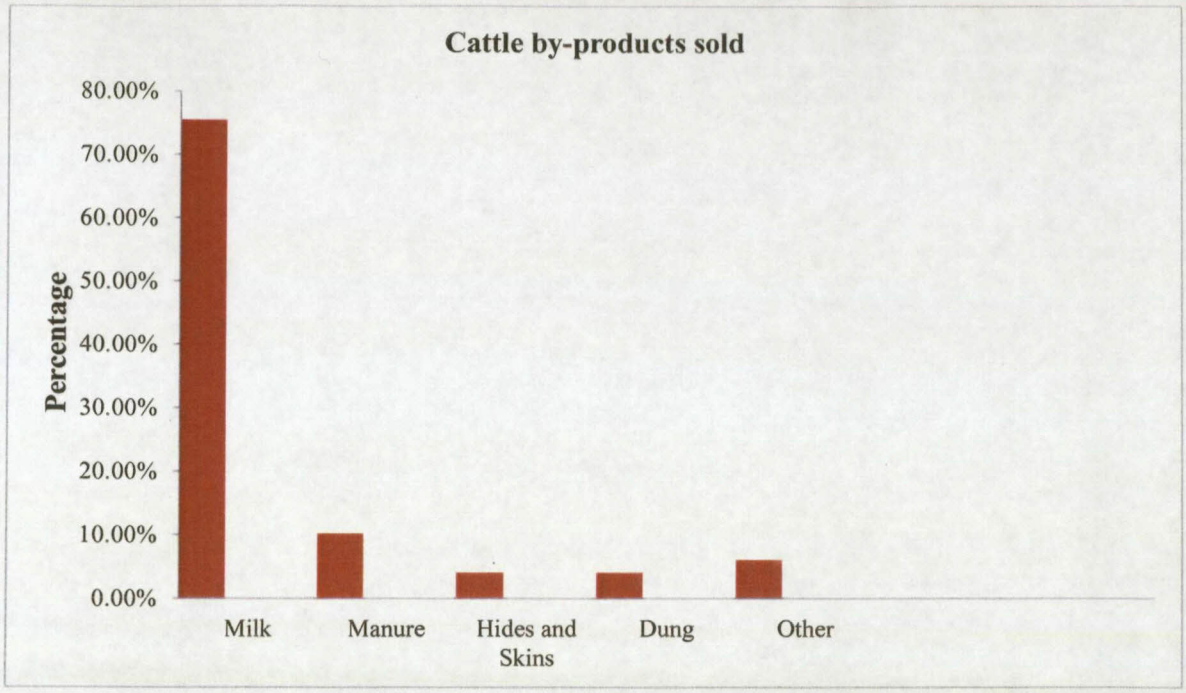


Figure 10.4: Cattle by-products sold by communal cattle farmers in the Musekwa Valley.

These results are in line with those of Randela (2000) and Rege *et al.* (2006) who reported that communal cattle farmers in other parts of South Africa also sell cattle by-products apart from live animals to supplement their income. The ability of these cattle farmers to sell these cattle products might provide these local cattle farmers with an opportunity to raise extra cash for other household purchased inputs and household service requirements. For example, milk in other parts of communal South Africa sells between R3 and R7 a litre depending on areas (Randela, 2000). In the study area, key informant interviews revealed that cattle farming households sold milk at R5 a litre to the locals and R7 a litre for the outsiders. This is in contrast with the findings reported by Kidanu (2010) who found that in some rural cattle farming communities in Ethiopia, farming households would rather sell butter as selling milk is culturally unacceptable and a taboo.

However, milk yields in the study area might be affected as a result of the type of cattle breeds kept by the communal cattle farmers in the study area. For example, the majority of the cattle farmers in the study area keep more Nguni and crossbred animals such as the Bonsmara. Mapekula (2009) argued that milk yields among these breeds are not yet known unlike in the case of the exotic Holstein breed which is commonly kept by the majority of communal cattle farmers in the Eastern Cape Province of South Africa for example. The Holstein breed is known

for its high milk yields in South Africa (Mapekula, 2009). In addition, choice of breed, number of lactating cows, farmer's objectives, high tick-borne disease prevalence among animals, poor water supply, feed supply, prolonged milking intervals, age and body weight of the dam at calving and animal stress might also have to be effectively controlled in order to increase milk yields among the animals (Mapekula, 2009; Marufu, 2008; Randela, 2000). Poor milk yields have also affected communal cattle farmers in the Kyankwanzi District, Uganda particularly among the Kyankwanzi indigenous cattle of the Nyankore (Msubuka, 2011).

Manure is dry matter which is used as fertilizer while fresh dung is used as floor polish by the locals particularly women (Randela, 2000; Swanepoel *et al.,* 2000). According to Gachimbi *et al.* (2004), manure production and its quality are largely influenced by cattle housing strategies and cattle-production systems including type of feed. Confined animals are expected to produce more and quality manure than animals that are not confined. Cattle farmers in the study area are expected to produce more and quality manure from their animals because they confine these animals to enclosures particularly at night. This might increase their probability to gain more manure buyers and income from manure sales. According to Randela (2000), a minimum of 4.0% and maximum of 83.0% of communal cattle farmers in South Africa sell manure at a cost of R1 per a 20 litre container and R265 per load of a one ton pick-up truck particularly to those traders who buy for crop production. The extra income generated from these cattle by-products is expected to improve the general livelihoods of the communal cattle farmers' households. These cattle farmers are expected to improve their economic conditions in terms of access to purchased household inventories and inputs than those cattle farmers with no cattle by-products to sell.

The majority of the traders who buy cattle products from the communal cattle farmers in the study area are locals (60.0%), traders from other places (32.7%) and visiting commercial traders such as hides and skin traders (3.6%). The implication is that the cattle farmers should be producing acceptable volumes of these cattle products as traders might require large stock particularly those buying for commercial reasons. In addition, this large base of locally-based informal cattle by-products traders might also provide sustainability of the informal market which might be detrimental to commercialisation of this subsector in the study area. Apart from milk, manure and hides, some cattle farmers in the study area slaughter and sell their cattle as meat (32.7%). As indicated in Figure 10.5, these cattle farmers mainly sell the meat to locals (61.8%), distant butcheries (29.1%), visiting buyers (3.6%) and other undisclosed buyers (5.5%).

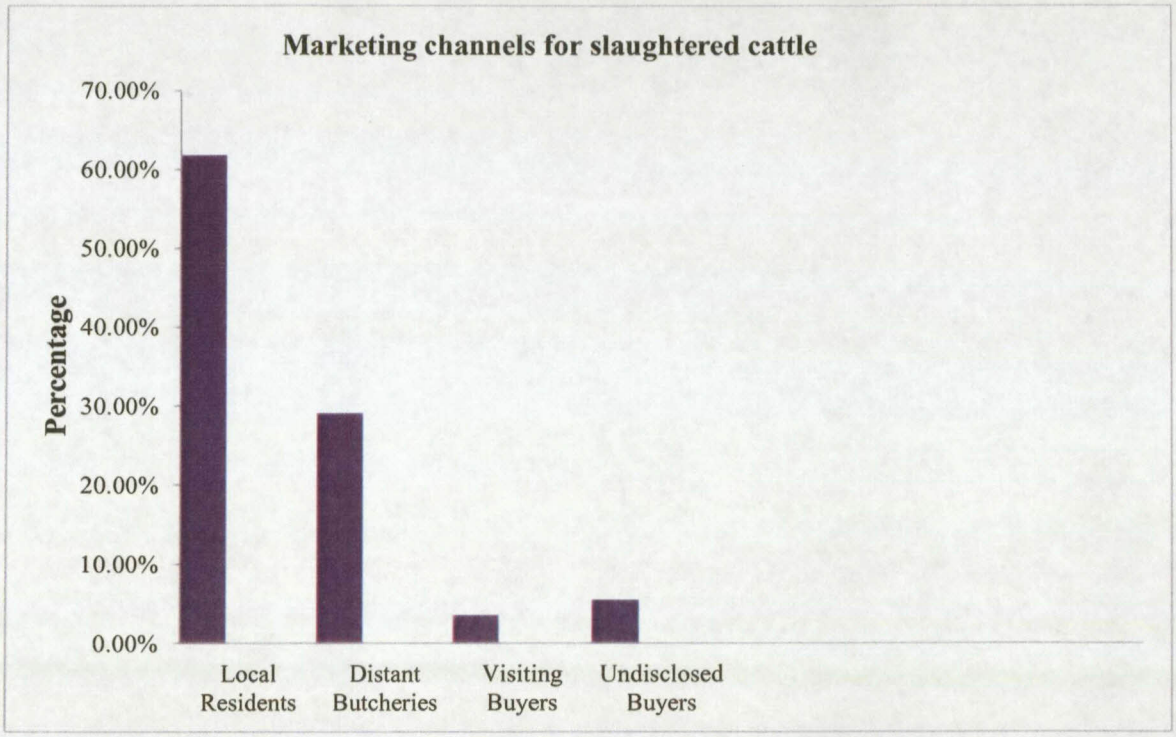


Figure 10.5: Marketing channels for slaughtered cattle among communal cattle farmers in the Musekwa Valley

However, the results reported by Randela (2000) in other parts of the communal areas in South Africa revealed that cattle farmers also slaughtered their animals particularly for occasions such as weddings and religious ceremonies only, with no intention to sell the meat. In addition, Barrett (1991) reported that communal cattle farmers in countries such as Zimbabwe slaughtered their cattle as a result of illness of the animal (36.0%), feasts (20.0%), and old age of the animal (16.0%), rituals (16.0%), accidents (4.0%) and other undisclosed reasons (8.0%). This shows that cattle slaughtering reasons among communal cattle farmers in the developing regions differ from region to region depending on various factors. The slaughtering of cattle might also increase the probability of market participation as this might increase cattle off-take rates (Montshwe, 2006). Of those cattle farmers in the study area who slaughter their animals, 54.6% of them seek for advice prior to slaughtering whereas 45.4% of them do not seek for any advice prior slaughtering. Possibilities are that sick animals might be slaughtered and eventually transmit contagious animal diseases to humans. In addition, female animals might be slaughtered when pregnant resulting in losses of potential calves and therefore affect available stock for the mainstream formal markets in future.

10.6 CONCLUSION

It is evident from these results that cattle market participation decisions and choice of the marketing channels among cattle farmers in the study area depend on a combination of factors. The results revealed that the formal and informal cattle marketing channels are central to cattle marketing activities in the study area. It is evident that although cattle farmers in the study area also target food production in their cattle farming practices, they also find cattle selling very important to generate needed income for other household purchased inputs and services. The majority of these cattle farmers participate in cattle marketing, however through the informal marketing channels. However, there are some cattle farmers in the study area who sell their animals through the mainstream formal cattle marketing channels.

In addition, cattle products such as milk, manure, hides and skins are also sold to generate additional household income in a multi-product system combining live animals. This kind of production and marketing system might play a major role in raising and improving the socio-economic endowments among these farmers' households. On the hand, improved access to household economic endowments might improve the general access to most of the factors of cattle production and market systems among these farmers' households in the study area. However, mainstream formal cattle marketing in the study area is constrained by increased reliance of the communal cattle farmers on the use of social networks as the main source of information dissemination to potential cattle traders. These strategies limit this information within the local informal marketing channels without reaching much to the formal cattle marketing channels. It should be noted however that the choice of these marketing strategies are greatly influenced by various factors such as farmer's demographic; technological and institutional circumstances and market preferences among others. In other words, from these factors, the productivity of the farm might be determined.

CHAPTER 11

ANALYSIS OF THE VARIABLES HAVING THE MOST SIGNIFICANCE ON FARM PRODUCTIVITY AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"...the extensive beef cow breeding herd remains the main source of beef for the ever growing consumer population and failure of the cow to conceive annually is the biggest constraint on optimum beef cattle production..." Moraka (2000)

11.1 INTRODUCTION

This chapter discusses the empirical results of the logistic regression model fitted to the survey results of the study to determine the variables having the most significance on farm productivity among communal cattle farmers in the study area. Increased farm productivity and low production costs are also envisaged to increase the probability of increased mainstream formal market participation among communal cattle farmers in the study area because in addition, more marketing channels might be attracted to these producers (Chitundu *et al.,* 2006). The objective of this chapter is to argue that while there are several factors having influence on the probability of the communal cattle farmers in the study area to increase farm productivity, there are however some factors which might have more significance on this than others. Farm productivity might be influenced by various factors such as poor herd performance, calving rates, high mortality rates among the herd, unrestricted use of grazing resources and land tenure systems among others (Mahabile *et al.,* 2005).

In addition, the objective of this chapter is to therefore identify those factors which might have the most significance on the probability of the communal cattle farmer to increase farm productivity in the study area using the so-called binary logistic regression model. Increased farm productivity might become an effective commercialisation strategy as it is also an effective economic development strategy among resource-poor farmers (Massuanganhe, 2008). It is premised that this chapter might provide crucial information for intervention planners — especially for commercialisation in improving productivity of the farm enterprise (Jacinta *et al.,* 2010).

11.2 SPECIFICATION OF THIS MODEL

Seventeen variables were fitted to the logistic regression model in order to achieve the objectives of this chapter. This model was chosen because of its ability to determine the effect of the selected variables on the probability of farm productivity and in addition, its ability to yield the highest predictive accuracy possible (Randela, 2005). In other words, this model is expected to explain the relationship reflected by the selected variables and farm productivity of the cattle-production systems in the study area. In addition, the binary logistic regression model has the ability to select the variables which have the most significance on farm productivity as envisaged in the study.

The **WEAN** is identified as the binary response variable for this model as indicated in Table 11.1 in which 1 = weaned a calf in the past 12 months; 2 = otherwise. In other words, cattle farmers in the study area are asked if they have weaned any calf in the past twelve months prior the study or not. Therefore, the response variable is "1" when the farmer weaned any number of calves in the past 12 months prior the study and "2" when the farmer did not wean any calf in the past 12 months prior the study. This model hypothesises that those cattle farmers in the study area who weaned calves in the previous 12 months prior the study are categorised as productive. Productive famers are more likely to commercialise their cattle-production systems than those farmers who did not wean any calf in the previous 12 months prior to the study. In addition, it is hypothesised that cattle farmers in the study area who did not wean any calf in the previous 12 months prior to the study are categorised as unproductive and therefore having increased levels of non-commercialisation probability. The functional form of this model is denoted in equation (1).

$$\text{In}\left(\frac{\phi i}{1-\phi i}\right) = \beta_0 + \sum_{j=1}^{K} \beta j \, X ij + \varepsilon i \qquad \textbf{(1)}$$

Where: j is the response category (1 or 2), i denotes cases (1,2,3, 4..., n), ϕ is the conditional probability, β_o is the coefficient of the constant term, β_j is the coefficient of the independent variable, X_{ij} is the matrix of observed values, ε_i is the matrix of unobserved random effects, $\frac{\phi i}{1-\phi i}$ is "odds" and $\text{In}\left(\frac{\phi i}{1-\phi i}\right)$ is the logarithm of "odds".

Equation (1) can be manipulated to give the odds ratio using equation (2)

$$\frac{\phi\, i}{1-\phi\, i} = \exp \left(\beta o + -\sum_{i=1}^{K} \beta i Xi \right) \quad (2)$$

The probability that the farmer weaned any calves in the past twelve months can be calculated using equation (3):

$$\phi_i = \frac{Exp\left(\beta_o + \sum_{i+1}^{k} \beta_j Xi_j \right)}{1 + Exp\left(\beta o + \sum_{i=1}^{k2} \beta j Xij \right)} \quad (3)$$

Equation (3) is intrinsically linear since the logit is linear in Xj (Gujarati, 1988); it indicates that probability ϕi lies between zero and one and vary non-linearly with Xi, the equation for calculating partial effects[1] of continuous variable is denoted by:

$$\frac{\partial \phi i}{\partial xi} = \phi i(1-\phi)\beta j \quad (4)$$

The partial effects of the discrete variables will be calculated by taking the difference of the mean probabilities estimated for the respective discrete variable, Xj =2 and Xj=1.

11.3 RESULTS OF THIS MODEL

Of the 17 covariates fitted to this binary logistic regression model, only **RECORDS** and **DISTANCE** covariates are retained as having the most significance at 5.0%. The other covariates are eliminated from the equation through interactive forward variable selection process of SAS (2009) as indicated in Table 11.1. As a measure of goodness of fit, the overall model fit was tested using the Hosmer & Lemesshow Goodness of fit test of linear/non-linear restriction and the results revealed that this model was appropriate and therefore a good fit for the data.

Table 11.1: Analysis of effects eligible for entry: Productivity model

Variable	DF	Score (Chi-square)	Pr-Chisq
AGE	1	2.3915	0.1220
EDUCATION	1	0.0398	0.8419
EMPLOYMENT	1	1.7727	0.1830
HHSIZE	1	0.4769	0.4898
FARMEXP	1	2.3637	0.1242
SYSTEM1	1	1.7877	0.1812
OWNERSHIP	1	1.9370	0.1640
RECORDS	1	12. 4939	0.0004*
SPOINT	1	3.5205	0.0606
DISTANCE	1	9.0751	0.0026*
ADVERT	1	0.3370	0.5616
EXTENSION	1	3.7297	0.0535
LOANS	1	2.1744	0.1403
INCOMESELL	1	1.6032	0.2054
TRANSOWN	1	0.1295	0.7190
MEMBER	1	0.0001	0.9915
MCHANEL	1	3.8079	0.0510

*retained covariates at P <0.05; that is, at 5.0% statistical significance

Table 11.2: Retained covariates for the productivity model (WEAN)

Variable	**Productivity**				
	Estimate	**Std error**	**Wald Ch-Square**	**Pr.Chisq**	**Exp (Est)**
RECORDS	4.9755	1.4076	12. 4939	0.0004	144.819
DISTANCE	-2.3585	0.7829	9.0751	0.0026	0.095

Table 11.3: Estimated correlation matrix: WEAN

Parameter	**Intercept**	**RECORDS**	**DISTANCE**
Intercept	1.0000	0.4519	-0.9549
RECORDS	0.4519	1.000	-0.5724
DISTANCE	-0.9549	-0.5724	1.000

Percentage of cases correctly classified : 95.0%

Percentage of deviance : 74.031

R-Square : 0.4250

Observed- Wean : 22 (40.0%)

Observed- Not Wean : 33 (60.0%)

Total observed : 55 (100%)

With regard to the predictive efficacy of this model, out of 55 sampled cattle farmers included in this model, 95.0% are correctly predicted. The percentage of deviance is 74.031. The results of this model revealed an R- Square of 42.5% for the study area. The results of this model revealed

that the proxy for productivity rate (**WEAN**) is 42.5%. This is explained by the fact that fewer farmers in the study area keep farm records while in addition these farmers are also faced with long distances to the mainstream formal marketing points. Farmers who did not keep farm records are likely not to wean animals. Farmers who have long distances to the mainstream formal marketing points might also not wean any calves.

This is corroborated by the results of the study that revealed that only 40.0% of these farmers had weaned some calves in the previous 12 months prior to the study while the majority (60.0%) did not. This means that only 40.0% of the communal cattle farmers in the study area might be classified as being productive while 60.0% might be considered unproductive. In other words, the communal cattle-production systems in the study area are characterised by low farm productivity rates. These results corroborate the findings of Grwambi *et al.* (2006), Nthakheni (2006), Stroebel (2004) and Tano *et al.* (2002) who argued that communal grazing systems in the developing regions are characterised by low productivity rates as compared to regions such as the Central and South America and the so-called Organisation Economic Co-operation and Development (OECD) in particular which have shown increased and better yields per *bovine* raised *per annum*.

11.4 RETAINED COVARIATES OF THIS MODEL

◦ RECORDS

These results revealed that farm record keeping has a positive correlation with farm productivity. The results of this model conform to *a priori* expectation. The implication of these results is that all things being equal, an increase of a unit of farm record keeping among the communal cattle farmers in the study area defined by a change from (X1 = 2) to (X1 = 1) might increase the farmer's probability of farm productivity by 4.9755. In addition, this model revealed that cattle farmers who keep farm records have an odds ratio of 144.819 of becoming more productive as compared to cattle farmers who do not keep farm records. Keeping of farm records is expected to provide the cattle farmer with an opportunity to develop among others - herd management flow which might improve cattle reproductive efficiency and performance (Duren, 2001; Lyimo *et al.*, 2004; Nell, 1998).

In addition, calf information records, bull management records and breeding records for example are crucial sources of information regarding growth performance management of calves by providing details on calving season; birth weights; weaning weights and weaning periods among

others. Farm records such as those dealing with marketing information among others are also crucial for farm productivity (Duren, 2001). Lyimo *et al.* (2004) further argued that farm records make it possible to compile, register livestock numbers and also to perform crucial production aspects such as quantification of mortality rates among animals which might improve the productivity capacity of the farming enterprise. This is corroborated by Nell (1998) who argued that farm record keeping is an important barometer of farm management skills among communal farmers as it is difficult to manage a farm without keeping proper records.

It is evident from these results that in order to improve farm productivity among the communal cattle farmers in the study area; extensive training in farm record keeping has to be increasingly prioritised among communal cattle farmers in the study area. The fact that the results of the study also revealed a positive influence of record keeping on the farmer's ability to wean more animals shows that this might increase the farmer's herd structure and hence the prioritisation of farmer training on farm record keeping. It is evident that if these farmers could wean more animals in the study area the same could increase the size of the cattle herd and the off-take rate – especially for the mainstream formal market. This corroborates the argument submitted by Nkhori (2004) who argued that cattle farmers with larger herd sizes are therefore more likely to commercialise their cattle-production systems than farmers with lesser cattle herds.

- **DISTANCE**

The results of this model also revealed that distance between the production site/farmer and the preferred mainstream formal cattle marketing channel has a negative significance on the probability of the communal farmer in the study area to be productive. Long distance between the farmer and the marketing point is expected to reduce farm productivity by -2.3585 for every unit added (1 kilometer) on the distance between the production site/farmer and the intended mainstream formal cattle marketing channel. The odds ratio reduces by 0.095 units between the distances. As a result of long distances between the farmer and the mainstream formal cattle marketing channels in the study area, it is expected that cattle farmers in the study area might find it difficult to access such mainstream formal cattle marketing channels in particular. This result is in agreement with those reported by Katjiuongua (2011) from a study conducted in Namibia. This might discourage these cattle farmers from increased productivity and any mainstream formal cattle marketing activities (Uchezuba *et al.*, 2009) because of poor marketing incentives.

In addition, cattle farmers in the study area are expected to accumulate increased transaction costs as a result of these long distances to the mainstream formal markets (Mthembu, 2008; Uchezuba *et al.,* 2009). Evidently, those farmers whose proximity to the mainstream formal markets might have lower transaction costs (Jacinta *et al.,* 2010). Increased transaction costs might influence the cattle farmer's choice of marketing channel (Gong *et al.,* 2006). As a result, the cattle farmer might not see the value of participating in the expected costly mainstream formal cattle markets and therefore these cattle farmers might be expected to be discouraged from increasing their cattle off-takes. On the other hand, those cattle farmers who have shorter distances to the mainstream formal marketing channels might be encouraged to produce more off-take than those farmers with long distances to these markets.

In addition, as most informal cattle traders are expected to be available nearer the communal cattle farmers in the study area; this is expected to provide quicker sales, increased probability of reduced transaction costs and increased profit margins. Long distances to mainstream formal markets might in addition also encourage these farmers in the study area to opt for the informal cattle marketing channels rather than the costly and unprofitable mainstream formal cattle marketing channels. This might constrain commercialisation. In addition, as longer distances between the cattle farmer and the mainstream formal cattle marketing point in particular cannot be reduced, cattle farmers in the study area are expected to continue doing trade outside the mainstream formal cattle markets.

This practice might be a constraint to commercialisation efforts in the study area. Furthermore, less enthusiasm in increased farm productivity might be self-defeating to the local farmers' socio-economic development and poverty alleviation efforts by government among the rural poor in general. In addition, low farm productivity is expected to result in perpetual poverty among communal cattle farmers particularly for the farmers in the study area where the farmers are already facing low household income from other sources and cash generating farming activities in particular. However, increasing such farm productivity might improve the living standards of these communal cattle farmers in the study area as farmers with better productivity rates are expected to also improve their mainstream formal market participation which might result in improved cash flow capacity (Rios *et al.* 2009).

It is of primary importance to understand that other factors as revealed by the results of the study point to the fact that long distances might remain a negative factor of farm productivity in the study area. Other factors such as lack of alternative cattle selling points nearer the cattle farmers

in the study area, lack of transport ownership among the majority of the cattle farmers and bad road networks are also constraining factors interconnected with distance to the mainstream formal cattle markets which might affect farm productivity. Personal ownership of transport might reduce transportation costs and increase the farmer's depth of mainstream formal cattle marketing options and the desire to improve on farm productivity in particular (Matungul *et al.*, 2002).

11.5 CONCLUSION

While the 17 identified covariates for each outcome covariate were selected on their anticipated probability to influence farm productivity in the study area, the binary logistic regression model selected **RECORDS** and **DISTANCES** as the only covariates with higher significance to farm productivity in the study area. These variables are expected to receive policy and strategic priority when addressing farm productivity constraints among communal cattle farmers in the study area. The implication of this result is that farm productivity among communal cattle farmers in the study area depends on multiple intertwined factors. It is evident that weaning of calves and distance to the mainstream formal cattle marketing points are mutually inclusive to affecting farm productivity among communal cattle farmers in the study area. If a farm's productivity is good, so might the probability of the farmer to wean more calves and to actively participate in the mainstream formal market – thus providing an increased opportunity for commercialisation.

CHAPTER 12

ANALYSIS OF THE VARIABLES HAVING THE MOST SIGNIFICANCE ON MAINSTREAM FORMAL CATTLE MARKET PARTICIPATION AMONG COMMUNAL CATTLE FARMERS IN THE MUSEKWA VALLEY

"...efficient marketing system stimulates increased production, and the reverse constitutes a constraint to any development effort..." Enete & Igbokwe (2009: 133)

12.1 INTRODUCTION

This chapter discusses the empirical results of the binary logistic regression model used in the determination of the variables having the most significance on farmer participation in the mainstream formal cattle market in the study area. This chapter argues that while there are several factors having influence on the probability of the communal cattle farmers to actively participate in the mainstream formal cattle market, there are however some factors which have more significance on this than others. The objective of this chapter is to therefore identify those factors which might have the most significance on the probability of the communal cattle farmer to actively participate in the mainstream formal cattle market in the study area.

12.2 SPECIFICATION OF THE MODEL

Seventeen variables were fitted to the logistic regression model in order to achieve the objectives of this chapter. The logistic regression model was chosen because of its ability to select the variables with the most significance on the cattle farmer's choice of the mainstream formal cattle marketing channels and to also determine the effect of these variables on the probability of the cattle farmer's probability to participate in the mainstream formal cattle marketing channels in the study area. In other words, this model is expected to explain the relationship reflected by the selected variables (Uchezuba *et al.,* 2009) and the cattle farmer's choice and use of the mainstream formal cattle marketing channels in the study area. This model is also expected to yield the highest predictive accuracy possible (Randela, 2005).

The **MCHANNEL** is identified as the binary response variable for this model as indicated in Table 12.1 in which 1= farmer participation in the mainstream formal cattle market in the past 12 months prior the study; 2= farmer participation in the informal cattle market or otherwise prior the study. In other words, farmers were asked if they had sold any animals to the mainstream formal cattle marketing channels in the past 12 months prior the study or alternatively if they had sold their cattle to the informal cattle marketing channels prior the study. Therefore, the response variable is "1'' when the cattle farmer sold any number of animals in the past 12 months to the mainstream formal cattle marketing channels prior the study and "2'' when the farmer sold cattle to the informal cattle marketing channels in the past 12 months prior the study. This model hypothesises that those farmers who sold their animals to the mainstream formal cattle marketing channels are likely to commercialise their cattle-production systems than those farmers who sold their animals to the informal cattle marketing channels. The functional form of this model is denoted in equation (1).

$$\text{In}\left(\frac{\phi i}{1-\phi i}\right) = \beta_0 + \sum_{j=1}^{K} \beta j \, \text{X} ij + \varepsilon i \qquad \textbf{(1)}$$

Where: j is the response category (1 or 2), i denotes cases (1,2,3, 4..., n), ϕ is the conditional probability, β_o is the coefficient of the constant term, β_j is the coefficient of the independent variable, X_{ij} is the matrix of observed values, ε_i is the matrix of unobserved random effects, $\frac{\phi i}{1-\phi i}$ is "odds" and $\text{In}\left(\frac{\phi i}{1-\phi i}\right)$ is the logarithm of "odds".

Equation (1) can be manipulated to give the odds ratio using equation (2)

$$\frac{\phi i}{1-\phi i} = \exp \left(\beta o + -\sum_{i=1}^{K} \beta i Xi\right) \qquad \textbf{(2)}$$

The probability that the farmer sold cattle to the formal marketing channels in the past twelve months can be calculated using equation (3):

$$\phi_i = \frac{Exp\left(\beta_o + \sum_{i+1}^{k} \beta_j Xi_j\right)}{1 + Exp\left(\beta o + \sum_{i=1}^{k2} \beta j Xij\right)} \qquad \textbf{(3)}$$

Equation (3) is intrinsically linear since the logit is linear in X_i (Gujarati, 1988); it indicates that probability ϕi lies between zero and one and vary non-linearly with X_i, the equation for calculating partial effects[1] of continuous variable is denoted by:

$$\frac{\partial \phi i}{\partial xi} = \phi i(1-\phi)\beta j \qquad (4)$$

The statistical analysis was conducted using the stepwise Logistic Regression procedures in the Statistical Analysis Software packages 9.2 (SAS, 2009). The SAS packages, like major statistical software packages have routines for calculating the Pearson Chi-square (X^2) and likelihood-ratio statistics (G^2) and their P-values. The P-values are approximations for true P-values, since the chi-squared distribution is an approximation for the true sampling distribution. It must be noted here that the P-value simply summarises the strength of the evidence against the null hypothesis; as such the accuracy to two or three decimal places should be sufficient for this purpose.

12.3 THE RESULTS OF THIS MODEL

Only three of the 17 covariates fitted to this model (**OWNERSHIP, RECORDS** and **WEAN**) are considered significant by this model at $P < 0.05$ (5.0%) as indicated in Tables 12.1. The other 14 covariates are eliminated from the equation of this model through interactive forward variable selection process of SAS (2009) as indicated in Table 12.1. As a measure of goodness of fit, the overall model fit is tested using the Hosmer & Lemesshow Goodness of fit test of linear/non-linear restriction and the results indicate that this model is appropriate and is a good fit for the data. With regard to the predictive efficacy of this model, out of 55 sampled communal cattle farmers in the study area included in this model, 95.0% is correctly predicted. The percentage of deviance is 75.353.

Table 12.1: Analysis of effects eligible for entry: Market choice model

Variable	DF	Score (Chi-square)	Pr-Chisq
AGE	1	0.4977	0.4805
EDUCATION	1	0.0164	0.8981
EMPLOYMENT	1	0.7924	0.3734
HHSIZE	1	1.4318	0.2315
FARMEXP	1	0.3016	0.5829
SYSTEM1	1	0.2698	0.6035
OWNERSHIP	1	4.3860	0.0362*
RECORDS	1	8.3214	0.0039*
SPOINT	1	0.3318	0.5646
DISTANCE	1	0.0168	0.8967
ADVERT	1	0.0453	0.8315
EXTENSION	1	2.9980	0.0834
LOANS	1	0.3487	0.5549
INCOMESELL	1	0.1819	0.6697
TRANSOWN	1	2.2429	0.1342
MEMBER	1	1.3455	0.2461
WEAN	1	4.3218	0.0376*

*retained covariates at P <0.05; that is, at 5.0% statistical significance

Table 12.2: Results of the market choice model (**MCHANEL**)

	Estimates	**Std error**	**Wald Ch-Square**	**Pr.Chisq**	**Exp (Est)**
Intercept	-4.9058	1.5832	9.6011	0.0019	0.007
OWNERSHIP	2.5507	1.2179	4.3860	0.0362	12.816
RECORDS	3.4076	1.1813	8.3214	0.0039	30.192
WEAN	2.3472	1.1290	4.3218	0.0376	10.456

Table 12.3: Estimated correlation matrix: Market participation

Parameter	**Intercept**	**OWNERSHIP**	**RECORDS**	**WEAN**
Intercept	1.000	-0.7513	-7190	-0.5978
OWNERSHIP	-0.7513	1.000	0.1867	-0.0122
RECORDS	-0.7190	0.1867	1.000	0.8031
WEAN	-0.5978	-0.0122	0.8031	1.000

Percentage of cases correctly classified : 95.0%

Percentage of Variance : 75.353

R-Square : 0.3788

Observed - Formal market : 31 (43.6%)

Observed - Informal market or otherwise : 24 (56.4%)

Total observed : 55 (100%)

The results of this model revealed an R- Square of 0.3788. This means that the proxy for mainstream formal cattle market participation among the communal cattle farmers in the study area is 37.9%. This is explained by the fact that some of these farmers also keep cattle for others which they might not be able to sell, a fewer number of these farmers also keep farm records while in addition a considerable number of these farmers also did not wean any calves in the previous 12 months prior to the study. In addition, those farmers who keep cattle on behalf of other people, not keep farm records and also not wean any calves might not be able to participate in the mainstream formal cattle market.

This is corroborated by the results of the study that revealed that only 43.6% of the communal cattle farmers in the study area are able to participate in the mainstream formal cattle market. A large majority of these farmers (56.4%) then opt for the informal cattle market. This means that the informal cattle market is the most popular and commonly used market in the study area than the mainstream formal cattle market among the communal cattle farmers. Cattle farmers in the study area are therefore regarded as largely conservative and highly subsistence in terms of cattle marketing. Commercialisation under these conditions might be constrained.

12.4 DISCUSSION OF THE RESULTS OF THIS MODEL

○ OWNERSHIP

As expected, the estimate of this variable indicates a positive significance with the mainstream formal cattle market participation. The results revealed that ownership of animals among the communal cattle farmers in the study might increase the farmers' probability of participation in the mainstream formal market by 2.5507 units. The odds of cattle farmers selling their cattle to the mainstream formal cattle marketing channels are 12.816 higher for farmers who own the cattle as indicated in Tables 12.3. This means that the odds of selling cattle to the mainstream formal cattle marketing channels in the study area are 12.8 times greater when the individual cattle farmers own the cattle they are keeping than when the farmers are keeping the animals on behalf of other people such as relatives. Nkhori (2004) argued that cattle farmers who own larger herds are also expected to actively participate in the mainstream formal cattle marketing than those who own smaller cattle herds. In addition, cattle farmers who sell larger quantities of animals might reduce their transaction costs than farmers who sell smaller quantities of animals. Those farmers who sell in larger quantities are therefore expected to actively participate in the mainstream formal cattle markets than those who sell smaller quantities of animals.

• **RECORDS**

As revealed in Table 12.3, farm records have a positive correlation effect with mainstream formal cattle market participation as expected. The cattle farmer who keeps farm records has a 3.4075 increase in probability in mainstream formal cattle market participation with the odds being 30.192, meaning that the odds for mainstream formal cattle market participation are 30.192 greater when the farmer keeps farm records. Records are expected to assist the cattle farmer to keep crucial information on cattle mortality controls, general cattle production management and cattle marketing activities among others (Lyimo *et al.,* 2004). Keeping of farm records such as those on market information and farm financial accounts might provide crucial information about the farming enterprise throughout the year (Duren, 2001). Those cattle farmers who keep farm records are also expected to be more entrepreneurial than those who do not keep them. Entrepreneurial cattle farmers are expected to actively participate in the mainstream formal cattle markets than those cattle farmers who are less entrepreneurial. The results of the study revealed that cattle farmers in the study area are expected to be less entrepreneurial because they do not keep farm records. Entrepreneurial farmers are likely to commercialise their farm systems more than those who do not keep records.

•**WEAN**

Table 12.3 further revealed that weaning of calves has a positive correlation effect with mainstream formal market participation as expected. This indicates that weaning of calves might increase the probability of the communal cattle farmer to actively participate in the mainstream formal cattle markets by 2.3472. In addition, the results of the study revealed that the odds are 10.456 greater when the cattle farmer weaned calves to actively participate in the mainstream formal cattle market as indicated in Table 12.3. The ability to wean calves among the communal cattle farmers in the study area might be a reflection of the cattle farmer's preparedness to produce surplus for the mainstream formal market. Weaning of calves also reflects productivity and farmers with higher productivity rates are expected to be more market-orientated regardless of other cattle marketing access factors which might have a different bearing to mainstream formal cattle market participation decision of the respective cattle farmer (Rios *et al.,* 2009). In addition, cattle farmers who weaned calves in a given period are more likely to actively participate in the mainstream formal cattle markets than those cattle farmers who do not wean calves. These results necessitate that a proper training programme on crucial factors of cattle production such as animal breeding techniques and disease control and management be

developed among the communal cattle farmers in the study area in particular. Training on animal breeding techniques might improve the calving rates which might lead to improved probability of weaning more calves over a given period. Evidence exists in the results of the study that there are continuous adoption of incorrect animal breeding techniques practices where cattle farmers resort to indiscriminant and inbreeding tendencies which might affect calving rates and weaning rates among others.

12.5 CONCLUSION

While the 17 identified covariates for each outcome variable were selected on their anticipated probability to influence participation in the mainstream formal cattle marketing in the study area, the application of the logistic regression model provided an opportunity to identify and address the factors with the most significance on this variable. This model selected **OWNERSHIP**, **RECORDS** and **WEANS** as the covariates with significance to the participation in the mainstream formal cattle markets among the communal cattle farmers in the study area. These variables are expected to receive policy priority when addressing constraints among communal cattle farmers in the study area in terms of mainstream formal cattle market choice and participation. It is evident from this model that farmer participation in the mainstream formal cattle market depends on intertwined factors rather than a single factor as this model proved the inter-dependence of cattle ownership, keeping of farm records and weaning of calves as having the most significance influencing such participation. Once these factors are identified, they might assist to classify the cattle production systems whether it is increasingly subsistence, emerging or highly commercialised. The level of commercialisation of the cattle production systems might be well determined by measuring certain crucial measuring variables on what is commonly known as the *Agricultural Commercialisation Continuum (ACC).*

CHAPTER 13

ANALYSIS OF THE COMMERCIALISATION LEVELS OF THE COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

"...this study has demonstrated the need to characterise each small-scale rural farming system prior to any intervention, as the general perception that these systems are similar is incorrect..." Schwalbach *et al.* (2001: 203)

13.1 INTRODUCTION

The level of commercialisation of agricultural production systems in the developing regions differ from place to place, between agricultural subsectors and time among others (Sokoni, 2007). Even in the same agricultural production system it is possible that various levels of commercialisation be displayed with farming systems being large scale, medium scale, emergent or smallholder (Copestake, 1997). For example, Foti *et al.* (2007) found that the livestock communal production systems in the Mashonaland Central in Zimbabwe were more commercialised than the communal crop production systems of the same region. However, this might be on certain selected and measured variables — not necessarily on the rest of the production system. In addition, Ruhangawebare (2010) revealed that communal cattle farmers in the Central Western Region of Uganda might be highly commercialised regarding access of and participation in the mainstream formal cattle market as the majority of these farmers sell most of their animals to this market.

On the other hand, most communal cattle farmers in most parts of South Africa sell their animals in the informal cattle markets (Montshwe, 2006; Nthakheni, 2006) which might imply lesser commercialisation of these farmers when compared to their Ugandan counterparts. These differences in commercialisation levels of agricultural production systems might result from different demographic, endowments, circumstances and conditions experienced by farmers within the particular agricultural production subsector and systems (Grwambi *et al.*, 2006; Stroebel, 2004). This view has been corroborated by various reviewed literature (Abera, 2009; Gibreel, 2002; Montshwe, 2006; Randela, 2005; Roets, 2004, Sokoni, 2007).

According to Abera (2009), Foti *et al.* (2007) and Tolemariam (2010), there are various instruments that might be used to measure the level of agricultural commercialisation of production systems notwithstanding the respective shot-comings and limitations of such instruments — especially with regard to their applicability and reliability in different situations and agricultural systems. It is based on this view that different researchers use different instruments as yardsticks to measure the level of an agricultural production system (Abebe, 2011). It is expected that some of these instruments used to measure agricultural commercialisation might also experience these limitations on the study. In view of this, the study opted to employ the so-called *Agricultural Commercialisation Continuum (ACC)* which appears more consistent and reliable to draw its conclusions when compared to the others. This instrument has been successfully used by Govereh *et al.* (1999), Montshwe (2006) and Randela (2005) to achieve the desired results.

The main objective of this chapter is to measure the level of commercialisation of the communal cattle-production systems in the study area. This chapter premises that this measurement of the commercialisation level of this production subsector in the study area might facilitate for proper understanding of commercialisation intervention strategies and approaches (Schwalbach *et al.*, 2001) in this subsector particularly in the study area. It is further envisaged that this measurement might furthermore provide crucial information for the commercialisation stakeholders in terms of decision-making for this process in this subsector (Randela, 2005). Acknowledging that the levels of commercialisation among agricultural production systems might be very crucial for proper planning for commercialisation in this study area is priority because it remains highly unlikely that farming systems have similar characteristics and levels of commercialisation (Schwalbach *et al.*, 2001).

Existing studies on the commercialisation of communal production systems in South Africa acknowledge the barriers, constraints and opportunities for commercialisation. However, these studies largely ignored the measurement of the levels of such commercialisation of the respective subsectors. This might result in flawed policy and development strategies for commercialisation as a result of misleading assumptions which over-emphasize the assumption that commercialisation level of farming systems are universal as long as they are all classified as subsistence and communal for example.

This assumption fundamentally ignores the fact that agricultural production systems have always revealed some different characteristics and commercialisation levels in the developing regions.

For example, agricultural development and transformation in sub-Saharan Africa in general has been highly constrained by flawed assumptions that this region bears homogenous and common farmer characteristics which therefore require similar strategies for development and transformation (Rege *et al.,* 2006). Pedra (2011) argued that often policy development in the developing regions emanate from personal experiences and judgments of policy-makers; purveyors of information and lobbyists which might compromise the final outcome because such sources might lack credibility of evidence for proper policy development.

This chapter argues that it is imperative for policy-makers of commercialisation to have correct and credible evidence that might assist them to uncover the extent of the opportunities and constraints of the agricultural production systems to be commercialised. Furthermore, the evidence might be crucial for the policy-makers in deciding their focus and determination of the interventions needed to respond to the opportunities and also address the constraints. Evidence exists that the cattle-production systems in the study area bear some different levels of commercialisation to other similar production systems in other developing regions in general and in other parts of South Africa in particular, and this suggest that commercialisation policy and strategic initiatives might have to differ from region to region.

In addition, this chapter answers among others, "*what are the characteristics of subsistence-orientated production systems, semi-subsistence/commercial production systems and the commercialised production systems in South Africa in particular using this case study*?" This is a question which existing studies attempted to answer without familiarizing themselves with the different levels of commercialisation between agricultural production systems. Some selected descriptive results of the study are used as commercialisation measuring indicators to analyse the commercialisation levels of this production system on the so-called *Agricultural Commercialisation Continuum (ACC)* or pathway (Abera, 2009; Gibreel, 2002; Govereh *et al.,* 1999; Randela, 2005; Montshwe, 2006; Leavy & Poulton, 2007) as indicated in Figure 13.1.



Figure 13.1: *Agricultural Commercialisation Continuum (ACC)*
Adapted from Randela (2005)

In this continuum, the number "0" represents zero percent and "100" represents 100.0% (Abera, 2009; Montshwe, 2006; Randela, 2005). Farming systems that have their commercialisation levels in terms of their measuring indicators towards zero percent, i.e., towards the left of this continuum are classified as highly subsistence; those within the centre, i.e. at 50.0% (mid-way this continuum) can be classified as being highly semi-subsistence/commercialized whereas those farming systems inclined towards the right, i.e., 100.0% can be classified as being highly commercialised (Abera, 2009; Montshwe, 2006; Randela, 2005). This corroborates the findings of Leavy & Poulton (2007).

In addition, it is imperative to note that the commercialisation level of any agricultural production system can be located at any point of this *Agricultural Commercialisation Continuum (ACC)* as indicated in Figure 13.1. For example, Randela (2005) argued that a larger percentage of production systems in South Africa and much of the sub-Saharan African region are still located at the lower end of this *Agricultural Commercialisation Continuum (ACC)* or pathway. This means that agricultural production systems in some of these areas are still highly subsistence. For the purpose of the study, various variables sourced from farmer demographic and household endowment, technological, technical and institutional characteristics of the study have been used as indicators to measure commercialisation levels of the communal cattle-production systems in the study area as indicated in Table 13.1 and Annexure F (Sheet 1-4).

Table 13.1: Selected variables used as commercialisation indicators

Indicator	Description of indicator
Farmer demographic and household endowment characteristics	
Youth	Measuring youth participation in cattle production in the study area
Employment status	Indicator measuring number of employed cattle farmers
Income range	Average amount earned by farming households *per annum*
Farmer entrepreneurial skills	Cattle farmers' entrepreneurial skills in cattle marketing
Budgeting	Ability of the cattle farmer to do budgeting
Financial management	Ability of the cattle farmer to manage farm finances
Livestock production	Measuring the farmer's cattle production skills, e.g. breeding
Marketing	Measuring farmers' existing mainstream formal cattle marketing skills
Risk management	The ability of the farmer to control and manage farm risk
Formal education	The highest formal school grade completed by the cattle farmer
Transport ownership	Measuring of the cattle farmer's ownership of automobile
Technical characteristics	
Landholding rights	The kind of landholding rights among the local cattle farmers
Ownership of cattle	Measuring whether farmers own cattle they keep or not
Cattle enclosures	Measuring whether the animals have enclosures or not
Dipping tanks	Measuring the availability and access of dipping tanks
Grazing camps	Measuring the availability and access of grazing camps
Marketing points	Availability and access of formal cattle marketing points
Proper roads	Measuring the condition of the local road infrastructure
Water Supply	Ability of the farmer to access on-farm water supply
Technological characteristics	
Animal identification	Measuring animal identification rates by local subsistence farmers
Breeding	Measuring adoption of breeding of animals by farmers
Farm record keeping	Measuring farm record keeping rates among the farmers
Vaccination	Measuring animal vaccination rates in the study area
Weaning of calves	Measuring the adoption of animal weaning
Productivity	Measuring farm productivity
Relevance of breed	Measuring the type of cattle breeds mostly kept by farmers
Formal market participation	Measuring farmer participation in mainstream formal cattle marketing
Distance to business nodal points	Measuring the geographic distance from the farmer's village to the nearest business nodal point
Mortality rates	Measuring cattle mortality rates among subsistence cattle farmers
Institutional characteristics	
Access to financial assistance	Measuring the ability of the farmer to access formal loans
Access to extension service	Measuring the ability of the farmer to access government extension service
Access to insurance	Measuring the ability of the farmer to access farm insurance
Knowledge on Government farmer Programmes	Measuring farmer awareness of farmer programmes provided by government
Membership in farmer organisations	Measuring the levels of membership in non-government farmer organisations
Participation in Government farmer Programmes	Measuring farmer participation rate in government farmer assistance programmes

13.2 RESULTS AND DISCUSSIONS ON THE MEASURING OF THE COMMERCIALISATION LEVEL OF THE COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

13.2.1 Farmer demographic and household endowment characteristics

The results of the study revealed that the majority of the farmer demographic and endowment characteristics are inclined towards zero percent of the *Agricultural Commercialisation Continuum (ACC)* as indicated in Annexure F (Sheet 1). For example, there are only 12.7% of the youth involved in cattle farming activities as cattle owners in the study area. The small number of youth involved in cattle farming in the study area might be a critical factor to impact on the levels of commercialisation of this subsector in the study area. Younger farmers are expected to be highly commercialised than older farmers because younger farmers might understand the benefits of commercialisation better than older farmers (Randela, 2005). This understanding is revealed by the ability of the youth to be generally progressive, receptive of new innovations and adoption of new technologies particularly in cattle production and mainstream formal market participation than older farmers (Mhanjana, 2009; Montshwe, 2006; Nell, 1998).

In addition, younger farmers are also expected to be physically suited to provide the hard labour of the demanding and complex nature of the cattle production subsector which the older farmers might find difficult to provide (Mathijs & Noev, 2002; Mmbengeni & Mokoka, 2002; Nkhori, 2004). These results are corroborated by the findings of Ainslie (2003), Grwambi *et al. (*2006), Mahanjana (2009) and Maine (2007) who argued that agricultural commercialisation in South Africa might be affected by the fact that older farmers dominate the sector. This might be as a result of migration of potential younger farmers in communal South Africa to urbanized areas in search of better employment and other social opportunities (Mudau, 2010; Randela, 2005). This factor might result in the marginalisation and exclusion of the younger generation of potential farmers from agriculture in general which might affect the success of any commercialisation initiatives of the communal agricultural production systems (Idasa, 2009). Most importantly, exclusion of youth in economic activities has been acknowledged as a negative factor for political and socio- economic development of a country (Butt *et al.,* 2011). For this reason, it is important for the youth in the study area to be encouraged to actively participate in cattle production activities to enhance commercialisation.

The results of the study further revealed that the majority of the communal cattle farmers in the study area have access to increased household income sourced from on-farm and off-farm activities such as livestock sales and government grants among others. The fact that the majority of these cattle farmers are able to access some household income might suggest that the majority of these farmers might be able to provide surplus cash for their on-farm activities which particularly might enhance farmer access of crucial purchased on-farm inputs and services. This might be suggesting that this cattle production system in the study area is highly commercialised in terms of financial income because of the wide income base.

However, distinction should be made between ability of the farmer to access household income and the amount the farmer is able to access. This chapter measured the income amount among communal cattle farmers' households and found it to bear subsistence characteristics as the amounts revealed that the majority of these farmers are of very low income category. This is justifiable as the majority of these cattle farmers in the study area are generally old and mainly access most of their household income from small old -age government grants and small wage income mostly from informal sectors. These old-age government grants are meant to provide relief against poverty (Mutshaeni, 2009).

A mere 16.4% of these farmers are able to access reasonably higher income amounts as indicated in Annexure F (Sheet 1) as compared to 28.2% of farmers who are of the lower income category in the paddy farming subsector in Malaysia (Man & Sadiya, 2009). While the majority of these farmers have access to some household income, it should also be noted that these incomes might not necessarily translate into the ability of these farmers to provide for on-farm activities as these income might be insufficient and inadequate for both off and on-farm activities. The implication is that if the commercialisation level of this cattle production system is measured in terms of the ability of its farmers to access household income, this production system might be classified as highly commercialised as a large number of these farmers have access to household income. However, on the other hand, a different approach used to measure the same but using the quality of the household income might present a different outcome.

It is evident that for this production system to be classified highly commercialised, a greater need to supplement household income among these farmers remains very crucial. This conclusion is corroborated by the results of the study which revealed that these farmers also resort to informal loans to raise more capital for on-farm activities. The world over, highly commercialised agricultural production systems are expected to be dominated by farmers with

reduced income uncertainties. To increase income, farmers might have to resort to income-generation activities such as remunerative work and sale of other crop and cattle by-products such as milk; manure; hides and meat in the case of those farmers involved in crop-livestock systems in particular (Altmann *et al.,* 2009; Barret, 1991; Grwambi *et al.,* 2006; IFAD, 2001). The probability of the farming households with access to broad-based income sources to invest in more advanced livestock technology adoption and purchase of on-farm inputs such as livestock drugs and vaccines among others is reasonably expected to rise (Man & Sadiya, 2009).

In contrast with this, the majority of these cattle farmers in the study area have small incomes with the majority of these farmers only earning less than R10 000 *per annum* from multiple-sources particularly government grants and informal jobs. In addition, these farmers also have increased household expenditure particularly on food and education of their children. Contrary to commercialised systems where the larger portion of income is mainly directed to on-farm activities, it is evident that the larger portion of income among these cattle farmers in the study area is especially directed to off-farm activities.

In addition, this production system revealed some high level of subsistence characteristics as the majority of its farmers are increasingly less-skilled in terms of livestock production (20.0%), management and control of farm risk (25.5%), financial management (38.2%) and budgeting (41.8%) among others as indicated in Annexure F (Sheet 1). These are crucial farming skills in which farmers should demonstrate some level of competence particularly for those farmers who are aspiring to commercialise their production systems. However, this constraint of limited entrepreneurial farming skills among communal farmers has been found to be very common in highly subsistence production systems particularly in sub-Saharan Africa (Abera, 2009; Yagoub *et al.,* 2007).

Kahi & Rewe (2008) argued therefore that this poor entrepreneurial skills among these communal farmers needs to be improved through adoption of farmer extension support service which might provide technical advice to these cattle farmers and improvement of farm record keeping skills which might in turn improve the farm management skills in general among others (Abera, 2009; Banga, 2008; Yagoub *et al.* 2007). In addition, various other sources such as friends, middlemen, neighbours and traders might also provide cattle production and marketing information to these farmers (Abera, 2009; Musenwa *et al.,* 2010). However, in highly commercialised production systems, farmers have access to various formal sources of knowledge-development institutions such as farmer workshops and development organisations.

Ownership of transport is an important indicator of agricultural commercialisation as farmers with personal transport are expected to be highly commercialised than those farmers without personal means of transport. According to Abera (2009), it is easier to commercialise farmers who own personal means of transport. In addition, Musemwa *et al.* (2010) argued that farmers who own means of transport tend to be active commodity sellers than those who do not own any means of transport. The results of the study as indicated in Annexure F (Sheet 1) revealed that transport ownership in this subsector in the study area is still of high subsistence characteristics as only 5.5% farmers own means of transport in the study area. This result reveals some similarities with other communal livestock production systems elsewhere in the developing regions as reported by Aklilu *et al.* (2002) and Niewoudt & Groenewald (2003).

However, there are certain exceptions where there has been some improved transport ownership among communal farmers as high as 47.0% in other developing regions (Waithaka *et al.*, 2007). As a result, communal farmers who lack access to personal transport mostly resort to alternative means such as group hired transport and/or walking their animals to the marketing points (Bailey *et al.*, 1999). In this regard, consequences are that it might result in increased transaction costs with added cost burdens (Mthembu, 2008; Randela, 2005) and poor physical conditioning of the animals in the case of livestock resulting in the withdrawals of these farmers from active participation in the mainstream formal cattle marketing activities. As income from cattle sales in paramount to the general livelihoods of these farmers, these farmers might therefore have to resort to alternative marketing options in the cheaper and affordable informal subsector.

The influence of formal education is very crucial in the conduct and behaviour of these farmers particularly in areas such as acquisition of modern livestock production skills and mainstream formal commodity marketing among others (Mahanjana, 2009; Mathijs & Noev, 2002; Moloi, 2008; Van Zyl, 1996) in determining the systems' nature; whether it is subsistence or commercial. Formal education among the communal cattle farmers in the study area is inclined towards the right of the commercialisation continuum. This might be as a result of the majority of the cattle farmers in the communal cattle production subsector in the study area having attained some level of primary school formal education. This factor is expected to improve commercialisation initiatives in the study area particularly taking into consideration the fact that literacy is an important determinant of agricultural commercialisation (Abera, 2009).

13.2.2 Technological and technical characteristics

The results of the study revealed that technologically, this production system still reveals highly subsistence level characteristics on the *Agricultural Commercialisation Continuum (ACC)* as indicated in Annexure F (Sheet 2). For example, there are no mainstream formal marketing points in the study area which might result in these farmers having to travel long distances to the mainstream formal cattle marketing points elsewhere. This might discourage some of these cattle farmers from active participation in these markets, opting to stay in the subsistence subsector instead. This might also be compounded by the poor gravel roads which further make transport very difficult in the study area as revealed in the descriptive results of the study.

These conclusion is backed by Mthembu (2008) who found that the majority of communal livestock farmers in South Africa have over the years revealed some resistance to active participation in long-distance mainstream formal markets particularly where roads are also poor, a factor which keeps the majority of these farmers in the informal subsistence livestock markets. However, the behaviour of communal farmers in South Africa revealed some contrasting tendencies with those reported by Mathijs & Noev (2002) who found that long-distance farmers in Bulgaria for example are more increasingly commercialised than those farmers with shorter distances to the mainstream formal marketing nodal points. This might be resulting from the fact that these farmers might be having reliable personal means of transport. In addition, these farmers might also decide to sell more of their animals to reduce transaction costs arising from repeated trips to the mainstream formal marketing points (Nkhori, 2004) making participation in these markets more productive and profitable.

Most crucially, long distance marketing channels are generally associated with increased transaction costs associated with long distances to the markets, increased marketing margins and imperfect information among others which might impact on these farmers' profit margins. Farmers might therefore want to avoid these excessive costs (Randela, 2005). It is evident that increased transaction costs might impede commercialisation efforts as farmers find it unattractive to participate in the mainstream formal marketing activities in particular. Existing research have argued that the ability of the farmer to participate in the mainstream formal market is largely determined by the nature of transaction costs incurred by the farmer, for farmers basically prefer competitive and profitable market transactions (Enete & Igbokwe, 2009; National Department of Agriculture, 2005; Shiimi *et al.,* 2010). For an agricultural production system to be increasingly commercialised, distances to the mainstream formal markets should

therefore be reasonably shorter as this is expected to create an efficient marketing system and to also increase mainstream formal market participation among the farmers (Enete & Igbokwe, 2009). Evidence exists that transaction costs in the communal production systems increased with distance while shorter distances are associated with decreased transaction costs (Mthembu, 2008; Nell *et al.,* 1999; Ouma & Abdulai, 2009; Pedrosa & Do, 2009), and therefore increased commercialisation levels are expected in production systems that are nearer main business nodal points than farmers in the remote areas far from service providers in particular (Mthembu, 2008; Omiti *et al.,* 2006).

Other commercialisation measuring indicators such as availability of grazing camps, mainstream formal marketing points and landholding rights as indicated in Annexure F (Sheet 2) in this production system have revealed some inclination towards the left side of the *Agricultural Commercialisation Continuum (ACC).* In addition, commercialisation measuring indicators such as mainstream formal cattle marketing participation, advertisement of sales, farm productivity, farm record keeping and animal breeding as indicated in Annexure F (Sheet 3) also revealed some inclination towards the left side of the commercialisation continuum. This suggests that these commercialisation measuring indicators in this production system are still of the subsistence characteristics. Furthermore, the cattle production system in the study area also operates in a total communal-based land-use right system as all the cattle farmers in the study area practice their cattle production practices in communal land. However, there is a sharp contrast between this finding and that of Tigrai in Ethiopia as reported by Abera (2009) who found that approximately 100% of subsistence farmers have land title deeds as they own the land on which they farm. The implication is that the Tigrai, Ethiopia's farming production systems in Abera (2009) revealed some characteristics of a highly commercialised production system. However in this case the issue of the size of the land the farmer owns might be a crucial matter to investigate for another relevant study.

It remains a fact that communal landholding practice as adopted in the study area might be accompanied by other commercialisation constraints such as poor management of grazing land among others. This is because land management decisions in communal land-use arrangements mainly rested with other people such as *chiefs* and community leaders and not with the respective cattle farmers in particular (Dapaah *et al.,* 2001; Mocwiri, 2006; Nthakheni, 2006; Sokoni, 2007). In addition, such lands also lack collateral value with financial institutions regarding provision of loans and credits as South African financial institutions for example are

known to be reluctant to provide loans and credits to communal farmers without guaranteed collaterals in particular (Adams *et al.* 1999; Nell, 1998). Some of this resistance to provide loans and credits to these farmers might however be inherent from past apartheid practices that continue to undermine black subsistence farmers (Francis, 2002).

On the other hand, other agricultural commercialisation measuring indicators such as the relevance of the breeds kept by communal cattle farmers in the study area, cattle identification, animal vaccinations, controlled weaning of the animals, adoption of telecommunication such as ownership and use of mobile telephones and advertisement of sales revealed highly commercialised levels in the production system in the study area. It can be costly for farmers to keep cattle breeds that are not appropriate to their local environment. It is evident in the study that the majority of these farmers keep more indigenous breeds than exotic breeds. This might be in response to both the farmer's needs such as the breed's milk and manure production capabilities and/or environmental considerations which might require breeds that are resistant to the local diseases and which are also tolerant to the extreme environmental conditions of the study area among others (Khombe, 2002; Mapekula, 2009; Musemwa *et al.,* 2008; Ndebele *et al.,* 2007).

In addition, Annexure F (Sheet 3) indicates that infrastructure such as dipping tanks and cattle enclosures which have been used to measure the ability of the farmer to control and manage farm risk are also inclined towards the right of the *Agricultural Commercialisation Continuum (ACC).* This might suggest that this production system is highly commercialised in terms of these indicators. Furthermore, access to on-farm water supply which is a crucial cattle production factor is also inclined towards the right side of the *Agricultural Commercialisation Continuum (ACC).*the study area is prone to extended droughts periods associated with devastating cattle mortalities. The fact that the majority of these farmers are able to access their on-farm water supply from other sources such as boreholes and communal taps might provide stability particularly during extended drought periods when water from river sources deteriorates.

Cattle ownership in this production system is inclined towards the right side of the commercialisation continuum as indicated in Annexure F (Sheet 2). However, cattle ownership in the study only refers to the number of cattle farmers in this subsector in the study area who own the cattle they keep. The results of the study have revealed that there are certain farmers who keep animals for other people. This difference of ownership is crucial to consider because it

might play a major role in production and marketing decisions which the farmer might have to make (Musemwa, 2008). If farmers own the cattle they keep, they are in most probability to commercialise than those who keep the animals for others. It is common among subsistence farmers to keep animals for others particularly in the communal areas of Southern Africa (Manona, 2005; Sikhondze, 2008; Sumberg, 2003) and this is expected to have an effect on the ability of the production system to provide enough cattle off-take for the mainstream formal markets in particular.

13.2.3 Institutional characteristics

It is imperative to understand that agricultural transformation in South Africa is taking place from a historical past designed to develop and empower white commercial farmers. This resulted in skewed agricultural service that favoured whites at the expense of black farmers particularly those in the so-called homeland reserves such as Gazankulu, Lebowa and Venda by institutional structures such as government extension support service, farmer support services in terms of finance, commodity marketing, research and implementation of policy in particular (Montshwe, 2006; Mthembu, 2008; Mudhara, 2010; Nthakheni, 2006; Randela, 2000; Verschoor, 2003; Xingwana, 2009). Mthembu further (2008) argued that if the services provided by these institutions are improved to be accessed in the communal production subsector, chances are that the level of commercialisation of this subsector might be increased.

The results of the study as indicated in Annexure F (Sheet 4) revealed that knowledge and participation in government farmer support programmes, membership in farmer organisations and access to financial and insurance assistance among communal cattle farmers in this production system in the study area are all inclined towards the left side of the *Agricultural Commercialisation Continuum (ACC)*. This reveals some increased level of subsistence characteristics. On the other hand as indicated in Annexure F (Sheet 4), access to farmer support through the farmer extension service revealed some increased commercialisation levels of almost 100.0%. This means that every single cattle farmer in the study area particularly in the communal production systems have access to farmer extension support. This access might improve the marketing side of the local production systems by increasing among others marketing information and cattle selling points among others. This assertion is corroborated by the positive and significant relationship between extension service and cattle selling points and on the other hand, the negative and significant relationship between extension and advertisement of sales as a source of information dissemination as indicated in Annexure E.

Membership of the communal cattle farmers in the study area in farmer organisations revealed that there are low levels of commercialisation in this regard as fewer farmers belong and actively participate in farmer-support organisations. This is common in communal areas of the developing regions particularly in countries such as Ethiopia where farmer organisations are weak and generally lacking in entrepreneurial orientation (Tolemariam, 2010). Highly commercialised production systems are expected to be located towards the right of the commercialisation continuum in terms of farmer membership in farmer organisations. Highly commercialised production systems use farmer membership in farmer organisations to access among others farm inputs and services such as collective bargaining in the mainstream markets in particular (Braja, 2008; Calkius & Ngo, 2005; Uchezuba *et al.*, 2009; Wickramasinghe, 2009). This might increase their commercialisation level.

13.3 CONCLUSION

It is evident that *Agricultural Commercialisation Continuum (ACC)* is an effective instrument to measure the level of commercialisation of an agricultural production system. The level of commercialisation of an agricultural production system depends on the location of the commercialisation measuring indicator on the *Agricultural Commercialisation Continuum (ACC)*. This allows for a determination of the level of commercialisation and to classify if the production system shows subsistence, semi-subsistence/commercialised or commercialised characteristics in terms of the particular commercialisation measuring indicator considered. If such determination of the level of commercialisation on the *Agricultural Commercialisation Continuum (ACC)* is not sufficiently carried out, conclusions as to the classification of the nature of the production systems could be flawed and deceptive.

The majority of the commercialisation measuring indicators (69.7%) in this production system are inclined towards the subsistence level of the *Agricultural Commercialisation Continuum (ACC)* showing levels which are tilted towards zero percent. However, a few of these indicators are inclined towards the highly commercialised level (30.3%) of the *Agricultural Commercialisation Continuum (ACC)*. Conclusions drawn can therefore be that this cattle production system in the study area is increasingly subsistence with a few characteristics of a commercialised production system; however these characteristics being insufficient to justify any classification of this production system as of a highly commercialised level. This view is justifiable having taken the arguments of other reviewed literature which revealed that it is

nearly impossible to find an agricultural production system in the developing regions such as South Africa and the sub-Saharan region in particular which is wholly subsistence without displaying some commercialised characteristics.

Of major interest is the fact that the results of the study revealed that the majority of the selected variables used as measuring indicators for commercialisation level of this cattle production system in the commercialisation continuum displayed lack of characteristics of a semi-subsistence/commercial level (50.0%) level. This is because the selected variables used as commercialisation indicators are either tilted towards the highly subsistence or the highly commercial side of the *Agricultural Commercialisation Continuum (ACC)*. This result suggested that the communal cattle production system in the study area is not yet of an emerging commercial production as its characteristics are either tilted to the highly subsistence or highly commercial side of the agricultural continuum. Of crucial importance is that commercialisation measuring indicators such as budgeting (41.8%) and formal market participation (43.0%) revealed some advancements towards the emerging farming system's level (50.0%).

It further emerged in the study that agricultural policy-makers and strategic planners should however take into consideration that classification of a particular production system as either highly subsistence, emerging commercial or highly commercialised would in all probability always differ from one agricultural production systems to the other, one agricultural subsector to the other and also between regions because of the differences in the farming conditions and circumstances dominant there. It is concluded therefore that it is impractical to find an agricultural production systems of similar characteristics with the other as such characteristics depend on the particular production systems' commercialisation measuring indicators in terms of the demographic and endowment typology of the farmers who operate in that production systems, technological; technical and institutional factors in particular. The characteristics of these factors cannot be homogeneous in any production system including those of the same country and/or region.

CHAPTER 14

SUMMARY, POLICY IMPLICATIONS, AREAS OF FURTHER RESEARCH AND CONCLUSION

"...the combination of real-life experience and expertise with academic knowledge can generate socially-engaged knowledge benefitting both the university and the community, whether business, public sector or NGO..." Botes (2005)

14.1 INTRODUCTION

The main objective of this chapter is to summarise the results and the findings of the study. This chapter also presents important policy implications and suggests identified areas for further research based on the findings of the study.

The main objective of the study has been both to investigate and identify constraints and opportunities regarding the commercialisation of communal cattle-production systems in the Musekwa Valley, Limpopo Province of South Africa. The specific objectives were to briefly characterise and describe the agricultural production systems adopted by communal cattle farmers in the study area, to estimate the productivity and subsequently to evaluate the sustainability of the cattle production system adopted in the study area. The study has further also characterised and described the demographic characteristics of the communal cattle farmers in the study area and demonstrated how these characteristics have impacted on the commercialisation process of the cattle-production systems, as the said commercialisation process has unfolded, particularly in the study area but also in South Africa in general. In addition, the study has also investigated, identified and profiled current cattle-marketing practices – particularly the available mainstream formal market opportunities for the local communal cattle farmers in the study area. Imperatively, the study has also offered policy recommendations to assist stakeholders of the commercialisation process in the study area in finding solutions to the constraints affecting the commercialisation process.

This final chapter draws conclusions based on both sets of objectives. A questionnaire-based survey involving 55 communal cattle farmers was conducted in the study area. The study concludes that there are multi-faceted demographic, technological and institutional constraints that affect commercialisation of the communal cattle-production systems in the study area. In

addition, there are some opportunities for the commercialisation of the production systems in the study area. The findings are compared with conclusions of other, yet similar empirical studies conducted in the communal areas of South Africa and elsewhere in the sub-Saharan Africa region and also in other developing regions, particularly the findings of Grwambi *et al.* (2006), Jari (2009), Montshwe (2006), Musemwa *et al.* (2007), Nthakheni (2006), Roets (2005) and Stroebel (2004).

14.2 THE RESEARCH PROBLEM

The research problem that guided the study is based on the current agricultural policy initiatives of the post-apartheid South African government in South Africa. The study sought to review how the dual agricultural systems in South Africa can be transformed into a single all-inclusive agricultural system, one that will be both beneficial to all those involved in agriculture – regardless of their race, colour and gender – and that is moreover in line with the provisions of the Bill of Rights enshrined in the country's first democratic constitution. The new policy aims at eradicating the colour-based agriculture that benefitted commercial white farmers during apartheid while at the same time marginalising resource-poor communal black farmers. The South African government aims to transform communal agriculture into a viable, productive and sustainable commercially orientated subsector in the hope of improving and bettering the socio-economic gains, livelihoods and economic empowerment among particularly the rural black farmers.

Government believes that skewed access to agricultural factors of production between commercial and communal farmers – particularly in the former homelands – still persists two decades after the demise of apartheid. The major aim of communal agricultural commercialisation is to remove the barriers and constraints preventing this subsector from operating commercially by, among others, promoting equal access to factors of agricultural production and mainstream formal marketing. The South African Government and so are various other researchers also argue that, notwithstanding some obvious constraints, the communal production subsector in South Africa is furthermore ready to be commercialised.

14.3 LITERATURE REVIEW

Literature on the commercialisation of communal cattle-production systems in sub-Saharan Africa is in very short supply – particularly that on South Africa. However, most of the available

literature focuses on the complexities of livestock production and on opportunities and market participation by smallholder farmers and not necessarily on commercialisation of the cattle-production systems. What is crucial for the purposes of the study is the fact that the reviewed literature concurred and revealed that modern agriculture – particularly the livestock subsector, which is booming world-wide – is fast becoming increasingly integrated and highly commercialised. The relevant literature further affirms that there is a growing need, particularly in the livestock subsector, to commercialise communal agriculture.

The literature furthermore provides evidence that most agricultural systems in the developing regions, particularly the sub-Saharan African countries, are currently transforming from communal agricultural practices into modern, highly mechanised and commercialised approaches. Dual agricultural systems created prior to independence by the colonial governments in most countries of the sub-Saharan African region and in some other developing countries are currently being replaced by single agricultural systems that are increasingly characterised as being highly liberalised and deregularised.

The literature also revealed that commercialisation of communal farming systems in the developing regions is being adopted as a growth strategy for not only sustainable livelihoods, poverty alleviation and economic empowerment, but also for employment creation to benefit the millions of rural poor. The literature also revealed that such commercialisation is taking place amid considerable debate on the usability, gains and profitability of the process.

It is evident that this process has its critics. Some pessimists maintain that the benefits and gains remain clouded with doubt, arguing that the benefits are neither entirely guaranteed nor tested and are thus inconclusive. On the other hand, consensus exists among the commercialisation optimists such as Grwambi *et al.* (2006) and McNeil & Matjuda (2007) that whilst there admittedly are some notable questions and doubts on the usability, gains, impact and profitability of the process – particularly as regards its impact on the vulnerable groups such as women and children – there also are fundamental reasons justifying its adoption as a growth-and-development strategy in agriculture. Much of the literature argues, for example, that commercialising communal agriculture has been successfully used for considerable gains in employment creation and economic improvement among the rural poor in especially the developing regions. Therefore, in all reasonableness, some optimists argue that the disadvantages of this process cannot sufficiently outweigh its advantages.

Furthermore, the reviewed literature revealed considerable constraints but also considerable opportunities have an impact on the commercialisation of communal production systems in the developing regions. A sizeable proportion of the literature also concedes that these constraints need to be identified and removed before any meaningful progress can be expected in this process.

Examples of identified constraints are: farmer typological constraints – gender, educational level, chronological age and farmers' farming experience; institutional factors – access to extension visits and services, access to agricultural development agencies such as contract farming (CF); and technological factors – the adoption of new technologies. Examples of fundamental factors favouring the process in most Southern Africa countries and also elsewhere in the developing regions are: opportunities provided by improved agricultural policy transformation aimed at agricultural liberalisation and deregularisation, the good farmers' livestock farming experience and reasonable cattle off-take rates among communal farmers in South Africa.

14.4 GENERAL MATERIALS AND METHODS

Higher levels of illiteracy among the respondents in this area necessitated having a translated version of the questionnaire – the original English into the local *Tshivenda* dialect. Translating the questionnaire into the local *Tshivenda* dialect is a departure from the approach followed in most previous studies conducted along similar lines in the region. Most of those studies resorted to using direct translations of the questions from the English versions to the indigenous language of the interview without taking into consideration incorrect interpretation of the questions and the subsequent responses from the respondents. This might lead to incorrect and flawed data being collected. However, a scarcity of proper individual words for some of the scientific terminologies used in the questionnaire proved to be very problematic in that considerable time was lost in searching for language experts and livestock scientists and practitioners to translate, verify and compare the resultant translations.

Yet, significantly, the translations proved to be beneficial: it became evident during the piloting mock interviews that the untranslated English version of the questionnaire posed considerable challenges. It also emerged during interviews that the translations did not entirely remove all of the anticipated language-related difficulties – in some cases, there were still some minor challenges in that interviewees required clarification regarding how specific, individual words

were understood and used by the interviewees. Interviewers were nevertheless thoroughly trained to deal with such problems.

The descriptive results of the study gave comprehensive analyses of the demographic, technological and institutional factors that had a bearing on the commercialisation of the communal cattle-production systems in the study area, either as constraints or opportunities. The results of the binary logistic regression models provided comprehensive results by identifying those variables with the most significance and influence on farm productivity and mainstream formal market choice and participation among the communal cattle farmers in the study area in question.

While the descriptive results identified a variety of constraining and conducive factors regarding commercialisation, the binary logistic regression models provided the policy-makers with the major factors to be prioritised in the process of commercialisation. During interviews, it became evident that respondents were sceptical of research where feedback was not provided. A follow-up feedback meeting with the stakeholders of the study – in particular the enumerators and representatives of farmers who were part of the interviews — was held based on the preliminary report of the study prior to its finalisation and acceptance by the University. Fruitful discussions emanated from this meeting where the communal cattle farmers in this study area expressed a desire to meet with the authorities in agriculture to raise certain issues based on the study report.

14.5 SUMMARY OF THE CONSTRAINTS IN RESPECT OF THE COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

The descriptive and empirical results of the study conclude that several farmer-demographic, endowment, technological and institutional factors constrain the commercialisation initiatives of the communal cattle-farming systems among the communal cattle farmers in the Musekwa Valley. The identified constraints are listed and briefly described in Table 14.1.

Table 14.1: Summary of the constraints on the commercialisation of communal cattle-production systems in the Musekwa Valley

Identified constraint	**General characteristics and explanation of the findings**
	Farmer-demographic characteristics
Age of the cattle farmer	The cattle-production systems in the study area are dominated by older farmers who are expected to struggle with the physically demanding nature of cattle-production activities especially when producing for the mainstream formal markets. The lack of youth participation and cattle ownership in this subsector also constrains the continuity of cattle-production practices in the study area. The advanced age of farmers also constrains the adoption of critical new cattle-production technologies.
Educational levels of the farmer and other household members	Poor educational levels that might constrain the adoption of new cattle-farming technologies, understanding of cattle production and marketing concepts also became a crucial constraining factor identified by the study. Other household members – spouses and children of the new/prospective farmer – also show poor educational levels, which suggests that they too might not be sufficiently able to assist with the farming activities, particularly regarding adoption of new technologies.
Cattle farming experience	It is of crucial importance to note that cattle-mortality rates in the study area increased with increased farming experience. This suggests that experienced farmers generally suffer more cattle losses in the Musekwa Valley area than do the less experienced farmers. This could result in decreased off-take rates for the markets in that the majority of the animals are owned by the most experienced group who could lose their animals to mortality. In addition, the more experienced farmers appear to be poor adopters of modern cattle-production and -marketing technologies as evidenced, among others, by their poor uptake of loans and their reluctance to become members of farmer organisations, which could constrain commercialisation initiatives within this group.
Marginalisation of women and youth	Cattle-farming activities in the study area are still strongly biased against women and youths. In the study area, few women and youth participate in the cattle-farming economic systems as owners of the animals This could be the result of gender-discrimination and youth-marginalisation tendencies, which are generally common in sub-Saharan Africa and particularly in South Africa.
Household income	Poor off-farm income-generation strategies result in an increased dependence on government assistance in the form of welfare grants. Lack of formal credit and loan institutions to provide the much-needed extra income for on-farm activities among these farmers also limits farmers' capabilities of accessing income.
Household expenditure	Generally, farming households are larger, as is the expenditure on off-farm activities like the provision of food and child education. It is difficult to access surplus cash for on-farm activities, which results in some farmers adopting informal loans as an alternative strategy to access some capital.

Access to on-farm inputs	Cattle farmers in the study area find accessing on-farm inputs – such as animal supplements, drugs and vaccines – very expensive, which could result in the adoption of unconventional strategies to the exclusion of modern technologies. The consequences of such practices are revealed in the high animal-mortality rates.
Technological factors	
Non-adoption of new technologies	As indicated in Annexure D, crucial cattle-production technologies, such as animal breeding, weaning and farm record-keeping are lacking among these cattle farmers. This constrains commercialisation initiatives. Poor breeding skills could result in the production of less desirable animals; uncontrolled weaning could extend calving intervals, this in turn resulting in poor stocking and off-take rates; and, the non-adoption of farm records could result in various deficiencies in terms of production and market practices.
Lack of infrastructure	On-farm infrastructure and equipment are vandalised to the extent of total dilapidation. The majority of the farmers lack proper fenced grazing camps, dipping tanks and water reticulation facilities. Furthermore, off-farm infrastructure such as roads and personal transport is in very short supply, and these factors constrain economic activities in the study area. Cattle farmers also rely on distant, mainstream formal marketing points as infrastructure such as feedlots and animal-handling equipment are either poor or virtually non-existent.
Poor entrepreneurial expertise	Cattle farmers in the study area still practise high levels of subsistence farming. Sales are neither advertised nor are they adequately marketed and farmers resort to price-guessing because, among other things, they lack animal-weighing equipment. In addition, a considerable number of the farmers lack the requisite skills in terms of risk management – of theft, animal diseases, droughts, banking, budgeting and financial management – that are expected in the mainstream cattle-marketing subsector.
Institutional factors	
Poor access to information	Farmers in the study area lack reliable means of accessing information and they mostly rely on informal means such as community meetings and word of mouth. Their geographical location is remote and they are unable to access crucial modern technologies such as landline telephones, television and internet facilities. These result in a decreased mainstream formal market base.
Poor knowledge of government farmer programmes	Cattle farmers in the study area have poor knowledge of crucial government farmer-assistance programmes – such as, for example, CASP, MAFISA and Land Care – intended to develop and assist subsistence farmers. As a result, crucial opportunities are missed.
High transaction costs	Because of extensive market-searching strategies and the considerable distances to markets, farmers are faced with increased transaction costs that serve to discourage farmers from increased production and from participation in mainstream formal markets.

14.6 SUMMARY OF OPPORTUNITIES FOR THE COMMERCIALISATION OF CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

Despite the obvious constraints on cattle-production systems' commercialisation among the communal cattle farmers in the study area as highlighted in Table 14.1, the results of the study have revealed that there are also some significant opportunities for the commercialisation of this particular production system. This section identifies and discusses some of the opportunities.

14.2: Summary of the opportunities for the commercialisation of communal cattle-production systems in the Musekwa Valley

Identified opportunity	General description and explanation of the findings
Farmer-demographic characteristics	
Access to telecommunication infrastructure	The majority of the cattle farmers in the Musekwa Valley have improved access to mobile telephone services, which could improve the efficiency of their communication with the targeted marketing channels, particularly mainstream formal cattle traders. This might improve their cattle-market base as more potential traders could have access to relevant information on crucial cattle-market factors among the farmers in the study area.
Farmer experience	The average cattle-farming experience is approximately 20 years, which is considerably higher than the 17 years among similar farmers in other parts of South Africa. Extensive cattle-farming experience could be an opportunity for commercialisation in the study area in that experienced farmers are expected to be more financially independent because they depend less on credit and loans.
Willingness of the farmers to commercialise	A considerable number of cattle farmers in the study area already participate in mainstream formal cattle marketing, which is a good sign of their willingness to commercialise. Other not-yet commercialised farmers might be persuaded to adopt commercialised cattle farming when they are witness to the benefits of doing so from those other farmers who are already commercialised.
Availability of farm labour	Cattle farmers in the study area have larger households, which could potentially translate into a useful, less expensive labour supply for farming without additional monetized labour sourcing.
Technological factors	
Adoption of new technologies	As indicated in Annexure D, crucial factors – such as parasite control, animal dehorning, bull-calf castration and animal supplementation – are already commonly adopted by the cattle farmers in the study.
Institutional factors	
Improved current government policy	The South African government has embarked on national communal farmer's commercialisation initiatives that are expected also to benefit the communal farmers in this specific study area. A considerable number of programmes are in place to assist the process, such as the CASP, MAFISA, Land Care and land-reform programmes.
Active extension-service provision	The local extension service provision has been located in close proximity to the farmers for extension service provision. There are satellite extension stations at the Khomele and Musekwa villages so as to enable communal farmers in the study area to access such services at minimal costs to themselves.
Availability of extension service	Extension officers are placed within the areas they are to serve. Extension service is therefore cheaper, quicker and readily available on daily basis when the farmer needs assistance. It might improve access to information.

14.7 POLICY RECOMMENDATIONS

This section hypothesises that policy implications flow from the conclusions drawn from the study.

14.7.1 Farmer entrepreneurial development

The results of the study revealed that there are considerable constraints regarding cattle farming entrepreneurial development among the communal cattle farmers in the Musekwa Valley. The majority of the farmers revealed a lack of crucial skills in, among others, animal breeding, veld- and pasture-management, record-keeping, financial management, budgeting, credit and loan understanding, risk management and agricultural contracting. Lack of these skills might impact negatively on the commercialisation initiatives of the communal farming systems in the study area. Authorities in agriculture should look into the entrepreneurial training of the communal cattle farmers in the Musekwa Valley area given the increased prioritisation of commercial livestock production, cattle marketing, risk management, financial management and budgeting. Among others, advanced and experienced commercial farmers, government institutions dealing with agricultural development, the private sector, Agri-BBEE entities, CBOs, NGOs, donor groups and financial institutions could be engaged to assist in the development of farmer-entrepreneurial skills in the study area. Such training might assist in creating productive, active mainstream formal cattle-marketing activities and sustainable cattle-farming ventures.

14.7.2 Integration into cattle production of vulnerable groups

There is no proper integration or introduction of the youth into cattle-production practices in the study area and this places a serious constraint on the system's future, that is, its continuity. Incentives for the youth should be introduced through encouraging local schools to adopt a stronger curriculum in agriculture. This could be achieved by introducing agricultural exhibitions in local secondary schools specifically to lobby for interest among the youth in agriculture and then particularly in livestock production.

In addition, the private sector and also government ministries, such as the Department of Agriculture, the Department of Education, the Department of Social and Welfare and other departments dealing with youth affairs and women affairs should be encouraged to form partnerships to develop youth, women and other marginalised groups – such as the physically challenged and the poor – in pursuing agriculture as a trade and then particularly livestock

production. Local tertiary institutions, for example the Madzivhandila College of Agriculture, Mashamba FET College and the University of Venda could also assist by promoting a comprehensive agricultural curriculum for the local schools within the Musekwa Valley. These institutions could possibly also deploy some of their staff to assist in the supplementary teaching of agricultural science in these schools – particularly after hours or during school vacations.

Science-Maths Olympiad programmes in South African high schools promote physical science and mathematics among high school learners. The same strategy could be adopted for promoting agriculture and then particularly in respect of livestock production. The Limpopo Department of Agriculture could also initiate a programme to empower youth and women in respect of cattle-production and ownership, especially those showing an interest in and some basic understanding of this subsector. Loaning out of animals for a certain period to individuals and groups among the said groups could be used as a strategy for such empowerment. Such aspiring cattle farmers could keep these animals for a certain period after which the animals are then loaned out to other groups and so the process could continue until it achieves its objectives.

14.7.3 Restoration and development of infrastructure

The Limpopo Department of Agriculture should look into reviving the collapsed cattle-trading post located at the Musekwa village in the study area. Doing so could assist the cattle farmers in the study area to gain access to a trading post nearer to their villages. The long distance from the farming point (villages) to the nearest cattle-marketing point and other business nodal points has been identified as one of the major factors constraining access to crucial farm inputs such as animal drugs and vaccines and to mainstream formal market participation among cattle farmers in the study area. Bringing relevant infrastructure, such as trading posts and drug stores, closer to these communities could do much to lessen the high expected transaction costs that often arise from distant input access and from mainstream formal cattle-market searching. The cattle farmers who are in closer proximity to centres of economic activity – such as drug supply stores and cattle-trading posts – will reap increased benefits.

In addition, other equally important infrastructure such as grazing camps and water-reticulation facilities should be protected from vandalism and their proper care should further be encouraged. This could be achieved by educating members of these communities regarding the good of such infrastructure in the quest to improve household livelihoods and eventually to win the fight against poverty. Extension officers could also be encouraged to work closely with the respective

community leaders of villages, particularly with local *chiefs*, local civic structures, farmer organisations and youth groups in addressing the infrastructural vandalism affecting the communities. Community meetings, school campaigns and visits, among others, could be used to this end.

14.7.4 Popularisation of government programmes among communal farmers

Government programmes and projects, such as CASP, MAFISA, land reform, land care and ASGISA, meant to develop farmers in South Africa are not popular among the majority of the communal cattle farmers in the study area. Cattle farmers here lack proper information on the above programmes. Efforts should be made by the Limpopo Department of Agriculture to popularise the said programmes and projects among the farmers in the study area. The Department of Agriculture should consider organising workshops and/or placing information advertisements by means of various sources such as electronic and print media – particularly local newspapers – and radio to familiarise rural farmers with such programmes. There should be continuous interaction between extension officers and the cattle farmers regarding new government programmes and initiatives.

14.8 AREAS OF FURTHER RESEARCH

The main objective of the study is to investigate and identify constraints on and opportunities for the commercialisation of the communal cattle-production systems in the Musekwa Valley of the Limpopo Province. Further research is required so as to investigate how communal farmers in the study area could exploit the existing opportunities presented by the current, general agricultural policy transformations in South Africa in respect of communal agricultural commercialisation. For example, research is needed to investigate how women and the youth can be integrated into cattle-production systems in the Musekwa Valley. Existing research only identifies and acknowledges the exclusion and marginalisation of these groups without dwelling much on possible strategies to integrate these groups into active livestock production and specifically into mainstream formal market participation.

Secondly, it is difficult to develop and transform a subsistence livestock-production system in the communal areas without empowering farmers in those areas to have access to production inputs and resources, particularly those pertaining to landholding and land-use rights. In that farmers in the rural areas of South Africa do not generally have any land-tenure rights, important stakeholders, such as financial institutions, find it difficult to take the risk of financing farming

enterprises without collaterals. Efforts to transfer communal landholding rights from traditional leaders to individuals in the communal areas are to be fast-tracked if any meaningful transformation and commercialisation initiatives are to be realised.

While the topic of land reform in South Africa has received wide attention from various individual researchers and from organisations, such as PLAAS, empirical research is as yet insufficient and needs, for example, to establish how best to allay the fears of the traditional leaders and make them understand that transferring the communal landholding rights – currently vested in themselves – to individuals remains the only viable option for facilitating economically viable and sustainable agricultural production systems for individual economic improvement, agrarian and rural development, particularly in this area.

Here, multidisciplinary research, research that seeks to include other fields – for example, anthropology, sociology, psychology, political science, religion and economics – so as to facilitate meaningful findings on this topic, could be of great assistance. As other perspectives in land-rights issues are involved in South Africa at large, such findings may however not be relevant only to agricultural scientists. Literature reviewed forth study concentrates mainly on other aspects of the land-reform programme in South Africa, such as legal aspects. The benefits of individual tenure holding in the rural areas and the fears of traditional leaders regarding landholding-rights transformation have received significant attention in South African research.

Thirdly, it is generally accepted that the success of modern agriculture, particularly that of livestock production, lies in the involvement of the so-called linkage agencies, such as contract farming (CF) in the development of agriculture. The results of the study reveal that cattle farmers in the Musekwa Valley have no formal membership or partnerships in agricultural development agencies, contract farming and other forms of farmer organisations being no exception. It is paramount that further research be conducted on the involvement and role of contract farming in communal cattle production in terms, among others, of assisting communal cattle farmers to access cattle production inputs, to increase farm productivity, to improve farm sustainability and mainstream formal cattle-market participation.

Given current conditions in these particular communities, efforts need to be made to establish how the communal cattle farmers and other linkage agencies might be persuaded to consider establishing partnerships in cattle-farming development and commercialisation among the communal cattle farmers in the study area. Such research should, among others, look into

determining the benefits of establishing communal farmer-contract farming agency partnerships in the study area. In addition, the hindrances, constraints and solutions regarding the emergence of the said farmer-contract farming agency partnerships among communal cattle farmers in the study area could indeed become quite crucial.

Fourthly, the study revealed that cattle farmers in the Musekwa Valley still rely on primitive methods and approaches in respect of animal-supplementation strategies. For example, most farmers use the dry seeds of various tree species for animal supplementation, particularly during dry seasons and periods of drought. There is a need to conduct an empirical investigation to determine, the nutrient content of these seeds and moreover to also establish whether it is safe to use such seeds for animal supplementation. Unlike in Ethiopia – where such empirical studies have already been conducted before – there is no evidence of similar research in the South African communal cattle-production subsector. Existing literature concentrates mainly on the nutritional content of livestock forage and then particularly on goat production, without specifically focusing on seed nutritional values and content that would apply to the forage used by the communal cattle farmers in the study area.

Fifthly, a considerable body of literature deals with, among others, livestock production practices, the general demographic characteristics of communal farming households, agricultural production systems, farmer-livelihood strategies, the entrepreneurial skills and competencies of farmers and their social systems. The literature reviewed for the purposes of the study further revealed that ample reference is indeed made to and emphasis is placed on the nature of the communal farmer and even, to a certain extent, to the existing cattle-marketing channels in communal systems.

What is however missing or inadequately dealt with is empirical research investigating the demographic typological characteristics and the specific market needs of the existing and the potential cattle-marketing channels. This information might assist in the planning of mainstream formal cattle-market exploitation strategies. The study hypothesises that the continued absence of this crucial research could result in the continuous underdevelopment of efficient, sustainable and proper mainstream formal cattle-marketing systems in the communal cattle-production systems in South Africa in general. Under such conditions, commercialisation of the subsector is sure to remain highly impeded and a largely unattainable ambitious venture.

Finally, cattle disease among the livestock of the communal cattle farmers in the Musekwa Valley is a crucial constraint on the commercialisation initiatives in the subsector in question. What is crucial forth the study is that the so-called LSD has been shown to affect the majority of the cattle farmers in the study area. This is unusual because the disease is less prevalent among the livestock of the majority of communal cattle farmers in most parts of South Africa. It is imperative to investigate the causes of the said disease in this particular study area. It is not enough simply to know that the disease is mainly caused by biting insects and that it also exists in this area. Proper, extensive research should be undertaken to establish what kind of biting insects are responsible for spreading the disease among cattle. The findings could assist towards designing proper preventative, control and management strategies in respect of the disease.

This disease has moreover proven to be deadly wherever it has previously occurred. For example, in Egypt and Zambia it resulted in serious disasters. It is thus important to measure how dangerous it can be among cattle in the communal areas of South Africa, particularly among those in the Musekwa Valley. The LSD demonstrated cross-border tendencies – after it was imported into Egypt by infected Somali cattle. Efforts should be made to research the cross-border potential of the disease in respect of the study area and the areas across the Limpopo River in Zimbabwe, the latter appearing to be prone to the disease.

14.9 CONCLUSION

This study concludes that the commercialisation of communal cattle-production systems is a viable strategic option for facilitating socio-economic advancement, and for enhancing both sustainable livelihoods and poverty reduction among the resource-poor communal cattle-farming households, particularly in the former apartheid-created homelands. In addition, the study concludes that, among others, commercialisation of the communal cattle-production systems in the Musekwa Valley will:

- Facilitate the removal of the many constraints and complexities facing cattle production and the mainstream formal marketing of cattle in the study area.

- Facilitate the exploitation of the opportunities provided by the commercialisation of the communal subsector in South Africa at large and particularly in that of the Limpopo Province.

- Increase the probability of the communal cattle farmers developing cattle-production systems characterised by modern productive and sustainable cattle-production approaches and better technological innovation.

- Increase the probability of the communal cattle farmers actively participating in the mainstream formal cattle market in South Africa by providing, among others, guaranteed household livelihoods, access to factors of production and increased mainstream formal cattle-marketing options.

- Provide a viable employment and living base for the rural poor, particularly the youth, who often migrate to the urban and metropolitan areas in search of such opportunities.

- Improve economic conditions and the general livelihoods of the communal cattle-farming households by increasing their general income capacity through the increased profitable sale of their animals and other important by-products such as milk, manure and hides.

- Increase opportunities for marginalised groups, such as women and the youth, to participate actively in commercial cattle-production practices, thereby improving and advancing their general economic conditions and household livelihoods.

- Facilitate human capacity development, rural community development, cattle production and marketing education, problem solving and technology transfer, and so empower both individual communal cattle farmers and groups to become active participants in the over-all South African mainstream formal cattle-production and marketing practices.

Apart from revealing the benefits to the communal cattle-production systems of commercialisation in the Musekwa Valley, the study also presented various interdependent factors that are crucial constraints working against such commercialisation. While some of these constraining factors are demographic, others are endowment related, yet others are technological and some are even institutional. Of critical importance is that the study also identified the factors having the most significance and impact on commercialisation efforts in the study area. Four such factors were identified. The weaning of calves, the distance to the mainstream formal cattle-marketing points, record-keeping and cattle ownership were identified as factors that should receive priority in that the results of the study revealed that such factors had considerable

impact on most of the on-farm productivity and on the participation of the communal cattle farmers in the mainstream formal markets.

This study further concluded that other interrelated factors also offer some opportunities for the commercialisation of the communal cattle-production systems in the Musekwa Valley. For example, a highly favourable agricultural development policy, one that dismantles the dual agricultural systems institutionalized by the erstwhile apartheid government, is currently in place in South Africa. This new policy has deregularised, liberalised, modernised and assisted the communal farming subsector so that is has become more productive, competitive, profitable and more sustainable in South Africa at large.

In line with various commercialisation critics and pessimists, the study further concludes that such commercialisation of communal cattle-production practices in the study area could also be accompanied by significant consequences. However, such consequences do not form part of the empirical interest of the study. Above all, subsistence cattle production in the communal areas of South Africa remains constrained in terms of growth, development and commercialisation because of its reliance and dependence on inadequate resources, poor inputs supply and the significantly less developed informal marketing system. As a result, the subsector needs to commercialise its systems in order to be more productive, more sustainable and more economically viable – especially in the modern agricultural era in which global communal agricultural trends are fast changing towards larger commercialised production units.

Finally, it is clear from the process of this study that a number of issues have emerged with regard to commercialisation of the communal cattle production systems in this study area. Among the crucial issues raised regards the question "*how best to undertake a successful communal agricultural commercialisation process given the many constraints facing the process - especially in South Africa where this process is currently unfolding?*" The research processes of this study revealed that commercialisation of the communal cattle-production systems might have to emanate from a simplified research process through what this study calls an *Agricultural Commercialisation Roadmap (ACR)* as presented in Figure 14.1. This *Agricultural Commercialisation Roadmap (ACR)* can in addition be adapted for the commercialisation process of any communal agricultural production systems of developing regions - especially sub-Saharan Africa where the farmer and farming systems characteristics are expected to be closely related with those presented by this study.

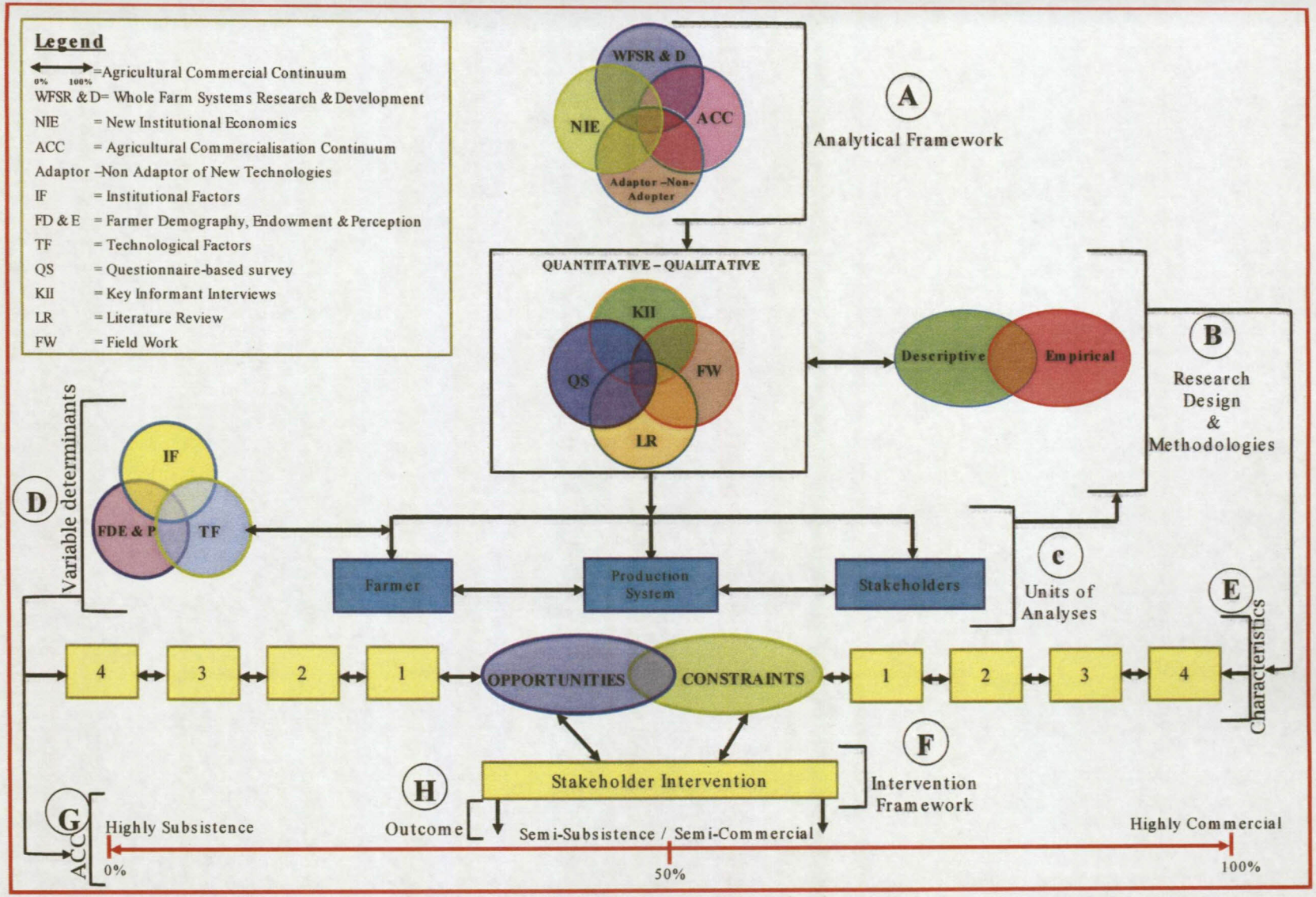


Figure 14.1: *Agricultural Commercialisation Roadmap (ACR)* for communal production systems

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ANNEXURE A
GENERAL SURVEY
QUESTIONNAIRE (English Version)
COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY
DATE :
ENUMERATOR :
RESPONDENT :
RESPONDENT NUMBER :
VILLAGE :

This questionnaire concerns the study, **"COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY"** only, and may not be used for any other purposes.

The questionnaire contains information of the respondents. The information's confidentiality is guaranteed. The questionnaire will be used in gathering information on personal characteristics, socio-economic, socio-cultural, farming systems practices and land-use at the Musekwa Valley study area. It will assist the researcher in drawing conclusions on the problem statement as well as designing recommendations to all the stakeholders; communal farmers, commercial farmers, agricultural extension officers and policy-makers on agriculture in the Limpopo Province.

Unless otherwise stated, the respondent should complete the questionnaire by crossing in the appropriate box.

A. PERSONAL INFORMATION AND HOUSEHOLD CHARACTERISTICS

A.1 Who is the head of the household

Father	1
Mother	2
Girl-child	3
Boy-child	4
Other (indicate	5

A.2 Marital status of household head

Married	1
Single	2
Divorced	3
Widowed	4
Separated	5

A. 3 What is the age of the household head?

>65 years	1
55-64 years	2
45-54 years	3
35-44 years	4
25-34 years	5
15 years and under	6

A. 4. Indicate ages for household members per category

Age category in years	Number
<10	1
11-18	2
19-30	3
31-40	4
41-50	5
51-60	6
>61	7

A.5 What is the highest educational level attained by the household members?

Member	Household head	Partner	Child 1	Child 2	Child 3	Child 4	Other (specify)
Level of education	1	2	3	4	5	6	

A. 6 What is the Language used in your household?

Tshivenda	XiTsonga	Northern Sotho	Other (Specify)
1	2	3	4

A.7 Indicate your arithmetic ability per category (tick one per category)

Addition	Good	1	Fair	2	Bad	3
Subtraction	Good	1	Fair	2	Bad	3
Multiplication	Good	1	Fair	2	Bad	3
Division	Good	1	Fair	2	Bad	3
Budgeting	Good	1	Fair	2	Bad	3
Marketing	Good	1	Fair	2	Bad	3
Farming	Good	1	Fair	2	Bad	3
Financial management	Good	1	Fair	2	Bad	3
Risk management	Good	1	Fair	2	Bad	3
Grazing management	Good	1	Fair	2	Bad	3

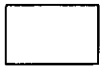
A.8 Is the household head employed?

Yes	1
No	2

A.9 What is the sector of employment for the household head?

Government	Private Companies	Local Employer	Commercial farms	Self employed	Other (specify)
1	2	3	4	5	6

A.10 How many members are there in your household?



A.12 Indicate the number of female members of your household

A.13 Indicate the number of male members of your household

A.14 Indicate the number of children of your household attending school

A. 15 How long have you been doing cattle farming?

.....Years

B. FARM CHARACTERISTICS

B.1Who owns the land in which you farm?

Personal land	Communal land	Leased land	Rented	Other (specify)
1	2	3	4	5

B.2 Are there any other livestock farming activities you practice apart from cattle farming?

Yes	1
No	2

B.3 What are your next important livestock farming activity after cattle farming?

Sheep	Goat	Chicken	Horse	Donkey	Mule	Pig	Other (specify)
1	2	3	4	5	6	7	8

B.4 Why do you farm on cattle?

Household consumption	Lobola	Money	Feasts and ceremonies	Drought power	Other (specify)
1	2	3	4	5	

B.5 What type of breed do you farm on?

Type of breed	
Tuli	1
Afrikaner	2
Brahman	3
Bonsmara	4
Nguni	5
Hereford	6
Holstein	7
Sanga	8
Crossbreed	9
Other(specify)	10

B.6 Why do you keep the breed mentioned above?

Reason	
It adapts well to the area	1
Affordability	2
Common breed of the area	3
It was recommended	4
It produces more milk	5
Because of its features: colour, size, etc	6
Inherited	7
Other farmers have this breed in the area	8

B.7 Indicate the numbers of the breed you keep per category

Cows (>3 years)	Heifers	Bulls (>3 years)	Calves (0-1 year)	Oxen (castrated)
1	2	3	4	5

B.8 Do you own all the cattle you keep?

Yes	1
No	2

B.9 If not, who are the owners of some of the cattle you keep?

Neighbours	Relatives	Commercial farmers elsewhere	Other (specify)
1	2	3	4

B.10 How many cattle do you keep belonging to other people?

B. 11 Do they pay you for keeping their animals?

Yes	1
No	2

B.12 If yes, how do they pay you for keeping their cattle?

Money	1
Given some animals after a while	2
Other (Specify)	3

B.13 Is there any stock theft in the area?

Yes	1
No	2

B.14 If yes, how do you control it?

Police help	1
Farmers' joint operations	2
Community policing operations	3
Private security operations	4
Other (specify)	5

B.15 Which of your animals have been stolen in the past twelve months?

Cows	Calves	Heifers	Bulls	Oxen
1	2	3	4	5

B.16 What was the main threat of your animals in the past twelve months?

Disease	Drought	Veld fires	Theft	Predators	Other (specify)
1	2	3	4	5	6

B.17 In the past twelve months what was the condition for your bush?

Good	Fair	Bad
1	2	3

B.18 What threatened your bush condition in the last twelve months?

Soil erosion	Deforestation	Overgrazing	Alien plants	Other (specify)
1	2	3	4	5

C. FARM MANAGEMENT PRACTICES

C.1 Do you identify your cattle?

Yes	1
No	2

C.2 How do you identify your cattle?

Ear tags	Birth marks ,e.g. , colour	Nose tags	Hot branding	Tattoos	Other (specify)
1	2	3	4	5	5

C.3 Do you keep records for your farm?

Yes	1
No	2

C.4 Which record do you mainly keep?

Production records	Financial records	Health records	Marketing records	Other (specify)
1	2	3	4	5

C.5How do you manage your grazing space?

Rotational grazing in camps	Rotational grazing in the area without camps	Free grazing in the camps	Open grazing in unfenced land	Other (specify)
1	2	3	4	5

C.6 Do you farm crops?

Yes	1
No	2

C.7 If yes, what sort of crops do you farm with?

Sorghum	Maize	Millet	Green vegetables	Fruit	Other (specify)
1	2	3	4	5	6

C.8 What do you do with the crop residue after the harvest?

Cut and carry to animals	Allow animals to graze on crop residue	Leave in the field	Sell	Burn	Other(specify)
1	2	3	4	5	6

C.9 What other supplements do you use for your animals?

Salt licks	Mineral licks	Mealie concentrates	Protein licks	Bone meal	Other (specify)
1	2	3	4	5	6

C.10 When do you use supplements?

Winter	Summer	Year round	During Pregnancy	During Drought	Other (specify)
1	2	3	4	5	6

D. ANIMAL INFORMATION

D.1 Do you weigh your calves at birth?

Yes	1
No	2

D.2 What was the highest weight recorded for your newly born calf in the past 12 months?

D.3 What was the least weight recorded for your newly born calf in the past twelve months?

D.4 What is the calving interval of your cows?

At age 24 months	1
At age 30 months	2
At age 36 months	3
At age 42 months	4
At age 48 months	5
48 months>	6

D.5 When do your heifers calf for the first time?

After 12 months	After 18 months	After 24 months	After 30 months	After 36 months

D.6 Are there any calving difficulty experienced by your animals in the past twelve months?

Yes	1
No	2

D.7 What is the main calving difficulty experienced by your animals in the past twelve months?

Legs first	Crossing of the calf	Sick animal	Excessive size of the calf	Other (specify)
1	2	3	4	5

D.8 Indicate the main reason for weaning your animals

Time to wean	1
Time to breed the cow	2
Need milk for sale	3
Dry season	4
Selling the cow	5
Other(specify)	6

D.9 When do you wean your animals?

Soon after birth	2-3 months old	4-5 months old	6-8 months old	8-10 months old	10-12 months old
1	2	3	4	5	6

D.10 How many calves did you wean or separate successfully last year?

D.11 Do you dehorn your animals?

Yes	Sometimes	No
1	2	3

D.12 If yes, what method do you use when dehorning?

Boat dehorning	Gas dehorning	Wire dehorning	Other (specify)
1	2	3	4

D.13 Do you castrate your animals?

Yes	1
No	2

D.14 I f yes, how do you castrate them?

Burdizzo	Elastrator	Knife	Other(specify)
1	2	3	4

D.15 At what age do you castrate your animals?

Soon after birth	1
<I month	2
1-6 months	3
9-12 months	4
>12 months	5
Other (specify)	6

D.16 Did any of your animals die in the past 12 months?

Yes	1
No	2

D.17 If yes, which animals had the highest mortality rate?

Young calves	Heifers	Cows	Bulls	Oxen	Steers
1	2	3	4	5	6

D.18 What was the main cause of deaths of your animals in the past 12 months?

Natural causes	Traps	Accidents in the roads	Other (specify)
1	2	3	4

D.19 Did you try to solve the problem?

Yes	1
No	2

D.20 What disease have you mostly experienced with your animals in the past 12 months?

Tick-borne	Foot and Mouth Disease	Lumpy Skin Disease	Brucellosis	Other (Name)

D.21 Do you control parasites on your animals?

Yes	1
No	2

D.22 If yes, how do you control the parasites?

Hand dressing	1
Dipping	2
Injection	3
Spray	4
Pour on	5
Other (specify)	6

D.23 When do you control the parasites?

D.24 Do you treat internal parasites?

Yes	1
No	2

D.25 If yes, how do you treat internal parasites?

D.26 Based on what do you treat internal parasites?

D.27 Do you vaccinate your animals?

Yes	1
No	2

D.28 How often do you vaccinate your animals?

When threatened by disease	Quarterly	Twice a year	On veterinary advice	Other (specify)
1	2	3	4	5

D.29 If you do not vaccinate your animals, what is the main reason?

High prices on vaccines	1
Lack of availability of vaccines	2
Lack of knowledge on vaccines	3
Other (specify)	4

D.30 Do you have a breeding programme for your animals?

Yes	1
No	2

D.31 If yes, indicate the period you use for breeding

D.32 Who helps you with the breeding?

Extension officers	Veterinary professionals	Private Consultants	Other (specify)
1	2	3	4

D. 33 If not, what is the main reason for not having any breeding programme?

Lack of knowledge	It is expensive	Lack of equipment	Other (specify)
1	2	3	4

D.34 Do you have special bull(s) for breeding purposes?

Yes	1
No	2

D.35 If yes, do you own the bull(s)?

Yes	1
No	2

D.36 If no, indicate who owns the bull(s) you use for breeding purposes?

D.37 What do you look at when selecting a bull for breeding purposes?

Availability	Affordability	Quality	Age	Other (specify)
1	2	3	4	5

E. MARKETING INFORMATION

E. 1 Do you sell your cattle?

Yes	1
No	2

E. 2 If yes, why do you sell your cattle?

To raise money	To reduce stock	Demand of the buyer	Availability of buyers	Other (specify)
1	2	3	4	5

E.3 When you sell your cattle, do you perform price surveys?

Yes	1
No	2

E.4 Which channel do you use in selling your animals? (Indicate the most important)

Local informal market	1
Speculators	2
Auctioneers	3
Butchers	4
Co-operatives	5
Abattoirs	6
Other (specify)	7

E.5 Why do you prefer your choice channel?

The only available channel	Most common and popular in the area	Guarantees good price	Quicker to sell	Lesser costs
1	2	3	4	5

E.6 What is the most common informal market you had access to in the past 12 months?

Those buying for funerals	1
Those buying for weddings	2
Those buying for rituals	3
Those buying to increase stock	4
Other (specify)	5

E.7 How often do the traders above visit your area to buy your animals?

Daily	Daily	Monthly	Often	After some time
1	2	3	4	5

E.8 Is there any animal selling point in your area?

Yes	1
No	2

E.9 If not, how far is the selling point from your area?

<10Km away	10Km-20Km	20Km-30Km	30Km-40Km	40Km>
1	2	3	4	5

E.10 How do you transport your animals to the selling point?

Walk the animals to the selling point	Own transport	Individual hired transport	Group hired transport	Other (specify)
1	2	3	4	5

E.11 Apart from cattle, which of the following was your next best seller in the past 12 months?

Milk	1
Dung	2
Hides	3
Manure	4
Other (specify)	5

E.12 Who was the most frequent buyer of the above in the past 12 months?

Local people	Visiting members of the public	Formal market	Other (specify)
1	2	3	4

E.13 Do you slaughter your animals?

Yes	1
No	2

E.14 If yes, why do you slaughter your animals?

To sell	For food	For ceremonies and rituals	Other (specify)
1	2	3	4

E.15 How do you determine the price for your carcasses?

Weigh and sell per Kg	Market driven	Negotiate	Offer by buyer	Guess the price	Other (specify)
1	2	3	4	5	6

E.16 Did you ask for professional inspection before slaughtering?

Yes	1
No	2

E.17 How many animals did you slaughter in the past 12 months?

E.18 Do you receive market information prior to sales?

Yes	1
No	2

E.19 If yes, what is your main source of market information?

Radio	1
Television	2
Extension Publications/Magazines	3
Newspaper	4
Extension officers	5
Co-operative officers	6
Other (specify)	7

E.20 If you do not receive market information, would you want to receive any in the future?

Yes	1
No	2

E.21 What type of market information would you want to receive?

Dates of sales	Sales price	Potential buyers' information	Other (specify)
1	2	3	4

E.22 How often would you like to receive the market information?

Daily	Weekly	Monthly	Bi-annually	Other (specify)
1	2	3	4	5

E.23 What determines the selling price of your animals?

Market prices	Offer by the buyer	Guess the price	Other (specify)
1	2	3	4

E.24 Do you promote your sales?

Yes	1
No	2

E.25 If yes, how do you promote the sales?

Word of mouth	1
Radio	2
Newspapers	3
Magazines and other Publications	4
Word of mouth	5
Traditional Councils and Community meetings	6
Other (specify)	7

E.26 Do you buy cattle?

Yes	1
No	2

E.27 If yes, from whom do you buy your animals?

Other local farmers in your village	Other farmers in other villages	Neighbouring Commercial farmers	Auctioneers	Other (specify)
1	2	3	4	5

E .28 What are your reasons for buying animals?

Increase stock	Resell	Slaughter	Other (specify)
1	2	3	4

E.29 How many animals did you sell in the past 12 months?

E.30 What are the animals you prefer to buy?

Calves	Heifers	Breeding females	Old Cows	Young Bulls	Old Bulls	Other (specify)
1	2	3	4	5	6	7

F. INFRASTRUCTURE

F.1 Do you provide shelter for your animals?

Yes	1
No	2

F.2 If yes, what shelter do you have for your animals?

Open kraal	Roofed kraal	Cow shed	Other(specify)
1	2	3	4

F.3 What is your means of transport for general purposes?

Own car	Public (bus, taxi)	Donkey cart	Tractor	Other(State)
1	2	3	4	5

F.4 Are the roads in your area tarred?

Yes	1
No	2

F.5 If not, what is their condition?

Good	Bad	Fair	Worse
1	2	3	4

F.6 How often are the roads maintained?

Once in a month	1
Once every three months	2
Twice a year	3
Other (specify)	4

F.7 Do you have access to telephone?

Yes	1
No	2

F.8 What sort of telephone do you use?

Landline-Private	1
Landline- Public	2
Community Phones	3
Cell phone	4

F.9 In the past twelve months, did you have any contact with the following?

Co-operative Centre	Yes	1	No	2
Extension officer	Yes	1	No	2
Private Consultant on cattle farming	Yes	1	No	2
Veterinary officer	Yes	1	No	2

F.10 Do you have a Bank Account?

Yes	1
No	2

F.11If yes, how far is your nearest Branch of your Bank?

<10 Km	10-20 Km	>21 Km
1	2	3

F.12 Do you have access to credit facilities?

Yes	1
No	2

F.13 If yes, what is the facility you are able to access for loans?

Commercial Banks	1
Land Bank	2
Development Bank	3
Amashonisa	4
Government Schemes	5
Stokvels	6
Other (specify)	7

F.14 When last have you applied for a loan?

> a months ago	>a year ago	< a months ago	< a year ago	Other(Specify)
1	2	3	4	5

F.15 Was the loan approved?

Yes	1
No	2

F.16 If not, what was the main reason for the decline?

Blacklisted	1
Affordability	2
Insufficient reason(s) for assistance	3
Other (Specify)	4

F.17 Are your animals insured?

Yes	1
No	2

F.18 Who are the insurers?

(Specify):	460

F.19 Who helps you with livestock farming knowledge? (main one)

Farmers Union	1
Farmers workshops and meetings	2
Agricultural magazines	3
Extension officers	4
Self study	5
Other (specify)	6

F.20 What is the source of drinking water for your animals?

Borehole	1
Tap water	2
River	3
Windmill	4
Other (specify)	5

F.21 What is the estimated distance that your animals walk to the watering point?

F.22 Do you have access to electricity?

Yes	1
No	2

F.23 What kind of electricity do you use?

Pre-paid supply	Metered supply	Other (specify)
1	2	3

F. 24 If you do not have electricity, what did you use for energy in the past 12 months? (the main source)

Diesel generators	1
Paraffin	2
Bio-fuels	3
Candles	4
Wood	5
Solar heating	6
Other (specify)	7

F.25 At present, what do you need most for your cattle farming?

Dipping tank	Weighing scales	Feedlot	Cold Storage Rooms	Other (specify)
1	2	3	4	5

G. ECONOMIC INFORMATION OF THE FARMER'S HOUSEHOLD

G.1 What sort of housing structure do you dwell in?

Brick house	Shack	Mud hut	Other (specify)
1	2	3	4

G.2 Do you have access to clean drinking water?

Yes	1
No	2

G.3 What is the source of your drinking water?

Household tap	Communal tap	Communal borehole	River	Other (specify)
1	2	3	4	5

G.4 How much do you make *per annum* in selling your cattle?

<R10 000	R10 000-R 20 000	R20 000-30 000	R30 000-R40 000	>R40 000
1	2	3	4	5

G.5 What is your annual income from other sources?

<R10 000	R10 000-R20 000	R20 000-R30 000	R30 000-R40 000	>R40 000
1	2	3	4	5

G.6 Apart from the farm, what is your other main source of income?

Government child grant	1
Government old age pension	2
Retirement income	3
Other faming activities	4
Other (specify)	5

G.7 How much do you spend on the family *per annum*?

G.8 What do you spend much on per month?

Food	Education	Health	Transport	Other(Specify)
1	2	3	4	5

G.9 How much do you spend on the farm *per annum*?

G.10 What farm necessity consumes the most of your farm expenditure?

Animal stock	1
Animal health	2
Equipment	3
Labour	4
Animal Feed	5
Other (Specify)	6

G.11 What do you mainly associate your cattle with?

Food provision	1
Wealth	2
Status	3
Savings	4
Other (specify)	5

H. FARMERdecision-making

H.1 Do you belong to any farmerorganization?

Yes	1
No	2

H.2 What is the name of the farmerorganization you belong to?

H.3 Do you know about the Comprehensive Agricultural Support Programme?

Yes	1
No	2

H.4 If yes, are you a participant in the Programme?

Yes	1
No	2

H.5 If not, why not participate?

Not interested	I do not know	Never invited	Other (specify)
1	2	3	5

H.6 If yes, for how long have you been a participant?

Less than a year	More than a year but less than five years	More than Five years but less than ten years	Other (specify)
1	2	3	4

H.7 How do you rate the Comprehensive Agricultural Support Programme in your area?

Good	Just fine	Bad
1	2	3

H.8 Are you in the management structures of the Comprehensive Agricultural Support Programme in your area?

Yes	1
No	2

H.9 What would you want the Comprehensive Agricultural Support Programme do for your?

Provided some breeding bulls	1
Provided farm skills and training	2
Provided Infrastructure, e.g., water, camps	3
Provided some needed cash to individual farmers	4
Provided some important information, e.g., marketing of animals	5
Other (Specify)	6

H.10 What is the main thing you would want the Comprehensive Agricultural Support Programme to do for you?

Help improve quality of animals	1
Increase stock	2
Improve price of animals	3
Supply equipment	4
Improve the grazing camps	5
Obtain my own farm	6

H.11 Who initiated the Comprehensive Agricultural Support Programme in your area?

Department of agriculture	1
Municipality (District/Local)	2
Farmers	3
Local Civic Structures	4
Traditional Council/Leadership	5
Other (specify)	6

ANNEXURE B

GENERAL SURVEY

QUESTIONNAIRE (TSHIVENDA VERSION)

COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY

DATE	:
ENUMERATOR	:
RESPONDENT	:
RESPONDENT NUMBER	:
VILLAGE	:

This questionnaire concerns the study, **"COMMERCIALISATION OF COMMUNAL CATTLE-PRODUCTION SYSTEMS IN THE MUSEKWA VALLEY"** only, and may not be used for any other purposes.

The questionnaire contains information of the respondents. The information's confidentiality is guaranteed. The questionnaire will be used in gathering information on personal characteristics, socio-economic, socio-cultural, farming systems practices and land-useat the Musekwa Valley study area. It will assist the researcher in drawing conclusions on the problem statement as well as designing recommendations to all the stakeholders; communal farmers, commercial farmers, agricultural extension officers andpolicy-makers on agriculture in the Limpopo Province of South Africa.

Unless otherwise stated, the respondent should complete the questionnaire by crossing in the appropriate box.

Sources: Nell (1998), Marfo (2004), Mocwiri (2004), Stroebel (2004), Montshwe (2006), Nthakheni (2006)

A. ZWIDODOMBEDZWA ZWA MUFUWI NA ZWA MUTA WA MUFUWI

A.1 Thoho ya muta ndi nnyi?

Khotsi	1
Mme	2
Khomba	3
Mutukana	4
Munwe -vho	5

A.2 Vhuimo ha thoho ya muta

Mala/Maliwa	1
U ethe	2
O tala	3
Tshilikadzi	4
Fhandekana	5

>65	1
55-64	2
45-54	3
35-44	4
25-34	5
15	6

A. 3 Thoho ya muta u na minwaha mingana?

A.4 Kha vha sumbedze minwaha ya mirado ya muta

Minwaha		
<10	1	
11-18	2	
19-30	3	
31-40	4	
41-50	5	
51-60	6	
>61	7	

A.5 Vhuhulwane ha pfunzo ho swikelelwaho nga mirado ya muta wavho ndi vhufhio?

Murado	Thoho	Mufarisi	Nwana 1	Nwana 2	Nwana 3	Nwana 4	Munwevho (Kha bulwe)
Vhuimo	1	2	3	4	5	6	7

A. 6 Hu ambiwa Luambo de mutani wavho?

TshiVenda	TshiTsonga	Tshisuthu tsha Livhuwa	Lunwevho (kha vha bule)
1	2	3	4

A.7 Kha vha sumbedze vhukoni havho kha zwi tenwa zwa divhambalo zwi tevhelaho

U tanganyisa	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
U tusa	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
U andisa	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
U kovha	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
Magavhelo	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
Vhuvhambadzi	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
Vhufuwi	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
U langa masheleni	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3
U langa ndozwo	Zwavhudi	1	Ndi khwine	2	A si zwavhud	3
U langa pfulo	Zwavhudi	1	Ndi khwine	2	A si zwavhudi	3

A.8 Thoho ya muta u a shuma lwa u tholwa? Ee 1 Hai 2

A.9 Mune wa mudi vha shuma kha sekhithara I fhio kha idzi dzo bulwaho?

Muvhusoni	Kha khamphani dzo diimisaho	Mutholi wa tsini	Kha Vhoramabulasi	Mudishumi	Tshinwevho (Kha vha bule)
1	2	3	4	5	

A.10 Mutani wavho huna mirado mingana? ☐

A.12 Hu na mirado mingana ya tshisadzini mutani wavho? ☐

A.13 Hu na mirado mingana ya tshinnani mutani wavho? ☐

A.14 Vhana vha dzheneho tshikolo ndi vhangana mutani? ☐

A.15 Vha na minwaha mingana vha tshi fuwa kholomo? Minwaha ya.....

B. ZWIDODOMBEDZWA ZWA VHUFUWI

B.1 Mavu ane vha fuwa khao ndi a nnyi?

Ndi a muta	Ndi a shango	Ndi a u tou liza	Ndi a rennde	Tshinwevho (Kha vha bule)
1	2	3	4	5

B.2 Nga nnda ha vhufuwi ha kholomo, hu na zwinwe zwine vha fuwa Ee 1 Hai 2

B.3 Ndi tshifhio tshine vha fuwa tshi tevhelaho kholomo kha izwi zwo bulwaho ?

Nnngu	Mbudzi	Khuhu	Bere	Bongola	Meila	Nguluvhe	Tshinwevho (Kha tshi buliwe)
1	2	3	4	5	6	7	8

B.4 Ndi ngani vha tshi fuwa kholomo?

U itela zwiliwa	Mamalo	Tshelede	Minyanya na Vhutambo	U pana	Tshinwevho(Kha tshi buliwe)
1	2	3	4	5	6

B.5 Vha fuwa kholomo de?

Lushaka lwa Kholomo	
Tuli	1
Funukanere	2
Brahmani	3
Bonsmara	4
Nguni	5

Hereford	6
Holstein	7
Sanga	8
Crossbreed	9
Inwe vho (Kha I buliwe)	10

B.6 Ndi ngani vha tshi fuwesa lushaka lwo bulwaho afho ntha?

Mavhaga	
Lushaka ulu lu tshila zwavhudi kha vhupo hashu	1
Lu a rengea	2
Lushaka lu wanalaho nga vhunzhi kha vhupo hashu	3

Lushaka lwo tou themendelwa nga vhanwe kha nne	4
Lushaka lu bveledzaho mafhi manzhi	5
Nga mulandu wa zwidodombedzwa zwalo; muvhala, vhuhulu	6
Ndi ifa	7

B.7 Kha vha sumbedze tshivhalo tsha tshakha dzi tevhelaho dzine vha fuwa

Tsadzi (>3 Minwaha)	Tholeadzi	Mboho (>3 Minwaha)	Namana (0-1 Nwaha)	Phulu
1	2	3	4	5

B.8 Kholomo dze vha fuwa ndi dzavho dzothe? Ee 1 Hai 2

B.9 Arali dzi si dzavho dzothe, dzinwe ndi dza nnyi?

Muhura	Mashaka	Vhafuwi vha u ita bindu	Munwevho (Kha vha mu bule)
1	2	3	4

B.10 Kholomo dzi si dzavho ndi nngana? [ ]

B. 11 Vha ya badelwa kha u swiswa kholomo Ee 1 Hai 2

B.12 Tshihulwane tshine vha badelwa nga tsho ndi mini?

Tshelede	1
U swaelwa namana	2
Tshinwevho (Kha tshi buliwe)	3

B.13 Hu a tswiwa kholomo vhuponi ha havho? Ee 1 Hai 2

B.14 Arali hu tshi tswiwa kholomo, vha langisa hani u tswiwa uho?

Nga thuso ya Mapholisa	1
Nga u tingisana u linda ha Vhafuwi	2
Nga u tingisana u linda nga Vhadzulapo	3

Nga u shumisa feme dza Vhalindi	4
Tshinwevho (Kha tshi buliwe)	5

B.15 Kha Minwedzi ya 12 yo fhiraho, vho no tswelwa lushakade lwa kholomo nga maanda?

Tsadzi	Namana	Tholeadzi	Mboho	Phulu	Inwevho (Kha vha bule)
1	2	3	4	5	6

B.16 Tshishushedzi tshihulwane kha Minwedzi ya 12 yo fhiraho kha zwo bulwaho afho ntha ho vha mini kha kholomo dzavho?

Madwadze	Gomelelo	Mililo ya daka	U tswelwa	Zwipuka zwa daka	Tshinwevho (Kha vha tshi bule)
1	2	3	4	5	6

B.17 Kha Minwedzi ya 12 yo fhiraho, daka lavho lo vha li kha tshiimo-de?

Tshavhudi	Tsha Khwine	Tshi si tsha vhudi
1	2	3

B.18 Ndi tshini tsho khakhisesaho tshiimo tsha daka lavho kha Minwedzi ya 12 yo fhiraho?

Mukumbululo	1
U renwa ha miri	2
U fulisa zwifuwo lwa u fhira mpimo	3

Miri I sili yo dzhenelelaho	4
Tshinwevho (Kha tshi buliwe)	5

C. VHUBVELEDZI HA BULASI NA VHULANGULI HAYO

C.1 Vha ya swaya kholomo dzavho? Ee 1 Hai 2

C.2 Vha dzi swaisa hani?

Tshinina kha ndevhe	Tswayo dza mupo sa muvhala	Tshinina kha ningo	Tshifanyiso tsho tou fhisedzelwaho	Mbalo dzo tou fhiosedzelwaho	Tshinwe (Kha vha bule)
1	2	3	4	5	6

C.3 Vha ya vhulunga rekhodo dza zwa vhufuwi havho? Ee 1 Hai 2

C.4 Ndi i fhio rekhodo vha no i vhulunga u fhira dzinwe?

Rekhodo dza mveledziso	1	Rekhodo dza zwa vhubindudzi	4
Rekhodo dza zwa masheleni	2	Inwevho (Kha vha bule)	5
Rekhodo dza zwa mutakalo	3		

C.5 Vha langisa hani pfulo yavho?

U tshentsha gamba	U tshentsha zwifuwo kha vhupo vhu so ngo gammbelwaho	U sokou fulisa hu sina ndango	U fulisa hu sina ndango ha dovha hu sivhe na gammba	Tshinwe (Kha vha bule)
1	2	3	4	5

C.6 Vha ya lima? Ee 1 Hai 2

C.7 Vhalima mini tshihulwane kha zwothe?

Makhaha	Mavhele	Luvhele	Miroho	Mitshelo sa matamatisi	Tshinwevho (Kha vha bule)
1	2	3	4	5	6

C.8 Vha ita mini nga muhwane?

Vha hwalela kholomoni	Kholomo dzi rwa muhwane	Ndi litsha hanengei masimuni	Ndi a rengisa	Ndi a fhisa	Tshinwevho (Kha vha bule)
1	2	3	4	5	6

C.9 Zwinwe zwa u thusedza zwiliwa zwa kholomo dzavho ndi mini?

Muno wa u muna	Minerala wa u tou muna	Mufumbu	Protheini I muniwaho	Mufumbu wa marambo	Tshinwe (Kha vha bule)
1	2	3	4	5	6

C.10 Vha thusedza lini u engedza zwiliwa zwa kholomo dzavho?

Vhuriha	Tshilimo	Nwaha wothe	Musi kholomo I na damu	Hu na gomelelo	Tshinwe (Kha vha bule)
1	2	3	4	5	6

D.ZWIDODOMBEDZWA ZWA KHOLOMO DZAVHO

D.1 Vha ya kala zwinamana zwo dzwaliwaho? Ee 1 Hai 2

D.2Tholeadzi dzavho dzi dzwala lini lwa u tou thoma?

Dzi na minwedzi ya 24	1	Dzi na minwezi ya 42	4
Dzi na minwedzi ya 30	2	Dzi na minwredzi ya	5
Dzi na minwedzi ya 36	3	Minwedzi ya 48 u ya ntha	6

D.3 Tholeadzi dzavho dzi dzwala nga murahu ha tshifhinga tshi ngafhani?

Nga murahu ha minwezi ya 12	1		Nga murahu ha minwezi ya 30	4
Nga murahu ha minwedzi ya 18	2		Nga murahu ha minwedzi ya 36	5
Nga murahu ha minwedzi ya 24	3			

D.4 Kholomo dzavho dzo vhuya dza vha na vhuleme musi dzi tshi dzwala kha minwedzi ya 12 yo fhiraho? Ee 1 Hai 2

D.5 Ndi vhufhio vhuleme he vha tanganesa naho musi kholomo dzavho dzi tshi dzwala?

U bva ha milenzhe u thoma	1	U hulesa ha namana	4
U rambalala ha namana	2	Tshinwe (kha vha tshi bule)	5
U lwala ha kholomo	3		

D.6 Ndi lini hune vha phusisa kholomo dzavho?

Hu tshifhinga tsha u phusa	1	Huna gomelelo	4
Uri kholomo I vhe na damu	2	Musi ri tshi rengisa mme	5
Hu tshi todea mafhi	3	Tshinwe (Kha vha bule)	6

D.7 Vha phusisa kholomo dzavho lini?

Dzi tshi tou dzwala	Dzi na minwedzi mivhili uya kha miraru	Dzi na minwedzi mina uya kha mitanu	Dzi na minwedzi ya rathi uya kha ya malo	Dzi na minwedzi ya tahe uya kha ya fumi na muthihi	Dzi na minwedzi ya fumi uya kha ya fumi na mivhili
1	2	3	4	5	6

D.8 Vho phusisa namana nngana kha minwedzi ya 12 yo fhiraho zwavhudi? [ ]

D.9 Kholomo dzavho dzi a bviswa mananga?

Ee	Tshinwe tshifhinga	Hai
1	2	3

D.10 Mananga a kholomo dzavho a bviswa hani?

Boat dehorning	Nga xasi	U tou rumbulela nga darata	Tshinwevho (kha tshi bulwe)
1	2	3	4

D.11 Vha a fhahula mbohwana dzavho? Ee [1] Hai [2]

D.12 Vha dzi fhahulisa hani?

Nga u tou manya nga Burdizzo	U vhofha nga lekere	Nga u shumisa Lufhanga	Tshinwe vho (Kha vha bule)
1	2	3	4

D.13 Ndi lini hune vha fhahula mbohwana dzavho?

Musi dzi tshi tou dzwaliwa	1	9-12 minwedzi	4
<I nwedzi	2	>12 minwedzi	5
1-6 minwedzi	3	Minwevho (Kha vha I bule)	6

D.14 Vho vhuya vha felwa nga kholomo kha minwedzi ya 12 yo fhiraho? Ee [1] Hai [2]

D.15 Vho feleswa nga lushaka de kha dzo bulwaho?

Namana	Tholeadzi	Tsadzi	Mboho	Phulu	Phulwana
1	2	3	4	5	6

D.16 Tsho vhulahesao kholomo dzavho kha minwedzi ya 12 yo fhiraho ndi mini?

U fa lwa mupo	Magwekwe	U thulwa dzibadani	Tshinwe (Kha vha tshi bule)
1	2	3	4

D.17 Vho lingedza u tandulula thaidzo iyi? Ee [1] Hai [2]

D.18 Kha vha bule vhulwadze ho vha itelaho thaidzo khulwane kha kholomo dzavho kha minwedzi ya 12 yo fhiraho?

Magufha	Khwanda na mulomo	Vhulwadze ha mapundu	Brucelossis	Vhunwevho
1	2	3	4	5

D.19 Vha ya langa zwikhokhonono na zwilumi zwa kholomo dzavho? Ee [1] Hai [2]

D.20 Vha zwi langisa hani?

U tou bvisa nga zwanda	1	U fafadzela	4
U shumisa dipe	2	U shela mushonga	5
U shumisa dzhigiseni kana u thavhela	3	Other (specify)	6

D.21 Ndi lini hune vha langa zwikhokhonono izwo?

D.22 Vha ya langa zwikhokhonono zwa nga ngomu ha kholomo dzavho? Ee 1 Hai 2

D.23 Vha zwi langisa hani?

D.24 Tshi itaho uri vha lange zwikhokhonono izwi ndi mini?

D.25 Vha ya haela kholomo dzavho? Ee 1 Hai 2

D.26 Vha haela lini kholomo dzavho?

Musi hu na khonadzeo dza malwadze	Nga kotara	Luvhili kha nwaha	Musi dokotela wa zwifuwo o themendela	Tshinwevho (Kha vha bule)
1	2	3	4	5

D.27 Arali vha sa haeli kholomo dzavho, tshiitisi thshi hulwane ndi mini?

U duresa ha mishonga ya u haela	1	U sa vha na ndivho ya zwa u haela zwifuwo	3
U sa wanala ha mishonga ya u haela	2	Tshinwe (Kha vha tshi bule)	4

D.28 Vha na mbekanyamaitele ya u diisa kholomo dzavho? Ee 1 Hai 2

D.29 kholomo dzavho dzi diiwa lini?

D.30 A vha thusaho nga biridini ndi nnyi?

mulimisi	Dokotela we zwifuwo	Vhathusi vha phuraivethe	Munwevho (Kha vha bule)
1	2	3	4

D. 31 Ndi ngani vha si na mbenganyamaitele ya biridini kha kholomo dzavho?

Ndi u shaya ndivho	Zwi a dura	U shaya tshomedzo	Tshinwevho (Kha vha bule)
1	2	3	4

D.32 Vha na mboho ya tshipentshela ya u dia? Ee 1 Hai 2

D.33 Arali I hone, mboho iyo ndi yavho na? Ee 1 Hai 2

D.34 Arali mboho I si yavho, ndi ya nnyi?

D.35 Musi vha tshi nanga mboho ya u dia, vha sedza mini?

U leluwa ha u wanala hayo	U nga kona u I fuwa	Vhudi hayo	Minwaha yayo	Tshinwevho (Kha vha bule)
1	2	3	4	5

E.VHUVHAMBADZI HA ZWIFUWO ZWAVHO

E. 1 Vha a rengisa kholomo dzavho? Ee 1 Hai 2

E. 2 Ndi ngani vha tshi rengisa kholomo dzavho?

U wana tshelede	U fhungudza danga	Musi vharengi vha tshi toda kholomo	U vha hone ha vharengi	Tshinwevho (Kha vha bule)
1	2	3	4	5

E.3 Musi vha tshi rengisa kholomo dzavho, vha athoma vha sedza uri mimaraga ya kholomo? Ee 1 Hai 2

E.4 Vha vhambadzela vha fhio kholomo dzavho? (Kha vha bule murengi muhulwane)

Vharengi vha mahayani	1	Koporasi	5
Vhabvumbi vha maraga wa zwifuwo	2	Vhathavhi vha kholomo	6
Vhoradziokisheni	3	Munwevho (Kha vha mubule)	7
Vhorasilaha	4		

E.5 Ndi ngani vha tshi rengiselesa vhe vha bula afho ntha?

Ndi vhone vharengi vhe vhothe	Ndi vhone vha wanalesaho kha vhupo ha hashu	Vha na mutengo wa vhudi	Ndi tavhanya u rengisa	Zwifhungudza mbadele dza u vhambadza
1	2	3	4	6

E.6 Kha vharengi vha mahayani, ndi vha fhio vha rengesaho kha vhone?

Vha u rengela dzimpfu	1	Vha u rengela u fuwa	4
Vha urengela minyanya	2	Tshinwevho (kha vha bule)	5
Vha u rengela zwitungulo	3		

E.7 Vharengi vho bulwaho afho ntha vha anzela u da u renga lini?

Duvha na duvha	Nga Vhege	Nga Nwedzi	Tshifhinga tshinzhi	Lwa tshidole
1	2	3	4	5

E.8 Hu na hune ha rengiselwa hone kholomo kha vhupo ha havho? Ee 1 Hai 2

E.9 arali hu sina, hune vha vhambadzela hone ndi vhukule vhu ngafhani na hune vha dzula hone?

<10Km	11Km-20Km	21Km-30Km	31Km-40Km	40Km>
1	2	3	4	5

E.10 Kholomo dzavho vha dzi swikisa hani hune dza rengiswa hone?

Dzi tou swogiwa	Nga tshiendisi tshanga	Nga tshiendisi tshine nda tou hira	Nga tshiendisi tsho hiriwaho nga gute	Tshinwevho (Kha vha bule)
1	2	3	4	5

E.11 Nga nnda ha kholomo vho rengisesa tshinwe tshifhio kha minwedzi ya 12 yo fhiraho?

Mafhi	1	Mupfudze	4
Matoko	2	Tshinwevho (Kha vha bule)	5
Mikumba	3		

E.12 Tshe vha bula afho ntha tsho rengeswa nga vhafhio kha minwedzi ya 12 yo fhiraho?

Vharengi vha mahayani	Vharengi vha no tou da vha tshi bva hunwe	Vharengi vha u bindudza	Tshinwe (Kha vha bule)
1	2	3	4

E.13 Vha ya thavha kholomo dzavho? Ee 1 Hai 2

E.14 Ndi ngani vha tshi thavha kholomo dzavho?

U itela u rengisa	U itela zwiliwa	U itela minyanya na zwitungulo	Tshinwevho (Kha vha bule)
1	2	3	4

E.15 Mitengo ya nama vha i vhea hani?

I tou kalwa nga Khilogireme	Nga tshikalo tsha makete wa nama ya kholomo tsha tshifhinga tshetsho	Nga nyambedzano na murengi	Nga zwine murengi a fulufhedzisa	Mutengo wa u tou u humbulela	Tshinwevho (kha vha bule)
1	2	3	4	5.	6

E.16 Vha ya toda nyeletshedzo vha saathu thavha kholomo? Ee 1 Hai 2

E.17 Vho thavha kholomo nngana kha minwedzi ya 12 yo fhiraho?

Ee 1 Hai 2

E.18 Vha saathu u rengisa kholomo vha a ita thodisiso ya makete wa kholomo?

E.19 Vha wana hani mafhungo a kwamaho zwa makete wa kholomo?

Radio	1	Mulimisi	5
Thelevishini	2	Koporasi	6
Magazini wa Zwavhalimi	3	Tshinwevho (Kha vha bule)	7
Gurannda	4		

E.20 Arali vha sa wani mafhungo a zwa makete wa vhuvhambadzi ha kholomo, vha ya toda na u vhu wana tshifhingani tshidaho ? Ee 1 Hai 2

E.21 Vha toda u thuswa u wana mafhungode a makete wa kholomo?

Maduvha a seleni	Mitengo ya seleni	Vharengi vha wanalaho	Tshinwevho (Kha vha bule)
1	2	3	4

E.22 Vha toda u wana mafhungo a makete wa kholomo lini?

Duvha na duvha	Kha Vhege	Kha Nwedzi	Luvhili kha Nwaha	Tshinwe (kha vhabule)
1	2	3	4	5

E.23 Ndi tshini tshi hulwane tshi taho mitengo ya kholomo dzavho?

Matshimbilele a makete wa kholomo nga tshifhinga tshenetsho	Zwine murengi a fulufhedzisa	U sokou humbulele mitengo	Tshinwevho(Kha vha bule)
1	2	3	4

E.24 Vha ya andadza marengisele a kholomo dzavho? Ee 1 Hai 2

E.25 Vha andadzisa hani kurengisele kwa kholomo dzavho?

Khuwelel ya u tou divhadza nga mulom	1	Nga u tou vhudza vhathu	5
Radio	2	Dzikhoroni na mitanganoni ya vhadzulapo	6
Gurannda	3	Tshinwevho (Kha vha bule)	7
Khandiso dza Vhafuwi	4		

E.26 Vha a renga kholomo kha vhanwe vhafuwi? Ee 1 Hai 2

E.27 Vha renga kha vhafhio nga maanda?

Vhafuwi vha mudi wa hashu	Vhafuwi vha minwe midi ya tsini	Vhafuwi vha u bindudza vha tsini	Vhoraseleni	Tshinwevho (Kha vha bule)
1	2	3	4	5

E .28 Ndi ngani vha tshi renga kholomo kha vhanwe vhafuwi?

U engedza danga	U rengisa	U thavha	Tshinwevho (Kha vha bule)
1	2	3	4

E.29 Kha minwedzi ya 12 yo fhiraho vhorengis kholomo nngana? [ ]

E.30 Vha anzela u renga lushaka lufhio lwa kholomo?

Namana	Tholeadzi	Tsadzi dza u fuwa	Tsadzi dza magologodo	Phulwana	Phulu	Inwevho (kha vha bule)
1	2	3	4	5	6	7

F.INIFURASITIRAKITSHA

F.1 Vho itela kholomo dzavho fhethu ha u dzula? Ee 1 Hai 2

F.2 Arali zwo ralo, ndi fhethu de?

Danga li na thanga	Danga li si na thanga	Thsinwevho (Kha vha bule)
1	2	3

F.3 Vha shumisa tshiendedzi de kha nyendo dza duvha nga duvha?

Tshiendedzi tsha vhune	Tshiendedzi tsha nnyi na nnyi	Gariki	Gandakanda	Tshinwevho
1	2	3	4	5

F.4 Bada dza havho dzo shelwa tshigontiri? Ee 1 Hai 2

F.5 Arali zwi so ngo ralo, dzi kha tshiimo de?

Tshavhudi	Tshi si tshavhudi	Tshakhwine	Tsho fhifhaho
1	2	3	4

F.6 Bada dza havho dzi anzela u shumiwa lini?

Luthihi kha nwedzi	1	Luvhili kha nwaha	3
Luthihi kha minwedzi miraru	2	Tshinwevho (Kha vha bule)	4

F.7 Vha a kona u swikelela thingo? Ee 1 Hai 2

F.8 Vha shumisa thingo de?

Dza thambo (Dza phuraivethe)	1	Dza tshitshavha	3
Dza thambo (Dza nnyi na nnyi)	2	Thingo thendeleki	4

F.9 Kha minwedzi ya 12 yo fhiraho, vho vha na vhukwamani na vhatevhelaho?

Senthara ya Koporasi	Ee	1	Hai	2
Mulimisi	Ee	3	Hai	4
Muthusi wa zwa vhufuwi wa phuraivethe	Ee	5	Hai	6
Dokotela wa zwifuwo	Ee	7	Hai	8

F.10 Vha na bugu ya u vhulunga masheleni ya Bannga? Ee 1 Hai 2

F.11 Bannga ine vha vhulunga khayo masheleni I vhukule vhungafhani?

<10 Km	10Km-20 Km	21Km>
1	2	3

F.12 Vha ya kona u hadzima masheleni j\kha vhakolodisi ? Ee 1 Hai 2

F.13 Arali vha tshi kona u swikelela vhahadzimisi vha masheleni, ndi vhafhio vha nthesa vha konaho u vha hadzima masheleni?

Bannga dza nnyi na nnyi dza vhubindudzi	1	Zwikimu zwa Muvhuso	5
Bannga ya zwa mavu	2	Zwitokofela	6
Bannga ya Mveledziso	3	Tshinwevho (Kha vha bule)	7
Vhomatshonise	4		

F.14 Vho fhedza lini u hadzima masheleni?

Zwina nwedzi	Ho no fhela nwaha	Ho no fhela minwedzi	Zwi afhira nwaha	Tshinwevho (Kha vha bule)
1	2	3	4	5

F.15 Khadzimiso yo tendiwa? Ee 1 Hai 2

F.16 Arali I songo tendiwa, yo haniwa nga lifhio?

Nga u tshinyala dzina kha vhahadzimisi	1	Khadzimiso a si ya ndeme	3
U sa do kona u humisela murahu khadzimiso	2	Tshinwevho (Kha vha bule)	4

F.17 Kholomo dzavho dzo tsireledzwa nga Inishorentsi? Ee 1 Hai 2

F.18 Vho tsireledzaho kholomo dzavho ndi vha fhio?

Kha vha bule:

F.19 Ndivho ya zwa vhufuwi vha i phumbudzwa nga vhafhio nga maanda?

Unioni ya Vhafuwi	1	Vhalimisi	4
Mitangano ya Vhafuwi na ngudo phufhi	2	U di pfumbudza nga tshavhukoma	5
Magazini ya Vhafuwi na Vhoramabulasi	3	Tshinwevho (Kha vha bule)	6

F.20 Kholomo dzavho dzi nwa madi a bvaho ngafhi?

Bwidzini	1	Phaphaphani	4
Bommbini	2	Hunwevho (Kha vha bule)	5
Mulamboni	3		

F.21 Kholomo dzavho dzi tshimbila lwaendo lungafhani u tevhelela madi?

F.22 Vha na mudagasi? Ee 1 Hai 2

F.23 Vha na mudagasi de?

Wa u badela vha saathu us humisa	Wa u badela wo no shumiswa	Munwevho (Kha vha bule)
1	2	3

F. 24 Arali vhe sina mudagasi, vho shumisa mini kha minwedzi ya 12 fo fhiraho?

Tshidududu tsha dizili	1	Khuni	5
Pharafeni	2	Sola	6
Zwivhaswa zwa u itwa nga mitshelo	3	Tshinwevho (Kha vha bule)	7
Makhandela	4		

F.25 Tshine vha khou tshi lila zwa zwino ndi tshi fhio kha zwa vhufuwi ha kholomo?

Fhethu ha u dipisela kholomo	Tshikalo tsha kholomo	Ha u fuwela kholomo	Ha u rothodza nama	Tshinwevho (Kha vha bule)
1	2	3	4	5

G. NZULELE YA ZWA EKONOMI YA MUTA WA MUFUWI

G.1 Vha dzula kha nndu ya lushaka-de?

Ya zwidina	1	Nndu ya *Tshivenda*	3
Zhazha	2	Inwevho (Kha vha bule)	4

G.2 Vha a kona u swikelela madi a u nwa o kunaho? Ee 1 Hai 2

G.3 Vha shumisa madi a bvaho ngafhi?

Kha phaiphi ya hayani	1	Mulamboni	4
Kha phaiphi ya nnyi nannyi	2	Thsinwevho (Kha vha bule)	5
Bwidzi ya nnyi na nnyi	3		

G.4 Vha wana vhugai kha u rengisa kholomo kha nwaha ngamaanda kha minwedzi ya 12 yo fhiraho?

<R10 000 fhasi	R11 000-R 20 000	R21 000-30 000	R31 000-R40 000	>R40 000 u fhira
1	2	3	4	5

G.5 Kha nwaha, vha kona u vha na vhugai vha wanaho zwinwe zwiko nga nnda ha u fuwa kholomo?

<R10 000	R11 000-R20 000	R21 000-R30 000	R31 000-R40 000	>R40 000
1	2	3	4	5

G.6 Ndi tshi fhio tshiko tshi ne tsha vha thusa kha inwe tshelede ya muta?

Gavhelo la Muvhuso la vhana	1	Hunwe u lima	4
Pensheni ya Muvhuso	2	Tshinwevho (Kha vha bule)	5
Pensheni ya u awela nga u aluwa	3		

G.7 Vha shumisa vhugai kha nwaha kha u unda muta wavho? ____

G.8 Ndi tshi fhio tshi hulwane tshi no todesa masheleni kha muta kha nwaha?

Zwiliwa	Pfunzo ya vhana	Mutakalo	Zwiendisi	Tshinwevho (kha vha bule)
1	2	3	4	5

G.9 Vha shumisa vhugai kha nwaha vha tshi itela u fuwa? ____

G.10 tshihulwane tshi no todesa tshelede kha u fuwa kholom ndi tshi fhio kha nwaha?

U renga dzinwe kholomo dza u engedza danga	1	Vhashumi	4
Mutakalo wa kholomo	2	Zwiliwa zwa kholomo	5
Tshomedzo	3	Tshinwevho (Kha vha bule)	6

G.11 Kholomo dzavho vha dzi tumanya na mini nga maanda?

U vha itela zwiliwa	1	Mbulungo ya masheleni	4
Lupfumo	2	Sialala na Lutendo	5
Maimo	3	Tshinwevho (Kha vha bule)	6

H. MAGA NA PHETHO DZA MUFUWI

H.1 Vha murado wa madzangano a vhafuwi? Ee 1 Hai 2

H.2 Vha murado wa dzangano lifhio? ____

H.3 Vha ya divha nga ha CASP? Ee | 1 | Hai | 2 |

H.4 Arali vha tshi divha, vha ya dzhenelela kha phurogireme iyi? Ee | 1 | Hai | 2 |

H.5 Arali vha sa dzheleleli, ndi ngani?

U shaya dzangalelo	A thi divhi	A tho ngo vhuya nda rambiwa	Tshinwevho (kha vha bule)
1	2	3	5

H.6 Vha na tshifhinga tshi ngafhani vhe kha phurogireme hei ya CASP arali vha tshi dzhenelela khayo?

Fhasi ha nwaha	Zwi fhira nwaha, a zwi swiki minwaha mitanu	Minwaha mitanu, a zwi swiki minwaha ya fumi	Tshinwevho (Kha vha bule)
1	2	3	4

H.7 Comprehensive Agricultural Support Programme vha vhona i na vhuimo-de kha vhupo ha havho?

Ha vhudi	Ha khwine	vhu si ha vhudi
1	2	3

H.8 Vha kha vhulanguli ha Comprehensive Agricultural Support Programme kha havho? Ee | 1 | Hai | 2 | vhupo ha

H.9 Iyi phurogireme ya CASP vha toda I tshi vha itela mini tshihulwane sa Rabulasi?

Mboho dza u dia	1
U pfumbudza vhafuwi	2
Zwiko u fana na gammba	3
Masheleni kha vhafuwi	4
Nyandadzo ya mafhungo a vhafuwi u fana na kurengisele kwa kholomo	5
Tshinwevho (Kha vha bule)	6

H.10 Vha nga tama CASP i tshi vha thusa nga mini tshinwevho?

U khwinisa nyimele ya kholomo dzashu	1	U disa tshomedzo dza u fuwa kholomo	4
U engedza madanga	2	U khwinisa dzigammba	5
U khwinisa mitengo ya kholomo dzi rengiswaho	3	U wana bulasi ya u ima u wothe	6

11 CASP kha vhupo ha havho yo tumbulwa nga nnyi?

Muhasho wa zwa vhulimi kha phurovintsi	1
Masipala	2
Vhafuwi	3
Zwiimiswa zwa vhadzulapo	4
Vhavhusi vha sialala	5
Vhanwevho (Kha vha bule)	6

ANNEXURE C

QUESTIONS CHECKLIST FOR KEY INFORMANT INTERVIEWS

Instructions:

1. Kindly choose only one option you consider most appropriate per question.

2. If you choose the "other" option, please indicate what "other" represents.

A. Category of the informant

1. Academic 2. Auctioneer 3. Butcher 4.Commercial farmer 5. Extension Officer 6. Other

B. How do you rate cattle production practices in the study area 1. Productive 2. Non-productive 3. Improving 4. Not improving 5. Other

C. If productive/improving, what do you think makes the system productive/improving? 1. Good animals all-round 2. Good livestock managerial skills by farmers 3. Availability of markets 4. Good support by stakeholders 5. Other

D. If unproductive/not improving, what makes the system unproductive/non-improving? 1. Poor conditions of animals 2. Poor livestock managerial skills 3. Unavailability of markets 4. Lack of support by stakeholders 5. Other

E. If you were to assist the farmers in the study area, what would receive your utmost priority?

1. Cattle production skill improvement 2. Provision of right type of animals for the area 3. Production inputs such as drugs and vaccines 4. Off-farm infrastructure support 5. Other

F. How would you rate cattle productivity in the study area? 1. Bad 2. Good 3. Poor 4.Weak

G. How would you rate access ability of farmers to cattle market? 1. Bad2. Good 3. Poor 4. Weak

H. What do you think is the main challenge to cattle production in the study area?

1. Lack of cattle production skills 2. Environmental challenges 3. Lack of production resources 4. Poororganisational structures on farming such as Farmerorganisations 5. Poor on-farm infrastructure 6. Poor off-farm infrastructure 7. Poor institutional support such as extension service 8. Poor educational background of farmers 9. Other

I. If you had it your way, what would you recommend for the cattle-production systems in the area? 1. Leave the system as communal 2. Transform the system into a more commercial system

J. If you were to transform the system into a more commercial mode of production, what would your strategy be? 1. Target improvement of the inputs side of production 2. Target the market/commodity side of the system

K. Do you think the farmers in the study area are ready to move from subsistence to commercial mode of production? 1. Yes 2. No

L. If yes, indicate your main reason for such as assertion.

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M. If not, also indicate your reason

.....

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N. How do farmers in the study area deal with animal supplementation during needy times?

A. Use of local trees

B. Use of modern means

O. If trees are used, which trees do farmers specifically use?.....

.....

.....

.....

P. Do farmers in the study area use Contract farming (CF) and any other agricultural development agencies?

1. Yes

2. No

Q. What are the reasons for the above?

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R. Do you participate in trading in the area? Yes.....No.....

S. What are your reasons for the above?

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T. What foods do people in the area depend on?.....

.....

.....

.....

D. Summary of adopters and non-adopters of modern cattle production and marketing technologies among communal cattle farmers in the Musekwa Valley

PRODUCTION						
Variable	Total Adopters	%	Total Non-adopters	%	Total	%
Animal identification**	55	100	0	0	55	100
Breeding*	14	25.9	40	74.1	54	100
Castration**	53	96.4	2	3.6	55	100
Dehorning**	42	77.8	12	22.2	54	100
Parasite control**	51	96.2	2	3.8	53	100
Production system*	7	12.7	48	87.3	55	100
Weaning**	40	72.3	15	27.7	55	100
Vaccination**	51	94.4	3	5.6	54	100
MANAGEMENT AND TECHNOLOGIES						
Banking*	26	47.3	29	52.7	55	100
Cattle enclosure**	54	98.2	1	1.8	55	100
Membership*	11	20.0	44	80.0	55	100
Insurance*	0	0	55	100	55	100
Loans*	4	7.3	51	92.7	55	100
Record Keeping*	21	38.2	34	61.8	55	100
HOUSEHOLD ENDOWMENTS						
Employment**	6	10.9	49	89.1	55	100
Electricity**	53	96.4	2	3.6	55	100
Land*	0	0	55	100	55	100
Own transport*	3	5.5	52	94.5	55	100
Remittances*	55	100	0	0	55	100
Telecommunication**	42	76.4	13	23.6	55	100
MARKETING						
Selling of cattle**	49	89.1	6	10.9	55	100
Slaughtering*	18	32.7	37	67.3	55	100
Market searching**	28	50.9	27	49.1	55	100
Product marketing*	22	40.0	33	60.0	55	100
By-product selling*	52	93.9	3	6.1	55	100

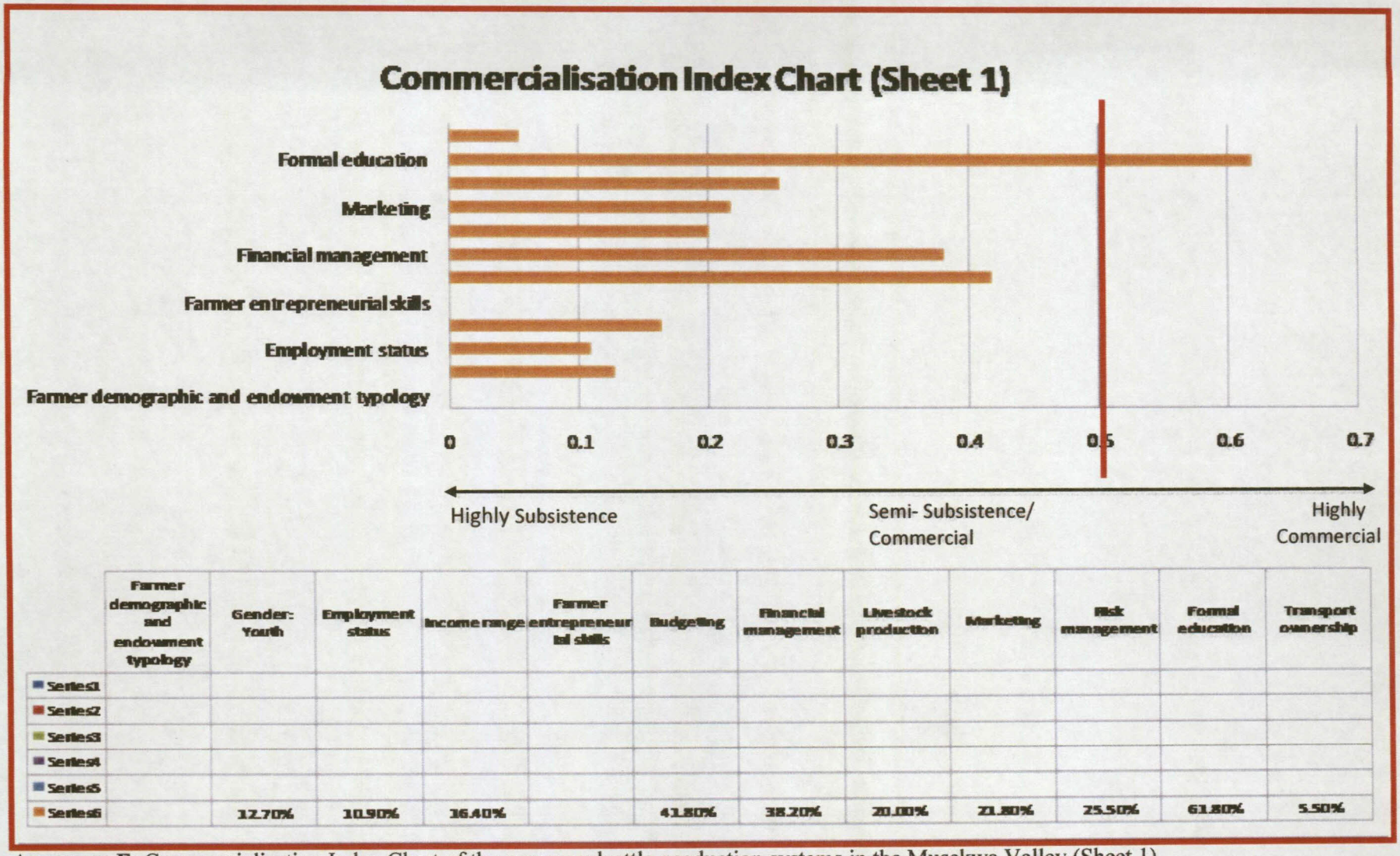
Key:n=55 * Constraint for commercialisation ** Opportunity for commercialisation

Annexure E Correlation coefficient of selected variables

	OWNERSHIP	RECORDS	MORTALITY	SPOINT	DISTANCE	ADVERT	EXTENSION
MC	-0.25902	-0.28950	0.47849	0.28407	-0.21606	-0.10477	-0.05543
	0.0562**	0.0320*	0.0002*	0.0356*	0.1131	0.4465	0.6877
AGE	-0.03711	-0.00866	-0.02450	-0.14571	0.01871	0.17837	-0.17485
	0.7879	0.9500	0.8591	0.2885	0.8922	0.1926	0.2017
EMPLOYMENT	-0.02105	-0.27501	0.04490	-0.02204	-0.00822	0.07143	0.02204
	0.8787	0.0421*	0.7448	0.8731	0.9525	0.6043	0.8731
HSIZE	-0.01160	0.19579	0.02475	0.02126	-0.03566	0.19521	0.09568
	0.9330	0.1520	0.8577	0.8775	0.7960	0.1532	0.4871
EXPERIENCE	-0.07840	-0.04064	0.03583	-0.17239	-0.00255	-0.04433	-0.05336
	0.5694	0.7683	0.7951	0.2082	0.9853	0.7479	0.6988
SYSTEM1	0.30666	0.07554	-0.10400	-0.16496	0.14986	0.20045	-0.06186
	0.0228*	0.5836	0.4499	0.2288	0.2748	0.1423	0.6537
OWNERSHIP	1.00000	-0.20651	0.15504	-0.22416	0.14288	-0.18948	0.11695
		0.1304	0.2584	0.0999**	0.2980	0.1659	0.3951
RECORDS	-0.20651	1.00000	-0.38966	-0.20510	-0.01845	0.35140	-0.18388
	0.1304		0.0033*	0.1331	0.8936	0.0085*	0.1790
MORTALITY	0.15504	-0.38966	1.00000	0.24942	-0.21003	-0.34424	0.13164
	0.2584	0.0033*		0.0663**	0.1238	0.0101*	0.3381
SPOINT	-0.22416	-0.20510	0.24942	1.00000	-0.21298	-0.07715	0.25714
	0.0999**	0.1331	0.0663**		0.1185	0.5756	0.0581**
DISTANCE	0.14288	-0.01845	-0.21003	-0.21298	1.00000	-0.16295	-0.17749
	0.2980	0.8936	0.1238	0.1185		0.2346	0.1949
ADVERT	-0.18948	0.35140	-0.34424	-0.07715	-0.16295	1.00000	-0.23146
	0.1659	0.0085*	0.0101*	0.5756	0.2346		0.0891**
EXTENSION	0.11695	-0.18388	0.13164	0.25714	-0.17749	-0.23146	1.00000
	0.3951	0.1790	0.3381	0.0581**	0.1949	0.0891**	
LOANS	-0.01324	0.17938	0.02824	0.20219	-0.28939	0.41931	0.06470
	0.9236	0.1901	0.8378	0.1388	0.0321*	0.0014*	0.6388

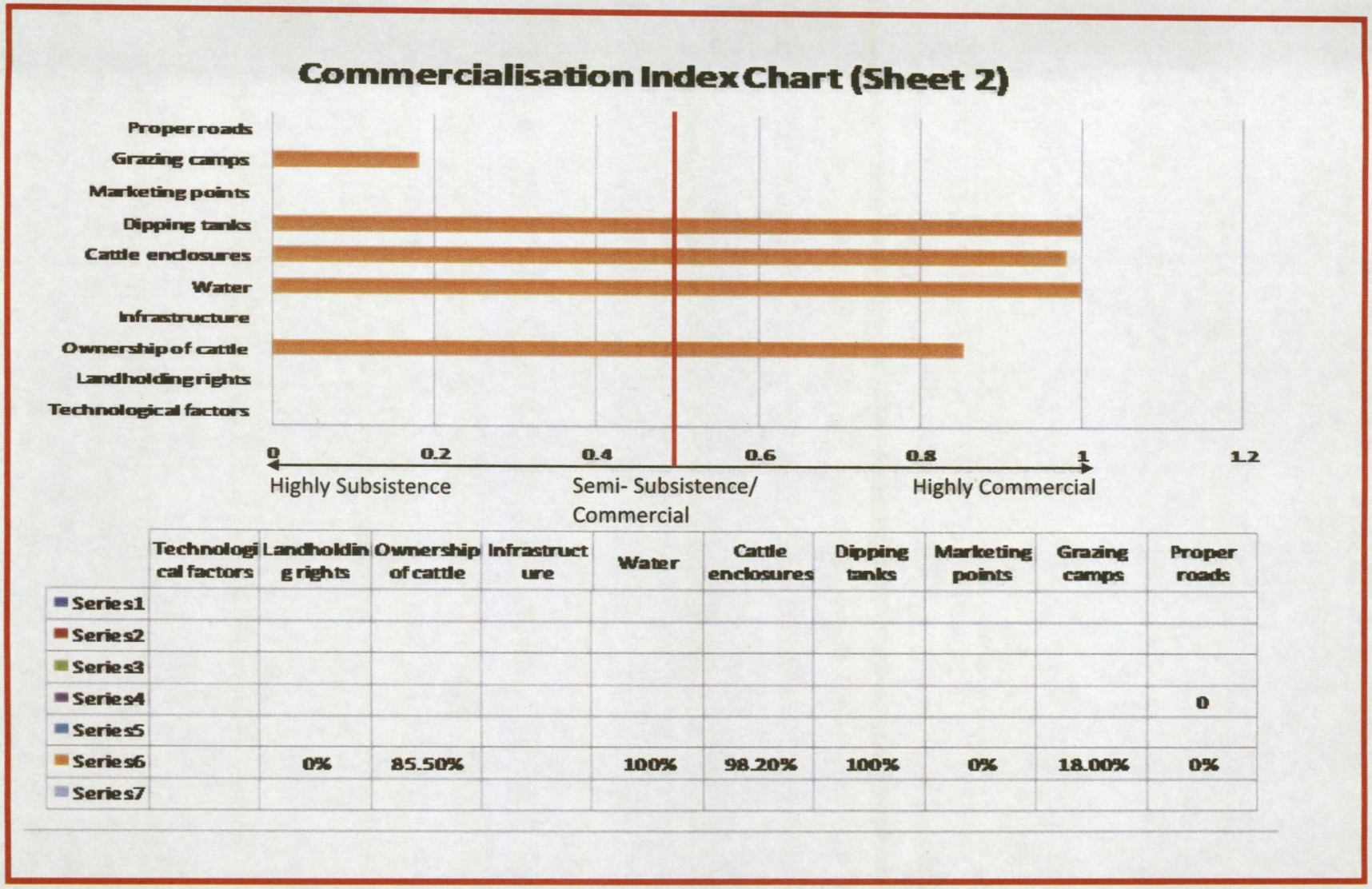
	LOANS	INCOMESELL	TRANSOWN	FARMEXP	MEMBER	WEAN
MC	-0.02824	-0.10631	0.21134	0.21404	0.07332	-0.10477
	0.8378	0.4398	0.1214	0.1166	0.5947	0.4465
AGE	-0.04070	0.00505	-0.03498	0.06156	-0.24415	-0.13640
	0.7680	0.9708	0.7999	0.6553	0.0724	0.3207
EDUCATION	0.04368	-0.16051	0.03269	-0.10695	0.20412	-0.08333
	0.7515	0.2417	0.8127	0.4371	0.1350	0.5453
EMPLOYMENT	0.21714	0.00287	-0.08405	0.15497	-0.02916	0.30952
	0.1113	0.9834	0.5418	0.2586	0.8326	0.0215*
HSIZE	0.28047	0.01244	0.00676	-0.19579	0.01406	-0.03445
	0.0381*	0.9282	0.9610	0.1520	0.9188	0.8028
EXPERIENCE	0.09295	0.18680	-0.02608	-0.04877	-0.05430	0.22166
	0.4997	0.1721	0.8501	0.7237	0.6938	0.1039
SYSTEM1	0.08405	0.02145	0.09172	-0.18783	0.05455	0.08909
	0.5418	0.8765	0.5054	0.1697	0.6924	0.5178
OWNERSHIP	-0.01324	0.04309	0.09910	0.10036	-0.30943	0.23159
	0.9236	0.7548	0.4716	0.4660	0.0215*	0.0889**
RECORDS	0.17938	0.05702	-0.18877	-0.38375	0.35553	-0.56530
	0.1901	0.6793	0.1675	0.0038*	0.0077*	<.0001*
MORTALITY	0.02824	0.10631	0.11154	0.23873	-0.07332	0.02993
	0.8378	0.4398	0.4175	0.0792**	0.5947	0.8282
SPOINT	0.20219	-0.23220	0.31774	-0.18388	-0.09449	-0.15430
	0.1388	0.0880**	0.0181*	0.1790	0.4926	0.2607
DISTANCE	-0.28939	-0.26425	-0.00564	-0.07820	0.10566	0.41217
	0.0321*	0.051*	0.9674	0.5704	0.4427	0.0018*
ADVERT	0.41931	0.14045	-0.19612	-0.19862	0.14845	-0.21212
	0.0014*	0.3064	0.1513	0.1460	0.2794	0.1200
EXTENSION	0.06470	-0.17647	-0.15131	0.18388	0.00000	-0.07715
	0.6388	0.1975	0.2702	0.1790	1.0000	0.5756
LOANS	1.00000	0.21664	-0.13363	-0.26747	0.14979	-0.01747
		0.1121	0.3307	0.0484*	0.2751	0.8993
INCOMESELL	0.21664	1.00000	-0.10624	-0.05702	-0.09829	0.04013
	0.1121		0.4401	0.6793	0.4753	0.7711
TRANSOWN	-0.13363	-0.10624	1.00000	-0.30562	-0.12010	0.13074
	0.3307	0.4401		0.0233*	0.3825	0.3414
FARMEXP	-0.26747	-0.05702	-0.30562	1.00000	-0.16841	0.18334
	0.0484*	0.6793	0.0233*		0.2190	0.1803

Significant at *5.0% and **10.0%



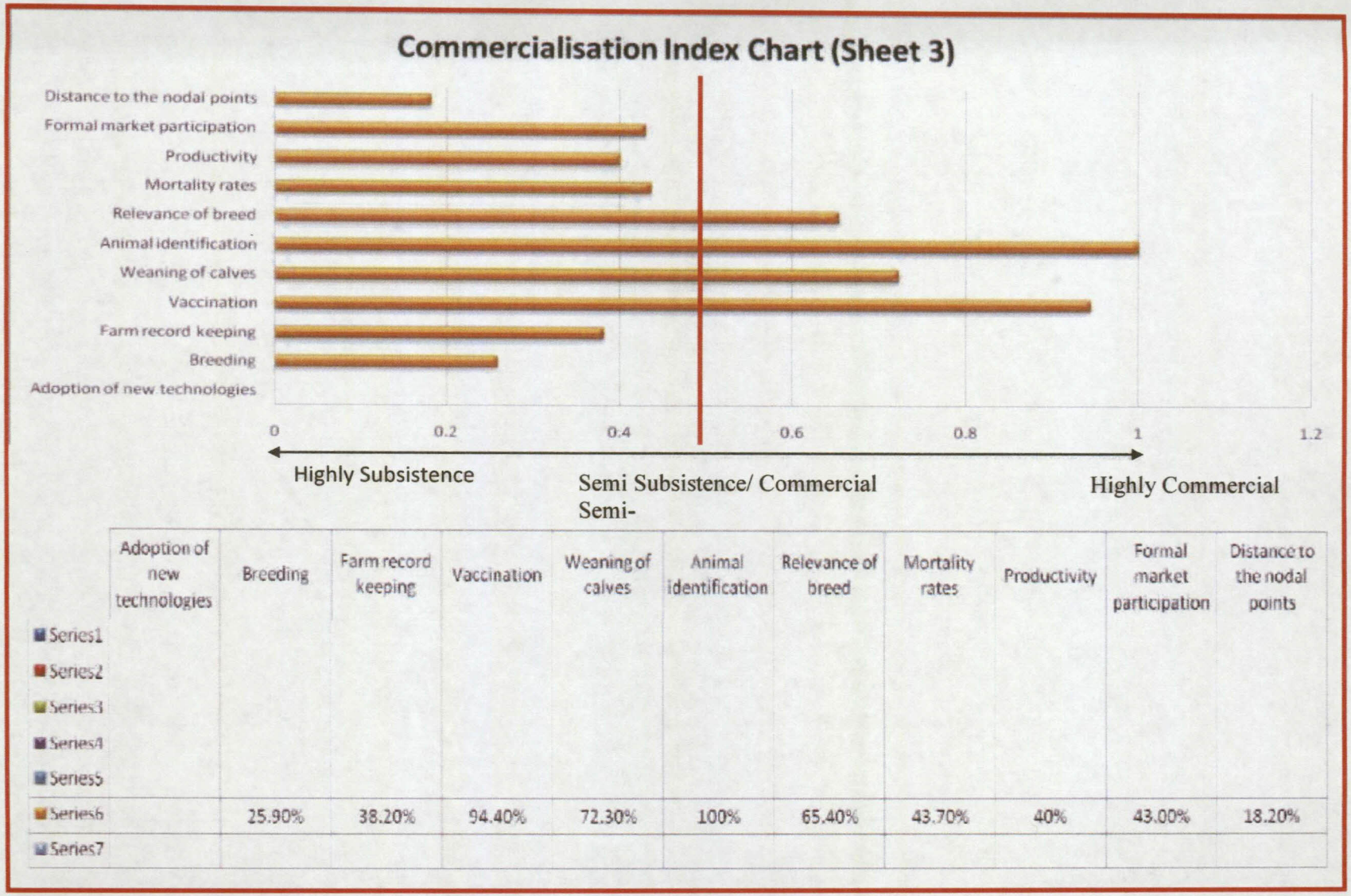
	Farmer demographic and endowment typology	Gender: Youth	Employment status	Income range	Farmer entrepreneurial skills	Budgeting	Financial management	Livestock production	Marketing	Risk management	Formal education	Transport ownership
Series1												
Series2												
Series3												
Series4												
Series5												
Series6		12.70%	10.90%	16.40%		41.80%	38.20%	20.00%	21.80%	25.50%	61.80%	5.50%

Annexure F: Commercialisation Index Chart of the communalcattle-production systems in the Musekwa Valley (Sheet 1)



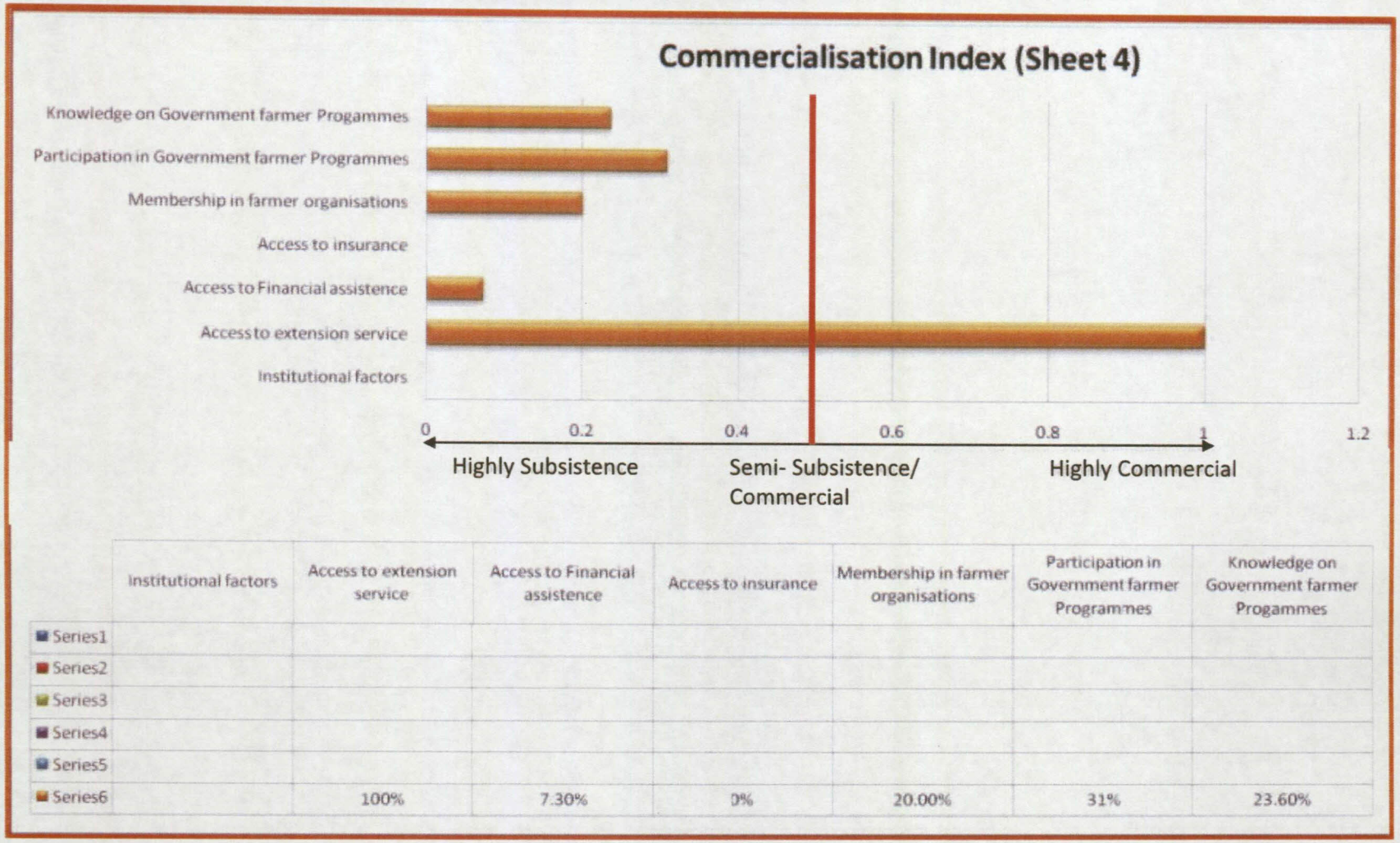
	Technological factors	Landholding rights	Ownership of cattle	Infrastructure	Water	Cattle enclosures	Dipping tanks	Marketing points	Grazing camps	Proper roads
Series1										
Series2										
Series3										
Series4										0
Series5										
Series6		0%	85.50%		100%	98.20%	100%	0%	18.00%	0%
Series7										

Annexure F: Commercialisation Index Chart of the communalcattle-production systems in the Musekwa Valley (Sheet 2)



	Adoption of new technologies	Breeding	Farm record keeping	Vaccination	Weaning of calves	Animal identification	Relevance of breed	Mortality rates	Productivity	Formal market participation	Distance to the nodal points
Series1											
Series2											
Series3											
Series4											
Series5											
Series6		25.90%	38.20%	94.40%	72.30%	100%	65.40%	43.70%	40%	43.00%	18.20%
Series7											

Annexure F: Commercialisation Index Chart of the communalcattle-production systems in the Musekwa Valley (Sheet 3)



	Institutional factors	Access to extension service	Access to Financial assistence	Access to insurance	Membership in farmer organisations	Participation in Government farmer Programmes	Knowledge on Government farmer Progammes
Series1							
Series2							
Series3							
Series4							
Series5							
Series6		100%	7.30%	0%	20.00%	31%	23.60%

Annexure F: Commercialisation Index Chart of the communalcattle-production systems in the Musekwa Valley (Sheet 4

Summary of the thesis

ANNEXURE G

The South African agricultural sector is undergoing transformation from the dual production system introduced by the apartheid regime – one that discriminated against farmers on the grounds of colour – to a single, inclusive system aimed at safeguarding the interests of all farmers irrespective of colour. The aim of the new, inclusive agricultural system is to promote equal production and marketing opportunities among all farmers. To this end, government developed a policy that aims toCommercialize the subsistence agricultural system, particularly as it is practised in the majority of the areas of the former homelands and in other rural areas.

Government and scholars of commercialisation policy in South Africa concede that while this policy offers some opportunities forcommercialising the communal agricultural system, there are nevertheless some considerable constraints affecting such commercialisation initiatives. The main objective of the present study was to investigate the constraints on and opportunities for the commercialisation of communal cattle-production systems. The specific objectives were to characterise both communal production systems and cattle farmers and then to measure the productivity and sustainability of the communal cattle-production systems in the particular study area.

To achieve its objectives, the study focused on the Musekwa Valley of the Limpopo Province of South Africa. Fifty-five communal cattle farmers were selected and interviewed by using a questionnaire comprising both open-ended and closed questions. Various stakeholders were further also interviewed to source evidence. A five-step approach, one based on the so-called *whole-farm evaluation* theory developed from farming systems research (FSR), new institutional economics (NIE), the *adopter-non-adopter* model used by Bahta and Bauer (2006), Jari (2009) and Nell (1998), the *binary logistic regression* model and also the *agricultural commercialisation continuum* model were used to analyse and draw conclusions regarding the constraints on and the opportunities for the commercialisation of the communal cattle-production systems in the chosen study area.

The study concluded that current agricultural policy provides a major opportunity for the commercialisation of communal production systems. In addition, there are also some significant improvements in respect of farming households' typological and endowment factors that provide

further valuable commercialisation opportunities. For example, more farmers are able to access some kind of household on-farm and off-farm income from, among others, agricultural sales and government grants, which might improve farmer access to purchased on-farm inputs. However, constraints such as a lack of access to proper financial support, an increase in the levels of exposure to farm risk, the poor adoption of critical cattle-production and mainstream formal marketing technologies, a lack of adequate skills in cattle-production and mainstream formal marketing practices, and other technical factors such as a lack of certain infrastructure and extended distances impact negatively on and retard both commercialisation and its pace.

The application of the *agricultural commercialisation continuum* model revealed that the cattle-production system in the Musekwa Valley does indeed have a combination of characteristics that indicate that this specific production system contains elements of both subsistence and commercial production systems. Of the 35 selected variables used as indicators of commercialisation for the latter production system, only ten (28.6%) were found to bear highlyCommercialized characteristics, while, 25 (71.4%) revealed subsistence characteristics. It is thus concluded that the cattle-production systems practised in the Musekwa Valley display pronounced subsistence characteristics.

Key words: *cattle production system, adopter-non-adopter model, binary logistic regression, commercialisation continuum, farming systems research (FSR), infrastructure, new institutional economics (NIE), opportunities, risk, communal production system.*

Opsomming van die proefskrif

BYLAE H

Die Suid-Afrikaanse landbousektor ondergaan tans 'n gedaantewisseling van die tweeledige produksiestelsel soos deur die apartheidbewind ingestel – een wat op grond van kleur teen boere gediskrimineer het – na 'n enkele, inklusiewe stelsel gerig op die beskerming van alle boere se belange, ongeag hul kleur. Die doel van hierdie nuwe, inklusiewe landboustelsel is die bevordering van gelyke produksie- en bemarkingsgeleenthede vir alle boere. Met die oog hierop het die regering 'n beleid ontwikkel wat daarop gemik is om die bestaanslandboustelsel – veral soos dit in die grootste dele van die voormalige tuislande en in ander landelike gebiede beoefen word, te kommersialiseer.

Sowel die regering as kundiges op die gebied van kommersialiseringsbeleid in Suid-Afrika erken dat alhoewel hierdie beleid wel geleentheid vir die kommersialisering van die bestaanskommunale landboustelsel bied, daar nietemin ook beduidende beperkinge is wat sodanige kommersialiseringsinisiatiewe benadeel. Die hoofdoel van die huidige studie was 'n ondersoek na die beperkinge op en geleenthede vir die kommersialisering van die bestaanskommunale veeproduksiestelsels. Die spesifieke doelwitte was gemik op die tipering van sowel bestaanskommunale produksiestelsels as veeboere en om die produktiwiteit en volhoubaarheid van bestaanskommunale veeproduksiestelsels in die spesifieke studiegebied te meet.

Ten einde die doelwitte te bereik, was die fokus van hierdie studie op die Musekwa Vallei in die Limpopo Provinsie van Suid-Afrika. Vyf-en-vyftig bestaanskommunale veeboere is gekies en onderhoude is met hulle gevoer aan die hand van 'n vraelys wat sowel oop as geslote vrae bevat het. Voorts is onderhoude met verskeie belanghebbendes gevoer ten einde getuienis te bekom. 'n Vyfstapbenadering gebaseer op die sogenaamde geheelplaasevalueringsteorie *(whole-farm evaluation theory)* wat uit boerderystelselnavorsing (BSN) ontwikkel is, die nuwe institusionele ekonomie (NIE), die aannemer/nie-aannemermodel soos gebruik deur Bahta en Bauer (2006), Jari (2009) en Nell (1998), die binêre logistiese regressiemodel en ook die landboukundige kommersialiseringskontinuummodel is gebruik om tot gevolgtrekkings te kom in verband met die beperkinge op en die geleenthede vir die kommersialisering van die bestaanskommunale veeproduksiestelsels in die gekose studiegebied.

Die studie het tot die gevolgtrekking gekom dat huidige landboukundige beleid 'n belangrike geleentheid vir die kommersialisering van bestaanskommunale produksiestelsels bied. Hierbenewens bied betekenisvolle verbeteringe ten opsigte van die tipologiese en skenkingsfaktore van boerderyhuishoudings verdere waardevolle kommersialiseringsgeleenthede. Aldus is meer boere in staat om toegang tot die een of ander tipe huishoudelike inkomste op die plaas of weg van die plaas – soos onder meer landbouverkope en staatstoelaes – te verkry wat hul toegang tot aangekoopte op-die-plaas insette kan verbeter. Hierteenoor het beperkinge soos 'n gebrek aan toegang tot behoorlike finansiële ondersteuning, 'n toename in die vlakke van blootstelling aan plaasrisiko, gebrekkige implementering van kritieke veeproduksie- en hoofstroom formele bemarkingstegnologieë, 'n gebrek aan toereikende vaardighede in veeproduksie en hoofstroom formele bemarkingspraktyke, en ander tegniese faktore, soos 'n gebrek aan sekere infrastruktuur en uitgebreide afstande, 'n negatiewe impak op en vertraag sowel kommersialisering as die pas daarvan.

Die aanwending van die *landboukundige kommersialiseringskontinuummodel* het aan die lig gebring dat die veeproduksiestelsel in die Musekwa Vallei inderdaad oor 'n kombinasie van eienskappe beskik wat aandui dat hierdie spesifieke produksiestelsel elemente van sowel die bestaans- as die kommersiële produksiestelsels bevat. Daar is bevind dat van die 35 geselekteerde veranderlikes as indikatore van kommersialisering van die laasgenoemde produksiestelsel, slegs tien (28.6%) hoogs gekommersialiseerde kenmerke vertoon, terwyl 25 (71.4%) bestaanskenmerke openbaar het. Die gevolgtrekking word dus gemaak dat die veeproduksiestelsels in die Musekwa Vallei besliste bestaanskenmerke vertoon.

Key words: *cattle production system, adopter-non-adopter model, binary logistic regression, commercialisation continuum, farming systems research (FSR), infrastructure, new institutional economics (NIE), opportunities, risk, communal production system.*

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ANNEXURE I: Summary of the descriptive results of the study

Gender distribution

Gender	Number	Percentage
Men	45	81.8
Women	10	18.2
Total	55	100

Household headship

Household head	Number	Percentage
Men	44	80.0
Women	10	18.2
Child-headed	1	1.8
Total	55	100

Educational profile of household members

Category	No.	(No Schooling)	(Primary Education)	(Secondary Education)	(Post-School Education)	Percentage
Respondent	55	21 (38.2)	19 (34.5)	15 (27.3)	0	100
Spouse	52	25 (48.1)	20 (38.5)	7 (13.5)	0	100
Children	217	86 (39.6)	48 (38.3)	83 (22.1)	0	100
Other	22	0	11 (50.0)	11 (50.0)	0	100
Total	346	132(39.6)	98 (27.5)	116 (32.9)	0	100

Employment status

Employment category	Number	Percentage
Unemployed	44	80.1
Private companies	2	3.6
Government	2	3.6
Other well-doing local villagers	2	3.6
Commercial farms	1	1.8
Undisclosed status	4	7.3
Total	55	100

Household annual income from cattle farming

Income range	Number	Percentage
<R10 000	46	83.6
R11 000- R20 000	6	10.9
R21 000- R30 000	1	1.8
R31 000-R40 000	2	3.6
Total	55	100

Household expenditure

Item	Number	Percentage
Food	36	65.4
Education	14	25.5
Household health	4	7.3
Transport	1	1.8
Total	55	100

On-farm expenditure

Source of expenditure	Number	Percentage
Animal health	26	47.20
Animal feeds	16	29.10
Acquisition of farm equipment and inputs	9	16.40
Buying more stock	4	7.30
Total	55	100

Type of house structure

Type of house	Number	Percentage
Brick house	41	74.6
Traditional house	12	21.8

Temporary or shack house	2	3.6
Total	55	100

Energy generation strategies

Source of energy	Number	Percentage
Candles	29	52.7
Firewood	17	30.9
Solar	6	10.9
Other	2	3.6
Bio-oils	1	1.8
Total	55	100

Livestock species

Livestock species	Number	Percentage
Goats	34	65.3
Donkeys	8	15.4
Chicken	7	13.5
Sheep	3	5.8
Total	52	100

Reasons for keeping cattle

Reason	Number	Percentage
Generation of income	38	69.1
Food production	15	27.3
Ceremonies and rituals	1	1.8
Draught power	1	1.8
Total	55	100

Cattle ownership

Designated group	Number	Percentage
Men	44	80.0
Women	10	18.2
Other	1	1.8
Total	55	100

Number of cattle herd

Category of the animals	Total heads of cattle	Percentage
Females > three years	344	13.0
Young heifers	766	28.9
Oxen > three years	487	18.4
Calves on foot	803	30.1
Bulls	252	9.6
Total heads of cattle	2 652	100

Environmental risk

Factor	Number	Percentage
Deforestation	21	39.6
Overgrazing	16	30.2
Other	10	18.9
Soil erosion	6	11.3
Total	53	100

Reasons of non-participation in the CASP

Reason	Number	Percentage
Do not have valid reason	29	52.7
Never invited to participate	15	27.3
Lack of interest in the CASP	6	10.9
Unspecified reasons	5	9.1
Total	55	100

Rating of the CASP

Rating of the CASP	Number	Percentage
Just fine	25	45.5
Bad	19	34.5
Good	11	7.5
Total	55	100

On-farm infrastructure from the CASP

Infrastructure	Number	Percentage
Grazing camps	39	70.9
Animal weighing scales	12	21.8
Dipping tanks	4	7.3
Total	55	100

Expected assistance from the CASP

Assistance	Number	Percentage
Breeding bulls	14	25.5
Farmer training	10	18.2
Infrastructure	13	23.6
Financial assistance	5	9.1
Marketing	4	7.3
Other	9	16.4
Total	55	100

Reasons for cattle production

Reasons for cattle production	Number	Percentage
Food production	36	65.5
Savings	12	21.8
Creation of wealth	6	10.9
Personal status	1	1.8
Total	55	100

Source of information used in cattle marketing

Source of information	Number	Percentage
Word of mouth	26	47.3
Community meetings	20	36.4
Radio	5	9.0
Other	3	5.5
Farmer magazine	1	1.8
Total	55	100

Reasons for the choice of the cattle marketing channels

Reason	Number	Percentage
Most popular trader	26	47.2
Guarantee of good price	14	25.5
The only available channel	7	12.7
Guarantee of faster transaction	5	9.1
Guarantee reduced transaction costs	3	5.5
Total	55	100

Farmer perception on selected skills

Skill	Rating in Percentage				
	Number	Good	Fair	Bad	Total Percentage
Addition	55	76.4	7.3	16.3	100
Subtraction	55	69.1	7.3	23.6	100
Multiplication	55	58.2	16.3	25.5	100
Division	55	52.7	18.2	29.1	100
Cattle marketing	55	21.8	36.4	41.8	100
Budgeting	55	41.8	23.6	34.5	100
Financial Management	55	38.2	40.0	21.8	100
Farm Risk Management	55	25.5	38.2	36.3	100