THE GENDERED DIMENSIONS OF FARMING SYSTEMS AND RURAL FARMER HOUSEHOLDS IN THE CONTEXT OF FOOD SECURITY: A PILOT STUDY OF SMALL-SCALE LIVESTOCK FARMERS IN MARBLE HALL AND RHENOSTERKOP

FINAL TECHNICAL REPORT

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CONTENTS

FIGURES AND TABLES

TABLES

FIGURES

MAPS

PHOTOS

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ABBREVIATIONS AND ACRONYMS

AFASA	African Farmers' Association of South Africa
AHT	Animal Health Technician
ALRI	Area Land Reform Initiative
ARC	Agricultural Research Council
ASGISA	Accelerated Shared Growth Initiative in South Africa
CASE	Community Agency for Social Enquiry
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CLARA	Communal Land Rights Act
CRDP	Comprehensive Rural Development Programme
DARDLA	Department of Agriculture, Rural Development, and Land Administration
DOA	Department of Agriculture
DWAF	Department of Water Affairs and Forestry
FAO	Food and Agriculture Organisation
GALVmed	Global Alliance for Livestock Veterinary Medicines
GDP	Gross Domestic Product
GHS	General Household Survey
HSRC	Human Sciences Research Council
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IPAP	Industrial Policy Action Plan
ISRDP	Integrated Sustainable Rural Development Strategy
KAPB	Knowledge, Attitudes, Practices & Behaviour
LRAD	Land Redistribution for Agricultural Development
MDG	Millennium Development Goals
NERPO	National Emergent Red Meat Producers Organization
NFCS	National Food Consumption Survey
NGO	Non-governmental Organisation
NGP	National Growth Plan
NDP	National Development Plan
NPC	National Planning Committee
NWGA	National Wool Growers' Association
OVI	Onderstepoort Veterinary Institute
PLAS	Proactive Land Acquisition Strategy
RECAP	Recapitalisation and Development Programme
SPSS	Statistical Package for the Social Sciences
WEAI	Women's Empowerment in Agriculture Index
YARD	Youth in Agricultural Development

EXECUTIVE SUMMARY

Introduction

This technical report presents insights from a pilot study addressing a human and social development component within the Agriculture Research Council (ARC) – Onderstepoort Veterinary Institute's (OVI) New Generation Vaccine programme study ("Livestock Vaccines Against Viral Diseases for Developing Farmers in sub-Saharan Africa"). This study addresses the gendered dimension of rural livestock farming systems and the relationship of this dimension to household food security, socioeconomic development, intra-household decision making, and improved livestock health within rural developing farmer households (encompassing knowledge, disease management and decision-making in households).

The study zooms in on the ARC/OVI New Generation vaccine programme sites in Limpopo, providing a gendered and socio-developmental perspective on communities where livestock farming is an integral part of social and economic life. This pilot provides a snapshot of two small-scale farming communities in the North-Eastern regions of South Africa in a way that is both descriptive and analytical and can provide an information base to inform future programmatic, policy and research interventions. The information and lessons emanating from this pilot study should stimulate studies on rural livestock keeping communities in other areas of the country, and act as an information base for further scale-up, implementation and monitoring and evaluation animal healthcare and vaccination programmes.

Objectives

As key actors in the agriculture sector, women can play a more vital role in addressing and leading efforts to improve local economic growth by farming with livestock, improving livestock health and thereby, contributing to household food security. The pilot research aims to (1) describe and analyse current knowledge in a selection of policy, scientific and grey literature in relation to gender and livestock farming and its relevance to usage (if at all) related to vaccines and disease management of animals by small-scale farmers in two communities (Marble Hall and Rhenosterkop); (2) identify some behaviour patterns, usage, uptake, knowledge, attitudes among small scale famers in relation to the vaccine usage and disease management; (3) provide some demographic perspectives in relation to a profile of the small-scale farmers and their households; (4) determine experiences in relation to the value of vaccines and its potential benefits related to access, challenges, opportunities and its social and economic benefits in so far as broader contributions to food security and community upliftment.

Two central untested assumptions underlies the analysis: (1) in rural contexts such as the areas of Marble Hall and Rhenosterkop, small-scale livestock farmers and their households experience a number of socio-economic challenges that also have bearing on combating livestock infectious diseases and ultimately food security; (2) capacity constraints, coupled with insufficient knowledge of animal health by farmers are factors that hamper socioeconomic development pathways for these households and communities.

Methodology

Qualitative and quantitative methodologies were utilized in the study; preceded by a literature review focused on the major arguments and debates within scientific, policy and grey literature.

Study population and sites

Participants were drawn from the Marble Hall and Siyabuswa/Rhenosterkop areas. The former is in the province of Limpopo, while the latter is in Mpumalanga (along the southern Limpopo border).

Study Design

The study obtained questionnaire-based (survey) data through interviews with male and female farmers from the study sites. This was a cross-sectional face-to-face survey profiling demographic information of the small-scale farmers (including an understanding of their household in terms of education; land ownership and use; socio-economic conditions; livestock quantities; ; household food security; and training needs) and a set of questions related to farm activities and practices (who manages day-to-day activities, land questions, household income, household and farming assets, types of household farming, sale and consumption of livestock products, record-keeping in relation to animal deaths and births, etc.); knowledge and understandings related to animal diseases (knowledge of diseases, disease treatment and disease prevention, vaccine use and practices); training and other assistance needs; and household food security and diet.

The qualitative instrument (focus groups and in-depth interviews) focused on broad themes that provided a perspective on experiences, challenges and attitudes of small-scale farmers in relation to a range of issues including 'women in small-scale farming', knowledge and experience of, and prevention and treatment of animal diseases (including use and knowledge of vaccines).

Sampling

The total qualitative dataset (n = 32) comprises 28 key informants representing the following profile, drawn from the areas of Siyabuswa and Marble Hall: Farmers (6 male and 6 female); 4 officials from the Department of Agriculture (DOA) (Animal Production); 5 Animal Health Technicians (AHTs); 3 State veterinarians; 2 Heads of Farmer Associations; A researcher from a university-based research institute; A non-governmental organisation (NGO) practitioner who works with small-scale livestock farming communities in the Limpopo Province. We also conducted four focus group discussions: 1 male farmer group and 1 female farmer group in the Siyabuswa area and 1male farmer group and 1 female farmer group in the Marble Hall area.

The final dataset for the survey comprised 85 completed survey questionnaires spread (almost) evenly across the Rhenosterkop (/Siyabuswa) area and Marble Hall areas.

Key Findings

The Livestock Sector and development in Africa and South Africa

The livestock sector is globally recognised as one the fastest growing and most economically important of agriculture's sub-sectors. In the study sites we worked in, livestock connects people to the land and to each other, and is integral to community and social life in ways that extend beyond 'pure' economic considerations, and can therefore be said to be a strong marker of communal and familial identities. Livestock farming is also a major contributor to food and nutrition security, thereby also directly contributing to sustainable livelihoods.

In the community households we surveyed in this study we found that most households are poor (these were mainly male headed households; with the majority of households earning between R2000 – R4000 per month); education levels are low (47 % of respondents had no formal education; 20 % had some primary education; 25 % secondary education; 3 % tertiary education; education levels in this sample were similar for men and women); household asset ownership demographics show that 62 % owned a stove, 68 % a fridge and 61 % a television, but it is noteworthy that 62 % did not own a car (the implications of this finding is further elaborated in the qualitative findings where we see that the lack of transport that farmers face means 1) poor access to animal healthcare services (and a reliance on animal health providers to come to the farmer instead of the reverse), and 2) increased vulnerability to stock theft, as a lack of transport means farmers cannot search for their livestock (and must compete against stock thieves who use vehicular transport)). The majority of monthly household spending is allocated to water and electricity, food, and education.

In terms of household ownership of livestock, the majority of households owned cattle (n=80; 94%). The three primary reasons provided for keeping cattle are: household consumption (34 %); sale of animals (30%); traditional purposes (10 %).

South African Policy perspectives on small-scale farming

The South African government policy and strategy recognises the significance of agriculture. However, while the international livestock data provides a resoundingly optimistic picture of the future of livestock in enabling a particular growth, development and poverty alleviation trajectory for the poor, agriculture as a sector (in comparison to other sectors) has been on the decline in South Africa. Nationally, 19.9% of households are involved in agriculture (Statistics South Africa, 2013a: 2). According to the latest figures, agriculture, which is the 6th biggest sector in terms of employment for women and the 7th in terms of employment for men (out of 10 sectors), accounts for just 3.5% of women employed and 5.5% of men in South Africa (Statistics South Africa 2013b: 33).

In spite of policy promises and some intervention by the state through land reform and rural and agricultural development initiatives (as well as through new legislation and acts) in the last twenty years to counteract and reverse the legacy of apartheid, the State maintains in its *20 Year Review* that a dualistic agricultural system continues to exist between white and black farmers (The Presidency, 2014: 63). There are a range of opinions from scholars with some claiming that speaking of a dualistic agricultural economy is unhelpful and outdated, with others claiming that there are significant nuances within the all-encompassing 'smallholder' category. The maintenance of support for a strong commercial sector in agriculture is maintained by some (including as a critical food security long-term food security measure for the country), while others suggest that commercial agriculture's low and declining contribution to Gross Domestic Product (GDP) growth, drain on critical resources such as water (60% of the country's water resources are used by irrigated agriculture), export-oriented production and increasing mechanization (which means less employment creation), should mean less support be given to commercial agriculture (this refers mostly to crop farming).

Our study suggests that there are significant challenges with regard to how smallholder farming is conceptualized in and through government policy (as the first step towards the final goal of complete commercialization, according to a pre-considered model). This has implications for the kinds of policies and approaches taken by government departments' right down to the municipal level. For instance, significant differences exist in terms of understandings around what the major problems and obstacles are to improving small-scale livestock farmers' ability to be more productive as farmers.

While government policy dictates that a key requirement for farmer development is for 'stocking rates' to be reduced, farmers interviewed in the study expressed resistance to

the DOA policy on reducing stocking rates. Government claims are that high rates are the cause of overgrazing in the context of insufficient land resources, with the result that farmers are reluctant to disclose their livestock numbers, and suspicious of questions around the number of livestock they keep. However, scholars interviewed in our study indicate that the fear of stocking rates is misplaced and forms part of the larger imposition of a commercial model of farming onto smallholder farming communities, which is producing unhelpful policy directives at the ground level. The need for more dialogue and the on-going transformation in conceptualizing the role of smallholder livestock communities and government policies towards them is therefore essential.

Women as Smallholder Farmers and Rural Development

Within the global development arena, small-scale farming and women are increasingly identified as key to the eradication of global hunger. In the sub-Saharan context in particular, women are viewed as the backbone of smallholder agriculture, where the Food and Agriculture Organization (FAO, 2011) estimated that women formed about 50 % of the economically active population in agriculture. Women are also identified as key to rural development strategies in the South African context of government programmes. However, women's role in smallholder livestock farming in the South African context is sometimes still considered an encroachment on a male domain, which is reflected in the fact that animal health practitioners more often deal with male rather than female farmers. For instance, an animal health practitioner (male) in the Rhenosterkop area says: "[…] *With the livestock farmers we are dealing mostly with the men. It's like the African culture. The man is the head of the house; he is the one who looks after the livestock".*

In the community households we surveyed in this study we found (in respect of the management of day-to-day activities in relation to gender of household head) that men (58 %) are more likely than women (25 %) to manage day-to-day farming activities by themselves. Women (65 %), rather, were more likely than men (32 %) to employ a hired worker to tend to day-to-day farming activities (this was corroborated by some farmers, see chapter 4).

Key obstacles facing women in small-scale livestock farming

In spite of the recognition of women as critical actors in the farming sector, they face a number of impediments. Their invisibility in respect of decision-making processes and their lack of control over livestock assets and income has a negative impact on intra-household welfare and relations and economic development. Additional issues are: lack of ownership of livestock assets; lack of ownership of land; lack of access to extension services; lack of access to credit, training and education including about diseases and treatment of these; insufficient government support; low literacy rates; constraints related to mobility (which prevents accessing of services, education, etc.); time use in respect of

providing nurture and care on the one hand, and balancing this with the responsibilities of farming.

Sex-disaggregated livestock data

The gendered nature of decision-making processes and women's independence, control and self-assertion in relation to their livestock (including the health and well-being of their animals) is also contingent on better understanding the gender dynamics within the households. While findings suggest that there are a complex array of factors (notably issues of power, culture, and received ideas about what constitutes appropriate gendered roles), there is a simultaneous need for sex-disaggregated data for intra-household dynamics to better understand the gendered dynamics within the household context.

Land

Land remains a contentious political, social and economic concern in the post-apartheid context. Over and above the racialized history of land, and the dualistic agricultural economy (in which land features as a key divide), land reform is slow and remains a factor of inequity (in respect of availability and access of suitable arable land for the poor and for women in particular) and more especially in respect of policy reform (in relation to, for instance, efficient and productive use of commonage land) exists. Land is also not easily accessible due to high costs.

The survey component of this study found that 56 % of the sample did not own the land they worked on; 34 % owned the land (and 14 % did not respond).

Water

In addition to land as a necessary commodity in the agricultural and livestock sector, findings indicate that less is said about water in relation to its role for agricultural prospects and policies. Evidence suggests that water supply (including due to climate change) is on the wane, and water accessibility and consumption is also racialized, as 60% of the country's fresh water supply is used by (primarily white) commercial farmers. Lack of access to water feature in the interviews, in the literature, particularly for water-stricken areas such as Limpopo (Munyai 2012), and is often stated as a primary concern in municipal planning documents such as for the Dr. J. S. Moroka Municipality in Mpumlanga. Some participants referenced problems related to rainfall and drought: Farmers in the Rhenosterkop area complained about the lack of rain:

> *[Res1:] The rain here is very scarce, but when it starts to rain it becomes heavy rain…[Res2:] And when it becomes dry, it takes a long time to rain and then we*

have a problem. Like now you see winter is coming, and there is no water. People like to set the veld on fire and water might take two days without coming out of the tap, and there is no rain.

The lack of rain means lack of grazing for cows, and the lack of good grazing means cows cannot produce milk and cannot be milked, but also has an impact on livestock health as poor grazing land also means less immunity to diseases (especially in winter) and a tendency to eat bones off the veld in order to supplement mineral deficiencies (which again, impacts on animal health).

Food Security

While the the FAO suggests that 95% of South Africans are well-nourished, other evidence for instance the 2011 General Household Survey (GHS) shows that 11.5% – close to 10 million people – experienced hunger in the 30 days prior to the survey (Hendriks, 2013:2). Besides experiencing hunger, "22.7 percent of the population, or 13.8 million people, has insufficient access to food and many households (21 percent) continue to experience difficulty in accessing food" (The Presidency, 2014:65). The links between poverty, economic growth and food security have not been explored in ways that offer good policy options for enhancing growth in ways that will reduce poverty and improve food security. Given the international development data (Herrero et al, 2014, Njuki and Sanginga, 2013), and the International Livestock Research Institute's (ILRI) suggestion of a 'livestock revolution' that small-scale livestock production has significant potential in addressing food security and nutrition needs, South African policy makers need to assist and empower smallholder farmers to ensure food security in rural contexts through livestock keeping.

Findings in our survey sample for this study indicate that 15 % of adults answered Yes and 13 % of children answered No when asked whether anyone in the household went hungry in the past year due to there not being enough to eat.

Obstacles and challenges experienced by small-scale farmers

Disease is one of the major challenges facing the communities we worked with. Poor knowledge of diseases (including causes, treatment and prevention) is evident among smallholder farmers in both qualitative and quantitative findings. There are significant blockages in effective animal health service provision and knowledge transmission, caused by a range of factors including high cost of medications, transport issues faced by both health providers and farmers, cut-backs by government in provision of medicines and vaccines, and an atmosphere of mistrust between health practitioners and farmers (with the former often seeing farmers as unresponsive and reticent to change). That this has implications for effective animal health and disease control is confirmed by the fact that

farmers sometimes communicate that it is vaccinations administered by animal health technicians that are responsible for animal deaths. More cohesive and united efforts between animal health practitioners and farmers is required for vaccination programmes to work and for proper health management of livestock.

Animal Health, Diseases, Vaccinations and Knowledge Uptake

Smallholder farmers are the worst affected by disease outbreaks, resulting in mandatory slaughter of animals, and this ultimately compounds the cycle of poverty for already poor rural communities (disease is for example spoken about as a challenge for many farmers featured in this study). An animal health practitioner in Marble Hall stated that hunger was the main cause of death of livestock, followed by disease. This is backed up by an animal health practitioner in the Rhenosterkop region who states that mid-to-late spring and winter, "*most of the animals die of hunger"*. In a focus group discussion with male farmers in Marble Hall, one respondent states that the problem of disease is worsening: [A]*nimals have so many diseases that we can't keep track of, we need to prevent that. When we investigate they say its lumpy skin and we have to have medication for that and its challenging. Those diseases were not there in the past.*

In the community households we surveyed in this study we found animal death was primarily due to disease (as the main cause of decreases in livestock levels over the past 12 months) were highest among cattle (54 %) and chickens (64 %).

Vaccinations and inoculations are being used less in developing countries to promote animal health due to high costs and lack of AHTs required to implement such services. Findings also suggest that diseases need to be better understood in relation to animal health, socio-economic conditions of communities and households, geographical region, knowledge of diseases (including their proper scientific names, as well as treatment); and appropriate interventions required (including vaccinations).

In the community households we surveyed in this study we found knowledge of diseases (for example which diseases are tick-borne) was very low and many respondents either did not know or did not wish to respond (33 %). Similarly lack of knowledge of which diseases are zoonotic showed up as 87 % (reflecting either that respondents did not know or could not provide an answer). In respect of vaccine use and knowledge we found 43 % of households indicated there is no difference between medicines and vaccines; 23 % indicated that vaccines prevent diseases while medicines were used to treat diseases (there were also a large number of non-responses, many of which indicate that respondents 'did not know').

Qualitative insights indicate that inspite of many roles and tasks women face, as one State Veterinarian reported, women may even have more understanding of their animals than

men, but are faced with competing challenges in terms of a) physical strength and b) time constraints where women's household activities prevent them from having time to regularly oversee their animal's wellbeing: "*they won't find time to check after the animals to see which animals are sick so they only depending from the headbo[ys] to see which animal is sick".*

Lacking "manpower", the state vet says, means that women rely on their headboys, neighbours or male relatives to take their animals to the dip tank and also to inject their animals. More important, qualitative insights indicate that women are also looking to be empowered in terms of disease knowledge. An AHT in Marble Hall states that a major constraint on women is the lack of knowledge about animal health, as well as the fact that mothers are concerned with their family's wellbeing so "*they are not in the fields or where the animal are grazing looking after the animal".*

In the community households we surveyed in this study we found that training needs as indicated by farmers reflected the following: 50 % said they wanted training in animal feeding and nutrition; 58 % said they wanted training in understanding disease symptoms and diagnosis; and, 57 % wanted vaccination training.

Animal Health Services

While there is widespread recognition in the literature that animal health services are critical to the health and well-being of livestock farmers, there are mixed views arising in the study from both farmers and animal health practitioners in terms of what happens in practice. Many do not actively consult professional advice even if the services are available, preferring to talk among their peers. The apparent reluctance of some farmers to properly manage the health of their livestock is explained by one of our respondents as resulting from a lack of economic incentives (with the implication that policies and policy makers and implementers too need to see things in a sense, 'the other way around', i.e. in terms of animal health not being the first step to something else but rather the outcome and result of general prosperity):

> …[I]*f a farmer cannot sell the product and have money out of it, then he is not going to manage it right, he's not going to buy medicine and he's not going to put effort into the management, that's what happens .So that's a key thing if you can make money out of something then you make sure it's healthy and then is protected.*

In another example, a DOA official, indicated there was mistrust of and scepticism about the efficacy of vaccines that leads to farmers not being cooperative with animal health practitioners:

[T]here's this allegation […] let's say maybe [the AHT] has gone to vaccinate some of the cows then you will find out that there are some that would be dying but not due to [the AHT] but due to certain diseases then they associate and say the vet person has been here he's killing our cattle that's why some of them are adamant not to come [for assistance]".

Also insightful are perspectives provided by service personnel (such as state veterinarians, DOA officials and AHTs) who indicate constraints in respect of poor leadership that results in lack of implementation and poor service delivery; low staff morale and last minute cancellations of appointments with farmers. Some farmers complained that their reluctance to access AHTs and health services related for example to the slow responses from health practitioners (late arrivals result in animal deaths) compounding their own state of poverty.

In the community households we surveyed in this study we found 52 % of respondents utilized animal health services (either AHTs or state vets) in the 12 months preceding the study. 61 % of respondents indicated it took more than 4 hours for an AHT to respond to requests for assistance.

Other challenges faced by small-scale livestock farmers

Stock theft in large quantities is on-going, and some participants interviewed indicated that it is on rare occasions that stolen livestock is recovered and perpetrators caught. In our study some participants indicated police collusion in stock theft (implying that crime has broader systemic problems than merely the problem of stock theft). The seeming gender implications of livestock theft are also an important finding. For example, a female respondent in Marble Hall suggests that it is her inherent weakness as a woman that resulted in her livestock being stolen: "*my husband… is away with work so they took advantage that I am a woman then they stole them".* Theft also left farmers traumatised and stressed (even though the study did not probe the broader dimensions of the trauma and health risks), and acts as a deterrent to farmers' motivation and enthusiasm towards livestock keeping as a pathway to household socioeconomic development (and prosperity). Other challenges faced by farmers include road accidents, drought, fires (destroying grazing land and killing livestock) and lack of sufficient support from government.

Record Keeping

Interviews with farmers and animal health practitioners indicate that many farmers do not keep records (of animal births, deaths or purchases, or vaccination records) which compromises animal health and ultimately farmers' own engagement with and understanding of the health history of their animals.

The community households we surveyed in this study indicated that 75 % of households do not keep records of entries and exits of animals, vaccination records, records of sick animals, or livestock calendars.

Recommendations

The main recommendations are listed below and are premised on extrapolating the critical themes and issues arising from findings that triangulate insights from the literature review, in-depth interviews and focus group discussions, and the survey.

Gender-sensitive approaches to livestock farming

While the gender and care arrangements of households and communities cannot be changed overnight, a more targeted and focused training programme should be developed. Developing a training programme that adopts a gender mainstreaming model with a defined curriculum (working closely with small-scale farmers, policy makers, relevant civil society organisations and vaccine specialists) is a useful strategy. Such an intervention might require scoping of other sites to make comparative assessments and then piloted in selected communities to monitor and track change over a period of time (change related to patterns, trends, knowledge uptake, skills development, and behaviour modification in relation to impact pathways and changing relations in respect of gender).

Policy Considerations

While policy is in place to prioritize women and reversing the historical divisions based on apartheid, the State's promise that "smallholders would be strengthened and their numbers increased (such that) rural households would produce their own food" (The Presidency, 2014:63) has not fully materialised and requires more concrete and tangible attention in respect of policy review. Critical in this regard is the need for urgent attention to be given to resolving inequities in terms of land ownership (based on racial divisions) to address the need of both small-scale and commercial farming for black farmers in general, and for women in particular.

The bigger policy question that requires resolution by the State, small-scale and commercial farmers, and the private sector, is to "transcend the rather facile dichotomy between smallholders and commercial farmers, and look, instead, to the ways in which agriculture is socially organized" (Atkinson, 2013: 33). Other policy considerations include the following:

- Policy attention needs to stimulate land reform interventions to show more tangible results that address poverty reduction and food production, prioritize women's land rights, and thereby further stimulate economic growth and employment in the agricultural sector.
- Attention is required to prioritize coordination between the water and food sectors because even though State policy (including the NDP) has proposed a substantial increase in the productivity of the agricultural sector, this is not matched by consideration of critical water shortages in the country. Over and above accessibility, availability and consumption, the water pricing strategy needs to take into account historical racialized imbalances to ensure appropriate and targeted redistribution to the development of rural communities. Additionally, aligning the water and land question to broader attention to climate change interventions is essential for planning purposes.
- Public and private partnerships need to be revisited in terms of how they are formulated and implemented, particularly in light of significant and widespread failures in joint partnerships, and significant gaps and limitations need to be addressed.
- Crime prevention strategies formulated in the social security cluster policy environment should ensure interventions that protect commercial and small-scale farmers from increasing stock thefts (these have both local and international implications; especially in the latter where rural communities border neighbouring countries). Combined with this there should be interventions that prioritize infrastructure development (including improved conditions of roads to ensure better transport and access to and from farmers by animal health practitioners), and for small-scale farmers to better house livestock (to keep them safer, healthier and to protect against theft).
- Critical interventions required by the State point to increased budgets and resources to prioritize development in the small-scale livestock sector.

Food Security

Given that the communities featured in this pilot study could be described as mostly food secure and that livestock keeping is a major feature of these communities, the connection between food security and livestock keeping must continue to feature strongly as a policy, programmatic and research issue in order for future interventions to be based on on-going understanding of community needs, challenges and scientific developments.

Animal Health, Diseases, Vaccinations and Knowledge Uptake

Animal disease prevention, and particularly vaccination, is central to achieving and maintaining long-term food security. State intervention (in partnership with research, educational and multilateral institutions) is required to ensure appropriate and targeted

resources, programming and services that take into account training needs, knowledge gaps, and scientific development to scale up. While the broader problem of poverty may not be easily resolved, it requires a multidimensional approach by state actors to plan ahead to ensure early detection of diseases, have plans in place to ensure empowerment of farmers, protection of animal health and knowledge uptake of livestock communities. Training should take into account knowledge that enhances skills and information retention, and should consider as key to effective knowledge transmission, the relationship/s between animal health practitioners and farmers. Such training should prioritize women (not to the exclusion of men) and be in the context of greater financial and resource support from the state for small-scale livestock farmers.

Research and Communication

There is a need for more sex-disaggregated livestock data to understand intra-household relations. Additionally, while there is much rich information and data emerging in this pilot study, there are limitations in respect of its sample size, and its focus on two small livestock-keeping communities. Therefore no generalised perspectives from this baseline can be made about the whole country. If we are to fully have a picture of trends, issues and obstacles in the small-livestock sector and its connection to food insecurity, poverty reduction, a more representative sample and broader reach of sites is required. Opportunities also exist in respect of identifying responses that capitalize on local knowledge of men and women to strengthen knowledge and skills uptake to decrease animal losses, increase the sustainable livelihood of the farming communities, and ultimately increase food production and supply in healthy environments (Beinart & Brown, 2013). Combined with research information, appropriately designed learning materials and teaching aids would be useful tools in enhancing pedagogical interventions. That said, on-going research is recommended that will inform programmatic and policy development.

Conclusions

Our findings, albeit limited to the cross-sectional perspectives of two sites/communities in two adjacent provinces in the North-East of South Africa, provide important and valuable insights into a number of areas that should be addressed. These findings suggest that we have scope to learn lessons and consider options for future work and interventions in the broad context of small-scale livestock farming, vaccine development initiatives in Africa, and ultimately combating food insecurity. A study of this scope, in spite of its limitations, confirms the need to integrate animal health, food security and gender empowerment in research, policy and programmatic planning.

CHAPTER 1: INTRODUCTION

Introduction

This technical report presents insights from a pilot study addressing the human and social development component within the Agriculture Research Council (ARC) – Onderstepoort Veterinary Institute's (OVI) New Generation Vaccine programme study ("Livestock Vaccines Against Viral Diseases for Developing Farmers in sub-Saharan Africa"). The "human" and the "social" is understood as focusing on improvements in the social conditions of peoples' lives , in this case through the development of poor, rural communities. Recognising that a pilot project entails a snapshot, this case provides a cross-sectional perspective of two small-scale livestock farming communities in the North-Eastern regions of South Africa. This study is descriptive (as well as being analytical) and provides an information base to inform future interventions (programmatic, policy and research). It is our hope that the information and lessons emanating from this pilot study will further stimulate studies on small-scale livestock communities in other areas in the country. This study can inform the design of future projects (including through its limitations), and act as a base from which to design scale-up studies, as well as inform the design of any planned vaccine implementation, monitoring and evaluation programmes.

Background

The principal research problem identified in the OVI study is that infectious diseases are responsible for high rates of morbidity and mortality in animals, and some infectious diseases of animals also pose a significant threat to human health and life. Infectious diseases also contribute extensively to economic loss in the agricultural livestock sector worldwide (Lefèvre et al., 2011), and such losses are amplified in contexts where veterinary services and appropriate infrastructure do not exist to control infectious diseases. There is also a growing recognition that the advances in biotechnological improvements to control animal disease cannot be implemented without taking into account the social and economic dimensions (and in particular the role of women) in the contexts into which they are introduced (see Herath, 2007; Kipuri, 1989).

In zooming in on the OVI New Generation vaccine programme sites on the southern Limpopo border, this study provides a gendered and socio-developmental perspective on the two study sites falling within the ARC's Vaccine Programme where livestock farming forms an integral part of the communities in question. This study addresses the socioeconomic and gendered dimensions in rural livestock farming systems and the relationship of these dimensions in decision making to livestock health within rural developing farmer households (encompassing knowledge, disease management and decision-making in households). Besides having communities in which livestock keeping forms a strong component, the study areas, namely Rhenosterkop and Marble Hall,

located along the Mpumalanga / Limpopo provincial borders (see chapter three for a description of the geography and population of these areas) were also chosen as they have been affected by recent livestock disease outbreaks.

Scientific and socioeconomic contexts

Within the agricultural sector (and livestock farming in the food security context) globally there is much effort to address the challenges and problems faced by women to ensure they are protected through equal access to various services including animal health services and vaccines, credit and market facilities. Veterinary vaccinations are amongst the greatest successes in preventing, controlling and reducing the incidence of animal diseases worldwide. The use of veterinary vaccines is essential, not only in animal health, but for general public health as well. Vaccines have been a major contributor in the eradication of major diseases like Rinderpest, and preventing countless deaths of livestock as a result of infectious diseases annually (Njeumi et al., 2012:729-746).

Livestock systems are the largest land-use activity on earth (Hererro et al., 2010:822-825), and global livestock production is expected to double by 2020. A central focus in this sector is to ensure that benefits – in particular to small scale farmers – are reaped in a sustainable manner and by doing this, to give good effect to the multifunctional nature of livestock in developing communities (Thomas-Slayter & Bhatt, 1994:467-494). A large percentage of people living in poverty are located in rural areas of developing countries; and the sites that fall within this study (namely Marble Hall and Rhenosterkop) represent an area with socio-economic challenges of rural communities living with low employment opportunities, which means that livestock farming takes on a particularly significant role (as outlined in the rest of this report). In addition to this, there are significant arguments (though not uncontested, as will be discussed in Chapter two) that small-scale livestock (and general agricultural) farming is more economical and productive per hectare than large scale commercial farming, which is an argument for increased support for the small-scale farmer.

Socioeconomic and development challenges are faced by most smallholder farmers, but are felt most acutely by women, when trying to access, control and manage livestock health and farming. As a result it is far more difficult for rural women than for rural men to reach their full potential as farmers and livestock keepers and take medical decisions for their animals.

Currently, there is increasing focus in rural development on small scale farmer's livestock production and its impact on household food security, human welfare and socioeconomic development. While much of the earlier arguments on rural livestock farming centred on scientific and technical aspects such as disease epidemiology, outbreaks and control, animal movements and transboundary diseases etc., attention is now increasingly turning to the multidimensional human and social dimensions impacting on rural livestock

production (Quisumbing & Pandolfelli, 2010:581-592). Central to this is the idea that it is men and women as *agents* who are ultimately responsible for carrying through effective farming to ensure healthy and productive livestock to strengthen food security needs.

While women and the poor are likely to be most affected by rural livestock health and farming, the constraints they face in rural farming systems are not being adequately addressed in research programmes due to the lack of a systematic approach and low capacity to integrate gender and animal health in a meaningful way. In this pilot study we explore some of these constraints and barriers in the context of two sites that form part of the (broader, scientific) study that focuses on a vaccination programme. As key actors in the agriculture sector, women can play a more vital role in addressing and leading efforts to improve local economic growth by farming with livestock, improving livestock health and thereby, contributing to household food security. The study will explore efforts, activities, and initiatives, as well as constraints and challenges faced by women within the study's sites in relation to household food security and vaccine use and animal healthcare.

Gender, livestock production and animal healthcare

This study is concerned with the gendered implications of rural livestock development initiatives and programmes. Studies on the gender perspectives on livestock disease prevention (i.e. mitigation, adaptation, policy development, decision-making) and disease control need further investigation in the South African context. Women are powerful but often neglected agents of change and their leadership is critical. They play a potentially significant role in dealing with issues such as decision making within households, animal care, use of livestock farming by-products, household food security, population growth, and economic growth, developing scientific research and technologies and policy making, etc.

While several studies have been conducted on gender issues and food security in various African countries (e.g. Das & Laub, 2005:218–222; Lemke, 2003:59–67; Kerr, 2005:53–74), the gender differentiated impacts of rural primary animal health and livestock farming is currently fragmented. Joint and collaborative action is required to develop effective policies and strategic actions to achieve sustainable food security through improved animal healthcare and disease reduction. There is a need to develop an interpretation of the gendered dimensions and impact of vaccinations on farming systems and rural farming households to determine the difference vaccinations and primary animal health programmes have made in these communities as well as the future direction for further strategic research in these areas.

Addressing gender issues effectively in vaccine research and disease control is critical to improving local productivity and reducing poverty in South Africa and Africa as a continent. Despite the recognised importance of gender considerations to the success of

research and development initiatives, there remains a need for effective planning, implementing and monitoring frameworks and capacity development in gender analysis. Developing a gender responsive lens and applying it in research will provide an opportunity to improve gender equity in livestock primary health and therefore production, and to meet the converging challenges of disease control, livestock production, household food security, micro economic growth, massive fluctuations in markets and food prices and poverty reduction and rural development initiatives.

Rationale and Objectives of the Study

Gender considerations become more significant when we recognise that two thirds of the world's 600 million poor livestock keepers are in fact rural women (Thornton et al., 2003:311-322), many of whom live under very dire conditions of poverty. Gender interacts in several ways with other identity markers such as race, class and geographical location, to impact on individuals' and groups' levels of poverty and food security. For example, in South Africa, statistics indicate that poverty and low incomes negatively affect mainly poor, African women, including those who reside in rural contexts. To illustrate the argument that poverty cannot be separated from politics, a number of scholars have linked poverty in South Africa with apartheid policies which, they conclude, were responsible for disempowering individuals, households and selected race groups, especially those living in rural areas (see for example Van der Walt & Morolo, 1996:137-138). In this regard, May et al. (2000:47-48) motivate how the strategy of the introduction of homelands and the migrant labour system contributed to the unequal, racialized distribution of resources and to the negative skewing of poverty against African women in rural areas.

Typical of the poor is that they spend more than 50% of their earnings on food. Women are known to be responsible for food selection and food preparation for the households, as well as for the care and feeding of children. In rural areas the availability of women's time is a key factor in the availability of water for hygiene, firewood collection and frequent feeding of young children (confirmed by the Census 2011 data). Since it is women who are mainly responsible for household agricultural production, any intervention that enables them to increase the productivity of their time spent on farming activities, and to spend less time on routine household tasks such as fetching water, firewood and groceries, is likely to be most effective in increasing agricultural output (HSRC, 2004). Similarly, peri-urban areas affected by problems of food security are in low-income and informal settlements. Watkinson and Horton (2001) argue that the ultra-poor are rural households with more than half the members being pensioners, and where the household is often supported by women. Hence the burden on women providing for their families in rural areas is greater.

As an important component in agriculture, livestock has been recognised to be important for promoting sustainable livelihoods and to:

> …have significant potential for poverty alleviation, often in areas where few other options exist. However, there is also an increasing awareness that certain types of livestock systems are associated with important downsides such as environmental degradation, greenhouse gas emissions, zoonotic and emerging infectious diseases, or food-borne illnesses…Gender will be central to achieving this balance. Livestock are important in women's livelihoods and asset portfolios. (Kristjanson et al 2010: 2)

Livestock is therefore understood as a tool in the broader context of addressing poverty. The International Livestock Research Institute (ILRI) research has also provided a framework called the "livestock pathways out of poverty" (ILRI, 2008), that centralizes the value of assets, markets and other institutions to explore different aspects of small-scale livestock production and marketing, including the impact of animal diseases on poverty (Perry & Grace, 2009:2643 – 2655).

This framework has also been utilized to investigate gender issues within the livestock sector and has value and relevance for this study. Kristjanson et al. (2010:2) provide a cogent summary of the framework:

> The three hypothesized livestock pathways out of poverty are: (i) securing current and future assets; (ii) sustaining and improving the productivity of agricultural systems in which livestock are important; and (iii) facilitating greater participation of the poor in livestock-related markets. While these three pathways are distinct, with each requiring particular strategies and interventions to be successful, they are closely interlinked. At different instances, each of these pathways may offer a greater opportunity to reduce poverty than others. Nevertheless, livestock keepers, researchers and developers alike must attend to all three pathways if they hope to sustain and optimize development of livestock-based enterprises.

In this context the proposed pilot research project which adopts in part a similar model aims to (1) describe and analyse current knowledge in a selection of policy, scientific and grey literature in relation to gender and livestock farming and its relevance to usage (if at all) related to vaccines and disease management of animals by small-scale farmers in two communities (Marble Hall and Rhenosterkop); (2) identify some behaviour patterns, usage, uptake, knowledge and attitudes among small scale famers in relation to the vaccine usage and disease management; (3) provide some demographic perspectives in relation to a profile of the small-scale farmers and their households; (4) determine experiences and farmer knowledge in relation to the value of vaccines and its benefits related to access, challenges, opportunities and its social and economic benefits in so far as broader contributions to food security and community upliftment.

A central untested assumption underlies the analysis: (1) in rural contexts such as the areas of Marble Hall and Rhenosterkop, small-scale livestock farmers and their households experience a number of socio-economic challenges that also have bearing on combating

livestock infectious diseases and ultimately food security; (2) capacity constraints, coupled with insufficient knowledge and poor understanding of animal health by farmers in terms of contemporary science are factors that hamper development pathways for these households and communities.

A Note on Terminology

In this study we utilise the term "small-scale farmers" to refer to the rural (African) farmers who are considered "historically disadvantaged" within a South African historical context of land dispossession (see Cousins, 1996:166-208; The Presidency, 2014). We also use the term "smallholder" interchangeably with "small-scale farmer/ farming" at times in this report as the literature does not draw any significant distinctions between these two. Also, the use of the term "livestock keeper" is frequent in the literature (see for instance InfoResources, 2007), and often is used interchangeably with smallholder (see for instance Biber-Klemm, 2011). The FAO (Food and Agriculture Organization) includes in its definition of livestock keepers the following:

> …their tendency to operate with limited resource endowments relative to other producers in the sector, and the fact that, in general, small-scale livestock keepers have relatively low-levels of formal education and training. Small-scale livestock keepers often keep their animals on communal rather than private land, or they may be landless. (FAO 2009:6)

It should be noted that government policies in relation to the development of livestock keepers/ smallholders in rural areas makes use of the terms 'small-scale', 'emerging' and 'commercial' in ways that suggest a need for "graduation" from one to another, with the last signifying the attainment of 'real' success.[1] This model for agricultural livestock development is shared by African farmer organizations such as the African Farmers' Association of South Africa (AFASA) and the National Emergent Red Meat Producers Organization (NERPO), who also embrace this particular developmental model.

Atkinson (2013:29-34) critiques the idea of a dual economy made up of "small-scale" and "commercial" farmers in South Africa, and government policies being wedded to these distinctions (further discussed in chapter 2). Government's reiteration of the dichotomy of the agricultural economy in its *20 Year Review* (The Presidency, 2014), however, is also part of its clear refutation of the idea that past injustices in relation to land and agriculture have been overcome or dissolved in post-apartheid South Africa. The point to draw is that there is political significance and power attached to the use of different terms and this report takes the approach that the use of terms (in policy-making, as well as in the literature) is something we need to pay attention to, and not elide. More significantly, we take the approach that there is no single 'proper' way to apply the terminology, and no necessity for establishing the most correct way to use different terms. Rather our concern should be with how the terms are used by different actors and stakeholders with

a stake in the developmental agenda of livestock production and farming/ keeping in South Africa, in order to understand better the stakes involved.

Structure of the Report

The rest of this report is set out as follows.

Chapter 2 offers a review of the critical literature pertinent to the study, namely scientific, policy and "grey", and considers in broad terms the main themes, issues, trends and gaps relevant to understanding small-scale livestock farmers.

Chapter 3 describes the approach to, methods used and processes involved in developing the research, research instruments, data collection and identifies some limitations.

Chapter 4 summarises findings of the qualitative data (notably focused on key informant interviews and focus group discussions) in terms of the broad themes that emerge.

Chapter 5 discusses findings of the survey by describing the quantitative analysis process, reporting on the results, and analysing what these results mean.

Chapter 6 extrapolates and discusses a set of recommendations drawn from the literature review, qualitative and quantitative findings.

Conclusion

Following this brief introduction which outlined the background, scientific and socioeconomic context, rationale and objectives of the study, note on terminology and schematic structure, we now turn to a review of the critical review of literature in Chapter 2.

CHAPTER 2: CONCEPTUAL AND LITERATURE REVIEW

Introduction

This study is located within the broader global and national context of concerns related to food security and nutrition in developing countries and the small-scale livestock sector's role in addressing these concerns. In this section we specify the theoretical and conceptual approach to the study, and discuss the scientific, policy and related grey literature addressing the international and South African contexts. We are interested in what the literature tells us about small-scale livestock production and farming both globally and nationally, the role of women in this sub-sector, as well as issues around primary animal healthcare (including vaccine use) in small-scale livestock farming.

Conceptual Approach

The international development context emphasizes the role of women in addressing issues within small-scale livestock farming in achieving food security and socioeconomic development in poor contexts. We therefore utilize a gender lens in order to make sense of the global, national and provincial contexts in which small-scale livestock farming is practiced. This means that we also explore the issues and debates presented in the literature with a sensitivity to the gendered arguments and implications where possible. The following definition, presented by the International Fund for Agricultural Development (IFAD), forms the basis of our understanding:

> The term *gender* refers to culturally based expectations of the roles and behaviour of women and men…Gender issues focus not only on women, but on the relationship between men and women, their roles, access to and control over resources, and division of labour and needs. Gender relations determine household security, well-being of the family, planning, production and many other aspects of life. (IFAD, 2010:1)

Programmes and initiatives in small-scale livestock farming take into account the impact, role and effects of gender on intra-household and inter-household dynamics to differing degrees. The extent to which gender forms part of an approach renders that approach as variously gender-accommodating[2], gender-exploitative or gender-transformative, with the last seen as offering the best approach (Njuki & Miller, 2013:115-116). It is within this larger framework, of a need to see gender transformation as critical to socioeconomic development, that we offer a reading of the literature.

We begin with important trends in the international development context, namely the debates around the importance of livestock farming for achieving development goals, and women in small-scale agriculture, before moving to the South African context. Here

national and international factors overlap, specifically with reference to livestock farming and the state of the agricultural economy; women and agricultural employment in South Africa; the 'dualistic' agricultural economy; export-led growth in agriculture; land and water as significant natural resources in the context of livestock production; the links between agriculture, food security and nutrition, and the specific programmes and policies that have intervened in issues of agriculture, rural development and land reform within the South African context. Taken into consideration with specific insights around animal health, diseases, vaccinations and knowledge uptake, this review sets a framework for our study.

The International Development Context

The importance of livestock farming for achieving socioeconomic and development goals

Increasingly, livestock farming is being considered an important contributor to poverty alleviation and women's empowerment within the international pro-poor development agenda (IFAD, 2010; Herrero et al., 2014). The livestock sector is "one of the fastest growing agricultural subsectors, a major contributor to food and nutrition security as well as serving as an important source of livelihood for nearly 1 billion poor people in developing countries" (Munyai, 2012: 3). In their book, *Women, Livestock ownership and markets: bridging the gender gap in Eastern and Southern Africa* (2013), Njuki and Sanginga explore the importance of the livestock sector to pro-poor development and providing pathways out of poverty, including through providing household food security.

Stroebel et al. (cited in Munyai, 2012:24) tabulate the benefits and products derived from livestock in the following way:

***Table 1**: Livestock products and their benefits*

BENEFIT	PRODUCTS
Food	Milk; meat; eggs; blood; fish; honey; processed products
Clothing	Wool; hides; skins; leather
Work	Draught power cultivation; transport of goods and people; threshing; milling; pumping water
Monetary	Capital wealth; investment and savings; income from hiring working animals; sale of products and animals
Social	Lobola (bride price);ceremonial; companionship; recreational; status
Manure	Fertiliser (soil amelioration); fuel; flooring
Other benefits	Feathers; bone meal; soap production

Source: Munyai 2012: 24

Citing various studies, Munyai affirms that livestock is important for the following reasons in the African context:

- 70% of people in sub-Saharan Africa are primarily dependent on livestock (for their livelihoods)
- Meat, milk and eggs provide about 20% of the protein in African diets, and perhaps most importantly, the fact that,
- Livestock provides a "deliberate household strategy to anticipate failures in crop yields or other income streams" (Munyai, 2012:4).

On their website, ILRI, states that livestock is going to become "agriculture's most economically important sub-sector, with demand in developing countries for animal foods projected to double over the next 20 years."[3] This is corroborated by Herero et al. (2014), who highlight the need for a serious consideration of livestock as a growing sector in African agriculture leading up to 2050. Their key finding is that milk consumption in sub-Saharan Africa will triple by 2050, and increases in the consumption of meat and eggs from poultry and pigs will also increase dramatically (Herrero et al., 2014:5).

ILRI's website refers to an "ongoing livestock revolution" that provides pathways out of poverty. According to Smith (2012), 7 of the 9 highest-value global agricultural commodities are from livestock which in order of contribution to GDP would be cow's milk, cattle meat, pig meat, chicken meat, hen eggs and lastly, buffalo's milk. Thus livestock are important to smallholders both for their consumption benefits as well as for their economic potential and productive benefits.

For development practitioners and those researching in the area of small-scale livestock farming, smallholder livestock farming is taking on an increasingly important role in relation to poverty reduction and food security:

> Livestock is considered a key asset for rural households worldwide and a primary livelihood resource for rural communities: about 752 million of the world's poor keep livestock to produce food, generate cash income, manage risks and build up assets [...] Livestock "widens and sustains three major pathways out of poverty: (1) securing the assets of the poor, (2) improving smallholder and pastoral productivity and (3) increasing market participation by the poor" [...] Especially in rural areas, the development of small-scale livestock enterprises must be seen as a key element of any efforts to eradicate extreme poverty and hunger. (FAO, 2013:5)

Women the "backbone" of small-scale agriculture: addressing global hunger and poverty

Within the international agricultural development agenda as described above, women are increasingly being identified as key to the eradication of global hunger (Njuki & Sanginga, 2013; Nesamvuni, Swanepoel & Stroebel, 2010; FAO, 2011).[4] Women have been identified as "the invisible agricultural producers" (Mofya & Chisenga, 2000:128). This is one of the contributing factors to women becoming a focus for aid organizations that place an emphasis on women and gender in (agricultural) development projects and programmes in developing countries. According to international humanitarian organization CARE[5] (which focuses on fighting global poverty) "women account for 60 to 80 percent of food production in developing countries." The Food and Agriculture Organization (FAO)[6] claims that "women, on average, comprise 43% of the agricultural labour force in developing countries." Whichever estimate is used, the numbers are significantly high, yet the 'invisibility' of women persists in the sense that there is both an undervaluation of this sustaining role of women, as well as a lack of support for them. CARE Australia estimates that only 5% of government agricultural services – in the form of training in agricultural techniques and livestock vaccination programmes – ever reach women (Ibid).

The role of women in agriculture is particularly strong in sub-Saharan Africa, where by 2010 women form 50% of the population economically active in agriculture (higher than any other region in the world), and where the employment of both men and women is also higher in the agricultural sector than in either industry or services (FAO, 2011). Hence the centrality of women to any rural development strategy has become a fact that is central to all international organizations development programmes: "The idea of women as food producers responsible for household food security has dominated the understanding of gender in rural development for over four decades" (FAO, 2011).

According to a recent publication highlighting gender in livestock farming in the African context, women "remain the backbone of global smallholder agriculture, and [are] one of the best hopes for ensuring future global food security" (Njuki & Sanginga, 2013: xv). Yet once again the invisibility of women in "decision-making processes" and "lack of female control over livestock assets and income" has a detrimental effect on both family welfare and economic growth (Ibid). Given that "two-thirds of the world's 600 million poor livestock keepers [are] rural women", there is, according to the authors, a need to consider the ways in which livestock-related opportunities relate to them (Njuki & Sanginga, 2013:2).

One particular and significant example of the importance of women in market activities related to small-scale livestock activities, cited as a big success story in the literature, is Operation Flood in rural India, and is hailed a global success in empowering women as part of food production and food security efforts (in this instance milk production).

Women became central to "village cooperatives from which milk was purchased and transported to distribution points in areas of demand" (FAO, 2011: 14). The FAO report goes on to state:

> By 1991, women constituted 93 percent of total employment in dairy production in India (World Bank, 1991), and by 1998 the majority of milk was being purchased from women's cooperatives (Patel, 1998)…By 2006 the programme consisted of 70,000 village-led cooperatives with 80 percent of the national herd kept on farms with *8 or fewer dairy animals*. (FAO, 2011:14) – emphasis added)

This highlights the productive potential of small-scale livestock farming (as having a significant impact on securing national food security in terms of the nation's milk requirements), with women at the helm.

It is important however, not to overstate the relationship between women's "empowerment" and household food security as a study in Nigeria found that increases in women's income reduced the per capita calorie intake of households:

> …which conflicts with the hypothesis that increases in the share of income under women's control will increase calorie intake. These results also suggest that the redistribution of intra-household income from male household heads to female spouses, as is sometimes promoted through development interventions and enforced through food security policies, may not yield desirable food calorie intake outcomes… (Kariuki et al., 2013:104)

Advantages of small-scale agriculture for women, and challenges faced by women

According to the International Fund for Agricultural Development (IFAD), the main benefits for women in livestock production is their ability to make decisions and be empowered, to generate an income, have their self-esteem boosted and the ability to access credit (IFAD, 2010). Women's ownership of assets, including livestock, means betterment for them as well as for the households in which they reside. "Reducing the gender asset gap or putting assets in the hands of women has been shown to have positive outcomes, not only for women themselves but for households" (Njuki & Sanginga, 2013:23).

Njuki and Sanginga (2013) go on to state that women's ownership of assets has been shown to increase their bargaining power, their role in household decision-making, and their role in expenditure on children's education and health (Ibid). Women's control over assets translates into their ability to exercise decision-making and other powers: "Increasing women's control over land, physical assets and financial assets can improve child health and nutrition, and increase expenditures on education, contributing to overall poverty reduction" (Njuki, Mburu & Pimentel, 2013:73). Mabhena (2013) writes about women farmers in Zimbabwe and presents women as the more rational, less sentimental

farmers, who are more likely to make sound economic and household decisions regarding the use and sale of livestock, than men, who remain mired in attachments to cattle based on social prestige.

It has become common to acknowledge that women are more likely to own and/or take care of small ruminants such as chickens, goats and sheep, rather than cattle (Njuki & Sanginga, 2013:24). This relates to their ability to contribute to household food security and dietary diversity, as well as being empowered, as having smaller livestock means these livestock can be sold more easily in order to purchase foods not produced by the household (Kariuki et al., 2013:106-107), thus also giving them direct access to participation in the marketplace.

However, the literature indicates that there are significant obstacles and challenges that women face in being able to use small-scale livestock farming as a springboard for self-empowerment. Some of the main obstacles facing women include the following:

- Lack of ownership (of livestock), of assets
- Lack of ownership of land
- Lack of access to extension services, credit, training, education etc.
- Lack of government support
- Low literacy rates
- Lack of access to information and organization
- Lack of control over household income
- Constraints on women's mobility (which prevents them accessing services, education, etc.)

Njuki and Sanginga (2013:27-28) distinguish between *decision-making* and *ownership*, as two separate spheres where women can and do exercise control. In their study of women-owned livestock in Kenya, Tanzania and Mozambique, they investigated the ability of women to make decisions about the sale of livestock that they themselves owned, showing the importance they place on decision-making authority and control over animals that are owned. For each type of livestock (dairy cattle, exotic chickens, goats, local chickens, pigs and sheep), women were asked to choose how they made decisions regarding sale of an animal, according to the following options:

- I can sell it without consulting my husband
- I can sell it but I would need to consult my husband
- My husband is the only one who can sell it. He does not have to consult me.
- My husband can sell it but he would have to consult me

This emphasizes not just the importance of "sex-disaggregated livestock data" (Njuki & Sanginga, 2013:3), but also the need for sex-disaggregated data for intra-household

dynamics, so as to help us better understand gender dynamics within the household (and not simply between separate male and female headed households).

The literature addressing development practitioners suggests a need for a gender-sensitive approach to livestock farming that does not set men and women in opposition to one another or as having exact symmetry in roles, assets and responsibilities (FAO, 2011:23). The FAO report emphasizes further the fact that men are not "independent agents unconstrained by concerns about the welfare of others, and women as altruistic individuals almost exclusively concerned with producing food for consumption and achieving food security for others" (FAO, 2011:23). Similarly, IFAD suggests that gender issues are not focused "only on women, but on the relationship between men and women, their roles, access to and control over resources, and division of labour and needs. Gender relations determine household security, well-being of the family, planning, production and many other aspects of life" (IFAD, 2010:1).

We see the twin objectives of food security and poverty reduction (on the one hand) and women's empowerment (on the other) coming together in how the measurement of women's involvement and role in small-scale agriculture is measured within the international development arena. The Women's Empowerment in Agriculture Index (WEAI) was "developed for USAID [US Agency for International Development] by IFPRI [International Food Policy Research Institute] and Oxford University", in order to "capture women's empowerment and inclusion levels in the agricultural sector, to raise the status of women in agriculture, improve nutrition and decrease poverty" (Njuki & Miller, 2013:121-122). The index considers five factors to be indicative of women's overall empowerment in the agricultural sector:

1) Decisions over agricultural production
2) Power over productive resources such as land and livestock
3) Decisions over income
4) Leadership in the community
5) Time use

The factors provide a kind of objective measure through (or against) which to consider gendered empowerment in small-scale agricultural and livestock keeping communities as "Women are considered empowered if they score adequately in at least four of the components (IFPRI, 2012)" (Ibid).

The centrality of gender to empowerment initiatives is entrenched in the context of international development work. We turn now to the South African context in order to understand better the policy and empirical contexts within which any gender-sensitive consideration of small-scale livestock farming would need to be situated.

The South African Context

One of the main issues with which this study is concerned is food security and the idea that smallholder livestock farming is a key contributor to household food security in developing countries. It seems that within the South African context, there have been significant challenges to rural development being ignited by smallholder agriculture. Government's hope that, through its agricultural and rural development programmes, "Smallholders would be strengthened and their numbers increased, and rural households would produce their own food" (The Presidency, 2014:63), has yet to be fully realized.

The FAO says 95% of South Africans are well-nourished; the country is one of two in sub-Saharan Africa whose population was "properly nourished" (Ghana is the other country) (AFASA[7], 2014:54). Others are more critical claiming that figures from the last representative National Food Consumption Survey (NFCS) (2005) "show that the level of child undernourishment in South Africa is exceptionally high for a developed, middle income nation" (Hendriks, 2013:2). The 2011 General Household Survey (GHS) shows that 11.5% – close to 10 million people – experienced hunger in the 30 days prior to the survey (Hendriks, 2013:2). Besides experiencing hunger, "22.7 percent of the population, or 13.8 million people, has insufficient access to food and many households (21 percent) continue to experience difficulty in accessing food" (The Presidency, 2014:65).

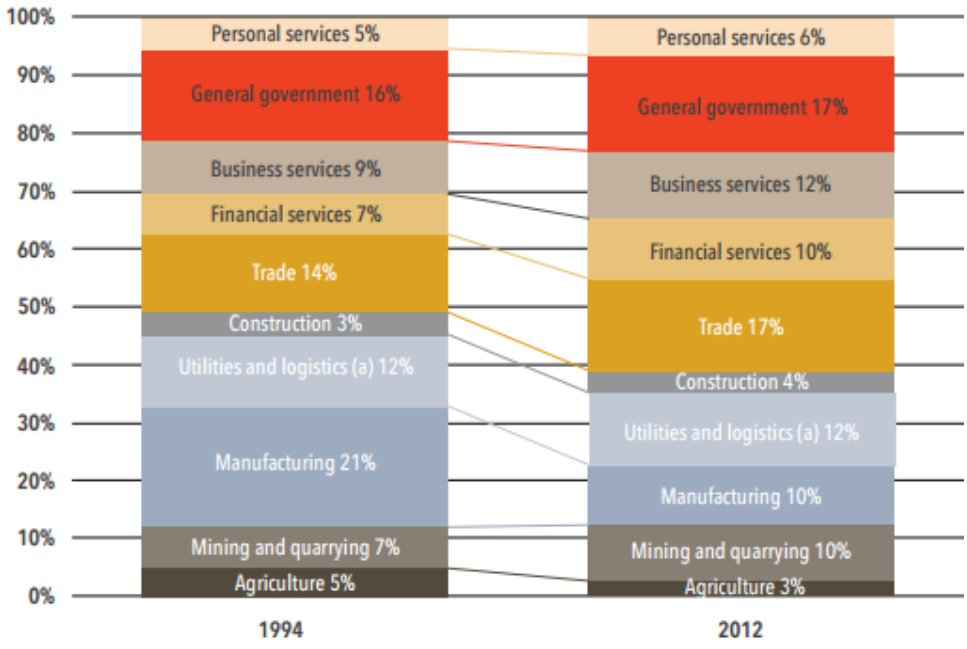
Hendriks (2013:1) claims that "…the country has no food security information and does not regularly collect such information". The *20 Year Review* seems to confirm this, as no outline of clear government policy or strategy development is laid out in this document. Hendriks is critical of the government's two key strategy documents, in relation to agriculture and food security: the National Development Plan (NDP) and the New Growth Path (NGP), the former emerging from the National Planning Commission (NPC) and the latter from the Department of Economic Development (Hendriks, 2013). Not only is food security being ignored as a significant issue (with the 2002 Integrated Food Security Strategy for South Africa (Department of Agriculture, 2002) needing significant revisions and review, but the links between poverty, economic growth and food security have not been explored in ways that offer good policy options for enhancing growth in ways that will reduce poverty and improve food security.

The geographical concentration of food insecurity is "…in rural areas", and is the result of a number of contributing factors including "a declining trend in subsistence food production, [and, the rising…] cost of food relative to the incomes of the poor" (the latter contributing to malnutrition and poor dietary diversity as well) (The Presidency, 2014:65-66). Commercial agriculture is said to underpin national food security due primarily to the country's dependence on "just under 40, 000 heavily stressed commercial farmers producing 12 million tons of white and yellow maize on average a year" (Hendrick, 2013:3).

There are ongoing debates over various issues within agricultural policies – including the merits of continuing government support for commercial agriculture (given the declining sector contribution to GDP), debates around the dualistic agricultural economy and whether the distinction between 'commercial' and 'smallholder' remains and is helpful for policymaking, how resource constraints (especially with water and land resources) relate to smallholder agricultural development – which will be discussed in the sections below. First however, we proceed with some contextualization and statistics on the agricultural sector within the South African economy.

While the international livestock data provides a resoundingly optimistic picture of the future of livestock in enabling a particular growth, development and poverty alleviation trajectory for the poor, we need to consider the fact that agriculture as a sector (in comparison to other sectors) has been on the decline in South Africa. Nationally, 19.9% of households are involved in agriculture (Statistics South Africa, 2013a:2). The graph below shows the composition of GDP by major industries in 1994 and then 2012, reflecting the shrinking of agriculture in its sectoral contribution:

***Figure 1**: Contribution of the Agricultural Sector to South Africa's GDP*

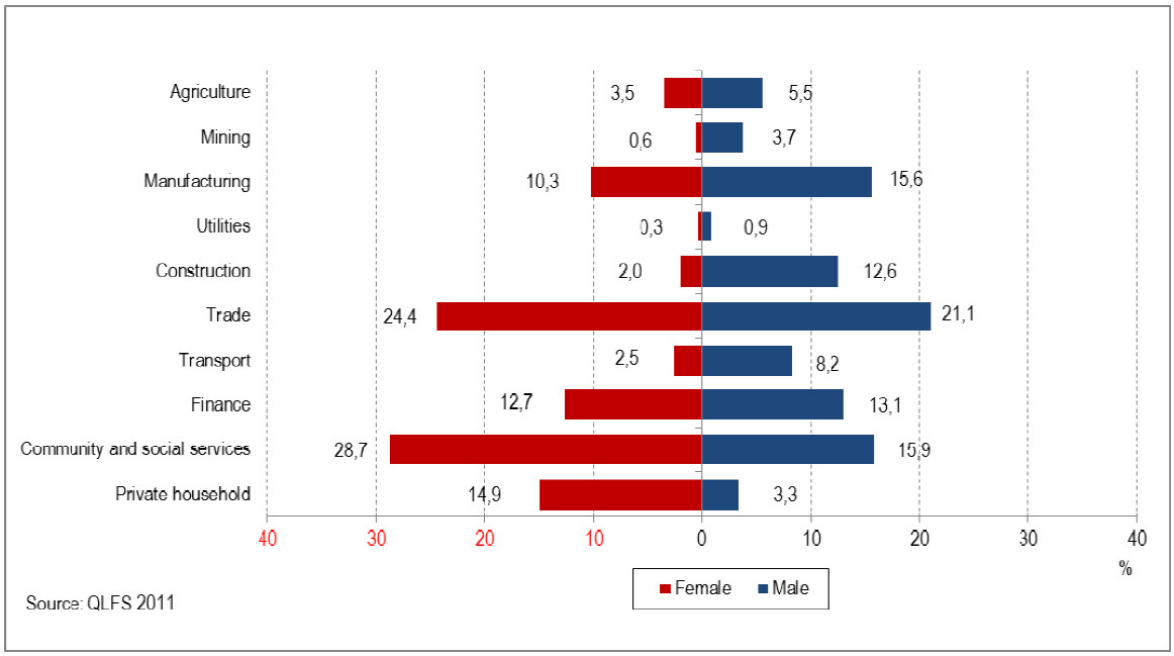


Source: The Presidency, 2014:88

There has been a decline in agricultural sector employment.[8] "Employment in agriculture declined from 1.1 million in 1992 to 706 000 in 2013. Reasons vary, including vulnerability of the sector to global market fluctuations, a shrinking commercial farming sector and the consolidation of small farm units into larger farms and mechanization" (The Presidency, 2014:65). Agriculture, which is the 6th biggest sector in terms of employment for women and the 7th in terms of employment for men (out of 10 sectors; see graph below),

accounts for just 3.5% of women employed and 5.5% of men (Statistics South Africa, 2013b:33). This declining significance in terms of its employment creation is illustrated in the graph below:

***Figure 2**: Gendered Employment in Agricultural sector*



Source: Statistics South Africa, 2013b:33

Natural resources – land and water – and agriculture

South Africa is faced with immense developmental challenges, which affect the agricultural sector, including "…improving livelihoods in marginalised rural areas and addressing issues of redistribution and equity within a context of… limited water resources and limited fertile land resources" (Goga & Pegram, 2014:3). The redistribution of land through land reform legislation and initiatives are central to government policies of rural development, poverty eradication and the agricultural development of smallholders and black commercial farmers. Water, a somewhat less politicized resource, also has significant implications for government's rural and agricultural development policies and programmes. Below is a discussion of water and land resource constraints and the ways in which they relate to issues of smallholder livestock production.

Land reform and the dualistic agricultural economy

Land continues to be a contentious political, social and economic issue in post-apartheid South Africa, and this is felt most strongly in the agricultural sector (see for example two recent studies highlighting some of the bigger debates on how land is also misunderstood; Cousins & Hebinck, 2013; Aliber et al., 2013). The dualistic agricultural economy that is often spoken about, and which is seen as a divide between commercial and smallholder agriculture, relates to land ownership (or stems from it, rather!): "Commercial farming owns 83% of the land, while communal (traditional/ subsistence) farming uses 17% of the farming land in South Africa" (Munyai, 2012:34).

The racialized history of land beginning with the 1913 Land Act has been extensively covered (Cousins & Walker, 2014 (forthcoming); Walker et al., 2010; Walker, 2008). The redress of imbalances could be said to have begun in 1993 with the Provision of Certain Land for Settlement Act (Act 126 of 1993) (McCusker & Schmitz, 2008). Walker *et al* (2010) argue that unlike water, for instance, land is tricky to pin down as a socio-economic right. Much needs to be considered in order to shape the dynamics of land and transform it into tangible substance – one that the poor can materially use to their advantage. For example, a range of scholars (Walker, 2010; Montshwe, 2006; Meissner, Scholtz & Palmer, 2013) have stated that in order for land to be transformed into a socio-economic right with real benefits to the poor aspects such as eco-system, biodiversity, as well as rural farmers' indigenous knowledge on farming should be a serious agenda on government policy.

Walker *et al* (2010) makes two crucial points with regards to the difficulties around land rights: 1) that land, unlike water, is difficult to quantify in terms of the rightful allocation per person, and 2) difficulties with establishing the form of tenure that the right to land should take for the purposes of enhancing human well-being. Walker *et al* (2010:472) underscores a crucial point when she emphasizes that in

> …[A] land reform beneficiary having title to a hundred hectares of farm land in a redistribution project in the arid Northern Cape is not, by virtue of that right, a thousand times more empowered economically and/or socially than someone who is renting a house on a tenth of a hectare in a townhouse development.

A summary of government's policies with regard to land reform can be found in the Presidency's *20 year review* document of 2014, which charts the process, progress and messiness since 2001 with the establishment of the Land Redistribution for Agricultural Development (LRAD) Grant, followed by the Communal Land Rights Bill in 2002. This was subsequently translated into the Communal Land Rights Act (CLARA) of 2004, which gave land owning communities land tenure rights which are protected by law, as well as to give communal land ownership to communities (The Presidency, 2014:65). "Progress in implementing the Act stagnated following constitutional challenges, and remains under development" (Ibid).

The year 2005 saw the introduction of the Proactive Land Acquisition Strategy (PLAS) as a result of the slow pace of land reform (The Presidency, 2014:63-64). From 2009 "the use of grants for land acquisition was discontinued after consultations with land reform beneficiaries" and the focus shifted to the acquisition of strategically located land through PLAS. Such land was leased rather than transferred to land-reform beneficiaries" (Ibid). In 2010 a Recapitalisation and Development Programme (RECAP) was introduced to provide increased support to land reform beneficiaries to enable them to utilise their acquired land as well as to address infrastructure backlogs on the acquired farms" (The Presidency, 2014:64).

Government's land redistribution, restitution and reform programmes continue to face significant hurdles particularly in effecting changes that impact positively on smallholder agriculture (Lahiff & Cousins, 2006), including:

> …backlogs, inadequate budgetary allocations, the need for more realistic deadlines, effective ways of resolving claims on land used for high value sugar, forestry and fruit production, provision of adequate post-settlement support, addressing the problem of dysfunctional legal entities for holding land in common, and creating joint ventures that benefit claimants in an equitable and sustainable manner. (Cousins, 2009:3)

By 2009, it still appeared that "land reform needed to show more tangible results in terms of poverty reduction and food production than it could demonstrate to date" (Aliber & Kleinbooi, 2009:5). In its *20 Year Review* reflection, government acknowledges that "…land reform has not yet realised its potential to stimulate economic growth and employment, especially in the agricultural sector" (The Presidency, 2014:87).

Critiques of government's land reform approaches include the fact that "there is no coherent national framework on the allocation of commonage land" (Atkinson, 2013:31). Communal land (i.e. land that is not privately owned, but rather owned by the state) is being managed by municipalities with "poor technical skills and no background in agriculture of any kind", which "prevents the development of effective, transparent and fair systems of access and use of commonage" (Ibid).

Women beneficiaries and land reform

According to government, women have increasingly become beneficiaries of the land reform and redistribution process.

> An enabling environment has been created for women to access, own, control, use and manage land, as well as to access credit. This led to an increase in female-

> headed households benefiting from land reform, from 1.2 percent of beneficiaries in 1994 to 13.3 percent of beneficiaries by 2007. (The Presidency, 2014:65)

Government however also places the issue of women's land rights out of its own sphere of responsibility, claiming that "…women continue to be denied their constitutional right to access land due to male dominance in traditional and cultural practices" (The Presidency, 2014:65).

In the CLARA, gender equality within the communal tenure context is identified as an important imperative (Du Plessis & Pienaar, 2010). Furthermore, South Africa has an obligation to address gender inequality within the context of land because of its international commitments. As one of the United Nations member states it is a signatory to the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) which states that "State Parties should ensure that women have access to agricultural credit and loans, marketing facilities, appropriate technology and equal treatment in land and agrarian reform as well as in land resettlement schemes" (Article 14 g of CEDAW in Moyo, 2013). However, the likelihood of the elimination of gender-based discrimination in land reform policy is still questioned by some scholars, such as Walker (2009).

Water, irrigated agriculture and development of smallholder rural livestock keepers

While much emphasis has been placed on land resources and the need for government policies to effect redress on that issue, less is said about the equally contentious issues around water. The country's limited water resources have significant implications for agricultural prospects and policies. There is a failure of coordination "at the highest level", between the water and food sectors because "both the NDP and the IPAP [Industrial Policy Action Plan] propose a substantial increase in agricultural activity, despite the fact that there is not enough water available for such expansion" (Ibid).

The tensions that exist between commercial agriculture and government include issues around government subsidizing the former's water needs despite the sector's declining contributions to employment and GDP. A significant amount of the country's water – 60% – goes to irrigated agriculture, a statistic with a racial character: "The white-dominated agricultural sector consumed 60 percent of the country's water" (The Presidency, 2014:124). It is significant to note that irrigated agriculture is problematic in this sense, as government has noted in its water strategy document of 2004: "…[I]rrigated agriculture does not hold above average employment creation advantages. This reflects the capital intensive nature of modern irrigation farming" (Department of Water Affairs and Forestry, 2004:33). Of the agricultural sector's contribution to GDP:

> …only an estimated 25 to 30 per cent is from irrigated agriculture. Therefore, *even though irrigation represents about 60 per cent of the total water use, its contribution to*

> *the gross domestic product is less than 1.5%*. The remaining percentage comprises rain fed cultivation and livestock farming, and afforestation. (Department of Water Affairs and Forestry, 2004 – emphasis added)

A draft report which provides an analysis of gaps in the Department of Water Affairs and Forestry (DWAF) water pricing strategy states that the government's water strategy does not make any effort to redress past imbalances or ensure the "redistribution of water for the development of rural communities" (Pegasys, 2012:5). Various caps and exemptions subsidizing the water usage of irrigated agriculture result in an income shortfall of R2.6 billion, which "is clearly unsustainable" (Pegasys, 2012:18). There needs to be more "justification and subsidy quantification" for decisions to continue subsidizing the irrigation sector. More significantly, while massive water subsidies continue to be offered to irrigated agriculture, the report states that "no provision is made for the use of water for animal rearing" (Pegasys, 2012:9).

A study confirming the lack of water resources as an issue for small-scale livestock farming/ keeping in Limpopo (Munyai, 2012:125), shows that across the types of assistance requested by farmers from government, 17.6% asked for drought relief programmes, and 11% water, which are among the strongest requests:

***Table 2**: Types of assistance requested by smallholder livestock keepers*

TYPE OF HELP	(%) NUMBER OF HOUSE HOLDS
Camps	9.6
Financial support	14.7
Veterinary and extension services	17.6
Subsidy of medicines	12.5
Training	2.9
Dipping and handling facility	11.8
Water	11.0
Fence along the road	2.2
Drought relief programme	17.6

Source: Munyai, 2012:125

Smallholder livestock farming and the state of the agricultural economy

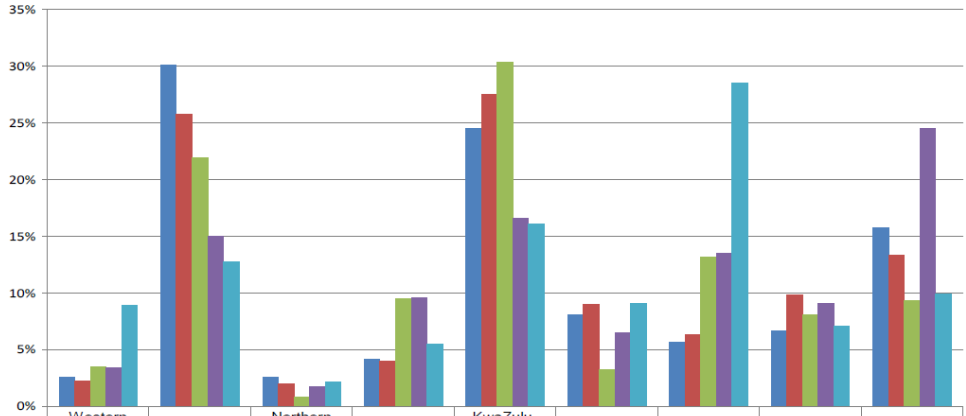
In the South African context, livestock accounts for 40% of the agricultural sector, making it the dominant industry for the sector (Munyai, 2012:9). As a sector, it "contributes up to 49% of agricultural output" and "enables South Africa to produce 85% of its own meat requirements" (Munyai, 2012:33). Livestock farming is the agricultural activity which most agricultural households practice – livestock agriculture accounts for 42.4%, mixed farming for 21.8% and crop farming for 31.2% of all agricultural activity (Statistics South Africa, 2013a:5). In South Africa, the estimated amount of agricultural land that is used by

livestock farmers, according to the Department of Agriculture, Forestry and Fisheries (DAFF), is 70% (as cited in Meissner, Scholtz & Palmer, 2013).

Government policy and strategy for rural development is centered on addressing issues of poverty, which recognizes the growing significance of livestock farming. Kraai (n.d.) draws distinctions between government policies geared towards poverty relief, poverty alleviation, poverty reduction and poverty eradication efforts. The first offers short term assistance as emergency relief for people in poverty-related distress, the second refers to the more sustained initiatives such as the social grant system to provide a "developmental stimulus", reduction refers to strategies and policies to reduce the number of people living in poverty as well as the severity of the impact, and eradication refers to the commitment by government to eliminate all forms of poverty. The Integrated Sustainable Rural Development Strategy (ISRDP) and Accelerated Shared Growth Initiative in South Africa (ASGISA) both consider livestock farming as the agricultural enterprise with the most likely chance of improving household food security and addressing poverty alleviation in the developing areas of South Africa (Montshwe, 2006).

The following graph shows the prevalence of different kinds of agricultural activity, including livestock farming per province:

***Figure 3**: Livestock, poultry and crop production by province*[9]



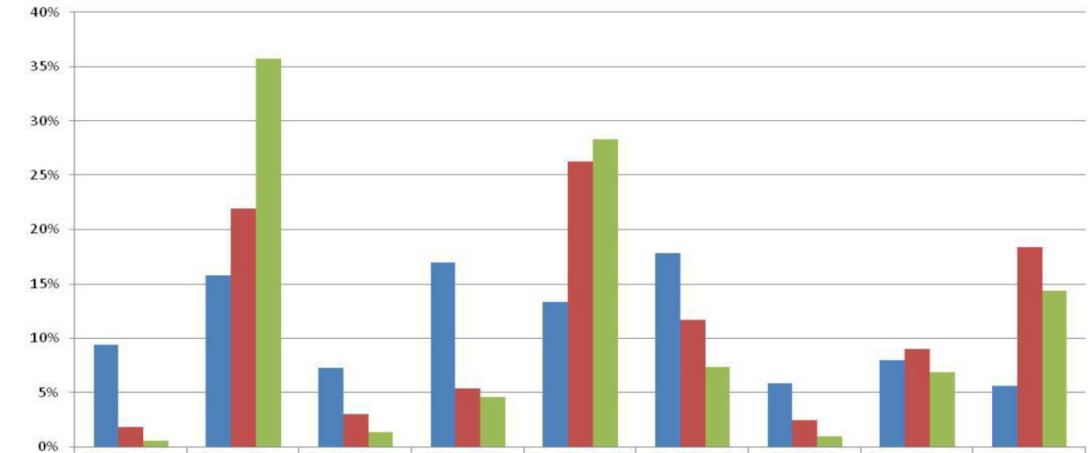
	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo
Livestock production	2,6%	30,1%	2,6%	4,1%	24,5%	8,1%	5,7%	6,6%	15,7%
Poultry production	2,2%	25,8%	2,0%	4,0%	27,5%	9,0%	6,3%	9,8%	13,4%
Vegetable production	3,5%	21,9%	0,8%	9,5%	30,3%	3,3%	13,2%	8,1%	9,4%
Production of other crops	3,4%	15,0%	1,7%	9,6%	16,6%	6,5%	13,5%	9,1%	24,5%
Other	8,9%	12,7%	2,2%	5,5%	16,1%	9,1%	28,5%	7,1%	9,9%

Source: Statistics South Africa, 2013a:3

Nationally, the number of agricultural households that keep 1-10 cattle is 78.6% (Statistics South Africa, 2013a:6), which tells us that specifically *small-scale* livestock agricultural production is a significant agricultural activity in the country. The number of agricultural households that own between 11-100 heads of cattle is 19.2% and the number of households that keep more than 100 cattle is 2.2% (Ibid).

The graph below shows the number of cattle owned per province, highlighting that, if we are to see smallholder farmers as owning less than one hundred head of cattle, then Limpopo is the country's third most significant province in terms of the number of small-scale livestock producers.

***Figure 4**: Percentage of small-scale livestock keeping households by province*

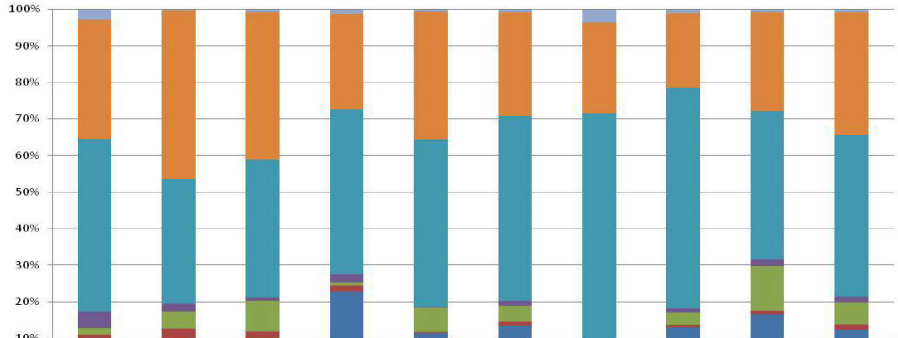


	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo
100+	9,4%	15,8%	7,3%	17,0%	13,3%	17,8%	5,9%	8,0%	5,6%
11-100	1,9%	22,0%	3,0%	5,4%	26,3%	11,7%	2,5%	9,0%	18,4%
1-10	0,5%	35,8%	1,3%	4,6%	28,4%	7,4%	0,9%	6,9%	14,3%

Source: Statistics South Africa, 2013a: 6

Smallholder livestock production in Limpopo is significant, particularly for cattle and goats, where the province is the country's largest keeper of goats, and the second most important province (after the Free State) for cattle keeping households, as illustrated in the graph below:

***Figure 5**: Types of livestock kept by households by province*



	Western Cape	Eastern Cape	Northern Cape	Free State	KwaZulu-Natal	North West	Gauteng	Mpumalanga	Limpopo	South Africa
Other livestock	2.9%	0.3%	0.8%	1.3%	0.6%	0.8%	3.5%	1.1%	0.8%	0.8%
Animal combination	32.6%	46.1%	40.4%	26.1%	35.0%	28.3%	25.0%	20.4%	27.1%	33.4%
Poultry only	47.3%	34.1%	37.7%	45.0%	45.9%	50.7%	62.7%	60.3%	40.6%	44.4%
Pigs only	1.3%	2.2%	0.9%	2.4%	0.3%	1.2%	1.0%	1.2%	1.8%	1.4%
Goats only	1.9%	4.7%	8.4%	0.8%	6.6%	4.4%	1.7%	3.5%	12.4%	6.1%
Sheep only	5.2%	2.7%	6.4%	1.6%	0.4%	1.3%	1.0%	0.5%	0.9%	1.5%
Cattle only	5.9%	10.0%	5.5%	22.8%	11.3%	13.3%	5.2%	13.1%	16.5%	12.3%

Source: Statistics South Africa, 2013a:5

While the shrinking contribution of agriculture defines in part the difficult economic context within which small-scale livestock farming is situated, more optimistically, a recent study of rural African livestock owners across nine different areas of the Free State, North West province and the Eastern Cape, suggests the increasing importance of livestock "for a significant segment of the rural population" (Brown & Beinart, 2012:2). "We found that even when smallholder cultivation was dwindling, interest and commitment to cattle and goats thrived" (Ibid). With the acquisition of land through government's land reform programmes, as well as continuing use of "the old communal pastures, livestock rather than crops have been the priority" (Ibid).

Studies such as Alcock's (2013) highlight a significant 'invisible', uncounted economic value produced by small-scale livestock production and exchange in South Africa. However, Alcock questions whether we should be valuing smallholder livestock production and exchange activities in terms of its value add to the economy. He suggests that, rather than being considered within the context of the development of the agricultural economy, support for small-scale livestock production might form part of government's *welfare* support strategies. Attempts to integrate smallholder livestock keeping communities into the formal agricultural economy often results in the application of particular commercialization models which have raised questions around the possibilities, benefits, challenges, difficulties, legitimacy and indeed viability of programmes and policies to push livestock keeping communities towards commercialization.

Debates around commercialization and the 'dualistic' agricultural economy

One of the major issues and debates about agriculture in South African is whether we continue to have a 'dualistic' agricultural economy, with (high-output) 'commercial' and (low-output) 'smallholder' farming. These divides are maintained by many as the historical legacy of land policies under white minority rule (see Cousins, 1996) including, among others, the infamous Natives Land Act (1913), the Native Trust and Land Act (1936), and the Group Areas Act (1950)[10], which led to the massive underdevelopment of both rural areas and black farmers' ability to be productive agriculturalists. According to government, "In 1994, most agricultural land was owned by whites (83 percent) and only 17 percent of the land was available for black people in the former homelands" (The Presidency, 2014:63). Hence "there was a dualistic agricultural system, with environmentally degraded arable land in the former homelands, and a flourishing white commercial sector in the highest-potential agricultural land" (Ibid).

To counteract this legacy of land dispossession and its effects, government has effected a barrage of legislation, acts, measures and programmes in agriculture, rural development and land reform over the last 20 years, and continues to do so. This is a process that could be said to have begun with the Abolition of Racially Based Land Measures Act (Act 108 of 1991) (McCusker & Schmitz, 2008). Now, twenty years later, government strongly maintains that a dualistic agricultural system continues to exist between white and black

farmers, and its approach to reversing the dualistic agricultural economy is reflected in its concern that very few commercial farms are owned by black people (The Presidency, 2014:87). Government policies towards smallholders have been characterized by a desire to move smallholders into commercial farming, as well as make smallholders central to efforts to improve household food security. Government seeks to transform the agrarian terrain, through a specific focus on the dispossessed and economically weak, particularly smallholder farmers:

> Government policy for agrarian transformation involved ensuring more equitable access to land, water, economic institutions, finance and infrastructure for landless people, farmworkers and smallholder farmers, as well as raising productivity and diversifying rural economies and rural employment. Smallholders would be strengthened and their numbers increased, and rural households would produce their own food. (The Presidency, 2014:63)

Some disagree with the idea of a dualistic agricultural economy claiming that within South African agricultural policy, "debates are typically based on artificial and extreme dichotomies" (Atkinson, 2013:374). Atkinson cites and agrees with Vetter's (2013) argument that government departments concerned with land reform, rural development and agriculture have failed to work together to create a coherent policy and vision for agricultural development. Atkinson further argues that "the difference between commercial, smallholder and subsistence farmers is often overdrawn" (Atkinson, 2013:30), claiming that commercial and subsistence agriculture can, and do, easily co-exist as evidenced by the fact that:

> Some black farmers want to remain 'survivalists', holding livestock for household food security; a second category of black farmers wants to be long-term smallscale, often part-time, farmers; and a third category are 'proto-commercial' farmers, who want to grow their herds and flocks and farm full-time at a large scale… (Atkinson, 2013:30)

The problem with depicting a dualistic agricultural economy includes the fact that a one-size-fits-all approach does not take adequate cognizance of the fact (as indicated in the quote above as well), that not all smallholders undertake livestock keeping or agriculture out of choice. Atkinson recognizes this when she says:

> …it may well be the case that many current smallholders are bottled up in agriculture, simply because the economy does not offer viable non-agricultural alternatives…Very often, we simply don't know who wants to farm, under what circumstances, because people are not given the means to make meaningful choices. (Atkinson, 2013:32)

Atkinson suggests that "South Africa needs to transcend the rather facile dichotomy between smallholders and commercial farmers, and look, instead, to the ways in which agriculture is socially organized" (Atkinson, 2013:33). Other scholars, speaking of the

dichotomy in a different way, suggest that a tension does indeed exist "between centralized, high-value agriculture, with indirect (or much delayed) benefits, versus, disaggregated, low-value agriculture and resource extraction, with short-term benefits…", and that a balance will need to be found between the two "in any future ventures" (Lahiff, Davis & Manenzhe, 2012:62).

According to Cousins and Scoones (2010:32) "how debates are framed and how success is judged is a major influence on the formulation of government policies". They claim:

> In southern Africa such debates tend to focus rather narrowly on farm productivity and economic returns. An implicit normative model in much usage in the region is the large-scale commercial farm, even when policies suggest that other scales and forms of production, such as smallholder farming, should be accommodated. (Ibid)

For Rauri Alcock a practitioner who founded a smallholder livestock NGO in KwaZulu-Natal, this is precisely the imperative – to consider how agriculture is socially organized and to take that as one's starting point (for all policy and programme initiatives). Alcock (2013) suggests that not only is the smallholder/ commercial dichotomy harmful (to the former), the continuum along which it assumes development should happen is harmful too. The idea that farmers should be pushed towards commercialization needs to be challenged, and there needs to be a resetting of what constitutes 'farming' and what makes a 'farmer'. Alcock shows we need to better understand how smallholder livestock communities are social organized, and that perhaps 'farming' with livestock (for most smallholder farmers) could be supported more within a conceptualization of it as a 'welfare' than a commercial activity.

However, government policy and the approach of international organizations (such as the FAO, working in South Africa), still favour those smallholder who undertake to commercialize. Black farmer organizations such as the African Farmers' Association of South Africa (AFASA) and the National Red Meat Producers Organization (NERPO), who represent smallholder black farmers seem also to embrace commercialization models. For instance, at an address at the NERPO annual general meeting in 2012, the FAO stated that they are "pleased to learn that the major goal of NERPO as an association of cattle, sheep goat and pig producers is to grow into commercial farmers/ farming and to participate meaningfully in the mainstream market".[11]

This 'commercialization' approach affects how the challenges faced by smallholder farmers are framed, and how the development of smallholders is understood and converted into policy. According to the FAO, these challenges would be:

> limited land size, precarious land tenure and inadequate livestock handling infrastructure, low quantities and unsuitable quality of livestock that are offered to the markets, deficient entrepreneurial skills for commercial livestock production,

> limited access to markets, limited access to affordable credit facilities and virtually no collective approaches to accessing both input and output markets.[12]

The challenges are great and in the context of poverty, poor infrastructural development, resource constraints and other significant challenges of rural underdevelopment, the viability of linear commercial models in rural contexts needs to be revisited. While the international development literature comes out overwhelmingly in favour of an emphasis on smallholder agriculture as key to addressing the poverty, food insecurity and development initiatives of developing countries, the critique provided above suggests that government's policies are built around commercialization models and may in fact place unviable expectations on smallholder agriculture in the South African context.

A critique of the need to provide support for smallholder agriculture

The literature offers another critique of 'commercialization' of smallholder agriculture (and attempts to address poverty through an emphasis on smallholder agriculture), albeit from a different perspective. Collier and Dercon (2014) present a number of criticisms of the emphasis on smallholder agriculture as the primary source of employment creation and poverty reduction. Writing specifically in the African context, the authors suggest that, economically-speaking, for coastal countries with large mineral resources (such as South Africa), the focus on developing smallholder agriculture (through support strategies) forms a part of the answer, although small-scale agricultural development should not be taken as a key or critical focus.

They state, "the argument in favour of promoting smallholders because of its *poverty* impact remains" but this should be "nested within an overall growth strategy that makes agriculture important but not the key sector" (Collier & Dercon, 2014:96). Instead, poor people in poverty-stricken rural communities, they argue, need to be incentivized to migrate away from rural areas towards urban centres where wages are higher and jobs more secure. "Poverty reduction tends to involve an increasing share of lower skilled people obtaining secure wage-earning jobs" (Ibid).

In contrast to some arguments for the high productive potential of smallholder agriculture, they argue that what has not been taken into account in the current argument for livestock as a poverty reduction strategy is the low productivity per worker "in agriculture across all developing countries" (Collier & Dercon, 2014:97). This they suggest is a result of smallholder agriculture being less a profession or career choice than a 'default activity' for poor people (which implies there is no incentive to move towards higher levels of productivity):

> African smallholders have not chosen to be entrepreneurs, they are in this activity by default. Having the single most important sector of Africa's economies almost exclusively run by these reluctant micro-entrepreneurs is a recipe for continued

> divergence of the sector from global agricultural performance, limiting growth and unlikely to help large-scale poverty reduction. (Collier & Dercon, 2014:99)

One implication is that a continued "focus on smallholders may actually hinder large scale poverty reduction" (Collier & Dercon, 2014:93). They argue rather that African countries need to follow mature European and fast growing Asian economies with their emphasis on massive urbanization of populations, and *a movement of people away from agriculture*, as "smallholders and the institutions to support and sustain them are weak agents for labour productivity growth in Africa" (Ibid).

This is an argument for commercial agriculture and for the employment of more farmers within waged labour on commercial farms, which has been critiqued as the answer to greater poverty reduction. One of the concerns about commercial agriculture for instance is that its growth is primarily export-oriented and this is not in keeping with the goal of alleviating poverty and achieving food security through agriculture. A need to attain and sustain South Africa's competitive edge is frequently emphasized when discussing agriculture's role in keeping the country a player on world markets. For instance, on a website promoting South Africa, it is stated that if our competitive advantage is exploited, this would place "South Africa among the top 10 export producers in high-value agricultural products. Excellent wines, indigenous rooibos and honeybush teas, and certain fruits are highly sought after in export markets".[13] Yet these are neither staple crops nor foods that sustain the majority of people in the country.

According to Hendriks (2013), speaking about a recent study of 10 African economies which explored the links between economic growth and poverty reduction, staple crops and livestock agriculture were rated as more effective for poverty reduction than export-led agricultural growth. Furthermore, "The bulk of South African agricultural exports is made up of raw commodities – a significant loss in terms of employment creation and economic growth" (Hendriks, 2013:11).

Programmes and policy interventions in agriculture, rural development and land reform

There have been a range of projects which have had successes, including a project funded by the Standard Bank of South Africa which initiated the farmer-mentorship programme to establish emerging black farmers in agriculture which it funded for R500 million (Jordan, 2012). The Mngcunube development programme (2008), as it was called, drew upon the experienced mentors to help:

> assist in identifying full value in existing skills, assets and technologies, and in promoting and increasing farmers' profits through the application of basic stock management principles. Not only has this program succeeded in the transfer of knowledge, but availability and affordability of resources such as livestock medicine

> has been brought within the reach of even the smallest farmer. (Mngcunube Development, 2008)

Another project, the Elundini livestock improvement program which was composed of livestock owners in 80 villages of the Elundini Local Municipality in the Eastern Cape and based on the experience gained by Mngcunube Development and related livestock work in communal areas of the Eastern Cape and Lesotho, was deemed a success (Jordaan, 2012; Kew, 2008). Public-private partnerships have also been reported to be successful. The Ukhahlamba District Municipality and the Gold Fields Foundation, represented by Teba Development is one such project. It was financed for R3 million and R4.2 million from the Thina Sinako Provincial Local Economic Development Support Programme (Kew, 2010, personal communication). This programme was formally launched on 1 March 2007 and was expected to run for 18 months; however, its duration was lengthened because of its successes.

In addition Mkhabela (n.d.) also mentions initiatives by the National Wool Growers' Association (NWGA) which is a private sector organization with the objective of developing small-scale producers and increasing wool throughput. It was reported that the project of linking up small-scale communal farmers to the wool market was successful.

Literature is replete with critiques of government's development programmes which are deemed not to provide nuanced understandings on the structural problems restraining development (Anseeuw & Mathebula, 2008) and have effectively failed to bring about rural development and agricultural renewal for the rural poor. Some scholars (Lahiff, 2001; Cousins, 2002) have observed that although government's development focus might be on agricultural development, the emphasis tends to be "on particular social groups having means of investment, reflecting a very controversial socio-political choice" and bringing into question the ability to effect widespread and empowering developmental shifts.

Some of the failed projects include, for example, the Dikgolo and Monyamane projects in Limpopo, where beneficiaries were required to use grant funding to build up commercial beef herds and keep their existing livestock in the communal areas (Lahiff et al., 2008). Another failed initiative is the Area Land Reform Initiative (ALRI), a joint initiative of the Makhado local municipality in the Vhembe district of Limpopo and the Nkuzi Development Association. The objective of this project was to come up with the new vision for agriculture in the area. This was against the backdrop of the density of land claims and the structural contrast of large-scale, capital-intensive commercial farming in close proximity to densely settled, impoverished communal areas (Manenzhe, 2006; Wegerif, 2006). Unfortunately, the ALRI initiative failed as a result of the limited buy-in from key government agencies.

In a review of various government projects which sought to effect agricultural development, a study by the Community Agency for Social Enquiry (CASE) in 2005-2006, provides a staggering and sobering assessment of successes and failures, which reveals how vastly success is outstripped by failure:

> Of the 128 projects with agricultural developmental aims, 83 percent have not achieved these developmental aims. Approximately nine percent (12) have partially achieved their agricultural developmental aims but are not generating any income. A further five percent have partially achieved their agricultural developmental aims and are generating income. However, these five percent of projects are not making a profit and are not sustainable yet. Two percent have achieved their agricultural developmental aims and are generating minimal profits that are reinvested. Thus, only one project (of a total of 128) has attained its agricultural aims and is generating a substantial and sustainable profit. (CASE, 2006: 21)

In a report based on 2 case studies of land reform programmes in Limpopo Province (the Levubu and Moletele programmes), Lahiff et al. (2012) show that "joint ventures" between poor communities and strategic partners have experienced significant problems and many have collapsed. The case studies do however show "how ambitious plans have over time, given way to more realistic expectations and a greater diversity of business models" (Lahiff et al., 2012:4).

The business model used in rural development programmes is a commercial one, seeking to make farms profitable and export-oriented agricultural production. However, as the lessons learned from the collapse of many ventures have shown, production for the domestic markets is increasingly seen as more cost-effective and even more profitable. What the studies show too, is that little of the restituted land is used by households for subsistence use. The return of communities to restituted land has not resulted in expansion of small-scale farming ventures by households as "this is seen as incompatible with the preservation of large-scale commercial agriculture and has been actively opposed by the leading actors in the process" (Lahiff et al., 2012:54). We see then how land restitution and the expectation that smallholders move inexorably towards commercialization, works to produce a particular model for the creation of agricultural value.

Animal Health, Diseases, Vaccinations and Knowledge Uptake

The issues discussed above provide a picture of the international and national contexts within which smallholder livestock keepers are understood as producers of food, and as part of the South African government's rural and agricultural development programmes. A crucial part of smallholder livestock holders being more productive and successful in improving the overall socioeconomic security of their households is through having healthy livestock that can multiply and do not succumb to disease. In the final section of

this review, we provide a brief overview of some of the issues raised in the literature around animal health and diseases, and the complexities involved in processes of knowledge uptake.

The importance of disease prevention programmes in order to assist in improved productivity of smallholder farmers is not in dispute (Herrero et al., 2014). For scientists such as Babiuk (2013), disease prevention, and particularly vaccination, may be the key to achieving global food security. In the South African context, smallholders who are already in precarious socioeconomic circumstances, are worst affected by livestock disease outbreaks as "governments usually instruct all livestock farmers to kill all the animals affected while not giving any compensation…[to] smallholder livestock farmers who do not usually have insurance against such losses" (Munyai, 2012:50-51).

There is, however, evidence to suggest that vaccination and inoculation are being used less in developing countries as a way of promoting animal health due to the exorbitant costs and lack of AHT (animal health technicians) required to implement such programmes (Munyai, 2012:57).

The need for well-capacitated extension officers in the successful implementation of disease-prevention programmes is confirmed by the literature (Heffernan, Thomson & Nielsen, 2008), which also suggests that disease needs to be understood in relation to access within specific geographical contexts, access to extension officers, knowledge of disease/s and knowledge about treatment of diseases, perceptions of vaccinations, and perhaps most significantly, the uptake of knowledge. In order for there to be knowledge uptake, there needs to be an examination of the relationship between "vaccination uptake, the primary source of information regarding animal health, distance to healthcare provider, and overall perceptions regarding vaccination (negative vs. positive)" (Heffernan, Thomson & Nielsen, 2008:6).

According to the 'innovation decision process', which explains the process through which knowledge uptake proceeds, ensuring uptake requires an understanding of how people choose to reject or accept new technologies. The processes involved are the following:

- Knowledge (exposure to a technology, and understanding its use);
- Persuasion (the creation of a positive/negative perception);
- Decision (deciding/not deciding to adopt);
- Implementation (actual use of the product); and
- Confirmation (corroboration or rejection based on a use outcome) (Heffernan, Thomson & Nielsen, 2008:2).

Heffernan, Thomson and Nielsen (2008:2) also consider the uptake of vaccines among poor Bolivian farmers, and show that knowledge uptake is a complex process within a poor, smallholder context:

> From the outset, there are a variety of elements that may hamper the uptake of livestock vaccines among the poor. First, vaccination has a low degree of 'observability' i.e. in the absence of a disease, the benefits of vaccinating animals cannot be easily viewed by farmers. Second, 'preventive' technologies, which decrease the incidence of some negative future event tend to have much slower adoption rates. Clearly livestock vaccines meet both of these criteria for slow adoption or uptake.

The 'observability' of vaccination will vary over time "depending on the incidence or prevalence of any particular disease" (Ibid). According to Munyai (2012:53), paucity of information remains a major hurdle for poor Limpopo livestock farmers who need more knowledge on animal management practices and pests and diseases, because it is mostly found in written form whereas most farmers are illiterate.

The importance of knowledge reception in appropriate forms, including about disease, has been emphasized in the African context by Mburu, Njuki and Kariuki (2013), who explain the importance of ICTs in enabling rural women's access to information. Livestock related information for smallholders (irrespective of gender), according to the authors, is obtained primarily through other farmers, secondly through groups, associations or cooperatives, and thirdly through the radio.

Animal health issues have become a central concern within rural development initiatives in South Africa (Beinart & Brown, 2013). Beinart and Brown's book is a recording of African veterinary medical knowledge including how local and scientific knowledges co-exist among rural livestock owners. While their older informants had grown up "in a context where government imposed practices, such as dipping and inoculation, rooted in scientific conceptualizations of disease causation and control", the researchers did find that rural African farmers' "ideas have [not] been completely transformed by these interactions" (Brown & Beinart, 2012:1). Further, the researchers findings revealed the "relatively limited penetration of biomedical ideas about germs, or parasites such as ticks, in the explanations of disease" (Ibid).

The study of animal health practices and disease control and treatment seems to confirm this as studies of the uses of traditional medicines and methods to control disease (particularly in the Eastern Cape) show (Masika, van Averbeke & Sonandi, 2000; Soyelu & Masika, 2009; Van der Merwe, 2000; Dold & Cocks, 2001; Van der Merwe, Swan & Botha, 2001). Other studies, of tick control measures used by rural small-scale farmers, including studies that explore state dipping programmes and the effect these have had on farmers' perceptions and practices in relation to disease control and the understanding of disease control, also paint a picture that seems to suggest a lack of biomedical knowledge of disease among rural livestock keepers (Masika, Sonandi & Van Averbeke, 1997; Moyo & Masika, 2009).

The latter study found that ticks were a major cause of disease in the area but dipping was not considered an effective means of control by the majority of farmers interviewed (94.9%), which results in farmers complementing the government dipping service through the following initiatives: spraying with conventional acaricides (22%), household disinfectants such as Jeyes fluid (18.6%), used engine oil (10.2%), chickens (5.1%), manual removal (5.1%), and pouricides (1.7%) (Moyo & Masika, 2009). The study also confirmed the use of plant remedies by farmers (6.8%), "mainly the leaf of Aloe ferox and the bark of Ptaeroxylon obliquum" (Ibid). According to another study (Hlatshwayo & Mbati, 2005) only about 40% of farmers in the eastern Free State province have an awareness of the effects of ticks on their animals, 84% use traditional or alternative methods (including used engine oil, household disinfectant and paraffin) to control ectoparasites.

The roll out of animal health practices and prevention and particularly vaccination programmes needs to take adequate account of the difficulties around knowledge diffusion and uptake particularly the fact that in smallholder livestock communities in developing contexts, "…the step from the availability of new technology to its adoption and efficient use is a large one, and innovations tend to spread slowly" (Collier & Dercon, 2014:94).

Insights and Extrapolations from the Review

- While gender does play a central role in issues around livestock farming, it should be remembered that in contexts of general disempowerment and poverty, it is the empowerment and return of the self-esteem of all that is crucial in order to effect positive changes. Certainly, this does not render gender a useless concept, as it would still be necessary to measure gendered effects, along with other effects.
- Livestock will be an increasingly important sector to consider investing in, given that a) livestock products like milk, eggs and meat are important and growing sources of nutrition and dietary diversity, and b) there are greater incentives in the South African context to invest in livestock production than in crop production (given the combination of resource constraints such as water which irrigated agriculture consumes too much of, and the fact that livestock have a wide array of uses, values and meanings which makes them important in rural contexts).
- There are declining rates of formal employment in the agricultural sector, including of women. However, involvement in small-scale livestock production should move away from measuring value purely in terms of the formal economy, employment within the formal economy, and the generation of economic value purely within the formal economy. New ways of calculating value, and understanding socioeconomic development in relation to how rural households view economic value, need to be considered.
- Small-scale livestock keeping and ownership does not follow commercial models of growth and productivity, and should therefore be more carefully considered as part of government policies for rural development and efforts at poverty alleviation/ reduction and eradication. This is different from small-scale livestock

farming being seen and treated as an 'engine of economic growth', which seems to be too high an expectation given significant barriers and constraints.

- The dichotomy between 'commercial' and 'smallholder' agriculture/ livestock farming forms part of the historical legacy of inequality between white and black rural farmers. The debates around land and water resources stem from these inequalities. More thought needs to go into how the relationship between these should affect policies, rather than the assumption that smallholders need to graduate to commercial farming (as the only path to progress; especially given that many public-private partnerships have collapsed).
- While agriculture as a sector may be dwindling in terms of its annual contribution to GDP, within the sector, livestock farming is increasing in socioeconomic significance, particularly to the rural poor household. Within the agricultural sector then, there needs to be further consideration of the economic and social roles of small-scale livestock farming, the valuation of it economically, and its growing significance as a source of livelihood and a store of value and income, and a source of nutrition and diet diversity across rural areas in South Africa.
- Veterinary medicine needs to consider the difficulties in knowledge uptake processes, and the gap between information and actual implementation and use of animal health practices and technologies (including vaccines).

CHAPTER 3: APPROACH, DESIGN AND METHODS

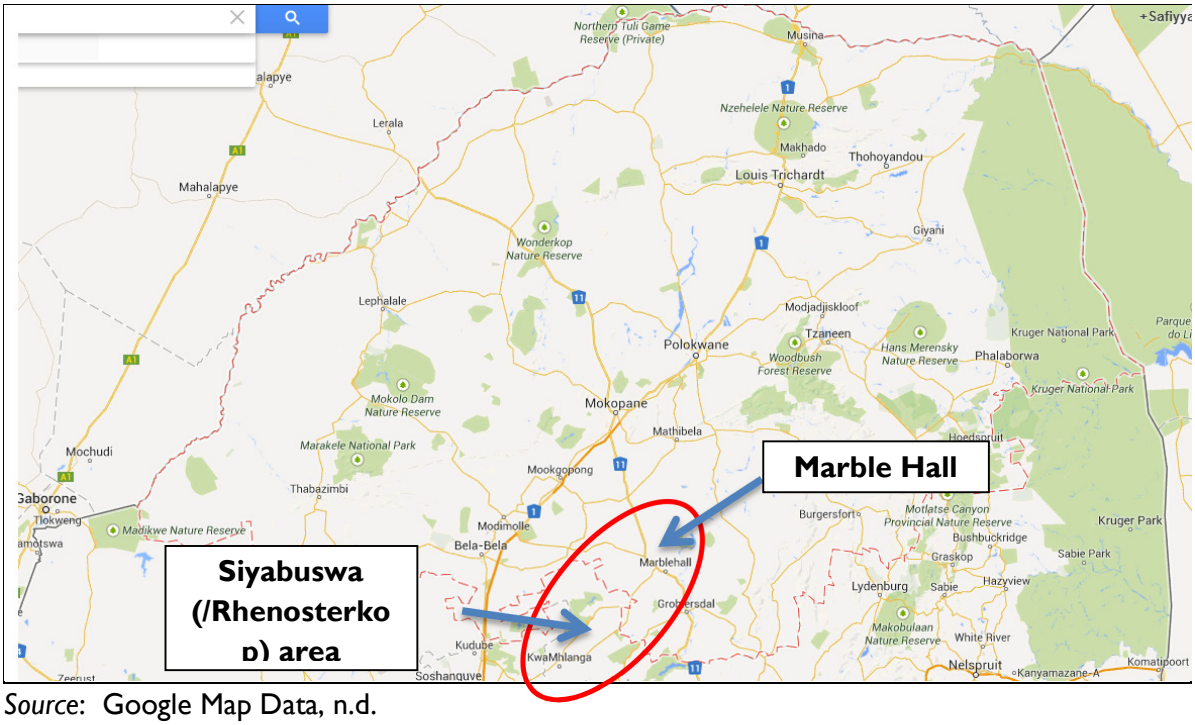
Introduction

In this chapter the description of the various methods, approaches and study design that have been adopted is provided. Furthermore, a detailed discussion on the processes that relate to the study beginning with (i) a contextual description of the study sites and population; (ii) the study aims and objectives; (iii) ethical considerations that informed the study; (iv) our approach to the study; and (v) the study components is offered.

Study Sites

This section provides a brief overview of the areas in which the study was conducted. We interviewed farmers around the Marble Hall and Siyabuswa/Rhenosterkop[14] areas. The former is in the province of Limpopo while the latter is in Mpumalanga. These areas both fall along the provincial border, as illustrated in the map below (the provincial border for Limpopo is indicated by the dotted map line).

***Map 1**: Map of Limpopo (dotted line shows provincial border) and study areas*

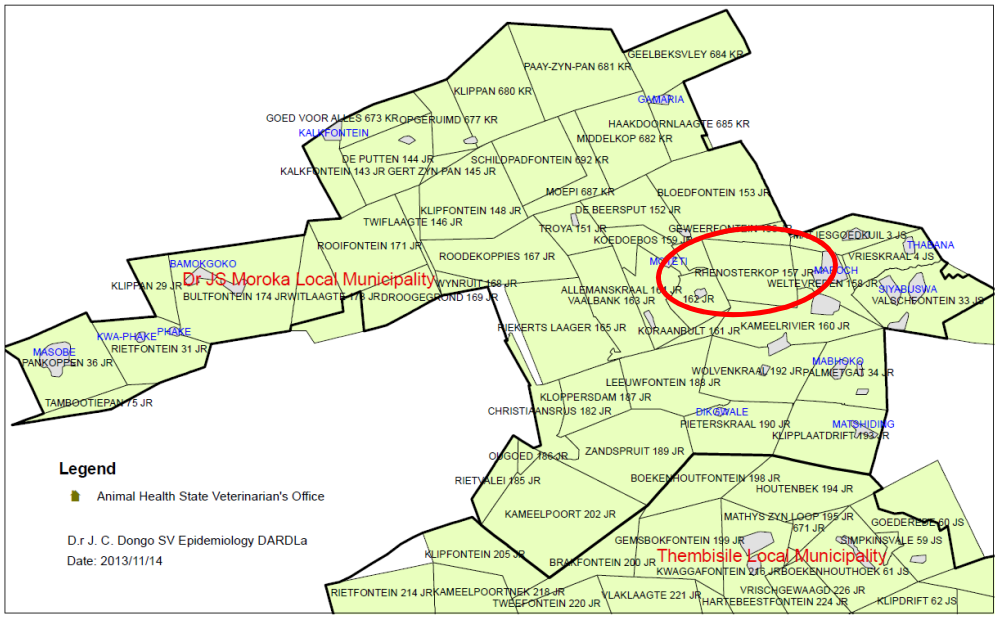


Source: Google Map Data, n.d.

The map below represents the farm areas within two adjacent municipalities in Mpumalanga, the Dr. J.S. Moroka Municipality in which the study was conducted, and the

neighbouring Thembisile Local Municipality. Siyabuswa is one of two relatively developed townships within the Rhenosterkop area, which is highlighted on the map.

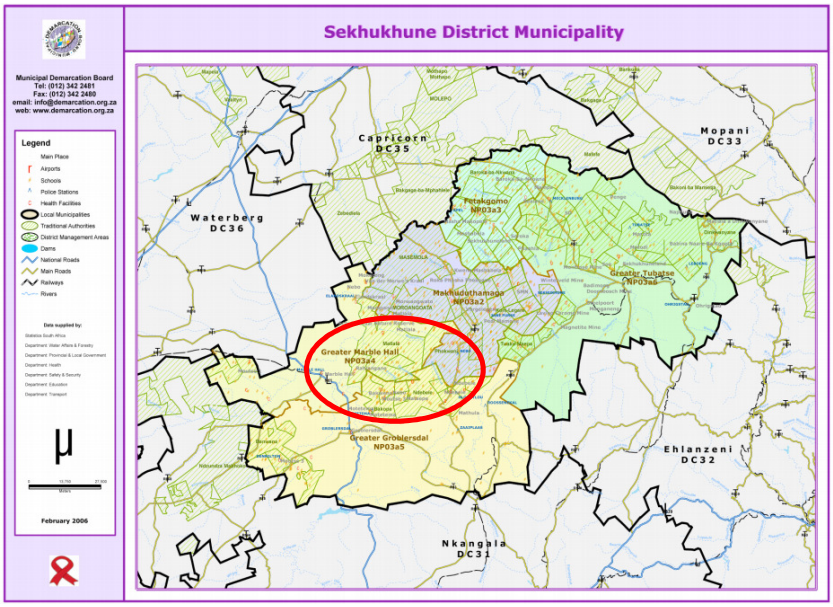
***Map 2**: Map of the Dr JS Moroka Local Municipality* (Rhenosterkop farm area highlighted)



Source: DARDLA (Department of Agriculture, Rural Development and Land Administration), Mpumalanga, n.d.

The following map represents the Sekhukhune District, in which the greater Marble Hall Area is highlighted by the red circle. This is the second primary area in which the research took place.

***Map 3**: Sekhukhune District Municipality Map*



Source: "Sekhukhune District Municipality", n.d.

The section below describes the Siyabuswa/ Rhenosterkop (Mpumalanga) and Marble Hall Town (Limpopo) areas, as well as providing a description of the two provinces.

Description of Study Areas

Some of the demographic information is in the Census 2011 data about both Mpumalanga and Limpopo Provinces include, but are not limited to, levels of literacy, household incomes, and ownership of houses. Educational levels for both the provinces of Mpumalanga and Limpopo remain among the lowest in the country. According to Census figures, in 1996 "the provinces with the highest functional illiteracy rates" were Limpopo and Mpumalanga and "this pattern remained unchanged until 2011, albeit with a significant decrease in functional illiteracy rates in all these provinces" (Statistics South Africa, 2012:39). In terms of income, the province with the lowest average annual household income is Limpopo (R56 844), while Mpumalanga fares better than the Eastern Cape, North West and Free State provinces with an annual household income of R77 609 (Statistics South Africa, 2012:42-43). On a more positive note, both Limpopo and Mpumalanga are provinces with the highest number of people owning their own homes (52.7% and 52.0% respectively) (Statistics South Africa, 2012:58). We turn to a brief description of Mpumalanga.

Mpumalanga

Out of South Africa's nine provinces, Mpumalanga is the fourth smallest in terms of population size, with just over 4 million people (out of a total population of almost 52 million) (Statistics South Africa, 2012:14). The provincial capital is Nelspruit (which forms part of the Mbombela Local Municipality). The principal languages are isiZulu (27.7%) and siSwati (24.1%), with Xitsonga being the third (10.4%) most widely spoken language ("Mpumalanga Provincial Government" (a), n.d.).

The provincial government website presents fruit as significant to the province's agricultural economy. Livestock farming receives mention on the website, particularly sheep rearing, but no mention is made of cattle or goats as part of livestock farming:

> An abundance of citrus fruit and many other subtropical fruit – mangoes, avocados, litchis, bananas, papayas, granadillas, guavas – as well as nuts and a variety of vegetables are produced here. Mbombela is the second-largest citrus-producing area in South Africa and is responsible for one third of the country's export in oranges…Groblersdal is an important irrigation area, which yields a wide variety of products such as citrus fruit, cotton, tobacco, wheat and vegetables. Carolina-Bethal-Ermelo is mainly a sheep-farming area, but potatoes, sunflowers, maize and peanuts are also produced in this region. ("Mpumalanga Provincial Government" (a), n.d.)[15]

The emphasis on export-oriented and commercial agriculture is noteworthy as the basis for the province's promotion of itself.

In Mpumalanga province, the Departments of Agriculture and Rural Development and Land Reform merged to form the Department of Agriculture, Rural Development and Land Administration (DARDLA). DARDLA has a number of programmes for small-scale livestock farmers, including:

- Sustainable Resource Management,
- Farmer Support and Development (which includes support to food insecure households),
- Veterinary Services,
- Technology Research and Development Services,
- Agricultural Economics Services, and
- Structured Agricultural Training (DARDLA Financial Report [DARDLA], 2013/2014).

While small-scale livestock farming does not appear prominently on the Department's website, it launched a Livestock Improvement Programme called Masibuyele Esibayeni ("Let's go back to the farm") in 2011, which involves loaning of animals (over a 5 year period) to farmers in order for them to increase their herd sizes. The Department claims the programme has assisted "3500 beneficiaries…through the loaning of 2283 animals" in more than 70 projects (DARDLA brochure/ pamphlet: Masibuyele Esibayeni (Livestock Improvement Programme), n.d.).

DARDLA also promotes its development of female farmers. Through its Youth in Agricultural Development (YARD) structure, DARDLA in conjunction with Price Waterhouse Coopers offered 25 female farmers, between the ages of 18 and 35, agricultural business training to help improve their crop farming abilities. This programme is called the Faranani Skills Programme, and was designed to empower women to be more productive farmers, to enable them to command higher salaries and to assist farmers in graduating from emerging to commercial farmers (*Tekulima Nentfutfuko*, Agriculture and Development, 1st and 2nd Quarter, 2011/2012:14).

The Siyabuswa/ Rhenosterkop area

Travelling in from Marble Hall to the Siyabuswa area (along the R573) where the Department of Agriculture has its provincial offices, there is a sign saying 'Mpumalanga Welcomes You'. Closer to Siyabuswa, there is a sign saying 'You are entering a Comprehensive Rural Development Programme (CRDP) Municipality', meaning that the Nkangala District Municipality which Siyabuswa falls under, is a part of the Rural Development and Land Reform Department's CRDP which is aimed at supporting rural

communities to take control of their future including through "broad-based agrarian transformation" ("Department of Rural Development and Land Reform", n.d.).

The Nkangala District Municipality (one of three district municipalities in the Province) comprises six local municipalities, consisting of 160 towns and villages. The district's economy "is dominated by electricity, manufacturing and mining" and agriculture is fairly low in the significant sectors, which are listed after the three leading sectors as "community services, trade, finance, transport, agriculture and construction" ("Mpumalanga Provincial Government" (b), n.d.).[16]

The town around which most of our interviews were conducted – Siyabuswa – falls under the Dr. J. S. Moroka Local Municipality (which is made up of 60 villages and just two towns, Siyabuswa and Libangeni), and "most villages in the Municipality fall under the jurisdiction of traditional leadership which is a system inherited from the previous administration" ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014) Located just 80 km north of the Tshwane Metropolitan Area, "large numbers of people commute daily to […Tshwane and Johannesburg]", and the municipality finds itself in competition with these urban centres ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:6). "The Municipality is predominantly rural with not much economic activities [and has a] high unemployment rate [of] 46% and high poverty levels" ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014).

Water remains one of the key problems of the Municipality including the provision of water services to households, the reduction of water losses, and the reduction of water backlogs as the top three priorities in terms of basic services infrastructure ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:10). Although the majority of people access water through a regional or local water scheme provided by the municipality, there are still significant numbers of people who rely on water vendors, water tankers, and boreholes as sources of water ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:26). Water for agricultural use remains a priority concern as "water shortages [have been] one of the critical factors hampering the development of agriculture in the area" ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:124).

In terms of educational attainment, the highest number of people in any single category are those who have obtained Grade 12 (37 603 people out of a total population of 249 705) ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:28). The second highest figure represents those who have not had any schooling (26 321). The third highest figure is for those who completed Grade 11 (18 791). The figures remain high for those who completed between grades 5 and 10, but

drop drastically for any post-school qualifications ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014).

The climatic conditions of the Municipality "are characterized by warm summers and moderate winters" and the land has "a high agricultural potential due to stable soil and geological conditions." ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:60). There are significant problems with land use and land rights, however: "Most of the land is allocated by traditional authorities with no systematic record keeping resulting in overlapping and conflict land rights/uses" ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014). There are also a large number of land claims:

> The entire central part of the Dr JS Moroka municipal area is under land claims […] According to the NDM Land Audit, the land claimed in the Thembisile and Dr JS Moroka municipal areas are mainly associated with cattle and game farming, some crop farming and on the two nature reserves. ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014)

There seems to be a clash in terms of municipal and tribal authorities and their jurisdiction over land. "In terms of land administration all pieces of land falling within the municipality is supposed to be owned and administered by the municipality… [but?] The vast amount of land in Dr JS Moroka Municipality is either tribal or communal land and is administered by traditional authorities through gazetting done by the Mpumalanga government" ("Dr. J. S. Moroka Local Municipality Draft Reviewed Integrated Development Plan 2013/2014", 2013/2014:85).

We now turn briefly to a description of our second study site that falls in the Limpopo province.

Limpopo

Limpopo, South Africa's northernmost province is named after the river that flows along its northern border. The name "Limpopo" originates from the Sepedi word diphororo tša meetse – meaning strong gushing waterfalls. The province shares its borders with three Southern African countries: Mozambique, Zimbabwe and Botswana ("Limpopo Provincial Government", n.d.). Limpopo is home to approximately 10% of South Africa's total population, with a total population size of around 5.4 million people (Statistics South Africa, 2011). The population of Limpopo consists of several ethnic groups distinguished by culture, language and race, including those classified as Asian/Indian (0.1%); Black (97.3%); Coloured (0.2%); and White (2.4%). The most common language groups are: Northern Sotho (including the Bapedi - 52%); Tsonga (Shangaan - 17.0%); and Venda 16.7% (Statistic South Africa, 2012).

The provincial capital city, Polokwane, boasts some of the country's most thriving cattle farms. Limpopo as a whole is rich agriculturally and, in addition to cattle and game farming, the province produces a large and varied number of crops, earning the title of "The Garden of South Africa" ("Limpopo Provincial Government", n.d.). The province produces "75% of the country's mangoes, 65% of its papaya, 36% of its tea, 25% of its citrus, bananas, and litchis, 60% of its avocados, two thirds of its tomatoes, [and] 285,000 tons of potatoes" ("Limpopo Provincial Government", n.d.). Other significant products include: coffee, nuts, guavas, sisal, cotton, tobacco, timber, sunflower, maize, wheat and grapes.

Photo 1*: Cotton farm on the R573 between Mpumalanga and Limpopo*

Despite a thriving agricultural sector, "Limpopo is marred by high poverty rates, inequalities in the distribution of income between various population subgroups, and unemployment" (Pauw, 2005). Limpopo continues to be one of South Africa's poorest and least educated provinces. Census data for Limpopo in terms of educational levels of the heads of agricultural households shows that Limpopo is ranked second in the country in terms of highest number of people who have not had any schooling (Statistics South Africa, 2013a:4). Limpopo also has the highest proportion of agricultural household heads with no income (Statistics South Africa, 2013a:4).

Marble Hall Local Municipality (Ephraim Mogale Local Municipality)

The Marble Hall Local Municipality, formerly part of the Mpumalanga Province, was established in 1942 and declared a township in January 1945, its development originating mainly because of the Marble Lime Mine. It was originally a cross-boundary municipality, with 16 villages, Marble Hall town and farming areas in Mpumalanga and two townships and 47 villages in Limpopo. In 2005, the municipality was incorporated into the Limpopo province (Greater Marble Hall Municipality, 2007/2008; Sekhukhune District Municipality, 2009/2010). It now forms the western part of Greater Sekhukhune District municipality, which is described as "a place of majestic beauty with regal mountains, lush valleys and meandering river ("Sekhukhune District Municipality", n.d.).[17]

The Marble Hall Local Municipality now spans a relatively large land area of approximately 1793 square kilometres. Almost 80 per cent of this land is utilised for agricultural purposes. Most of this municipal land area (60%) is owned by the state under the custodianship of tribal and or traditional authorities. This area incorporates a fragmented residential component composed of four formal towns (viz., Marble Hall, Elandskraal, Leeuwfontein, Regae, Zamenkomst), 21 semi-formal villages, 31 rural villages and 18 scattered villages (Greater Marble Hall Municipality, 2007/2008; Sekhukhune District Municipality, 2009/2010). The villages form two significant clusters of villages, one to the west of Marble Hall and one to the north and east of Marble Hall. Marble Hall is the main town and economic hub of the municipality (Steyn & Associates, 2008).

The estimated population size of the Greater Marble Hall Municipality is 123 331 people, which comprises approximately 12.55 per cent of the total district population. The table below shows the population numbers recorded for the national censuses.

***Table 3**: Marble Hall Local Municipality population by gender*

	1996	**2001**	**2011**
Female	52 181	65 561	65 327
Male	44 418	55 766	57 987
Total	96 599	121 327	123 313

Like the rest of the Sekhukhune District Municipality, the majority of people reside in rural areas with fewer inhabitants in the urban centres ("Sekhukhune District Municipality", n.d.).[18] According to Statistics South Africa, 7.3 per cent of people live in urban areas, 80.2 per cent in tribal or traditional areas and 12.5 per cent on farms (Statistics South Africa, 2014).[19]

Unemployment in the municipality is relatively high: of the 31 294 economically active people, 41.4 per cent of people are unemployed. The youth unemployment rate is slightly higher with 48.8 per cent of those aged 15 to 34 years unemployed (Statistics South

Africa, 2014). Educational levels vary with only 18.8 per cent of people completing basic education (grades 0 to 12), 22.7 per cent with no formal education whatsoever, and only 5.1% of people completing higher education (Statistics South Africa, 2014).

This concludes the overview of the study sites, and we turn to an explanation of the aims and objectives of the study, and the methods used to fulfil these objectives.

Broad Aims and Objectives

As indicated in Chapter 1, the aim of the proposed pilot research project is to (1) describe and analyse current knowledge in a selection of policy, scientific and grey literature in relation to gender and livestock farming and its relevance to use of vaccines and disease management of animals by small-scale farmers in two communities (Marble Hall and Rhenosterkop/ Siyabuswa); (2) identify some behaviour patterns, usage, uptake, knowledge, attitudes among small scale famers in relation to the vaccine usage and disease management; (3) provide some demographic perspectives in relation to a profile of the small-scale farmers and their households; (4) determine experiences in relation to the value of vaccines and their benefits as well as challenges related to access, service provision and knowledge of animal health.

Recognising that gender is a core underpinning of this study, we were primarily interested in assessing challenges faced by both male and female small-scale farmers within these two study sites. This pilot provides an opportunity to identify patterns in a focused snapshot leading us to an information base showing particular trends, issues and challenges in order to inform other studies and intervention (whether programmatic, research and/or policy). This pilot is intended to help us consolidate and advance current thinking about issues associated with gender, vaccine use and disease control in rural livestock production with small-scale farmers in two rural farming communities in South Africa, and to lay the foundation for further research on the development of gender-sensitive developmental initiatives in our rural livestock farming systems.

Ethical Considerations

The research process was conducted according to the guidelines of International Ethical Practice for Research with Human Subjects. As such all instruments, consent forms and ethical considerations were reviewed by the HSRC Research Ethics Committee before implementation. The Research Instruments were also shared with researchers from the OVI / ARC for feedback and comment. Prior to the commencement of the research an initial preparatory meeting was held with a selection of members of the farming community, facilitated by an OVI researcher who is familiar with the farming communities featured in this study and who works with the farmers, state vets and AHTs. That meeting

with the farming community briefed members about the research that was scheduled to take place. Steps to ensure and maintain ethical approach to the study are listed below:

- All participants in the research were invited to participate in the research after having been informed about the nature and the purpose of the research.
- Prospective participants were also informed that their participation was entirely voluntary and that they were free to withdraw at any point.
- The study and consent form was explained in detail to participants.
- The questionnaire (survey), focus group and in-depth interview guides were administered by researchers who were trained in research, its ethical dimensions and in settings where participants were based.
- It was explained to participants that no identifying information would be published to prejudicially link expressed opinions to them. Researchers also assured participants of confidentiality at all times, and to the limits of confidentiality in focus group discussions.

Our Approach

Our approach to this study is based on the understanding that the envisaged insights related to gender in its broad human and social dimensions serve a number of purposes both directly related to the development of work in vaccine programmes and to strengthen understandings of how vaccines and disease management are utilised by small-scale farmers and its potential benefits and impact (see chapter 1 for more detail).

Fieldwork

Fieldwork took place over two full weeks in May 2014, and was preceded by two prior visits to the farming communities to inform them about the impending study. With assistance from researchers at the OVI, we were able to also secure interviews with members of the farming communities and relevant stakeholders from government departments and farmer cooperatives. Five researchers conducted the fieldwork which was also preceded by training of staff that entailed explanation of the study purpose and objectives, ethical conduct of research, techniques involved in conducting research (qualitative and quantitative), and discussion and practice of the interview guides.

Qualitative interview guides were also translated into Ndebele and Pedi (two of the languages in the particular livestock keeping communities we worked in). The survey was not translated. Participants were given the option to choose their language of communication and the research team comprised staff who were fully conversant in these languages. Where interviews were conducted in Ndebele and/or Pedi, quotes from these are presented in English translation in the study report.

Sampling

Qualitative

In our planning phase we originally intended to conduct 20 key informant interviews. However, there were a few additional key informants that became available and were included. We eventually developed a sample of 28 key informants representing the following profile, drawn from the study areas:

- Farmers (6 male and 6 female)
- 4 officials from the Department of Agriculture (Animal Production)
- 5 AHTs
- 3 State veterinarians
- 2 Heads of Farmer Associations
- A researcher from a university-based research institute
- An NGO practitioner who works with small-scale livestock farming communities in the Limpopo Province

We conducted four focus group discussions:

- 1 male farmer group and 1 female farmer group in the Siyabuswa area
- 1 male farmer group and 1 female framer group in the Marble Hall area

The total qualitative dataset comprises 32, and we feature an analysis of findings by extrapolating key themes in more depth in Chapter 4.

Quantitative

Given that this is a pilot study and we were interested in determining patterns, trends and identifiable areas where gaps can be addressed, we selected farmers across different areas within the two study sites. We selected small-scale farmers and households to be interviewed, without aiming for an equal split between male and female livestock farmers. Instead, we wanted our sample to accurately reflect the skewed gendered participation in livestock keeping in the areas. In the planning phase we anticipated a survey sample size of 80. The final dataset for the survey comprises 85 completed survey questionnaires made up according to the following gender split:

- 76 percent Male and 34 percent female farmers
- 85 in total, split (almost) evenly between the Rhenosterkop (/Siyabuswa) and Marble Hall areas

Analysis

For the qualitative components, the data was transcribed and translated (where relevant from Ndebele and Pedi into English) following guidelines and codes determined by the research team. The translations were quality checked by the research team against the audio files and where major errors and discrepancies were identified, these were returned to the transcribers and translators for corrections. A first stage of micro-analysis was conducted with the transcriptions, where a key set of themes was identified and relevant quotations categorized. For the quantitative component (survey) we utilized the Statistical Package for the Social Sciences (SPSS) software to capture data from each survey. The captured data was then analyzed according to a list of questions (related to gender, animal healthcare and disease knowledge) that the research team established as a guide for data analysis.

Limitations

We discuss limitations of the dataset in more detail in chapter 5. As indicated previously, this is a pilot study focused on a small community along a provincial border in South Africa and, given that this is a small sample, limitations on generalizability from this sampling method exist (Hultsch et al, 2002) such that it is not possible to make generalized claims for other small-scale farmer communities in South Africa (or for the provinces concerned) based on this study.

Study Components

The study used a combination of a desk-based literature review, as well as qualitative and quantitative components.

Document Analysis and Literature Review

Document Analysis entailed, broadly, the review of existing legislative, policy and regulatory documents related to the small-scale farmers with a focus on livestock farming and relevant scholarly and policy materials from a national and international perspective as well as 'grey' reports. This information was used to supplement and inform the qualitative and quantitative instrument development and is presented in Chapter 2.

Qualitative research methodology

In order to develop a detailed and contextual understanding of gender in the two study sites, qualitative interpretive methods were employed to provide a perspective on experiences, attitudes, practices and perceptions related to knowledge of diseases, disease prevention and disease treatment, challenges faced by small-scale livestock farmers, and the gendered dimensions of smallholder livestock farming. Qualitative methods provide "a source of well-grounded, rich descriptions and explanations of human processes" including through the collection of data using interviews and group discussions (Miles, Huberman & Saldaña, 2014:4). Qualitative methodology uses multi-methods which involve an interpretive approach to the subject matter (Lichtman, 2009).

Key Informant Interviews

Face to face in-depth interviews were conducted with stakeholders related to issues around small-scale livestock farming. These included animal health technicians and state veterinarians, female and male farmers from Marble Hall and Rhenosterkop/Siyabuswa, farmer association heads, state veterinarians, Department of Agriculture (DOA) representatives, academics and NGO practitioners. Interviews generally lasted 45 to 90 minutes, and utilised a semi-structured approach drawing on a guideline which outlined the scope of enquiry. This scope had a core set of themes that were tweaked to probe selected informants. These are outlined in more detail below.

(1) Introduction: An introductory set of questions to orientate the key informant are directed to their area of expertise that cover their personal experience, role in the sector, and knowledge.

(2) Small-scale livestock farming in Limpopo: Questions covered experience and knowledge of small-scale livestock farming in South Africa more generally, and more specifically in Limpopo; perspectives on trends related to farming; importance of small-scale livestock farming in relation to economics; opinions related to government policies on small-scale agriculture and livestock farming; knowledge of barriers that farmers face; gaps in the livestock farming sector; and solutions related to interventions.

(3) Women in small-scale livestock farming: In this theme questions cover the importance of women to the agricultural sector; the approximate numbers of women in the farming economy in the province; the role of women in small-scale livestock farming and their position in the development of small-scale livestock farming and production (highlighting comparisons between men and women, including power dynamics); the types of support structures and/or programmes for women in this sector; and the existence and impact of women-led farming associations.

(4) Land and Land Ownership: Questions focus on how much land has been allocated to agricultural activity; whether the land famers are located in is zoned as a land reform area; access issues related to land; animal presence on the land; gendered ownership of land; and access, restrictions and problems related to animal grazing.

(5) Training programmes for small-scale livestock farmers: Participants are probed on whether small-scale livestock farming communities in Limpopo are involved in development programmes; the availability and types of training programmes; the existence, successes, challenges and/or failures of farmer cooperatives set up by local government; and the contributions (if any) of NGOs to farmer development in respect of teaching and learning.

(6) Diseases, vaccinations and animal healthcare: Questions address government veterinary services for small-scale livestock farmers; the proximity and effectiveness of services; reasons for and causes of livestock death; affordability of medicines; frequency of animal disease outbreaks; record-keeping related to animals; assistance of the government (includes constraints faced by AHTs and State vets in providing animal healthcare for famers) provided to farmers; monitoring of diseases and disease outbreaks; preventative measures that respond to diseases; availability of vaccination programmes; long-term solutions to disease and animal healthcare issues; and any relevant gendered challenges related to animal healthcare.

(7) Policy: Questions directly cover problems, gaps and solutions in terms of policies and policy implementation related to animal health and disease control.

(8) Meanings and significance of animals: Questions focused on the purpose, meaning and value of livestock; preference of farmers for particular types of livestock; as well as daily time use in farming.

(9) Household farming and economic activities: Several questions in this section probed the functional use of livestock to the household; diet and nutrition; responsibilities related to animal husbandry; sources of income; and economic profile.

(10) Perceptions of women and livestock farming: Questions focus on feelings and perceptions by men of women as livestock farmers; women's mobility in farming spaces based on customs and traditions (for example, are there areas where women are not allowed to enter?); and gendered roles within the farming activities.

(11) Primary animal healthcare: Questions focus on the source of information and advice for farmers in the event of animals falling sick; knowledge of preventative practices for animals; allocation of household income to animal health; accessibility of medication for animals.

(12) Health services: Focused questions directed to assess frequency of assistance from and the value of the services rendered by AHTs.

(13) Traditional practices and knowledge: Under this theme, a set of questions focused on the meaning, value and knowledge of traditional medicine in livestock farming; knowledge of traditional medicine and whether farmers consult traditional healers when their animals fall sick, or if they wish, for example, to enhance animal fertility.

(14): Vaccines: A number of questions in this section probed for example, farmers' knowledge of vaccines and diseases; accessibility and affordability of vaccines; frequency of vaccination; as well as the administering of animal vaccinations.

(15) Land and grazing: Questions covered frequency of grazing cattle; areas where cattle graze and availability of land for grazing; diet of cattle; and knowledge of animal breeding.

Focus group discussions

Focus groups comprised organized discussion with a selected group of farmers to understand their experiences around small-scale livestock farming, its gendered dimensions, and approaches to animal healthcare. The benefits of focus group discussions include gaining insights into farmers' shared understandings of everyday experiences in a group situation. Focus-group meetings with farmers entailed gender disaggregated discussion groups drawn from the communities of Marble Hall and Rhenosterkop/Siyabuswa. In this study the duration of focus groups was generally an hour. The female and male focus group guidelines are described in turn below.

Focus groups of female farmers were invited to respond to the following questions, in addition to an open question at the end asking if they had anything to add that may have been overlooked.

(1) Brief experiential introduction: Questions in this section covered experience as a small-scale livestock farmer; types of animals kept; activities that farmers engaged in on a daily basis, such as milking of cows, collecting of eggs; as well as grazing of animals.

(2) Gender and livestock farming: Questions focused on feeling and experience as a livestock farmer; ownership of cattle; obstacles and constraints faced by women in animal ownership; meanings of cattle ownership; women's mobility and entry in farming spaces, and ownership of land.

(3) Household farming and economic activities: In this section questions addressed the reasons for household farming; as well as the socio-economic functions of animal products and the value of farming as an economic activity.

(4) Challenges and support services in livestock farming: Questions addressed the difficulties and challenges faced by farmers; the kind of assistance that farmers may require; government programmes that address their concerns as livestock farmers; their knowledge of farmer cooperatives and/or associations, and the assistance such entities may/may not provide.

(5) Health services and animal healthcare: Farmers were probed about identifying who they speak to and obtain advice from when animals fall sick; how they care for animals when sick; relationships with state veterinarians and AHTs; how household income is distributed in relation to livestock (whether, for example, animal feeds, nutritional supplements, medicines/services) are purchased; as well as accessibility of medication for animals.

(6) Traditional practices and knowledge: Under this theme, a set of questions focused on the meaning, value and knowledge of traditional medicine in livestock farming; knowledge of traditional medicine and whether farmers consult traditional healers when their animals fall sick, or if they wish, for example, to enhance animal fertility.

(7) Vaccines: A number of questions in this section probed for example, farmers' knowledge of vaccines and diseases; accessibility and affordability of vaccines; frequency of vaccination; as well as the administering of animal vaccinations.

(8) General questions: Here the questions centered on farmers' knowledge of women-led organizations and/or associations/NGOs in the community who provide assistance (either developmental and/or programmatic); as well as any additional challenges faced as women.

The focus group guide for male farmers entailed similar questions that were posed to the female partners, but an additional set of questions covered the following theme:

(1) Women as small-scale livestock farming: A set of questions focused on male farmers' perspectives on their opinions and feelings toward women as livestock farmers; their observations if women faced any barriers to cattle ownership; knowledge of women who are able to own land; men's ability to own land; and their experience of women in farming in relation to their household role and in relation to customs and traditions.

Quantitative research methodology

Creswell (2009:xxiv) defines quantitative research as "methods (that) involved the processes of collecting, analyzing, interpreting, and writing the results of a study" where the envisaged "research provides a proposed explanation for the relationships among variables being tested" (xxiii). Quantitative methods generally rely on surveys, and use numerical and statistical calculations to provide some measures of information and have

some predictive advantages to find solutions for problems. The primary quantitative tool in this study was a survey which is described below.

Survey

For the purpose of this pilot we conducted a face-to-face survey related to the demographic profile of the small-scale farmers (including an understanding of their household; education; agricultural land; socio-economic conditions; livestock quantity, knowledge, skills, etc.) and a set of questions related to farm activities and facilities (who manages day-to-day activities, land questions, household income, household and farming assets, types of household farming, sale and consumption of farming products, record-keeping in relation to animal deaths and births, etc.); knowledge, uptake, access, challenges, and understandings related to animal diseases (including treatment and management); training and other assistance needs; as well as household food security and diet.

Conclusions

A number of important processes related to the approach, design and methods for the study have been outlined. In the next chapter, we turn to findings from the qualitative data where we focus on insights from the key informant interviews and focus groups.

CHAPTER 4: QUALITATIVE FINDINGS

Introduction

This chapter presents findings based on 28 in-depth interviews and four focus group discussions conducted over the period of two weeks in May 2014 in the Marble Hall, as well as Rhenosterkop area (see chapter three). As indicated in the previous chapter, we interviewed a range of stakeholders, namely animal health technicians, state veterinarians, female and male smallholder farmers, government officials from DoA, the heads of farmer associations, a representative based at an international livestock NGO and a researcher (at an academic institution) with expertise on issues relating to land reform and smallholder livestock production in South Africa.

The themes discussed below offer insight into what we found to be the most significant areas of concern highlighted by the different stakeholders interviewed. While we have collected a significant amount of rich data, this chapter does not provide all the information but rather makes critical choices that reflect some of the key findings. First we wanted to determine whether, in the areas of Marble Hall and Rhenosterkop, small-scale livestock farmers and their households experience a number of socio-economic challenges, and if so, what these would be as well as to what extent these experiences have a bearing on combating livestock infectious diseases and ultimately food security. Second, we focused on capacity constraints, insufficient knowledge and poor understanding of animal health by farmers in terms of contemporary science and their potential negative impact on human and social development pathways for these households and communities. We deal with these primary areas of concern by first examining the meanings and material benefits of livestock farming to people in the community, choices about keeping or selling livestock, issues around women's involvement in livestock farming, animal healthcare, and major challenges faced by livestock farmers, and supplement these with the opinions of animal health practitioners.

Meanings and material benefits: why farmers keep and (sometimes) sell livestock

Our findings confirm and build on the findings of other studies on smallholder livestock farming in Limpopo (Munyai 2012). Munyai found that cattle owners are mostly "elderly men" and that cattle and goats were the main animals in the village. Munyai's findings for why livestock are kept in a Limpopo village can be summarized as follows:

- Those who opt for livestock farming do so after receiving money in the following ways: through a) pension money paid out to them, b) income from employment, and c) inheritance from parents (108).

- "Most people keep cattle simply because they were able to afford to buy them" (108).
- "There are…some people…who keep cattle merely as a backup plan" (108).
- Seventy-six per cent of farmers kept livestock for "social prestige" whereas 16% kept them for "commercial purposes", and 6% in order to pay for hospital and school fees (120).
- Although just 24.6% of farmers interviewed said they were actually making money out of livestock farming, 75.4% of farmers said that they were "happy with livestock business" and the main reasons for their happiness were the facts that their animals brought them social status and a sense of security (124).

For many of the livestock keepers we spoke to in the areas visited, livestock 'farming' (at the individual level) is in some ways a continuation of a family tradition following the death of parents. It is an integral part of family life and lifestyle which for many began as children. As one female respondent states, "*I started farming since the age of 14, all of us at home we were involved in farming since we were children".* A male farmer in Marble Hall states:

> […] M*y family was farming even before me, so I continued with it [...] I started by herding my parent's livestock until I realize that farming is important. My father always had livestock and it was cows and goats […] Livestock has always being part of my family […]*

For yet another respondent, "M*y family had cows because I was born in a family that was farming, old grandfather passed away and we were left behind with these livestock so now we are grateful to have these cattle".*

The tradition of livestock farming in relation to family as the quotes above suggest, goes back several generations, and is passed on to younger generations. A female farmer in the Rhenosterkop area affirms the generational 'baton' of livestock farming: "*I was a farmer for a long time. When my mom got married she was given a cow. It was in 1950. This is something that comes from the parents".* The fact that livestock were given to female offspring as a store of value, as indicated in the quote above, is also reflected in the words of this female farmer, who explains the start of her access to livestock in the following way: *"[When] my father pass[ed] away […] his wish was to give every child in the house one cow as an inheritance…".* In some ways, inheriting a cow in this household held a dual meaning: a cow represents socio-economic value in developing a sustainable livelihood and an entry into the potential benefits of farming, and also represents a form of social reciprocity between family members.

***Photo 2**: Cattle grazing on the roadside in the Siyabuswa Area*

Beyond familial traditions, having cows provides the means through which social relations can be enacted to build cohesive communities. A female farmer in Marble Hall explains: "*We choose to have cows so that when there's a ceremony we are able to help people and help ourselves".* Ritual and ceremonial slaughter is crucial to the communities with which we worked. It is important to point out that while this is often spoken about in terms of the 'cultural' significance of the animals, livestock are not just a source of 'social status' (something that has come to contain a negative connotation in much of the literature), but a crucial form of social exchange and a producer of social and familial relations through reciprocity. An instance of this is captured in the following quote by a male farmer in Rhenosterkop:

> *In 2012 my brother's son was getting married, in Sepedi we call it a welcome ceremony for the in-laws. I told my brother I will help him, I took a goat and a bull and gave them to him, and then I told him not to pay me back because next time he'll be the one to honour me. We were happy he came with a van and took the goat and the bull here.*

It was uncommon for people to speak of keeping livestock in order to contribute directly to household subsistence needs, for instance, the use of cows for milk for children's nutritious needs, and slaughter of an animal for the sole and direct purpose of consumption of meat was virtually non-existent among respondents.

In terms of decisions to sell (or not), farmers explained that when livestock were sold it was in order to respond to food shortages at home. For instance one female farmer mentioned, "We *just sell a cow to buy maize meal for the children and [to] pay [for] some other things"*. Selling an animal in order to buy other foods is an important distinction from seeing the animal and animal products as a *direct* source of food. Very few respondents seem to view animals as an important source of food, although the slaughtering of animals for ceremonies does translate into meat for consumption. There is also some distinction made between cattle and goats. The following quote demonstrates both this difference, and the fact that killing animals purely as a source of meat would not be considered frivolous: "*No we don't slaughter just for fun, we only slaughter when we have a ceremony, a wedding or funeral. But we do slaughter goat maybe for food, but not cattle"*.

Besides food, the selling of livestock also helps to pay children's school or higher education fees and enables a household to obtain cash in times of financial strain. However, there does seem to be enough incentive not to sell, so that some farmers do not sell their cattle at all, as demonstrated by this comment during a women's focus group discussion in Rhenosterkop: "*[S]ome [farmers] do keep [cattle] just to grow them. The other farmer has 32 cows and 14 calves but still doesn't want to sell; he enjoys keeping them and see[ing] them grow in numbers"*.

The ownership of cows has particular political, economic and cultural salience in poor rural contexts, and these are not often distinguishable from each other, as economic necessity and prudence meld with social identity. Sikhweni and Hassan (2013) in their study also found that almost all farmers (participants in the study) held livestock as an insurance against unexpected circumstances (e.g., loss of household income or severe draughts). In our study one participant explained that *"cows are a black man's bank, if you don't have a cow in our culture, you are taken as if you don't know yourself"*. In other words, livestock (but cows in particular) are inextricably linked to identity formation in this context. Another participant expressed the value and meaning more explicitly in financial terms: *"Farming is actually a traditional bank […] I can take the farm and sell it so that my child can continue and go to school […] we are trying to say in other words it is my bank"*.

It is noteworthy that the sale of livestock does not necessarily imply a move towards *commercialization* as animals are often sold in order to obtain money for *necessities*, making livestock part of household sustaining strategies rather than a means to earning a profit. We turn now to insights into gendered issues as experienced by participants interviewed.

Gendered issues in livestock farming

The following section details the various gendered factors related to livestock farming that emerged from the qualitative research. These include the reasons for women being involved in livestock farming, their involvement in animal healthcare, men's perceptions of these women, the perceptions of 'weaknesses' of these women, and the major structural benefit accrued to women through livestock farming – namely, access to land.

Why women become involved/ are involved in livestock farming

Respondents in Marble Hall and Rhenosterkop frequently mentioned that there are few women involved in livestock farming. Occasionally this was expressed with some level of frustration, but mostly it was stated as empirical fact. For instance, an animal health practitioner (male) in the Rhenosterkop area says: "[…] W*ith the livestock farmers we are dealing mostly with the men. It's like the African culture. The man is the head of the house, he is the one who looks after the livestock".* According to a state veterinarian in Marble Hall (in response to a question about women's presence in dealing with livestock), in all his/her years of interacting with small-scale livestock farmers, women are mostly 'invisible' at the most frequent point of contact between livestock keepers and state animal health services, the dip tank:

> *In all the dipping I have been to, I haven't seen them, in dipping they don't come, I don't know maybe it is because men are saying they must stay behind or what and then maybe they're not interested. And again those I have met when they come to ask about an animal it is because the husband is not there or maybe he passed away or there is no one who can come. So in most cases we [don't] meet so many women in dipping […]*

The veterinarian highlights several reasons for women's lack of presence, including that the financial benefits of livestock are not being demonstrated enough. He says that women would be more 'on board' if husbands shared money from the sale of animals with them; this would encourage women to participate more. This, along with the suggestion that husbands may be restricting women's mobility, is speculative. However his emphasis on women attending dipping because the husband is not available or has passed on suggests that women's involvement in small-scale farming is the result of *necessity*.

For many women, farming with livestock is a source of livelihood in the context of unemployment and the loss of husband's income due to him passing away. According to a state vet in Rhenosterkop, in his experience 70 – 80 % of women he has worked with are involved with livestock farming as a result of their husbands becoming deceased and them "taking over" from their husbands. Very few cases he says are of women actively wanting to deal with livestock. Another woman confirmed this, stating that being or becoming a farmer is not a choice but rather, for women whose husbands die, farming is the natural outcome of inheriting his animals. Munyai's most significant gendered finding for

smallholder livestock keeping in Limpopo is that women "act as farmers" on behalf of their husbands who seek other employment in urban centres (Munyai 2012: 107).

There were numerous instances confirming women's involvement in livestock farming arising out of necessity rather than an active choice. This might not always be due to a husband's death though. For one woman (speaking in a focus group discussion in Rhenosterkop) she began farming as a result of cattle obtained through *lobola* (bride price in the Southern African custom when a man pays the family of his fiancée for her hand in marriage, usually in monetary form or in the form of livestock). However, there were also instances of women claiming that their involvement in livestock farming is independent of their husbands: "*We can make our own choice[s] [about] becoming farmers without standing beside our husbands".*

Whilst the quote above demonstrates an assertive claim of independence, other evidence suggests that some women experience a lack of agency in relation to their husbands, including experiencing frustration with their husband's decision-making about household livestock at times. A state veterinarian relates this account: "[T]*his other guy that I met […] he is a business man, he said to me his wife said if he can die she will sell all the cattle because she thinks they're not making money according to her*". This non-sentimental approach to livestock keeping on the part of women in livestock keeping communities (and how they make sense of the uses and meanings of livestock) is addressed as a gendered issue in the literature (Mabhena 2013), where women are said to experience less sociocultural attachment to cattle than men, making them more willing to sell animals for money and/or slaughter them for household consumption.

In contrast to government officials sometimes pessimistic view of women in livestock farming (as not interested, for instance), an international livestock NGO we spoke to that works in Limpopo said that a cornerstone principle for them was having a gender and family focus and women consequently constitute 80% of the beneficiaries of their projects, and that this focus on women was a means of "*restor[ing] dignity and hope".*

Women's involvement in livestock keeping is also informed by the need to make a living, which women do take on as their responsibility. For two female respondents in Marble Hall, women's involvement in livestock farming is understood primarily in gendered terms, with women cast as more responsible, dependable and reliable for meeting household needs than men. Asked if it is important for women to farm, they respond as follows: "*[Res1:] It is much better when women are farming because they [are] able to make a living [through] that. [Res2:] Women are better than men [when it comes to] farming".* When probed further on the reasons for this, the second respondent states: "M*en have never been right [laughter] you should know when a woman is farming if she can sell a cow then that money will come straight home [laughter] if the man can sell a cow you will never see that money […]*. The implication here is that women should be seen as more responsible and reliable in terms of managing finances and caring for the household; that there are in fact tangible

differences that accrue to the household in respect of profits from sales (and that men demonstrate the opposite).

The interviews also reflect that women farmers work mainly with poultry and pigs, as a DoA official in the Rhenosterkop area pointed out, and that this involvement in piggeries is based neither on necessity nor on circumstances, but on a genuine desire for farming: "*They definitely do love it, that's why I say most of them have piggeries".*

Men's perceptions of women's involvement in farming

In a focus group discussion with male farmers in Marble Hall, one respondent claimed not to mind if women were involved with farming as "*men can rest and women can take care of the cows".* A male respondent in a focus group discussion in Rhenosterkop states that "*it's a good thing that women are farmers because women think harder than the men […and] you could see that some women are cleverer than the men but they were not allowed to do men's work".*

A male farmer in Rhenosterkop says that women should farm because livestock is a way of life for all rural people "*and they can also make an income for their household and feed their children".* He goes on however, to acknowledge that there are traditional constraints such as women not being allowed to enter the kraals: "*even now if a woman wants to get in, I will stop them".* A male respondent in Marble Hall states the conditions under which a woman naturally keeps livestock would be when a man leaves a household and a woman becomes the new head of her household; then, "*She is supposed to take care of everything including the animals".*

The taboo of women entering the kraals and other cultural expectations that are gendered, were discussed in a focus group discussion with women farmers in Rhenosterkop. The spatial restriction around kraals is described by one participant as being at the discretion of men:

> […S]*ometimes it depends on whether the men of the household want women to enter into the Kraal or not, because when I was still young I used to go into the Kraal and my father never stopped me or told me I'm not allowed in there.*

A distinction is drawn by the women between Ndebele and Pedi cultures (two cultural and linguistic groups that reside in the study site), with one woman suggesting that it is the culture of the former that imposes restrictions and creates "perceptions" that "*a woman she's not allowed to enter a kraal".* Someone else suggests that in Pedi culture too, spatial restrictions exist, and it is mostly older women who are allowed to enter.

There is a suggestion from an animal health practitioner in Marble Hall that barring women from kraals is part of a male strategy to prevent wives seeing how many cattle their husbands own or how many they might be selling:

> *They say a woman is not supposed to go to the kraal, so that is a good strategy […] and then if you don't go to the kraal how would you know how many cows are in the kraal, you won't know.*

This also implies that though women may be primarily responsible for the labour of keeping the household going, the area of finance and financial transactions is traditionally seen as male. In terms of livestock farming, it also implies that when women become involved in livestock farming, they break this gendered role, and become involved in an economic arena.

Women's purported 'weaknesses' in relation to livestock farming

The perceived 'weakness' of women is often highlighted as a reason for them not being engaged in cattle farming. A female respondent in Marble Hall seems to confirm this when she says: "*I have to hire [a] cattle herder to look after them because I am a woman and I cannot […] take them for grazing*". What we do see however, is that she immediately provides a positive outcome of her employment of a cattle herder, stating:

> *That is part of job creation because I am going to pay him at the end of every month like as I have sold a cow I know that I should save some of the money so that I [am able] to pay the cattle herder […] I know I cannot use all [the] money because some of it has to pay him because it is job creation.*

A few respondents indicated that the cost of a herder was around R200 a month. Another female respondent in Marble Hall suggests that it is her inherent weakness as a woman that made her vulnerable to livestock thieves: "*My husband […] is away with work so they took advantage that I am a woman then they stole them".*

Not all women take a hands-off approach to the day-to-day activities of livestock keeping, as this woman from Marble Hall illustrates:

> *We don't have a cattle herder as you find me here, you have passed my cows somewhere that side, after they came out of the kraal they just went there so now I am going to look for them so that I can go and take them to drink water and around 4 o'clock I take them back home.*

These differences in opinion also suggest that the meanings and practices around livestock farming, especially the traditional belief that herding cattle is a man's work, are shifting in

the current context, and that multiple gendered meanings and expectations are existing side by side.

Access to Land: a major opportunity for women

The South African government claims in its *20 Year Review* (The Presidency, 2014) that it has significantly empowered women to own land, and this did not seem in dispute amongst the people we interviewed (see also Chapter 2 for a more detailed engagement about the issues around land in agricultural policy). There is an acknowledgement of, and even emphasis on the crucial role played by government in changing the rules, where previously only married women could access land, whereas now single women are able to do so, according to an academic we spoke to. According to the academic this opportunity to own land has significant potential in that it is:

> […] *a recognition of their [women's] independence. It helps them for example to start investing in herds and goats, possibly even in cattle. And with the assistance of their relatives they can begin to utilize all that grazing going on out there as basis to improve their livelihood.*

Aside from the implications that owning land implies the possibility of independent economic earnings, the land aspect is fundamental in that animals need land to graze, and women's access to land is crucial to them being able to earn a livelihood.

Women's involvement in animal healthcare

Women's involvement in livestock keeping relates to their involvement in animal healthcare. There were many ideas expressed around women and their caring for animals, with women often stating that they are knowledgeable and able to exercise independence in terms of animal healthcare. Asked if she knows how to inject a cow, a woman in Marble Hall responds:

> *Yes, you know when a cow is still a calf what should be given for the stomach bugs, we know that how many milliletres of medicine we should give to a cow because we have been taught that is why we are able to do it ourselves if there is a problem in a cow.*

The theoretical knowledge that women have does not necessarily translate in practice however, as we see when the interviewer probes further:

> *[Int:] When you say you inject it yourself, is it you who do it or [do] you call the men to do it for you? [Res:] We call the men to come and inject them but there*

were some women who were also taken to that school and they were taught, because they didn't take us all.

A female animal health practitioner agreed that women are less knowledgeable and also less assertive and therefore unable to assist with the care of their animals, and she expresses a degree of frustration having to deal with female farmers: "*They know less […] With livestock they don't know much […] when you find a woman that is doing farming you know you have to do everything even if you can explain to her but they don't have those guts to assist.*"

This also points to the idea that it is a lack of training that disadvantages women in being able to engage as equally as men in the care of their animals. An AHT in Marble Hall states that the lack of knowledge about animal health is a major constraint on women, and the fact that women (often as mothers and wives) have multiple household responsibilities means "*they are not in the fields or where the animals are grazing [or] looking after the animal*". The technician says that when faced with a sick animal women will usually call a man to assist them with the problem.

Speaking about the many responsibilities women face, in terms of family, as well as having to take care of their livestock, a state vet from Rhenosterkop states that in terms of knowledge, women may even have more understanding of their animals than men, but are faced with competing challenges in terms of a) physical strength and b) time constraints where women's household activities prevent them from having time to regularly oversee their animal's wellbeing: "*They won't find time to check after the animals to see which animals are sick so they [are] only depending [on] the headbo[ys] to see which animal is sick*". Lacking "manpower", the state vet says, means that women rely on their headboys, neighbours or male relatives to take their animals to the dip tank and also to inject their animals. (It was rare to see women at the dip tanks we visited, as men were clearly dominant in these spaces, and when they were there, they were usually older women.)

***Photo 3**: Woman farmer at a dip tank in Siyabuswa area*

Women are however, also looking to be empowered in terms of disease knowledge, and this access to knowledge is a more recent one for them, as one woman states:

> […] *We only knew that cows were taken to the field but, what we didn't know is when the d[isease] hits you'll end up having no cows and they will come after and tell you that you should have done this and by then it will be too late and you'll have to look for another cow to do that, so that what we'll like to get help and that will be from our own will if we do want to get help or not.*

A female farmer in Marble Hall says that "those who work with animals" will let them know at which times of the year to watch out for particular diseases, and "then we buy medicines".

The receding taboos around women's bodies in kraals were also historically a restriction on women's involvement in animal healthcare. During a focus group discussion a male farmer in Marble Hall says that while in the past a "*girl couldn't get in[to] the kraal but a boy [could], but now they can if a calf is sick they can give it medication".* Restrictions and fears about women's bodies and presence around kraals and pregnant cows have significantly

affected women's abilities to engage in animal healthcare, as another (female) farmer confirms:

> *There was a saying then that if a woman walk[s] between the animals when they are pregnant they are going to miscarry the calf, but I think now it's a little bit better. And then they didn't want us women to inject the cattle because if it dies they were going to blame you and say it is dead because of you, but now we touch them anyhow, yes things have changed a lot.*

Another meaning arising in this quote is that women's presence has a negative effect under particular conditions. In other words, a women's presence among pregnant animals is a natural death warrant. These ideas seem to be similar to the view in anthropological terms that menstrual blood is always viewed as dirt, filth and potentially a pollutant that upsets the natural order of things; and that during menstruation, for example, women's presence is construed as unclean.

The fact that these perceptions and meanings around women's presence is shifting however, suggests that women's involvement in livestock keeping and animal healthcare has the potential of increasing significantly.

Animal healthcare and disease in livestock farming

Diseases, knowledge of disease and disease treatment

Disease is spoken about as a formidable challenge facing farmers in both areas in which we worked. For instance, in terms of the death of livestock, an animal health practitioner in Marble Hall stated that hunger was the main cause of death of livestock, followed by disease (hunger as the primary cause of death is backed up by an animal health practitioner in the Rhenosterkop region who states that mid-to-late spring and winter, "*most of the animals die of hunger"*). In the literature, Sikhweni and Hassan (2013) confirm that livestock death as a result of animal disease is a serious problem.

An AHT in Marble Hall said that cattle deaths are mostly caused by the tick-borne diseases, including blackquarter, and the state vet in Rhenosterkop confirmed that tick-borne diseases are the most problematic. Other problematic diseases mentioned include heartwater, anaplasmosis, foot rot, redwater, something called 3-base dip sickness and a *"[recent] outbreak of lumpy skin*".

In a focus group discussion with male farmers in Marble Hall, one respondent states that the problem of disease is worsening:

> [A]*nimals have so many diseases that we can't keep track of [them], we need to prevent that. When we investigate they say its lumpy skin and we have to have medication for that and its challenging. Those diseases were not there in the past.*

A female farmer in a focus group discussion seems to share this idea of 'new' diseases, saying she has lost many cattle to disease and is only left with nine as "*these days they are sick, they suffering from eyes and ears".*

A potential extrapolation from this statement is that due to factors such as increased livestock mobility (based on road transport, importing new stock into the area, and human mobility for example), there is more exposure to livestock diseases, and that traditional approaches which were not designed to deal with these 'new' diseases are no longer sufficient or appropriate.

Various diseases and the levels of knowledge about treatment were discussed during the interviews. A male farmer in Marble Hall talks about the problem of "teary eyes" with cows, for which a powder medication is poured into the cow's eye, after which the eye is pressed: "*It [gets] inside the eye and that means it is cleaning the eye".* A male farmer in Marble Hall also refers to this problem, saying that the cow remains standing still and will not graze. Instead, "*it just sleeps or its eyes will have tears. When you ask the expert about this they will tell you which medication to use".*

A male farmer in Rhenosterkop states that ticks are a major concern and the causes of diseases. He describes one disease caused by ticks in the following way: "*When a cow has a problem with its eye, they turn green, tomorrow they get closed. It's like it has a headache. If it collapses there then it is dead."* This deadly disease, the farmer explains, causes cows to go blind: "*My cow was killed by that disease, it even got lost because it was just wandering, [then it] hit the tree and fell […] [I]t didn't know its direction, it was already rotten".* He says that it is better to kill the animal once you know it has contracted this disease and that some people kill and eat the diseased cow.

We found that most often farmers were unable to name particular diseases. Instead, they mostly described the symptoms of these diseases, such as this female farmer whose approach to disease and treatment is based not on robust knowledge but rather a reliance on 'the doctor', underpinned it seems by a reliance on medications as a quick and easy cure after diseases have already been contracted (and thus little prioritization of disease prevention): "*They do get sick you will see that cow becomes slow and weak; anytime it might fall so we call the doctors to come and inject it and after that injection it wakes up".*

Knowledge and understandings about how, when and why diseases are treated (including through the use of vaccines) is captured in the words of a male farmer in Marble Hall, which show that there is some understanding, though this is limited (so for instance, the

farmer understands the importance of timing of vaccinations, but perhaps less clearly its preventative purposes):

> *The doctors know at a certain time they vaccinate for a certain disease, and so on. They set a time table so that they know in which season they are coming. Sometimes they vaccinate for miscarriages, foot and mouth diseases and at times they vaccinate for dry skin diseases. If the disease is too strong for them to use this medication, they send you to take your cow to the doctor […] Sometimes we have diseases like dry skin or sweat. The doctors can say this disease is rife and we need to vaccinate so it won't infect other cows. Sometimes you find that the cow has a foot disease where its foot gets cracks underneath, others get miscarriages. They know when it's time for all of these diseases in order for them to vaccinate.*

Another significant problem we encountered with regard to treatment of disease is an undue reliance on Terramycin as a cure-all medication, as reflected in this statement by a female farmer in the Rhenosterkop area: "*I know that there's this sickness called [Tshwili?] but, I don't know where to find the medicine but, because we always rely on Terramycin even though it is not the right medication for it but, we still use it".*

Diseases mentioned as commonly experienced and problematic to farmers' livestock included:

- Foot and Mouth disease
- Lumpy Skin disease (rife in Rhenosterkop according to a healthcare practitioner)
- Black quarter
- Anthrax
- Rift Valley Fever (or *uMkhaza* – generally said to occur during mid-February)
- Downer
- Anaplasmosis (or *Nyawane)*

State animal healthcare services and barriers to purchasing of medicines/ vaccines

In this section we discuss the state's provision of healthcare services, the high costs of purchasing medications, and the tensions and benefits of farmers sharing the costs of healthcare and medication through communal purchasing. While animal health services are provided by the state (especially dipping services), farmers expect more help from the state particularly through the provision of medication and vaccines free of charge. This causes tensions between animal health practitioners who often feel that farmers wrongly "expect things for free" and are not committed to improving the health of their livestock. We provide a snapshot of responses to illustrate how farmers' choices around access to medication are affected by cost considerations, and how distances required to travel to buy medications also act as deterring factors for improving animal health.

The main issue underlying much of the discourse around animal healthcare between farmers and health practitioners, as we have extracted it, is a conflation of *willingness* and *ability* in health practitioners' perceptions of farmers' approach and stance to animal health care, which will be elaborated on in the discussion below.

Animal healthcare services that are provided free of charge (almost universally) by the state include dipping and vaccines for specific controlled diseases. In the Marble Hall area, unlike in Rhenosterkop, farmers did however indicate insufficient access to dipping facilities.

The main functions of the state animal health services, as explained to us by animal health practitioners include:

- Managing disease control – including alerting farmers when there is a disease outbreak
- Managing disease prevention – including vaccinating and promoting the use of vaccines amongst farmers
- Providing disease surveillance – including taking blood samples in order to check for new diseases.

While services such as dipping and certain vaccinations are paid for by the state, poor farmers are still required to budget for the purchase of medicines and vaccines, by the state. The price of medications and vaccines are often high and animal healthcare needs are low down the priority list for farmers who need to spend money on basic necessities like household food consumption. This is reflected in the example given by a state veterinarian in Rhenosterkop: "*I think lumpy skin is very expensive so [he/she] will tell you I can't afford to spend maybe R200 to buy that vaccine. You can understand them because the money they get is for food".*

For some farmers who can afford to buy medication in bulk and who own refrigerators, the problem is less pronounced and more easily resolvable such as for the female farmer in Rhenosterkop who says that the household cost of medication can be up to R700, but that medication bought for this amount lasts a long time: "*We buy in bulk as it lasts us for a long time. We put the medicine in the fridge."* Some farmers did indicate that they did not consider medication to be expensive and that their medication costs were often covered by the monthly fee paid to the farmers' association/ corporation they were a part of. In these instances then, farmer cooperation works to reduce costs.

Cooperative buying does not always work however, as suggested by a DOA official in Rhenosterkop. He notes that there are difficulties when it comes to payment for medication especially because situations usually arise where some members of the community are willing to pay for medication communally while others say they are unable to afford the communal cost (estimated at R20 per month per member):

These people don't buy medications. If they are a community like this and they must arrange to contribute money for the medications, and now when you talk about money it becomes a difficult issue. Because some will contribute and some will not, and they will say they don't have it. And when they go dipping those who said they don't have money will also want to include their cows.

Healthcare practitioners' perceptions and disease and animal health problems

An AHT suggests that the reasons for reluctance to buy medications might not be just financial, as for instance when farmers are pushed by animal health practitioners to purchase medication or vaccines:

> [AHTs will ask]…*can you please buy a lumpy vaccine, uh, they'll tell you I'll buy it and then they'll spend almost three months, they don't take it serious[ly]. Some of them they don't have money, some of them they do have it's just that they take it for granted, so I can simply say they like free things.*

This accusation or criticism levelled against farmers (by animal health practitioners as well as government officials) that they expect "things for free" was mentioned more than once:

> *Ja some of them they can afford but then just because then mostly it's like they look at the government like government should come and help or buy medication even treatment for them and that we don't do so they will tell you that my animal is sick but some of them they don't want to pop out […] to go and buy the medication they will tell you that the government should come and buy.*

It seems that government officials and health practitioners view farmers as quite significantly *unwilling* participants in efforts to address animal health issues, and to improve disease management and control. It should be noted however that communal areas are not well-stocked with medication or vaccines and farmers have to travel to the bigger towns and cities (which adds to the cost of accessing medication). This constitutes a major challenge in terms of accessibility of medication, cost of acquiring medication and a further disincentive to obtain medication. An animal health practitioner in one of the areas showed frustration with farmers' complaints saying that the area offers farmers a mobile pharmacy and that farmers are to blame for not using this service. When we were in the area and made requests to see the mobile clinic, however, we were told it was not in operation at that time (ostensibly due to it not being a time of year with high levels of disease outbreaks).

It is important therefore to distinguish between *unwillingness* and an *inability* to purchase medications. Cost has been highlighted as the most significant barrier to accessing and purchasing medicines and vaccines. Perhaps the second most significant barrier that arose

in our findings was distances required to travel to places where medication can be bought. Gehring, Swan and Sykes (2002) underscore a crucial point when asserting that in the past farmers did not need to travel long distances in order to purchase medicinal products for their animals. Previously, veterinary medicinal products were made accessible to small-scale farmers via State veterinary services from government stores.

However, as government administrations shifted and budgetary allocation changed so did the mandate of State Veterinary Services. Indeed, the role assumed by the State veterinary services as the supplier of veterinary medicinal products diminished (Gehring, Swan & Sykes, 2002). Thus, transport is a serious problem for most of the farmers mainly because, a) of the financial cost where a majority of the farmers rely mostly on their pension to live, and the cost of transport, besides the price of animal medicinal products, evidently becomes prohibitive, and b) the health of some of the farmers is a serious factor when having to use public transport to travel great distances. It is often the case that distances are vast between the homes and farmers and the location of taxis and/or public transport which poses immense physical strain on those farmers who have to walk to access public transport.

These concerns were illustrated by farmers, as for instance, when a state veterinarian rhetorically asks about a particular farmer, *[How does he/she] go to Marble Hall, we are talking about a 70 year old […]*. In an exchange with male farmers in a focus group discussion, where farmers were asked, "*Where do you buy animal medication? [Res:] At Kopano […] [Int:] How do you go to Kopano? […] [Res:] We catch a taxi or we hike."* This finding was also captured by Gehring, Swan and Sykes (2002) in their study which was conducted in the Madikwe District in the Free State, where it was found that farmers' villages did not have any outlets that sold animal medicinal products. The nearest outlet was between 10 and 30 km away. In this context the 175 farmers who participated in that study were entirely dependent on costly and often inaccessible public transport.

Farmers have certainly noticed the cut-back in government assistance in terms of providing access to, and financial assistance for, medications and vaccines. According to an official from the DOA, one of the major complaints by farmers (in the Rhenosterkop area) is that government officials would visit farmers to tell them about the medications "*and yet they do not provide those medications for them".* The official goes on to say that farmers' dissatisfaction with this lack of provision is based on the fact that it was different in previous years (and there has been a cut-back in terms of provisions from government): "*But it seems like earlier they were providing medications for them like the one to prevent abortions, and the other medication where they should be vaccinated yearly. But now they are not providing anymore".* Other farmers suggest that there seems to be a reduction in state services in terms of animal healthcare services, and a state veterinarian also agrees that there has been a cut in budgets for the provision of services. The reduction in government provision has been over the last three or four years according to some farmers' accounts. These claims of cut-backs are corroborated by the literature where

Brown and Beinart (2013) state that government has reduced its financial provisions for livestock disease prevention and control in recent years.

Despite cut-backs in government assistance in accessing medication, many farmers expressed gratitude to government for its provision of free dip and medicines and vaccines (although farmers did complain about the lack of medicine for specific diseases, such as for foot and mouth disease). The state vet in Marble Hall clarified that free medication is only for controlled diseases, those considered to be potentially detrimental to the country's economy.

It is noteworthy that the lack of provision of medications by the state and farmers' inability to access medication easily as discussed above, in the context of government policy having been different previously, has a significant negative impact on state healthcare providers' perceptions of farmers' commitment to animal health, and consequently, on farmers' perceptions of health care providers' role and service provision. As in the quotes above, health practitioners see farmers as just "wanting free things", as not taking animal healthcare "seriously", and expecting "government to come and buy".

Animal healthcare practitioners often complain that farmers do not seem committed to the sustained welfare and long term provision of care for their livestock. This is confirmed by a health practitioner in Rhenosterkop who attributes this unwillingness to the problematic 'mindset' of the farmers, which is seemingly unchangeable despite knowledge interventions:

> *We do almost 10 of those [healthcare] campaigns to try to change their mindset but what I have seen is they will change their mindset on something which is serious like if there's an outbreak which can cause the animals to get sick then they know,' oh these guys are important', they come, and […] when its quiet and animals are not sick, they start disappearing again. Later on when there's something coming they come back [I]that's the game you end up with.*
>
> *The dipping systems and vaccination systems is a free service from government and it was helping us to do that but now we still have other farmers that says I don't want to bring my animals for dipping's and all that, I can do it myself.*

The issue of accessibility of medication is an important one, and relates equally to the ability of animal health practitioners and farmers to work together in a unified way to ensure optimal livestock health. A male farmer in Marble Hall emphasizes the fact that he has "no problems" with AHTs and state veterinarians, and that he would like to access medications from them: "*[If] we can build a shop for medication, we can work with them [animal health practitioners] and maybe they can give us a quotation and we can buy [medicines from] them".*

The seeming reluctance of farmers to properly manage the health of their livestock is explained by one of our respondents as resulting from a lack of economic incentives (with the implication that policies and policy makers and implementers too need to see things in a sense, 'the other way around', i.e. in terms of animal health not being the first step to something else but rather the outcome and result of general prosperity):

> …[I]*f a farmer cannot sell the product and have money out of it, then he is not going to manage it right, he's not going to buy medicine and he's not going to put effort into the management, that's what happens. So that's a key thing if you can make money out of something then you make sure it's healthy and then is protected.*

The result of farmers' not buying medicines and vaccines (as requested by health practitioners) is also productive of (and produced by) what appears to be a growing mistrust and scepticism of the state and its health practitioners, which although not voiced openly by farmers, was often indicated in their tone and manner when speaking about the help they receive (or do not receive). This has an impact on animal health and disease management as perceptions about the purpose and function of vaccines is critical to uptake of vaccines (as discussed in the literature review in Chapter 2). A government official describes accurately the compounding effect of mistrust in helping to create (mis)understandings about vaccines (and more generally mistrust of animal health practitioners and decline in the use of animal health services):

> *[T]here's this allegation […] let's say maybe [the AHT] has gone to vaccinate some of the cows then you will find out that there are some that would be dying but not due to [the AHT] but due to certain diseases; then they [the farmers] associate and say the vet person has been here, he's killing our cattle that's why some of them are adamant not to come.*

This reluctance on the part of the farmers about obtaining medical advice from AHTs and state veterinarians is evident in interviews with farmers, who say they prefer speaking to each other about disease problems than consulting a professional, even if the latter may be available:

> *We do talk to each other first if one has a problem with their farming, because you find that maybe one of us has experienced a problem another farmer is experiencing now, then we are able to tell/help each other before we go for professional help outside.*

Some farmers indicated that consultation with health practitioners is not even a consideration and farmers seemingly in resignation 'deal with the consequences' of this rift. "*No, we just talk to each other about it but none of us has ever taken the matter to the relevant people who can help us. We just complain amongst ourselves. More cows die here".*

Farmer perceptions of obtaining help and knowledge from state health practitioners is not completely negative however. For instance, farmers mentioned workshops where practitioners provide knowledge about animal health, which they appear to welcome and recognize the need for:

> *They invite a person who […] will teach us about preventing diseases, the other will be teaching about how to find healthy grazing sites. We had this other doctor they were working with, she's a woman, and I just forgot her name. They also work together with her. They do come and give us information for when you have a certain problem.*

The state veterinarian in Marble Hall reported that relationships based on trust are important to farmers: *"I think that's where the thing is, the ones that you have a good relationship with them [...] they know if they have a problem, they will call you quickly and [you] give them advice".*

It is noteworthy however, as poor female farmers in a focus group discussion point out, that the lack of a telephone for the very poor is a barrier to accessing animal health practitioners: "*I don't have a phone. I even don't have their phone number but if there is a problem I will ask from someone".*

Use of Traditional Medicine

The use of traditional plants and botanical knowledge for treating and curing sick animals is one of the key themes that emerged from the data. It is noteworthy that farmers are reluctant to disclose their use of traditional knowledge and treatments (for fear of being rebuked for this disclosure by animal health practitioners who frown on use of non-Western medicines), and the resultant atmosphere of suspicion around traditional knowledge has turned it into a 'secretive' knowledge and practice. In spite of controversies around the effectiveness of traditional medicine, however, farmers continue to draw on such medicine as reflected in the focus group discussion with female farmers below:

> *[Int:]: Do you ever use traditional medicine to treat your animals, the sick ones? [Group:] No, we never used it [Int:] Have you heard of anyone who does? [Group:] No. [Single Res:] Let's be honest they do, you know when we go dip our cattle, we are supposed to use a dip, but you will find somebody using the oil, and there are some [using] African medicine, like the African beer if your animal has eaten poison plant it does work very well, and coke and [margarine?] as well.*
>
> *[Int:] You don't use African [cultural medicines] if the cows are sick? You try it first, the African culture? [Res:] Yes. […] There is another medication called*

Lepote for example if the cow gets medication. I get it and put in the middle and mixed it with water and give it to the cow. If it is not getting well we phone them [the animal health practitioners].

The use of traditional medicine and knowledge is also part of the story of how farmers' view state animal health services, in this case, not as the first point of call for assistance and knowledge in dealing with animal health problems. The retention of traditional medicine due to the cost effectiveness of herbal remedies seems a highly plausible and applicable explanation for the contexts in which we conducted interviews (and in light of the discussion above), and is confirmed by a study by Masikaa, van Averbeke and Sonandi (2000). This might be the case in our study since the majority of the farmers we interviewed found the cost of animal medicinal products expensive.

Challenges faced by state animal health practitioners

It is important to point out animal health practitioners face significant barriers to adequate service provision, which impacts on the services received by farmers. The two highlighted most often were a) transport constraints and b) a lack of departmental resources and budgetary constraints. One practitioner suggests that he/she has assistants "[…] *but we are struggling with transport. It's really difficult […] We struggle to meet farmers closely [since] last year beginning of December [2013]. I had no transport for the last two weeks since December*". The fact that the majority of farmers do not own their own vehicles (see chapter 5, Table 4) has serious implications for provision of healthcare (the smaller number of farmers who do own cars are also unable under these circumstances to access the help of the health practitioner as government regulations prevent this due to insurance risks for health providers).

The inability of animal health practitioners to provide a service due to transport constraints results in frustration on the part of farmers, many of whom complained about the amount of time taken for practitioners to attend to requests for assistance, which often has implications for the survival of their animals: "*They do come but they only come at the last minute. By that time the cow is already dying."*

Both the animal health practitioners, as well as livestock farmers indicated that insufficient budget on the part of the department has a cascading effect and many of the services including provision of medicines to farmers for free have been phased out forcing farmers to pay for medicines out of their own pockets, and impacting on how farmers feel about animal health practitioners who are their point of contact with the state. It is noteworthy that, despite the lack of resources, some animal health practitioners go to significant lengths to assist livestock farmers as illustrated in this quote:

We don't have resources at all. Because by the time when I started working, the last time I had to [buy] the syringes [for] the department […] It's been three years and at times within that three years there is a, the glasses breaks […] the

syringes but the needles you have to keep changing them we only get them once. At times you end up buying out of your own pocket.

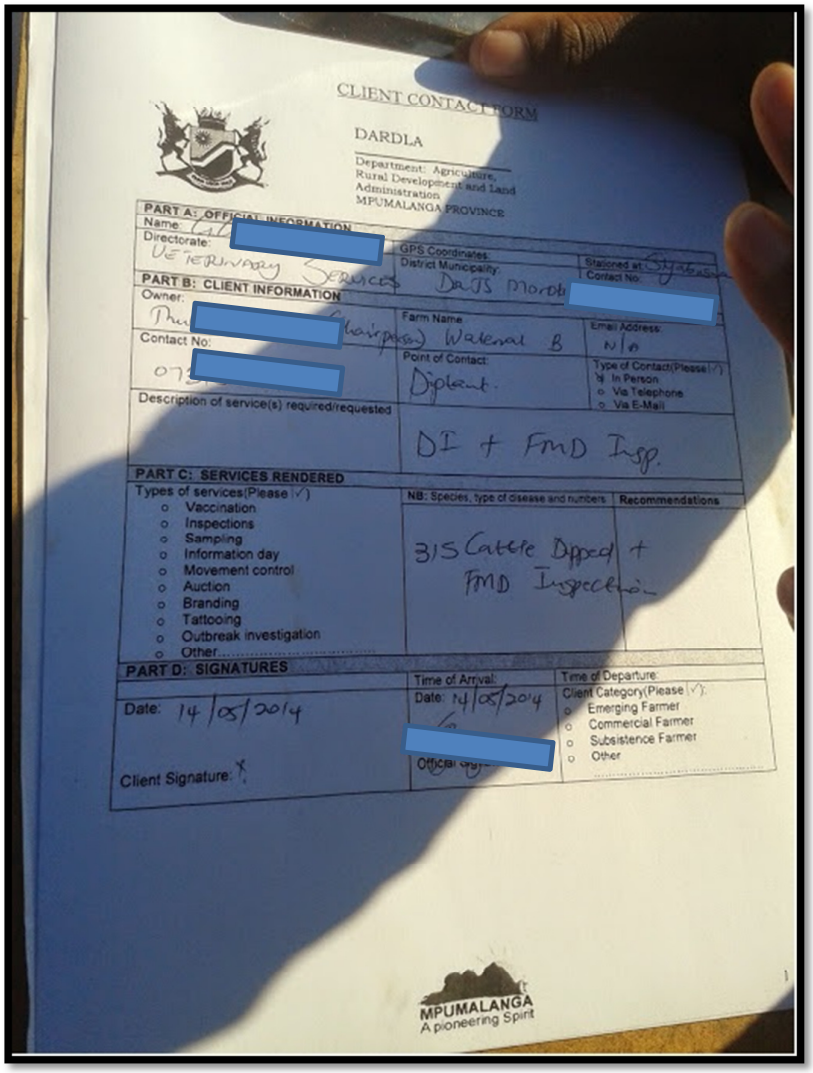


***Photo 4**: At a dip tank in the Siyabuswa area – DARDLA veterinary services inspection form*

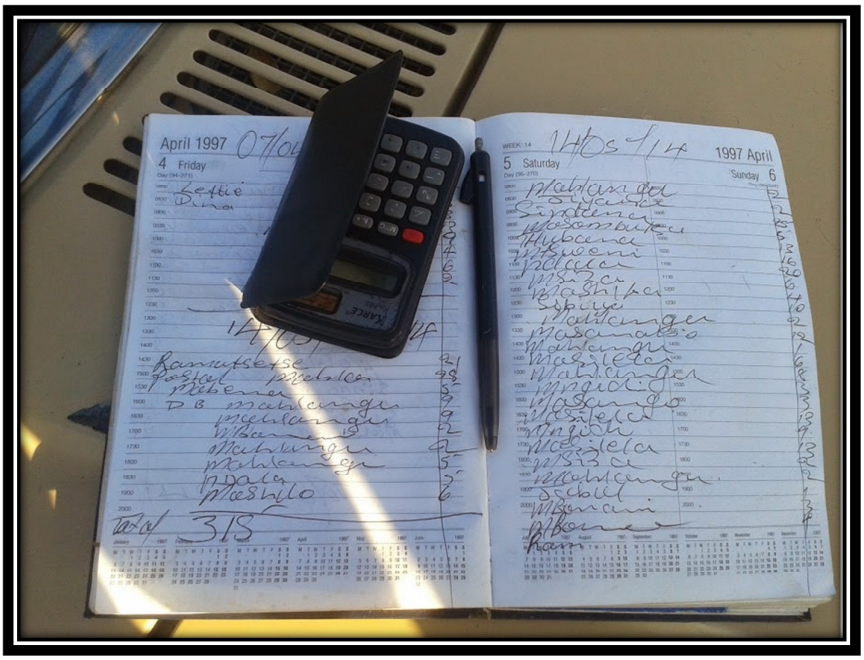


***Photo 5**: Farmer association head's logbook – who came for dipping, how many cattle were dipped*

***Photo 6**: Cows at the dip tank in the Siyabuswa area*

Other challenges faced by livestock farmers

Aside from disease, there are a number of challenges faced by livestock farmers that impact on farming practices (such as, livestock theft, infrastructural issues and water shortages).

Livestock theft

Stock theft is a major problem highlighted by several smallholder farmers. The participants stated that it is only on rare occasions that their stolen livestock would be found. Additionally, the prospect of the perpetrators being prosecuted is very slim. In some cases the participants accused the police of working with the perpetrators. Some farmers indicated taking the law into their own hands when they apprehend the perpetrator as a solution to which they are forced to resort.

The livestock seems to be stolen in large quantities, resulting in major losses. For instance, according to a male respondent in a focus group discussion in Marble Hall, "[T]*hey can steal 20 [or] 50 goats at night when we are sleeping and we do not have security [as] we live in the rural areas".* Another male respondent in an in-depth interview in Marble Hall stated that his father's entire kraal of 52 goats had been stolen. The farmer also stated that cows had been stolen from him on three different occasions, and that the prevalence of stock theft resulted in most of the kraals being closed (a consequence that was reiterated by many respondents). Many respondents said that animals were stolen from kraals at night.

There is a trend once again, to blame farmers for their ills, with an official from the DOA suggesting that stock theft is often a coordinated activity of one group of farmers against another. "*[T]hey [farmers] steal from each other. In livestock farming currently they steal from each other. These people are in groups; this group will steal for that one and so on".* Another explanation, also offered by a Departmental official, attributes stock theft to a cultural/ traditional difference between Ndebele and Setswana (two cultural and linguistic groups living in the area) people, where the former have "too many traditional ceremonies" which results in them stealing the cows of Setswana people:

> *The Setswana people complain about the Ndebele people saying they are the ones who steal their cows because they are traditional people and they have too many traditional ceremonies that include slaughtering of cows during Initiation ceremonies, weddings and other ceremonies.*

These may be considered to be cynical motives provided by departmental officials, and are contrasted by the explanation of stock theft by a male farmer in a focus group discussion who attributes theft in his area, simply to: "Poverty".

Female farmers in Marble Hall stated that although they like farming, stock theft led to a great deal of stress and that the size of animals does seem to contribute to their theft. As one female farmer in Marble Hall put it, "*Thieves would just enter the kraal at night put a goat on [their] shoulder and take [it]"*. This is echoed by another farmer in the area who says *"With goats it [theft] is worse"*. Farmers also suggest that increases in farmers' livestock herds results in these being targeted for theft. As one male farmer in Rhenosterop states, this has a circular effect, as theft then also becomes a major deterrent to growing ones herd: "*I only have 5 goats. I'm afraid to farm more because of the theft in the area…"* While farmers do acknowledge the positive impact that increased prosecution of thieves has had, the persistence of theft has resulted in discouraging many farmers from farming altogether: "*We used to have goats and sheep, and we even managed to educate our children selling goats and cows but now we have given up all that because they [thieves] are taking from us."*

Providing an instance of the extreme effect of stock theft on farmers, an official from the DOA in Rhenosterkop states that the loss of 45 cattle due to theft resulted in an old man having a heart attack (a week later) and dying. Farmers consequently employ different methods to prevent livestock from being stolen, including forming forums in order to alert each other when they see something suspicious, as a male farmer in Marble Hall stated. Female farmers in Marble Hall indicate that they have formed a group in the area through which those who have lost cows assist each other to search for them. A female farmer in Marble Hall also states that branding cows enables them to be more easily identified, which is of great assistance in retrieving lost cows.

Photo 7*: ARC team tagging cattle at Nguni cattle project in the Siyabuswa area*

With stock theft, once again, transport is an issue. The fact that the thieves use transport while the farmers usually do not have any means of transport to chase after the thieves or with which to help them in their search for the animals is a major impediment to retrieving stolen livestock. The farmers are then completely dependent on the police and yet "*We don't even know how far the thief will be by the time police arrive"*, as a male farmer from Marble Hall states. The lack of confidence in the police is shared across the two regions. For example, a male farmer in the Rhenosterkop region states that despite reporting stolen livestock to the police, the fact that *"every cow has a mark and a number"* and that these could be used by police to easily identify them at points of sale such as auctions, "*it's rare for the police to call you and tell you they've found your cows".*

Frustration with the inability of the police to arrest people and/ or retrieve livestock leads to community members taking action themselves against those responsible for theft. A female farmer presents the case as a form of assistance to the police who, prior to the interventions by the community, "*were unable to arrest these people… It is only now when the community starts to take action in arresting those people now (that) the police are able to work."* The respondent suggests that the action taken is of a violent or unlawful nature. The punishment meted out to stock thieves can be fatal as a male farmer from Marble Hall states in a seemingly matter-of-fact way: "*His children are also thieves and they killed the other one because he was stealing the cows around that time".* A female respondent from Marble Hall urges that government "*allow us to take [the] law in[to] our [own] hands so that if we catch a thief we must deal with him our own way".*

Lack of infrastructure and facilities

The lack of infrastructure is a finding that was articulated by several of the small-scale farmers and they experience the impact of this problem in many ways. For example, some of the farmers reported that as a result of lack of fence construction the loss of livestock (and theft, as discussed in the preceding section) is a daily and painful reality. This finding is consistent with the study conducted by Masiteng and Van Der Westhuizen (2001) who discovered that farmers do not have fencing, access to roads, irrigation systems and equipment. This point is illustrated by a government official: "*It is just that the major problem is that they don't have fences; their camps are not well equipped. Some don't have infrastructure […] where they can put their cows".*

The reply of one of the farmers, when asked if he would allow his son to undertake livestock farming, illuminates the stark reality of inadequate infrastructure in the lives of many farmers, and the inability to encourage or incentivize future generations to invest in livestock farming: "*I'll tell him to get a kraal first or he is going to struggle like me […]".*

Natural Resource constraints and natural disasters (such as fires)

Water shortages, poor rainfall and climate change issues

Farmers in the Rhenosterkop area complained about the lack of rain:

> *[Res1:] The rain here is very scarce, but when it starts to rain it becomes heavy rain…[Res2:] And when it becomes dry, it takes a long time to rain and then we have a problem. Like now you see winter is coming, and there is no water. People like to set the field on fire and water might take two days without coming out of the tap, and there is no rain.*

The lack of rain means lack of grazing for cows, and the lack of good grazing means cows cannot produce milk and cannot be milked.

A female farmer in Marble Hall states that, while in the "olden days", rain was abundant, people were now constrained in efforts to feed themselves and their families by the lack of water, which also has an effect on people's health:

> *There is no rain we struggle with water for the plants, we no longer plough because of the water and municipal water can be closed for a week sometimes so is another problem, our plants die and now we cannot eat and live just like long ago, so that we don't get the diseases like high blood pressure and others.*

An NGO working with livestock communities in Limpopo agreed that one of the major challenges affecting their implementation of projects in the province is drought because of its effects not just on grazing land but also on crop failure and for human consumption.

One recommendation that emerged to deal with climate pressure is that policy direct people towards keeping goats rather than cattle. Goats are hardier animals and more resilient to disease and climatic conditions and cheaper to acquire for poor households and should therefore be encouraged. They are the "poor people's cattle", "in tune with environmental change" (where climate change is radically changing the kind of vegetation that is able to grow), "*So a lot of rural household would do very well if they could keep more goats".*

Impact of veld fires on farming

Farmers were also critical of the lack of training provision on the part of government officials regarding incidents of fire on grazing land which can cause serious harm or even result in the death of livestock. This is a salient issue especially considering that The

National Veld and Forest Fire Act No. 101 was passed in 1998. This act was promulgated with the sole purpose of preventing and combating veld, forest and mountain fire and therefore reducing the damage and losses caused by fires to including to livestock (Westhuizen, 2009). Furthermore, according to the Constitution, fire-fighting services are a Local Government function (the arm of the government which is supposed to be close to the farmers). Even more so, the farmers did not report any interventions from The Fire Protection Associations which were established under The National Veld and Forest Fire Act No. 101 of 1998. The problematic nature of this issue is captured in the views expressed by some participants in the study:

> *[Res1]: Yes fire is a problem do you know what they do sometimes as a person passes on the road will light a cigarette and throw it down then it will start fire , then our cows will be nervous. [Int:] How do they react when there is fire, how do you protect them from catching fire? [Res1:] They run away, immediately when they see fire you would see them running away, they just check which direction is the wind blowing that is where the fire is going so they will go the other way […]*

In their study, which Masiteng and Van Der Westhuizen conducted in (2001) this particular issue was a key finding as their participants observed that without the intervention of the DoA, their likelihood of survival in the event of disaster such as drought or fire would not suffice.

Issues related to government policy vis-à-vis smallholder farmers

Two things emerged strongly in relation to government policies around smallholder livestock farming and farmers: 1) There was a significant amount of criticism and critique of government policy from farmers and those disconnected from government and 2) there was a noteworthy tendency across government officials – both health practitioners and those involved in other areas, such as Animal Production for instance – to criticize and blame farmers for the problems and lack of change and development in smallholder livestock farming.

Stocking rates, overgrazing, and acrimony

A common point of contention between farmers and government officials from the DOA is the issue of stocking rates (how many livestock farmers choose to keep), which government officials insist is the cause of overgrazing, which has a knock-on effect on animal health and wellbeing. The result has been the rise of suspicion of government authorities created in small-scale livestock farming communities, because government officials are constantly placing pressure on farmers to lower their stocking rates:

> *So now I am scared to even tell you I have cows … After telling you how many cows I have, you will request my ID document and make as if you are helping knowing that you are planning something else with my cows.*

Farmers remain resolutely resistant to the policy of reducing stocking rates. One DOA official relates his experience, which highlights the levels of suspicion on the part of farmers and incredulity on the part of government officials who cannot understand why farmers do not see what is obvious to them:

> […] *I went on the first Monday, I spoke to them about killing the invalid cows. […] So when I was with them the second time, they thought the first time I was here I said they must kill their cows […] I have found a challenge; I saw that time that these people don't agree with me […] But I was just trying to show and give them advice because this is a situation and they are here to compete by how many cows you have. This matter is here and existing, I have not seen it personally but I know it is here.*

An academic we spoke to suggests that the fear of stocking rates on the quality of grazing land on the part of government officials and animal health practitioners is misplaced:

> […R]*angeland management or rangeland science if you like, particularly in semi-urban areas, suggest that stock numbers are not a credible variable, but because climate is so variable […] you get other kinds of episodic events like disease, this play[s] [a] far more important role in regulating stock levels.*

This raises the question of whether there is a "misconception" (as one of our interviewees insists) that overgrazing is a major problem (a core challenge we were told smallholder farming faces, by both government officials and animal health practitioners)? For animal health practitioners, the argument about overgrazing and stocking rates is often an argument about *why* farmers are unable to prevent diseases: poor nutrition due to the unaffordability of nutritional supplements for farmers to feed livestock and poor grazing as a result of high stocking rates leading to overgrazed land means that many animals cannot survive the winter.

The academic we spoke to suggests that debates around stocking rates need to be seen within a wider policy context where government officials impose a commercial understanding and model of farming system onto smallholder farmers:

> …[I]*f you set up from the start with now that we need specialized livestock production systems with commercial objectives and this requires maximum output of milk or meat per hectare, per animal therefore we going to go in with the presumption that stocking rates need to come down. We going to go with the presumption that diseases [are] problems derived from stocking rates. That is a*

set of assumption which doesn't derive from the understanding of these farming systems, those breeds, and those environments themselves it's imposed from another model. So people are bringing inappropriate frameworks, assumptions, ways of thinking…

It is the case that DOA officials are emphatic about the need for stocking rates to come down as high rates affect grazing land, and that there is an idea that farming 'commercially' (acknowledging that different conceptions of what this might mean exist across individuals) is important:

We are trying very hard to instill the notion of saying you need to farm commercially not the old way to say you are proud with having big cattle but they don't help you with nothing so we [are] trying. [O]thers they are getting there but others they are still refusing to sell their cattle that's why the number of cattle versus the grazing camp." Another DoA official says: "[…] T*he thing is these people are too many and each one of them want their cows to multiply. They do multiply and they don't sell them.*

The commercial model of agriculture and government policy

There is significant frustration with government programmes and projects in livestock farming and rural development from both farmers and some animal health practitioners. The failure of most (if not all) projects mean there are no existing models of success in terms of livestock development programmes that can be used to build on:

…[T]he problem is that we haven't succeeded with those we have started with, we don't have a model that works and there's nothing that we could point out and say it's working because if we had a model that works then we could point and say let's build on that, you see.

This is attributed to a) poor leadership and b) poor management, by the state vet we spoke. He/she stated that these failures point to a need for "*a leadership with a vision of wanting to serve people".* A male farmer in the Rhenosterkop area shows frustration with government officials not attending to farmers' needs and requests (in his instance, the request for erection of a kraal), saying that for these officials: "…*[A]s long as they get paid, it is none of their business".*

Using the commercial farming system as a model is cited by a respondent as a major reason for the failure in government's initiatives:

[…] It *doesn't work because it's completely different socio-economic situation […] [which] doesn't really take seriously small scale system, household based, family*

based farming systems with very different kinds of objectives, constraints opportunities, technological challenges.

He/ she stated that there is a need instead to understand the smallholder sector and farming systems in a more nuanced manner. For instance, the diversity of the smallholders needs to be recognized and taken seriously by policymakers. Smallholders can be divided into four categories, each of whom has different needs, and each of whom also makes up different percentages of the national smallholder population:

- 2.5 million households = "*large groups of subsistence- orientated small holders who basically engaged in agriculture whether its vegetable gardening or cropping or livestock production as a supplementary source of food and that's the largest number"*
- 250 000 households = "*engage in agriculture […] as an additional source of cash income, in other words they are selling. And they may consume some of what they produce but they also produce cash[…]"*
    - 10 000 = integrated into "tight [and formal] value chains" (they have contracts with big retailers like Pick n Pay for instance). The fact that they are becoming commercial or "small-scale capital farmers" is represented by the fact that 1) they depend on access to finance, and 2) their orientation is basically to the market.
    - The bulk of these smallholders supply in a loose value chain: "*They don't have the tight requirements of quantity or quality that a contract requires.They sell in the informal market, they sell the bakkie traders, and sometimes they sell to local spar supermarket but not in terms of contracts".*

These distinctions are important for policymakers to recognize and to seriously consider in order for policies and programmes to be correctly and effectively targeted, or else "*we are going to be trying to tell people to do something which they're actually not interested in doing or can't do".*

The critique of government includes the idea that government (and the private sector as relevant stakeholders) are providing the smallholder with "zero support" according to one interviewee "*in terms of appropriate, dedicated farming system specific support for what they do".* An instance of this might be in the policy of acquiring and providing land to farmers which requires them to move far away from their current homes (as far as 120km). According to one frustrated government official: "[T]*hen they say they can't leave their families so we have that kind of situation whereby we really struggle to convince them".*

While for government officials this represents an instance of the 'stubborn' mindset of farmers, for others this would be an instance representing the two underlying reasons for the failure of most government agricultural development programmes: a) a fundamental failure to properly understand the farming systems of rural communities:

> *Generally government's programmes are remarkably ineffective and a huge amount of money [has] been wasted e.g. on buying thousands and thousands of tractors, dumping them on the department of agriculture. There is no real programme to offer them to farmers in a dedicated way [so?] they just sit there […] and extension officers handing out free [medicines?] on [a] random basis. So […] increase the amount of money being spent but in a very untargeted way, [in the] mean time the extension services continues to be demoralize[d], and trained in an inappropriate way. And we desperately need this new extension policy to kick in and start to revive the extension service[s], but more fundamentally we [need] a whole reorientation on how we think about small to medium scale agriculture.*

And b) the need for government policy to be shaped in a less top-down manner; rather policy needs to take into account existing systems and not simply dismiss these:

> …[R]*esearch and extension support should be about address[ing] farmers' needs, just listen to them, let's not tell them they're doing the wrong thing and they need to adopt a different system, that might be completely inappropriate (and I think it is).*

The academic we spoke to describes why 'understanding' farmers and their existing farming systems is better than 'prescribing' a solution:

> [An] *important objective reason for understanding the system is to understand why people do as they do, what are their objectives, what are their farming objectives and what are their livelihood objectives. And in this kind of system often the more stock you have the more benefits you get […].*

He continues to say that there is, for instance, a need for more integrated farming systems, combining livestock and crop farming. At the smallholder level, the relationship between crop and livestock production should be/ is strong. The academic makes the final point that policymakers need to recognize that the "internal logic" of such integration would push farmers to have more cattle:

> *If you want to have a draft team of two oxen of the sustainable basis you need a minimum herd's size of twelve of more, because you need some cows, you need a bull, they are going be young oxen, they are going to be young cattle's to replace all the older cows. So if you have less than twelve cattle's and you engage in crop production and you even plough with these animals an inherent drive to increase the animals to at least a minimum of twelve obviously it will be better to have sixteen or twenty and that internal necessity or logic of increasing the herd is not understood by people who don't understand this whole farming system, that's the logic we are trying to explore here.*

Other issues that emerged

Politics of Management

Several DOA officials highlighted concerns from their side that impact service delivery to farmers. These range from bad leadership to agreements that are not implemented. For example, one participant reflected:

> *I don't know if it's only the leadership from here but it is not sufficient. Sometimes I will not attend their meetings because they are not implementing what they have spoken about in the meeting, I won't go just because I'm supporting my work environment".*

Another said that a bad work environment also impacts on their ability to deliver: "*Totally, when it affects the service delivery and yourself it also demoralizes you. And then being unhappy at the work environment affects your productivity".* Another official highlighted the changing of appointments of DOA staff with farmers by higher-level bureaucrats at the last minute:

> *As you prepare to attend those people you called, they say you must not go there anymore, there is a meeting, and this meeting I only knew about it yesterday. I already have an appointment that's why I just say I forgot about this meeting.*

Based on some of these experiences, service provision and relationships with farmers become compromised, resentment builds up and relationships with the communities also fail. But it is also policy concerns that have bearing on small-holder farmers, as outlined in a next brief section.

Record keeping of livestock related activities

Record keeping is poor at all levels within small-scale livestock farming in the areas we worked in. A DOA official from Rhenosterkop had this to say when asked about record keeping: *"[Int]: But do you keep records of how many farmers in your area and how cows they have? [Res:] No currently we don't have it. But in actual fact I should have it on their profile."* This is supported by a comment from an AHT from Marble Hall who reflects that:

> *Our farmers don't have record keeping, they don't even keep it because that's the problem [...]and sometimes you don't even know if the animals, some of them if the animal is sick or if the animal dies you won't even know they don't even tell you until maybe you go to the crash pan.*

Key findings in broad terms

- Livestock serves a particular economic utility (nutrition; education; household survival) but also possesses social and cultural capital in these farming communities.
- These are primarily communities of livestock keepers rather than livestock farmers
- Poverty is a factor in the lives of these rural livestock keeping communities.
- Gendered arrangements and gendered behavior abound that impact on women and men differently (and such gender regimes have an impact on a variety of components) in livestock pathways in these communities.
- Land is problem that has historical roots, and is a problem that is compounded for black, rural small-holder livestock keepers.
- Animal healthcare poses several challenges for these communities in terms of access to medication, and efficient provision of animal healthcare services.
- Famers' knowledge of disease and disease management practices demonstrate limitations that compound animal well-being.
- Many challenges abound that negatively impact on livestock farming and animal healthcare (including quality service provision; transport; distance to towns to buy medications; livestock theft; livestock death from diseases; lack of adequate water and poor rainfall; veld fires; budgetary constraints by government and government policy).

Conclusions

The preceding discussion provided a description and brief analysis in broad terms outlining major insights in the qualitative dataset. The data confirms that livestock is a valuable and symbolic commodity for both men and women, viewed as both a cultural asset but also as an economic commodity (the idea that "*cows are a black man's bank*" and that *"farming is actually a traditional bank"* are important contextual insights into the world of small-scale livestock farming) that are not solely related to livestock serving the purpose of providing food and education.

There is an inherent idea that livestock is a marker of a connection to the land, soil and therefore is a form of identity. The data also confirms that there are tangible differences in respect of how men and women in the broader small-scale livestock farming communities experience livestock keeping/ farming. In several ways, gender features as a marker of important difference and has implications for how men and women are also treated and understood in the livestock pathway. The idea that women's involvement in farming

sometimes arises out of necessity rather than choice is important because it compels us to understand the social conditions that give rise to roles, responsibilities and decisions. The insight that women's presence in farming also has a positive impact on the management of household finances is important to consider.

Also notable are the challenges experienced by farmers in respect of access to and availability of adequate grazing land and water; livestock theft; the need for better training to understand diseases and their treatment; as well as access to and availability of animal medical supplies and costs of medication (which often are not free). Also insightful are perspectives provided by service personnel (such as state vets, DOA officials and AHTs) who indicate constraints in respect of poor leadership that results in lack of implementation and poor service delivery; low staff morale and last minute cancellations of appointments with farmers. There are also important considerations to be taken into account of government policy related to smallholder farmers (for instance, criticisms related to overgrazing; disputes related to stocking rates; the usage of a commercial farming system model to manage small-scale farmers; inefficiencies in policy related to farming systems).

A number of perspectives in relation to knowledge uptake indicate there is need for greater interventions to increase the knowledge pathways for male and female farmers in the provision of animal healthcare. In sum, insights in this chapter confirm that there are a complex array of problems requiring careful consideration of the socio-economic context of farmers, as well as the relationships between farmers and their households, between farmers and their communities; and perhaps most importantly between farmers and state actors (namely, State Vets, AHTs and DOA officials).

We revisit the qualitative findings and conclusions in chapter 6 in relation to relevant recommendations. In the following chapter, we turn to findings from the quantitative data, based on insights from the survey.

CHAPTER 5: FINDINGS FROM SURVEY DATA

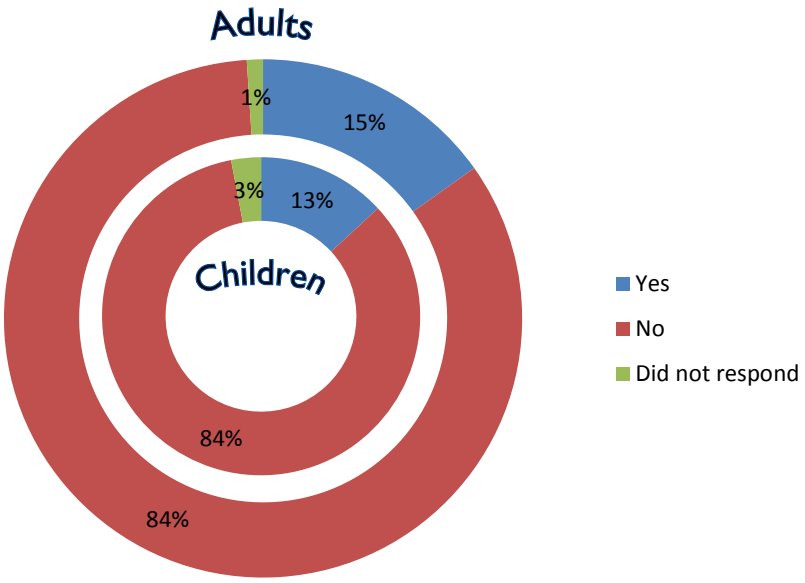
Introduction

This chapter highlights the results of the quantitative component of the study. The data was collated and analysed to obtain an understanding of the demographic profile of livestock keeping households, household farming practices and activities, practices and perceptions related to disease and animal healthcare, household food security and the gendered dimensions of all of the above.

One of the key issues of concern in this study is food insecurity in the context of small-scale livestock communities in South Africa. The data that is analysed in this chapter shows the significance of livestock farming in ensuring food security in two poor, rural communities. The chapter shows how communities with access to livestock can prevent poverty and food insecurity in many ways, confirming what is highlighted in the global development literature. Thus, the graph below shows that in the past year 15% of adults and 13% of children experienced food insecurity, which may be lower than what could be expected in other poor communities who do not have access to livestock keeping activities. It should be noted however that, nationally, the level of food insecurity is 11.5% and this is considered high for a "developed middle income country" (Hendriks, 2013:2). Government has stated that 22.7% of the population "has insufficient access to food" and the geographical location of food insecurity is "particularly in rural areas", with the causes including "a declining trend in subsistence food production, [and] the cost of food relative to the incomes of the poor" (The Presidency 2014:65-66).

As will be shown through the discussion below, livestock farming combats food insecurity through household consumption of animal products, livestock as a store of economic value, and the sale of livestock (as a source of household income, rather than as a commercial activity).

***Figure 6**: Household Food Insecurity*



The aim of this chapter is to understand farming practices in two areas along the Limpopo/ Mpumalanga border through a quantitative lens. This chapter aims to shed light on knowledge, attitudes, practices, and behaviours (KAPB) of male and female headed households in a sample of 85 famers in the region. Survey questionnaires formed the basis of the quantitative analysis (The questionnaire can be found in Annexure B). Through this process, the study explored whether there are gender differences in knowledge, attitudes, practices, and behaviours related to livestock and crop farming activities. This understanding will help determine whether there are any changes in terms of methodologies to better understand farming KAPB as well as any recommendations that can be made for future research.

The first part of this chapter highlights the demographic details of participants – with a total of 85 persons being surveyed during May 2014. The follow-up section is an analysis of the farming and animal health practices of the communities and households to which the respondents belong, which will be presented using frequency distributions and cross-tabulations. Data will be presented graphically where possible.

Results

Key findings and tables that clarify these findings will be provided in text, while detailed tables are provided in Annexure A.

The first section provides demographic details of the respondents.

Demographic characteristics of respondents

The sample comprised solely of African participants. The gender breakdown of the household head is as follows: 76% male-headed and 34% female-headed.[20] Most respondents were household heads (89%), 6% were the partner/spouse of the household head and 4% were the children of the household head. Males formed a larger part of the primary respondents (N=60, 71%) with the median age of the primary respondent being 63 years. Almost half (N=40, 47%) of respondents indicated that they had no formal education. Smaller portions indicated they had at least some level of primary (N=17, 20%) and secondary education (N=21, 25%) with only a fraction (N=3, 3%) having obtained a tertiary level of education. No observable difference was noted between male and female respondents regarding education level (Table 4).

***Table 4**: Education Level by Gender*

	Education Level (row %)									
Gender	**No formal education**		**Primary**		**Secondary**		**Tertiary**		**Not specified**	
Male	28	47%	12	20%	15	25%	2	3%	3	5%
Female	12	48%	5	20%	6	24%	1	4%	1	4%
Total	40	47%	17	20%	21	25%	3	3%	4	5%

Most respondents engaged in full time employment off the farm (N=35, 41%) with only 15% (N=13) indicating that they were employed on the farm full-time. While almost a third (29%) of respondents indicated that they were unemployed, they did still engage in farming activities, even if not for remuneration. As a general rule, there was no part-time work, either on or off the farm (Table 5). Men are more likely to be engaged in off-the-farm rather than on the farm work (50% as against 15%). The fact that unemployment is significantly higher for women than men (44% as against 23%), suggests that women are engaged in non-income generating work both outside and inside the household farm. The most important conclusion we can draw is that men are more likely to be engaged in income-generating work both off and on the farm, whereas women are generally not engaged income-generating labour.

Table5: *Employment status by Gender*

	Employment Status (row %)													
	Work off the farm (full time)		Work on the farm (full time)		Work on and off farm		Work on the farm but within the home		Unemployed		Other		Not specified	
Gender	N		N		N		N		N		N		N	
Male	30	50%	9	15%	1	2%	1	2%	14	23%	3	5%	2	3%
Female	5	20%	4	16%	0	0	0	0	11	44%	3	12%	2	8%
Total	35	41%	13	15%	1	1%	1	1%	25	29%	6	7%	4	5%

Of those respondents that indicated their years of farming experience (N=55, 65%), their farming experience ranged from no experience to as much as 60 years of experience. Three-quarters of farmers have more than 7 years of farming experience, whereas a quarter of farmers had more than 30 years of farming experience.

A quarter of female respondents have only had up to 2 years of farming experience and three-quarters have had up to 21 years of farming experience. For male respondents a quarter had up to 8 years of farming experience and three-quarters up to 31 years of experience. This confirms that farming is a male-dominated activity. We can assume that women are more engaged in domestic labor and caring functions within the household. The lengthy years of farming experience should be understood in relation to the fact (Table 5) that only 15% of men and 16% of women engage in full time farming activities, which suggests that farming experience is not part of full-time careers but rather part of family traditions that supplement other income ventures.

About half (N=42, 49%) of the respondents were part of a livestock farming association (LFA), while forty-three percent (N=37) indicated they were not

Farming Activities and Facilities

Most respondents indicated that the land they were on was not owned by themselves or their families (N= 48, 56%), while thirty-four percent (N=25) indicated that the land did belong to themselves/their family. Fourteen percent (N=12) did not respond to this question).

Of those respondents that indicated they themselves or their family did not own the farm they were on (N=48, 56%), 25% (N=12) indicated that the land was rented/leased from the tribal authority in the area while 2% (N=1) rented/leased it from the municipality and 2% (N=1) from a private owner. Irrespective of land ownership, in terms of land that is

used for grazing, 69% (N=59) of respondents indicated that they used community or public land for grazing.

Table 6: *Person who primarily manages day-to-day farming activities by gender of household head*

	Who primarily manages day to day activities on farm (row%)											
Gender of household head	**Self**		**Spouse**		**Son/ son-in-law**		**Daughter/ daughter-in-law**		**Hired Worker**		**Other**	
	N		**N**		**N**		**N**		**N**		**N**	
Male	38	58%	0	0%	3	5%	1	1%	21	32%	2	3%
Female	5	25%	1	5%	0	0%	0	0%	13	65%	1	5%
Total	43	51%	1	1%	3	3%	1	1%	34	40%	3	3%

There is a division of farming labour between people who manage their day to day farming activities themselves and those who hire workers (51% of those interviewed manage their own farming activities and 40% hire workers to do so) (Table 6). Male household heads and male respondents are more likely to manage the day to day activities themselves (63%), compared to female household heads and respondents who primarily hire someone to run the day to day farming activities (59%) (Table 6). This again confirms that livestock farming is a male activity in these communities, because even when women own livestock the task of managing and taking care of livestock is delegated to (male) hired workers.

Asset Ownership[21]

Ownership of household and farm assets is used as a proxy for economic wellbeing. Roughly two thirds of households had a stove, a fridge, and a television. One third of households reported having a household car (Table 7). The large number of people who do not have access to their own means of transport (62%) is discussed further in the qualitative findings, a) as an impediment in terms of access to animal health services and medicines, and b) increased vulnerability to stock theft. A small portion of households reported owning multiple assets. A significant number of households do not own a stove (36%) or a fridge (25%), which are basic necessities and points to the impoverishment of many households in these communities. No fridge has implications for storage of vaccines. Vaccines have to be stored at 4 degrees at all times.

***Table7**: Household asset ownership*

	Household Assets (N, Column %)							
	Stove		Fridge		TV		Car	
Ownership	N		N		N		N	
Does not own	31	36%	21	25%	28	33%	53	62%
Owns at least 1	54	64%	64	75%	57	67%	32	38%

People owned far less farming assets than they did household assets. Eight percent of households had a water pump on their properties, 5% had at least one animal shed, 20% owned an automated insecticide/water spray and only 5% of households owned at least one ploughing tractor.

***Table8:** Farm asset ownership*

	Farm Assets (N, Column %)							
	Automated insecticide/water spray		Ploughing tractor		Water Pump		Animal Shed	
Ownership	N		N		N		N	
Does not own	68	80%	81	95%	78	92%	81	95%
Owns at least 1	17	20%	4	5%	7	8%	4	5%

In summary, limited household and farming asset ownership show that extreme poverty is prevalent across these communities.

Livestock

Record keeping

Most (N=64, 75%) households do not keep written records of increases or decreases in livestock levels, with only twenty percent (N=17) of households keeping records (N=17, 20%). This translates to 14% (N=12) that keep records of animal births, 15% (N=13) that keep of animal deaths, 3% (N=3) that keep vaccination records, 5% (N=4) that keep records of sick animals and 2% (N=2) that keep livestock calendars.[22].

Livestock ownership

Almost all the households in the survey sample own cattle (Table 9). The ownership of chickens and goats is comparatively much lower, showing the importance particularly of cattle to these communities (and raising questions about the reasons for this significance, which are explored in the previous chapter). Sheep and pigs seem to be minimally sought after by these livestock keeping communities.

Table 9: *The distribution of livestock ownership in the areas*

Type of livestock	Proportion of households	N
Cattle	94%	80
Goats	26%	22
Chickens	28%	24
Sheep	8%	7
Pigs	3%	3

Sale and use of livestock products

Most households do not use livestock for commercial purposes, as only 27% (N=23) reported selling livestock products. Of the 21 households that sold these products, these were primarily sold by the household head (N=19, 83%) and at the sellers premises (N=16, 70%), which suggests a lack of available markets for selling livestock. In most of these households (N=22, 96%), money from the sale of the livestock/livestock products goes to the household head (for both female and male-headed households). Of those households that sold livestock products, 83% (N=19) were male-headed households. This suggests again the dominance of males in farming activities.

The breakdown of figures for each of the different livestock species (see Table 10 below), suggests that the sale of livestock products is highest for those households involved with chicken rearing. While most households own cattle, very few sell any products (such as milk, meat or hides) from their livestock.

Table 10: *Proportion of households that sell livestock products*

Type of livestock	Proportion of households	N
Cattle	26%	21
Goats	23%	5
Chickens	50%	12
Sheep	29%	2
Pigs	33%	1

The high level of household consumption of livestock suggests that livestock is mainly kept for food security (rather than for sale in the market) (Table 11). The fact that a significantly higher percentage of households use chicken rather than cattle for household consumption confirms that chickens are of more value to food security.

Table 11: *Proportion of households who keep livestock for consumption*

Livestock type	Proportion of livestock for household consumption
Cattle	42%
Chicken	95%
Sheep	100%
Goat	50%
Pig	67%

In summary, thirty-five percent (N=30) of households report using products of their livestock for household consumption. While very few households report selling products derived from their livestock, this does not mean that the animals themselves are not being sold. In general, all livestock is kept by households both for commercial use as well as food security purposes. Chickens are more likely than other livestock categories to bring in more regular household income as well as contribute to household food security.

Cattle

Livestock Ownership

Nearly all (N=80, 94%) households kept cattle livestock, with the median number of cattle per household being eight. The household head primarily owned the livestock (85%). Of those households that owned cattle livestock, the primary reason for keeping them was for household consumption (34%) followed by sale of animal (30%). Holding cattle is a form of savings in that they are easily convertible to cash. Even though few people indicated 'wealth status' as a reason for keeping cattle, it is an inherent store of wealth in the sense that people do convert their cattle holding into cash from time to time (indicated by the high number of sales of cattle).

Sale and household use of cattle livestock products

Just over a quarter (N=20, 26%) of households rearing cattle indicated that they sold products from their cattle livestock. Household sale of cattle products were limited to meat (N=5, 25%) and milk (N=1, 5%). Thirty-five percent (N=28) of households keeping cattle indicated they utilised their livestock/products for household consumption. This comprised 30% (N=8) of households indicating use of cattle meat and 4% (N=1) that use

cow milk. The implication here may be that despite the fact that many households use certain products, for instance sour milk, as part of their staple diets, it makes more (socio)economic sense to buy sour milk rather than produce it through household labour.

Changes in livestock levels of cattle

A high percentage of households experienced a decrease in cattle livestock levels (70%) sometime in the past year. Disease was the main contributor (54%, N=30). The total decrease in cattle was 224 cattle was reported by the 56 households (See Annexure A, Appendix A for number of cattle lost to each reason for decrease).

Of the households rearing cattle, just over half (N=45, 56%) reported an increase in livestock levels sometime in the previous year, primarily through birth (N=43, 96%). A total of 177 cattle were born between the 43 households. Birth being the primary reason for increase in community cattle levels (96%), this means that purchase from the market is almost non-existent. This is in line with the fact that this is a poor community that is not engaged in livestock keeping as a commercial activity.

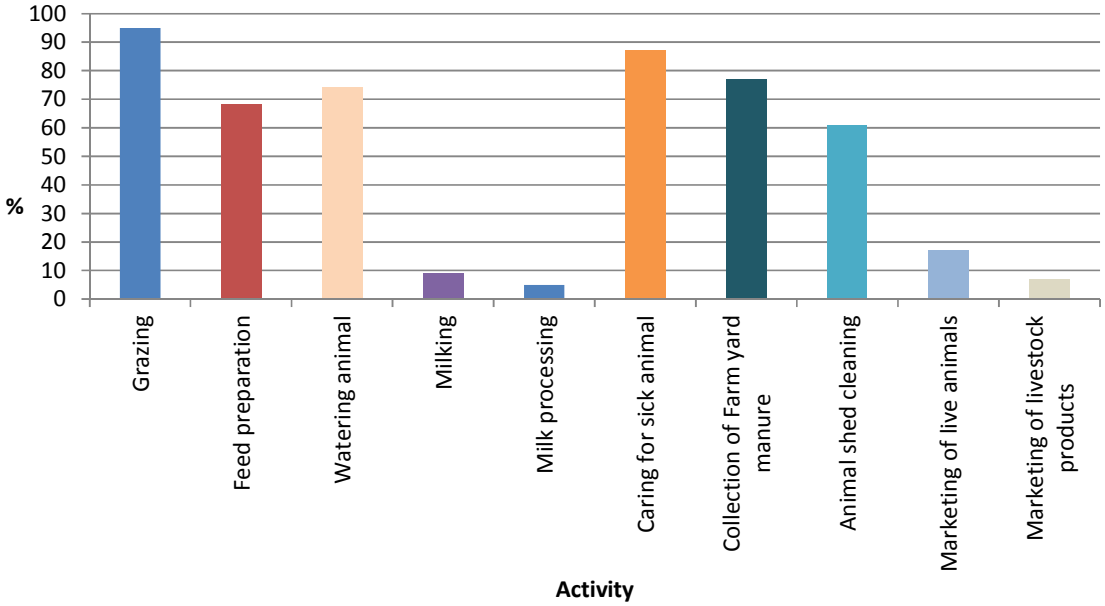
Table12: *Changes in cattle livestock levels*

			N	
Decrease	**Portion of Households rearing Cattle that experienced decrease**		56	70%
	Number Decreased	**Median**	3	-
		Range	30	
	Reasons for decrease	**Death due to disease**	30	54%
		Lost/killed by predators/accident	4	7%
		Natural death	5	9%
		Sale- urgent money requirement	2	4%
		Sale to raise funds to start business (non- livestock related)	3	5%
		Sold to raise funds to invest into livestock enterprise	1	2%
		Stock theft	2	4%
		Other	1	2%
		No Response	8	14%
Increase	**Portion of Households rearing Cattle that experienced increase**		45	56%
	Number increased	**Median**	2	-
		Range	42	-
	Increased though:	**Birth**	43	96%
		Purchase	2	4%

Cattle Livestock related activities[23]

Most households that own cattle engage in activities such as grazing of the cattle (N= 76, 95%), preparing their feed (N=54, 68%), watering[24] the animals (N=59, 74%), caring for the sick (N=70, 87%), collecting farm-yard manure (N=62, 77%), and cleaning of the animal shed (N=49, 61%). In most cases these activities are done by an adult male in the household followed by a hired worker (See Annexure A for full breakdown).

Figure 7:*Portion of households that own cattle that engage in selected activities related to their cattle livestock*



Cattle Health

Ninety-two percent (N=74) of households that rear cattle indicated which disease/symptom affects their cattle livestock most frequently. Reported diseases are not necessarily properly diagnosed, respondents were simply being asked to identify either the disease or the symptoms. Twenty-three percent (N=17) reported the most frequent disease symptom as swelling of the joints, wattle and foot pad. Eleven percent (N=8) reported diarrhoea while 50% indicated a range of other diseases (See Annexure A, Appendix A for full breakdown and outcomes of diseases). This seems to suggest that there are a range of different disease problems affecting cattle, rather than a single, dominant epidemic. This means there is generally poor animal healthcare and a need for preventative animal healthcare practices and programmes. The loss of cattle (even one) through disease translates into a large loss of wealth for poor households.

Chicken

Livestock Ownership

Twenty-eight percent (N=24) of households owned chicken livestock. The median number of chickens owned is 15. Of those households that owned chicken livestock, the primary reason for keeping them was for household consumption (75%). Chickens are a ready source of protein through meat and eggs, and the low number of households keeping chickens can be addressed in order to provide improved nutrition and dietary diversity.

Table 13: *Breakdown of Chicken livestock ownership*

		N	
Households that keep chicken livestock		24	28%
Number owned	**Median**	15	-
	Range	246	-
Person who primarily owns: Head		15	62%
Reason for rearing	**Household Consumption**	18	75%
	Sale of animal	0	0%
	Sale of animal product	0	0%
	Wealth Status	1	4%
	Religious/ traditional practices	0	0%
	No Response	5	21%

Sale and household use of livestock products[25]

Half (N=12) of the households that keep chicken livestock reported selling livestock or products of their livestock even though none of the households reported rearing chicken livestock for this reason. Although chickens are primarily kept for consumption reasons, when the need arises they are sold. Of these households, 83% percent (N=10) of households indicated selling chicken meat and 50% (N=6) reported selling eggs. Of the households that keep chicken livestock, 58% (N=14) indicated that they used products of their livestock for household consumption. This suggests that chickens are used for both commercial and household food security purposes, and this trend could be encouraged and assisted. Those using for household consumption comprised of 64% (N=9) of households that indicated they use chicken meat and 50% (N=7) of households that indicated they use eggs for household consumption. The fact that only 16 households use chickens for consumption suggests the possibility of affordable interventions (since

chickens are less expensive than other livestock) to improve both household security and act as a supplementary income source.

Changes in chicken levels[26]

Of the 24 households that rear chicken livestock, 46% (N=11) indicated that they had experienced decreases in their chicken livestock during the preceding three months. Sixty-four percent (N=7) of the households that had experienced a reduction in the level of chicken livestock indicated that this was a result of death due to disease. Again, as with cattle, this indicates that disease is a significant cause of loss in this instance with chickens (Table 14).

Forty-six percent (N=11) of the 24 households that reported keeping chicken livestock indicated that the levels of their livestock had increased in the past year. Households primarily reported increases due to birth (N=10, 91%) with one household reporting an increase due to purchase which occurred at a place other than the government livestock market, market, or sellers premises. Again, as was the case with cattle, people are not actively engaged in commercial enterprise in relation to their animals.

Table 14: *Changes in chicken livestock levels*

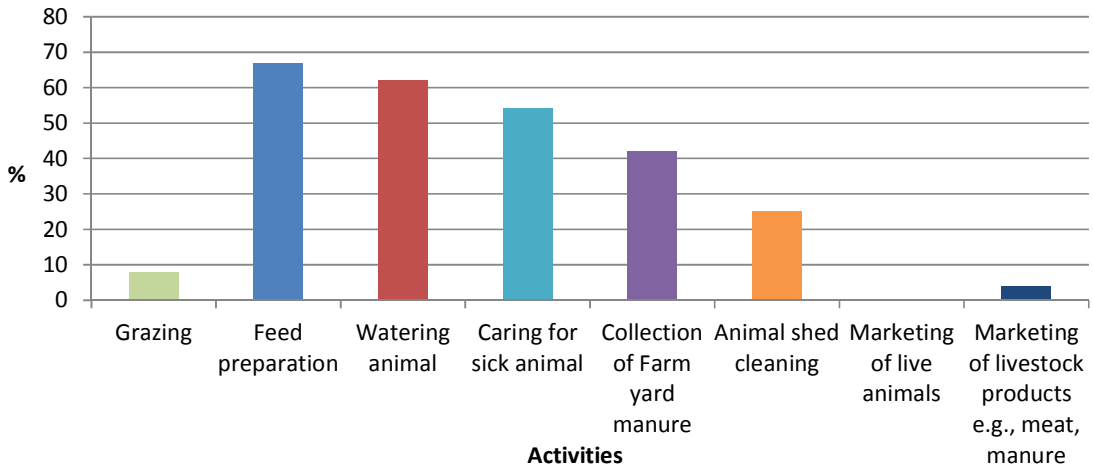
			N	
Decrease	**Households rearing chicken that experienced decrease**		11	46%
	Number reduced	**Median**	10	-
		Range	599	
	Reason reduced	**Death due to disease**	7	64
		Lost/killed by predators/accident	1	9
		Sale- urgent money requirement	1	9
		Other	1	9
		No Response	1	9
Increase	**Households rearing chicken that experienced increase**		11	46%
	Number increased	**Median**	5	-
		Range	11	-
	Increased though:	**Birth**	10	91%
		Purchase	1	9%

Chicken Livestock related activities[27]

Of the households that keep chicken livestock (N=24, 28%), roughly three-fifths (N=15, 62%) reported watering their livestock. Just over two-thirds (N=16, 67%) indicated that they were involved in some form of feed preparation. Fifty four percent (N=13) of households spent time caring for sick chicken livestock. A quarter (N=6, 25%) of

households reported cleaning their chicken shed. A small portion of households reported spending time grazing their chicken (N=2, 8%) or marketing their livestock (N=1, 4%). This again confirms the fact that keeping chicken livestock is not associated with commercial use.

Figure 8: *Portion of households that own chicken that engage in selected activities related to their chicken livestock*



Chicken Health

Just less than 30% (N=7) of households indicated which disease/symptom affects their stock most frequently. This includes diarrhoea, reported by 8% (N=2) of households, bird flu, fowl pox, liver disease and sores on the head, each of which were indicated by 4% (N=1) of households. Apart from the one household that reported their most frequent chicken disease/symptom as white diarrhoea, with the resultant outcome being surviving, the remaining households that specified the outcome of the disease indicated their diseased livestock had died. While some respondents could identify disease names, others can only identify symptoms. (Further information can be found in the tables in Annexure A, Appendix B).

Sheep

Livestock Ownership

Only seven households reported rearing sheep livestock. The low number of sheep-keeping households is confirmed by both observation and responses from the qualitative data. Further research needs to be done about the reasons for low levels of sheep

rearing. Six of the 7 indicated that their sheep livestock were reared for household consumption.

Table 15: *Breakdown of Sheep livestock ownership*

		N	
Households that Keep sheep livestock		7	8%
Number owned	**Median**	5	
	Range	15	
Person who primarily owns: Head		7	100%
Reason for rearing	**Household Consumption**	6	86%
	Sale of animal	0	0%
	Sale of animal product	0	0%
	Wealth Status	0	0%
	Religious/ traditional practices	0	0%
	No Response	1	14%

Sale and household use of livestock products

Two of the seven (29%) households that keep sheep livestock indicated that they sell their livestock (meat), the remaining portion did not indicate what products they sell.

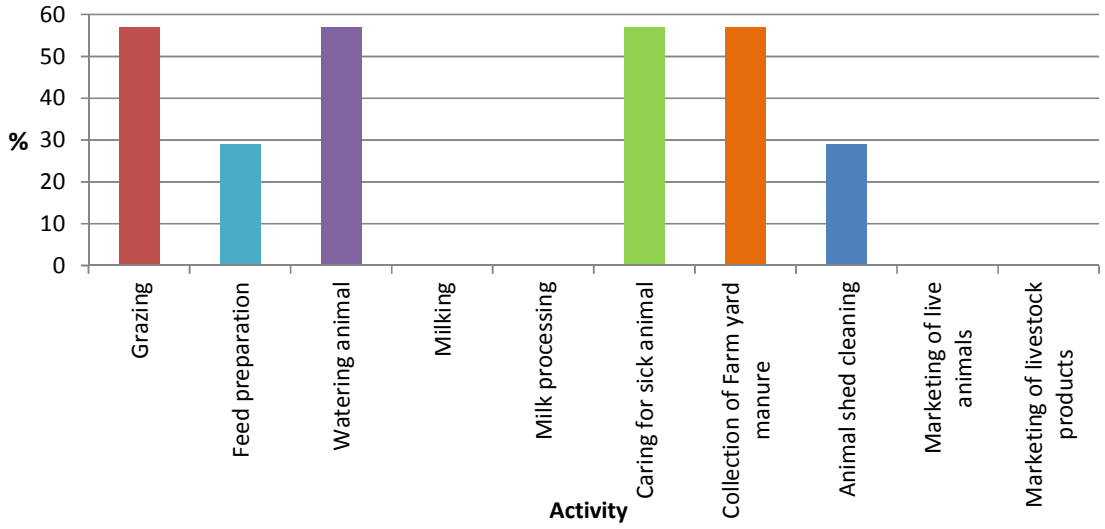
Changes in sheep livestock levels[28]

Of the seven households that reported rearing sheep livestock, only one household reported a decrease in sheep stocks in the previous year. This decrease was due to death caused by disease. It is noteworthy that loss through disease appears to be low for sheep. Two of the seven households that keep sheep livestock indicated that their stock levels have increased in the past year and both households indicated that this increase was due to birth.

Sheep Livestock related activities[29]

Almost three-fifths of households that own sheep engage in activities relating to the grazing of the sheep (N=4, 57%), watering the animals (N=4, 57%), caring for the sick (N=4, 57%), and collecting farm-yard manure (N=4, 57%). Twenty-nine percent (N=2) of households partake in activities of feed preparation and animal shed cleaning respectively. In most cases these activities are done by an adult male in the household with a few households reporting such activities being the responsibility of hired workers (See Annexure A, Appendix C for full breakdown). As with chickens, sheep do not seem to be reared for commercial use (Figure 9).

Figure9: *Portion of households that own sheep that engage in selected activities related to their sheep livestock*



Goats

Goat Livestock Ownership

Slightly more than a quarter (N=22) of households reported rearing goat livestock. Goats are generally preferred to sheep in this community, in line with our observations. Reasons for rearing goats included household consumption (41%) (Which includes consumption after ritual slaughter), sale of animal (27%), religious/traditional practices (4%) and other reasons (4%).

Table 16: *Breakdown of Goat livestock ownership*

		N	
Households that keep goat livestock		22	26%
Number owned	**Median**	7	-
	Range	25	-
Person who primarily owns: Head		18	73
Reason for rearing	**Household Consumption**	9	41%
	Sale of animal	6	27%
	Sale of animal product	0	0%
	Wealth Status	0	0%
	Religious/ traditional practices	1	4%
	Other	1	4%
	Not specified	5	23%

Sale and household use of livestock products

Twenty three percent of households that own goat livestock reported selling their livestock or products from their livestock. Forty-one percent of households indicated that they use their livestock meat for household consumption. One (4%) household reported using goat milk for household consumption. It is noteworthy that use of goat milk for household consumption is rare. This is again similar to the fact that cattle are not milked for household consumption. The remaining household did not indicate whether they sell/use any other products of their goat livestock.

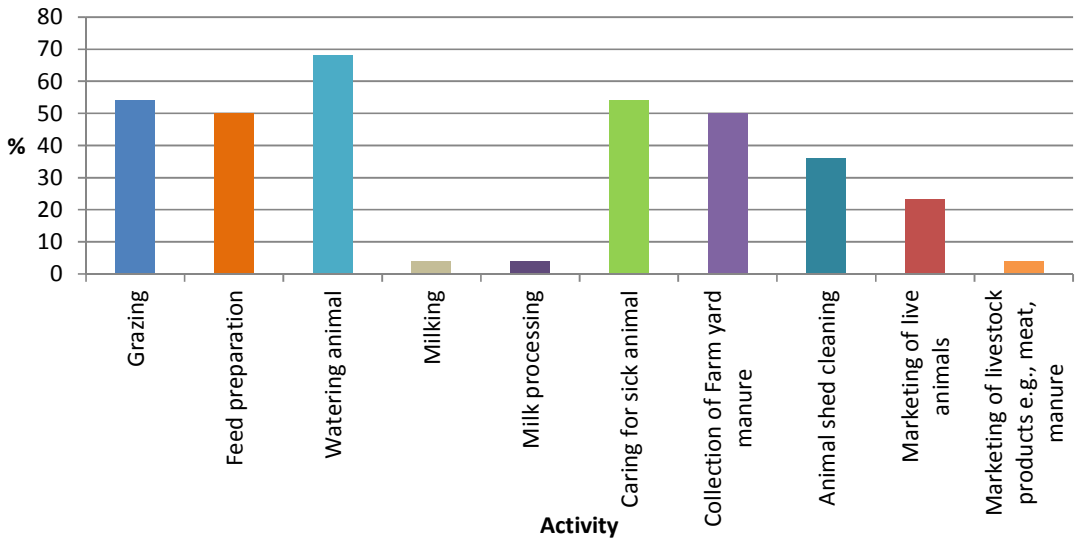
Changes in goat livestock levels[30]

Of those households that kept goat livestock (N=22, 26%), two-fifths (N= 9) indicated that they had experienced an event that lead to a reduction in their goat livestock levels in the last year. Disease is again a significant reason for loss of goat livestock, similar to other livestock. Reasons for the reduction in numbers included death due to disease (N=5, 56%), stock theft (N=2, 22%) and other reasons (N=1, 11 %). Goats also seem to be more susceptible to being stolen than other livestock and this was confirmed by reports made in the qualitative data. Nine of the 22 (41%) households that reported keeping goat livestock indicated that their livestock levels had increased in the past year. Most (N=8, 89%) of these households indicated that this increase was through birth, with only one having purchased an animal. Similar to other livestock, increases in livestock levels are through birth rather than purchase.

Goat Livestock related activities[31]

Roughly half of the households that own goat livestock engage in selected activities relating to their livestock including the grazing of the goats (N=12, 54%), feed preparation (N=11, 50%), caring for the sick (N=12, 54%) and collecting farm-yard manure (N=11, 50%). Just over two-thirds (n=15, 68%) of these households report watering their animals. Smaller portions of households reported cleaning animal sheds (N=8, 36%) and marketing of live animals (N= 5, 23%). One household (4%) reported engaging in milking, milk processing and marketing of the products they obtain from their goat livestock. These activities are done by a range of people across the sample including adult males, any/all adults, children and hired workers (See Annexure A, Appendix D for full breakdown).

***Figure10**: Portion of households that own goats that engage in selected activities related to their goat livestock*



Goat and sheep health

Heartwater is the only disease reported by more than one household (N=4, 15%). Individual households (4%) reported other diseases such as Anaplasmosis, internal parasites, foot abscess/foot rot, arthritis, pneumonia, stoma and constipation. This confirms the multiplicity of diseases which indicated generally poor health rather than the prevalence of one or two dominant diseases. People seem more knowledgeable about the names of goat diseases than the names of other livestock diseases.

Pigs

Pig Livestock Ownership

Only three households indicated ownership of pig livestock. Two households indicated their reason for rearing as sale of animal while the remaining household reared pig livestock for household consumption. Two of the three households indicated that the spouse owns the livestock. From qualitative data, we can assume that these spouses were women, which indicates that pig farming is usual a female activity. This varies from the other livestock types where most households indicated that the household head owns the livestock.

Changes in pig livestock levels[32]

Of the three households rearing pig livestock, two households reported a reduction in pig livestock in the past year. In both cases this decrease was caused by death due to disease. This is a confirmation of disease as the main cause of animal losses across all livestock in these communities. All three households owning pig livestock indicated that the level of pig livestock increased in the past year. Two of these households indicated that this increase was through birth. The remaining households indicated that the increase was due to a gift or exchange that was done at the other parties' premises

Pig Livestock related activities[33]

The households that kept pig livestock engaged in a number of activities related to their livestock. All three households reported spending time in feed preparation, watering their livestock and caring for sick livestock. One household reported spending time grazing their livestock, cleaning the animal shed, marketing live animals and marketing livestock products. Two households reported spending time collecting farm yard manure.

In one household these activities are primarily done by an adult male in the family. In the second household these activities are primarily done by adult females. The third household indicated that the activities were done by all/any adult household members.

Pig Health

Each of the three households that keep pig livestock reported a different disease affecting their livestock, these being diarrhoea, Erysipela, and internal parasites. In the latter two cases the resultant outcome was survival whereas the household reporting diarrhoea indicated their diseased livestock had died as a result of the disease. (Further breakdowns of information can be found in Annexure A, Appendix E)

Summary: Livestock

Most households in the survey sample kept cattle livestock (94%), which is significantly higher than any other type of livestock (roughly a quarter of households keep chicken and a quarter keep goat livestock). Very few households reported keeping either sheep or pig livestock. Reasons for keeping livestock were largely for household consumption or the sale of the animal. For all livestock types, respondents indicated that the livestock primarily belong to the household head (who is male in over 70% of households). Disease is the major cause of animal losses, whereas birth (rather than market purchases) is the major reason for increases in stock. Livestock related activities engaged in were primarily those involving taking care of the livestock (grazing, feed preparation, watering, caring for

the sick and collecting/cleaning livestock areas). Very few households reported involvement in marketing of livestock or the livestock products, and very few households are involved in the cleaning of animal sheds, an activity that is related to reducing disease. While livestock are valued for their meat, livestock do not seem to be valued for other products, particularly milk (but also eggs).

The primary cattle disease/symptom noted was swelling of the joints, reported by 23% of households rearing cattle; although it must be noted that 50% reported 'other' diseases affecting their livestock. Due to a high non-response rate from survey respondents around questions of disease, particularly sheep and goats, it is difficult to report this data. Less than half of those households rearing sheep and goat livestock reported the primary disease affecting their livestock. Fewer households (N=7) reported illnesses for chicken livestock. Only three households reported rearing pig livestock and here again disease was a major cause of loss.

Sale of livestock and household income

Households indicated that apart from sale of livestock they largely did not have alternate sources of income. Just less than a fifth (17%) of households indicated that they obtained income from wages and 58% reported obtaining income from social security. As the average age of the primary respondent is 63 years, this explains the high portion of households that obtain income from pensions (further breakdown can be found in Annexure A, Appendix F).

Table 17: *Income obtained from alternate sources*

	Yes		**No**		**Not specified**	
Alternate sources of income	**N**		**N**		**N**	
Food grain/ crop/ vegetable sales	2	2%	6	7%	77	91%
Fruit sales	0	0%	0	0%	100	0%
Forest product sales (herb, medicinal plants, timber)	0	0%	0	0%	100	0%
Land rent	1	1%	5	6%	79	93%
Savings money	3	3%	5	6%	77	91%
Wage income	14	16%	4	5%	67	79%
Business –shop/ trade	4	5%	5	6%	76	89%
Services rendered	1	1%	5	6%	79	93%
Remittance	5	6%	5	6%	75	88%
Pension	49	58%	3	3%	33	39%

Most households (N= 62, 73%) had an estimated monthly income of less than R4000 a month (that equals seven in ten households). Two-fifths (40%) of female-headed households indicated a monthly household income of less than R2000 per month compared to nearly two-fifths (39%) of the male-headed household sample that indicated a monthly household income of between R2000 and R4000 (Table 18). This is noteworthy as it indicates that female-headed households are generally poorer. Even though gender is related to household income, it should be noted that all households in the sample are generally poor.

However, the results above should be treated with caution as income data is not reliable; for instance, 41% of respondents indicated that they are employed full-time off the farm, whereas waged income is indicated in 16% of the cases (see table below). This emphasizes that people were reluctant to reveal their sources of income. Just less than a quarter (22%) of households chose not to answer questions related to income. In addition, for questions related to estimates of income and estimates of spending many non-responses were noted in the data. These questions are regarded as sensitive questions and there is usually a high rate of non-responses.

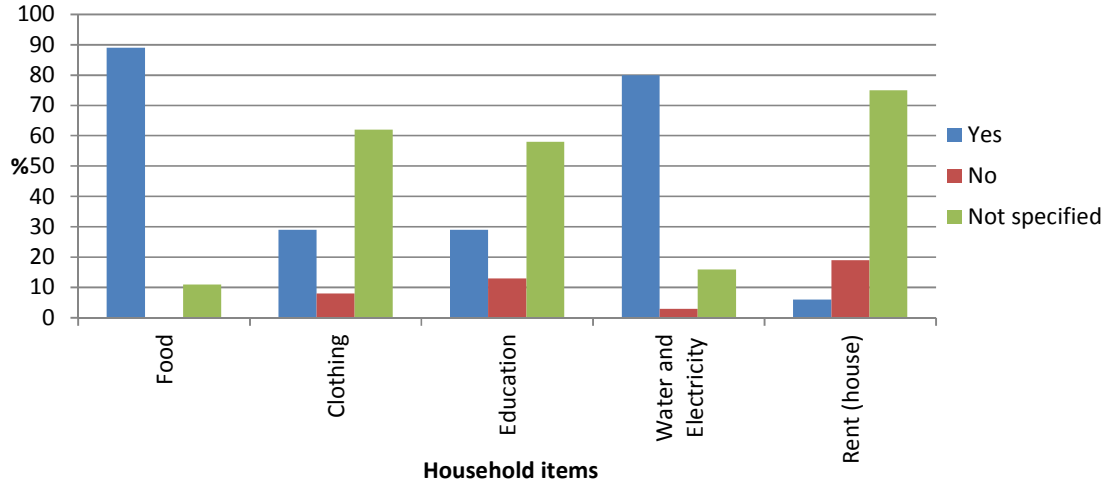
Table 18: *Total monthly household income (before tax)*

	Male-headed households		**Female-headed households**		**Overall**	
	N		**N**		**N**	
Less than R2000 per month	20	31%	8	40%	28	33%
Between R2, 000 and R4, 000 per month	25	39%	4	20%	29	34%
Between R4, 000 and R8, 000 per month	4	6%	1	5%	5	6%
Between R8, 000 and R16, 000 per month	2	3%	0	0%	2	2%
More than R16, 000 per month	1	1%	1	5%	2	2%
Not specified	13	20%	6	30%	19	22%

Household spending

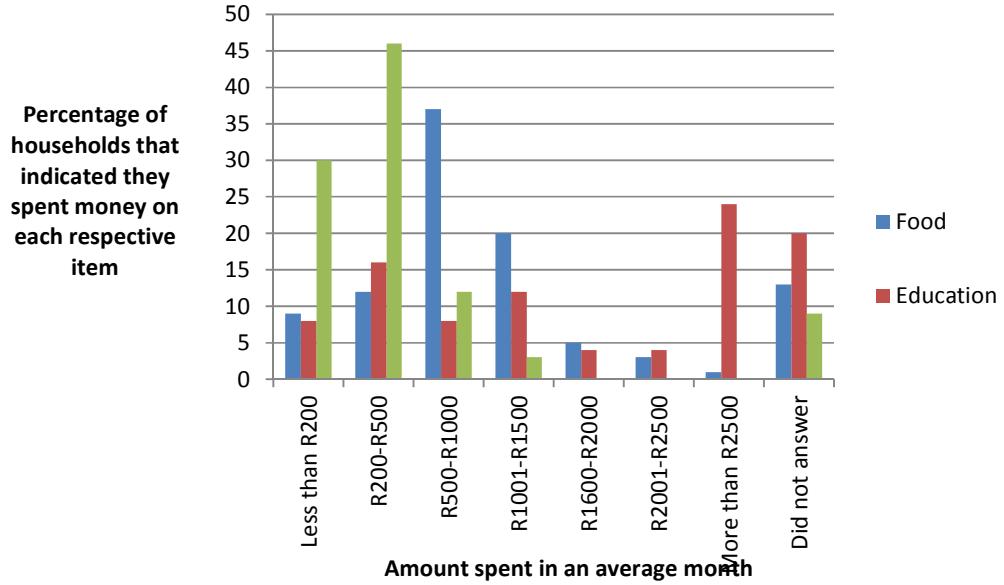
Households that spent on household related items ranged from 89% that spent on food to 6% that spent money on house rental. Just less than a third (N=25 29%) of households reported spending on clothing and on education respectively. Four fifths (n=68, 80%) of households reported paying for the water and electricity they receive. Only 6% of houses reported paying for rental of their homes.

Figure 11: *Portion of households reporting expenditure on household items*



Just over half (N=43, 57%) of households indicated that they spend between R500 and R1500 per month on food. As has been found in most surveys in South Africa, expenditure is usually higher than what is indicated in income and thus expenditure is a more reliable indicator of household income. There is a spread of amount spent on education across the sample. Just less than a quarter of the sample reported paying more than R2500 per month on education. The amount spent on education is very high. Of the households reporting spending on water and electricity, three quarters (N= 51, 76%) indicate spending less than R500 per month (Further details Annexure A, Appendix G).

Figure 12: *Spending on household items*



Farming related expenditure is lower than household consumption expenditure. Just over half (N=45, 53%) the sample reported expenditure on Terramycin and vaccines. Smaller portions reported spending on other aspects of farming like medicine (N=31, 36%), deworming (N=31, 36%) and tick dips (N=29, 34%). This indicates that animal diseases and animal healthcare are a concern for the livestock communities. Perhaps more money needs to be spent on *licks* (nutritional supplements given to cattle to lick on) as part of a preventative animal healthcare initiative. Few households reported spending on fertiliser, vegetables and *licks*.

Figure 13: *Portion of households reporting expenditure on farming-related items*

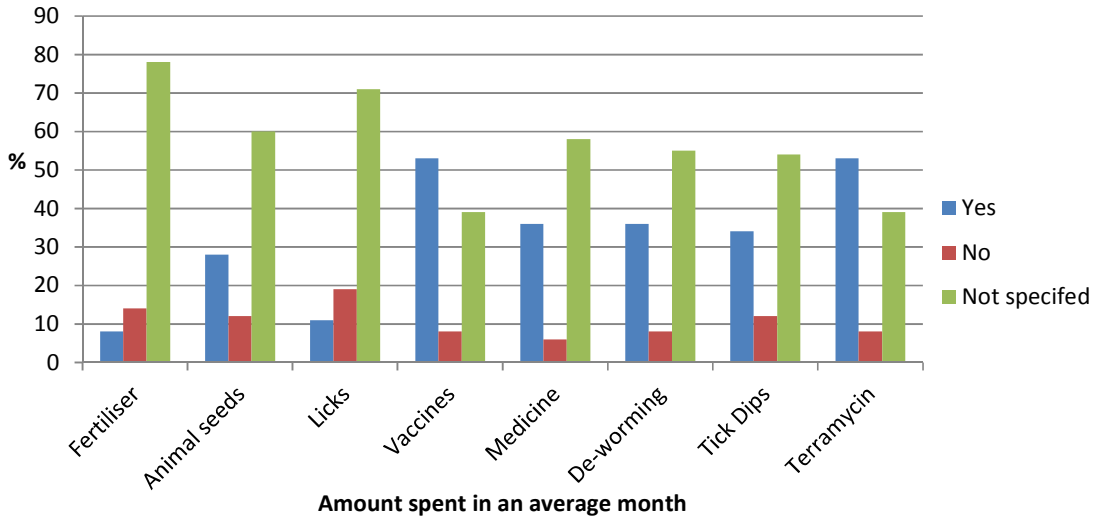
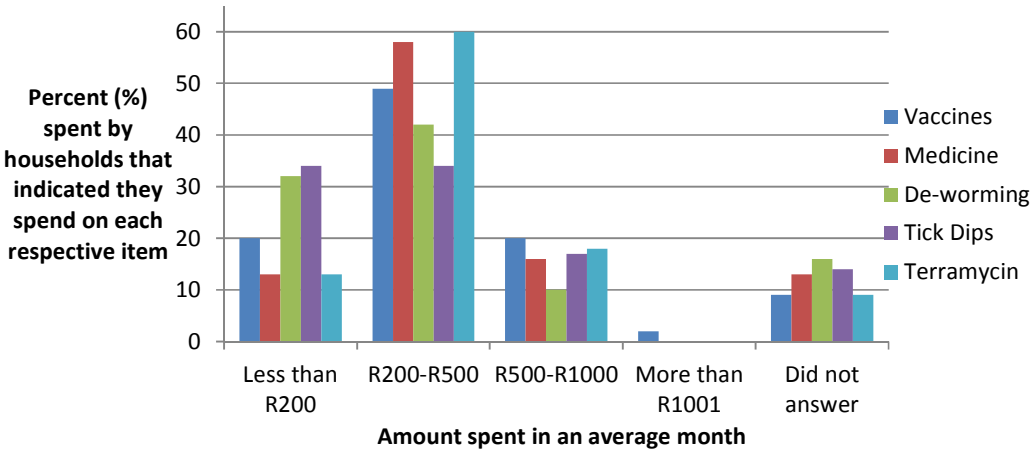


Figure 14 (below) breaks down the average monthly spending on these expenditure items. Of the households reported purchasing vaccines, medicine, de-worming, tick dips and Terramycin, most indicated spending between R200 and R500 on vaccines per month. Cognisance must be taken of the smaller sample size for the results in the table below

Figure 14: *Spending on farming-related items*



Time allocated to farming activities

Of the sample, ninety-five percent (N=81) of households indicated the time allocated to livestock farming. Most (N= 27, 32%) spent less than 10 hours in an average week tending to their livestock followed by 26% (N=22) that spend between 10 and 20 hours a week tending to their livestock.

Less time is spent on crop farming compared to livestock farming, which is due to these communities' primary reliance on livestock. Of the entire sample, only 13% (N=11) of households reported spending time crop farming (many respondents did not answer the question on hours allocated to crop farming as they are not engaged in crop farming activities). The results also indicate that livestock farming is mainly a male activity whereas crop farming is mainly a female activity. For those involved in mixed farming, males are more likely to spend more time in the livestock component compared to females.

Figure15: *Time spent on livestock and crop farming*

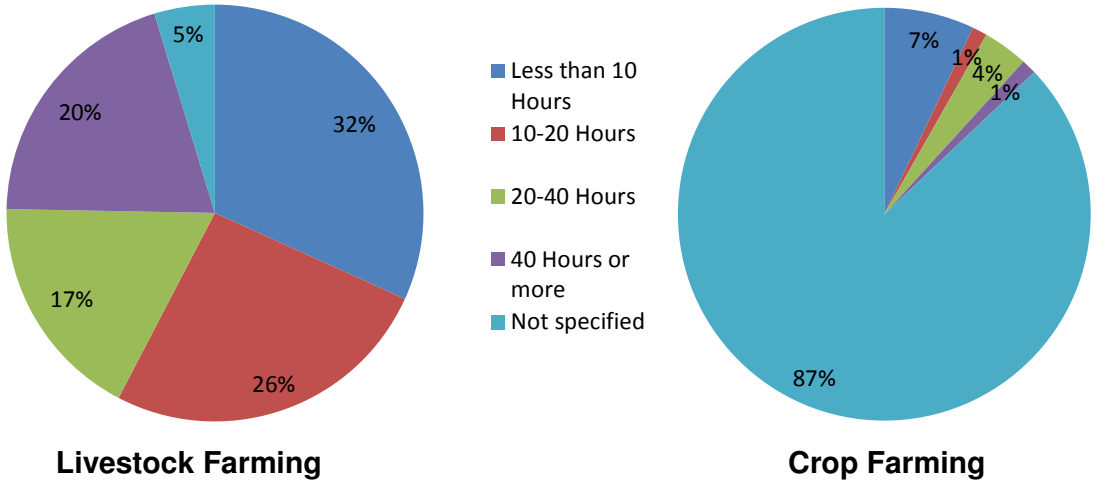
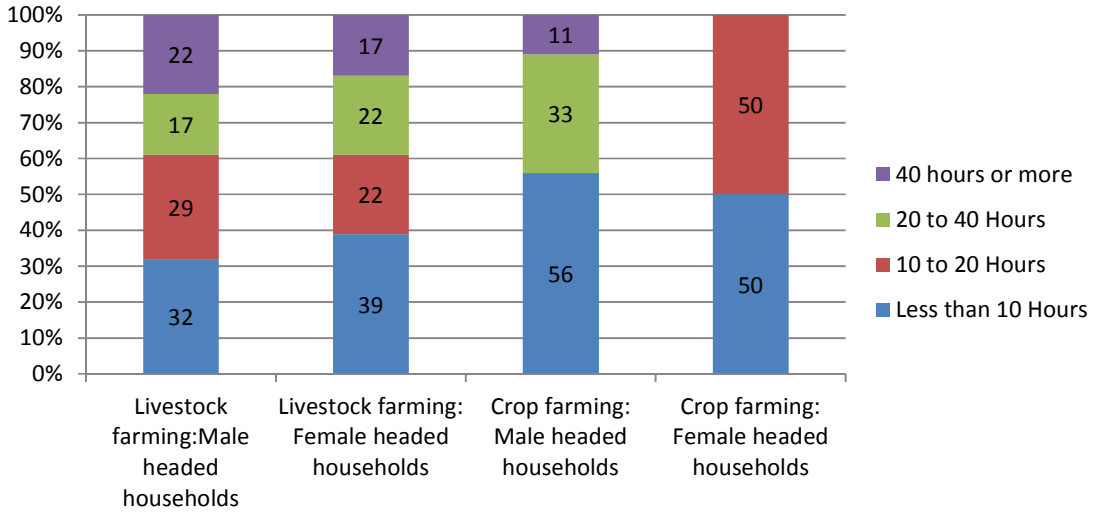


Figure 16: *Time spent engaging in farming activities by gender of household heads*



Animal Health Practices

Ninety-one percent (N=77) of households engage in preventative health practices, while seven households (8%) do not. Of the households that reported engaging in preventative healthcare practices, 97% (N=75) engage in dipping. Smaller portions of households implement resting pastures (N=5, 6%) cleaning manure off pastures (N= 8, 10%), fencing (N=4, 5%) and isolating sick animals (N=18, 23%) as measures to stop animals from falling sick/ diseases from spreading. Of those households that engage in dipping (N=77, 97%), households typically sent their animals to the dip tanks once a month (N=27, 36%).

Figure 17: *Frequency of dipping for those households indicating that they engage in dipping*

Respondents knowledge of livestock diseases

Tick-borne diseases

When asked which diseases are caused by ticks, 36% of the sample indicated a disease. A quarter (N=20, 24%) of respondents identified Heartwater as being caused by ticks. Smaller portions of respondents identified gall sickness (N=9, 11%) and Redwater (N=7, 8%) as being caused by ticks. Females appear to have better knowledge of diseases than males.

Thirty-three respondents (39%) did not select any of the options which presumably mean that they did not know the answer. This confirms the earlier finding that people are more aware of the symptoms of diseases than the underlying causes.

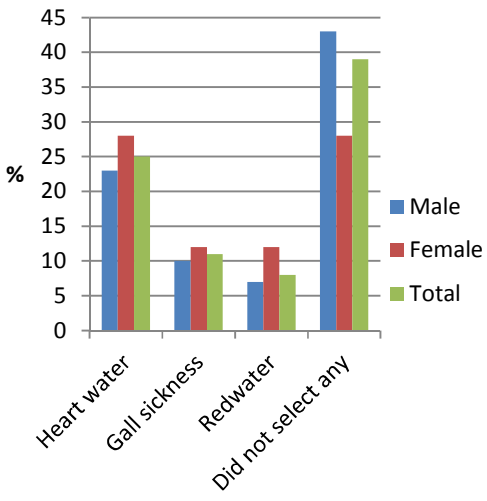


Figure 18: *Diseases caused by ticks*

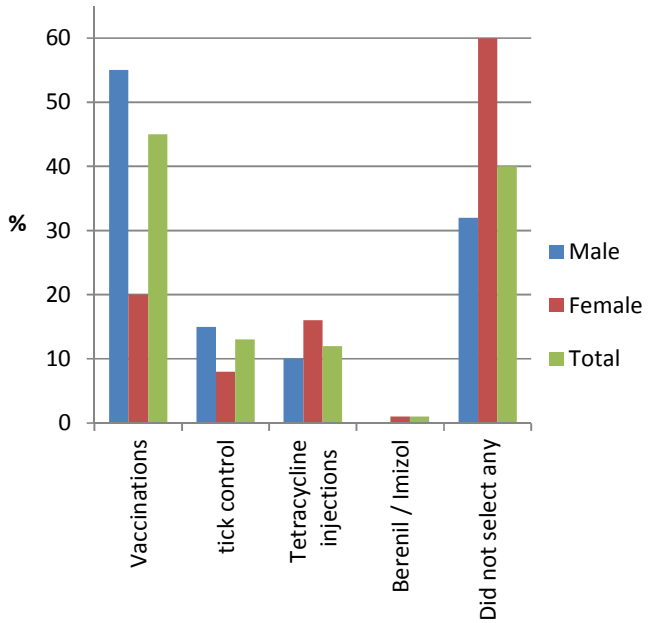


Figure 19: *Methods of preventing tick-borne diseases*

Forty-five percent (N=38) of respondents indicated tick-borne diseases can be prevented through vaccinations while thirteen percent (N=1) indicated that these diseases can be prevented through tick control. Only four respondents identified both vaccines and tick control as methods for preventing tick-borne diseases. Forty percent (N=34) of respondents did not select any of the options, as they did not know the answer.

Bacteria

Less than a fifth (N=15 18%) of respondents correctly attributed bacteria as the cause of pneumonia. Three respondents correctly indicated that Botulism is caused by bacteria. Three respondents incorrectly stated that Black quarter is caused by bacteria. Fifty-six respondents (66%) indicated that they did not know which diseases were caused by bacteria.

Zoonotic diseases

Only a few respondents reported knowledge of any diseases that can be passed on from animals to people (zoonotic diseases). Correct responses comprised three respondents that indicated Brucellosis, five that indicated TB, one respondent that indicated Anthrax and three that indicated Rabies. Seventy-four (87%) respondents did not specify an answer as they did not know.

Abortions

Answers about the causes of abortion included bacteria (N=3), viruses (N=2), rough handling (N=8) and vaccines (N=2). Other reasons given for abortion (9%) included transporting, hunger and Downer. Seventy-five percent (N=64) of respondents did not know.

Animal Health Services

Just over half (N=44, 52%) of respondents used animal health services (state veterinarian and/or animal health technician) in the 12 months preceding the study, while forty-eight percent indicated that they had not.

Considering the gender differences in terms of use of animal health services, most female-headed households (N=13, 65%) indicated that they did not use any animal health services in the past year. A much smaller portion of male-headed households indicate they did not engage the services of animal health services in the year preceding the study (N=7, 35%).

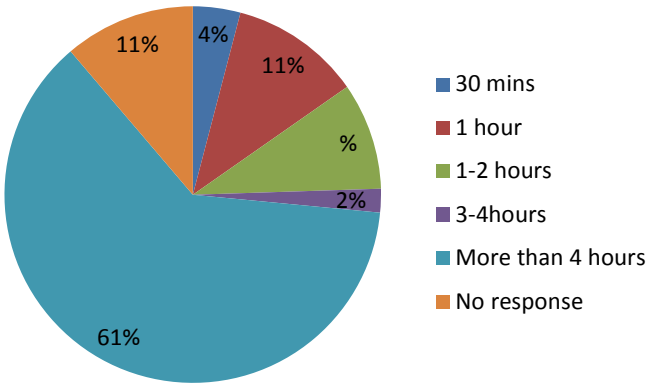


Figure 20: *Time taken by AHT to attend to request*

Of all the households that make use of animal health services (N=43, 51%), 75% (N=33) are satisfied with the service they receive. While people seem happy with the services of animal health practitioners, they have to wait a long time for their requests for services to be met. Most households spend on average more than four hours waiting for an animal health practitioner to get to them after requesting their services.

Households that use AHT services largely found their animal health services provider helpful and providing an essential service (N=32, 73%) while nearly half (48%) feel that there is insufficient animal health services support.

Table 19: *Statements related to attitudes to Animal Health Services*

Statements	Agree		Disagree		Did not specify	
	N		N		N	
Animal health services provider is helpful and providing an essential service	32	73%	1	2%	11	25%
Animal Health Service provider assists me when my animals are sick	30	68%	4	9%	10	22%
They are unable to help because I do not have medicines and vaccines for them to administer	13	29%	8	18%	23	52%
The state veterinarian or AHT will provide me with medicines and/or vaccines when I need them for my animals	19	43%	5	11%	20	45%
There is insufficient animal health services support	21	48%	9	20%	14	32%

Vaccination

Two-thirds (N=55, 65%) of households reported vaccinating their livestock and twenty-nine households (34%) reported not vaccinating their livestock. Slightly more male-headed households (N=44, 68%) reported vaccinating their livestock compared to female-headed households (N=11, 60%).

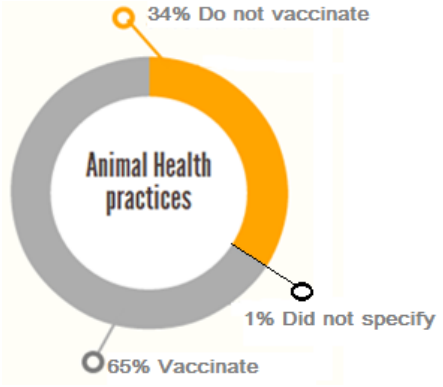


Figure 21: *Do you vaccinate?*

Of those households that indicated they do not vaccinate their livestock (N=29, 34%), only a few reported reasons for not vaccinating. These include the fact that vaccines are not readily available (N=1), vaccines cause harm, death or have negative impacts on the animals (N=1), vaccines are too expensive (N=2), there is no one available to administer the vaccine (N=1) and lack of knowledge about vaccines (N=2). When asked about the reasons people do vaccinate, the statement selected by most respondents was that they believe vaccines to cure animal diseases (N=22, 40%). For those households that do vaccinate their livestock, administration of vaccines are primarily done by an animal health technician (N=26, 47%), and secondarily by the farmer him/herself (N=17, 31%).

Diseases vaccinated against

Of the 80 households that keep cattle livestock, 66% (N=53) reported vaccinating their livestock. The primary disease households with cattle vaccinate against is Black quarter which 26% (N=14) of households vaccinate against. Within these 14 households, nine households (61%) indicated that they vaccinate for Black quarter every six months with the remaining households vaccinating once a year. A small portion (15%) of households reported vaccinating for other diseases. See Annexure A, Appendix A for a full breakdown of diseases vaccinated against and associated intervals at which vaccinations are done.

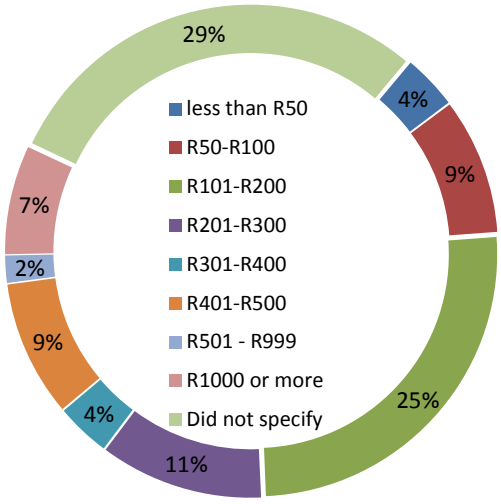
The questions on the diseases vaccinated against or livestock other than cattle were very poorly answered. For instance, one household (4%) that rears chickens reported vaccinating against Komboro and Stress pack. The remaining households did not specify. Of the seven households that reported keeping sheep livestock, four households reported vaccinating against disease. Of these four, one household reported vaccinating for pulpy kidneys and another for Heartwater.

One household (4%) that keeps goat livestock reported vaccinating for Heartwater. The remaining households did not specify. One of the three (33%) household that keeps pig livestock indicated the disease vaccinated against is a skin disease. This household vaccinates for skin disease every six months.

Price of vaccines

A quarter (N=14) of households that vaccinate (N=55) reported spending between R101 and R200 on average per vaccine. Seven households report paying less than R100 per vaccine while four indicated they pay R1000 or more for a vaccine on average.

Figure22: *Average price of a vaccine*

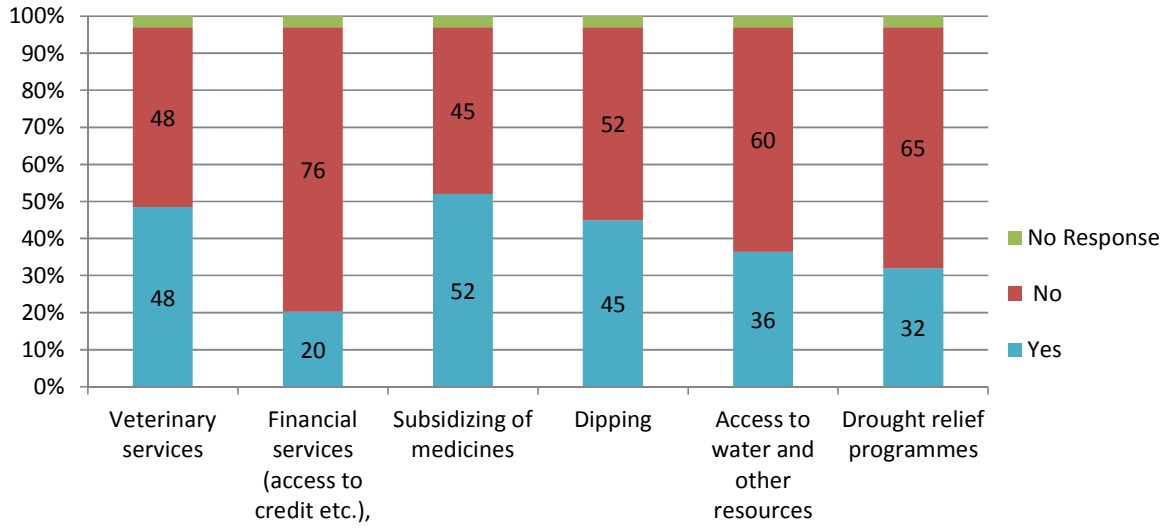


Vaccine knowledge

When asked what the difference is between vaccines and medicine, most households indicated that there is no difference (N= 37, 43%), while less than a quarter correctly stated that vaccines prevent disease while medicines treat diseases (N= 20, 23%).

Farming assistance and training

Table 20: *Areas farmers feel they need assistance with*

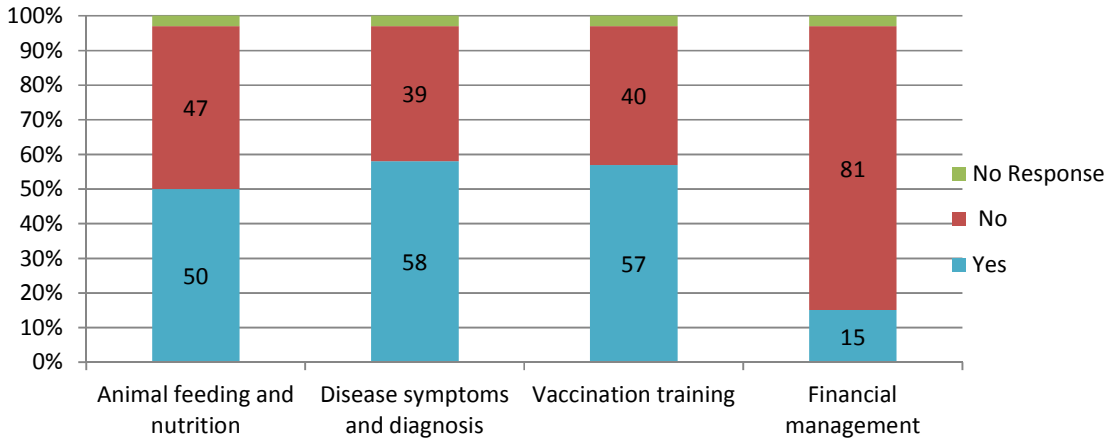


When asked what type of services with which households required assistance and training, 3 households did not respond to the question. Roughly half indicated that they need assistance with subsidizing of medicines (N=44, 52%), with veterinary services (N=41, 48%), and dipping (N= 38, 45%). A smaller portion of households require assistance related to drought relief programs (N= 27, 32%), access to water and other resources (N=31, 36%), and financial services such as credit (N=17, 20%). The fact that many farmers are requesting subsidies for medicines indicates that these may be too expensive and the implications this has for animal healthcare are significant.

More than half of households indicated that they require training related to animal feeding and nutrition (N=43, 52%), disease symptoms and diagnosis (N=43, 52%), and vaccination training (55%). Again, the requests of the farmers are in line with the kinds of challenges

they face, as has been identified in many of the preceding sections. Two-thirds (40%) of households would like financial management training.

Table 21: *Training needs of farmers*



Summary: Animal health practices and knowledge

Most households indicated that they do engage in preventative animal health practices. Knowledge of livestock diseases is generally poor.

While access to animal healthcare services is a challenge (in terms of amount of time spent waiting for an animal health practitioner), respondents who use the services report being largely happy with the service. Roughly two-thirds of households reported vaccinating their livestock. Cattle are more likely to be vaccinated than any of the other livestock, and are primarily vaccinated against Black Quarter. Most households report requiring assistance with medicine subsidies, vaccination services and drought relief programmes. Roughly half the sample would like training on animal feeding and nutrition, disease symptoms and diagnosis and vaccination training.

Limitations

A few key limitations need to be highlighted in order to contextualise the results of this study. The small sample size of this study does not allow for a comprehensive analysis of the nature of livestock farming in Limpopo province as a whole and rather only represents the practices of the two communities.

There were some ambiguities in the survey questionnaire which can be expected in a pilot project. Valuable lessons have been learned which will be implemented in follow-up studies.

Very few households reported keeping written records of changes in animal levels, vaccination records, livestock calendars and records of sick animals. This may reduce the accuracy of household reporting related to these areas.

Reporting on household income does not appear to be of a high quality, but this is not unusual in South African contexts as people are reluctant to reveal their true income.

Conclusions and Recommendations

The survey data confirms that livestock keeping is integral to the communities we worked in, with 94% of households keeping cattle. We found that most households are food secure, which indicates a primary relationship between keeping livestock and sustaining the consumptive needs of households. Increases in livestock levels were primarily through birth, and seldom if at all through purchase, which confirmed that livestock keeping is less a commercial activity, and more a household sustaining activity (livestock being used for household consumption, including through ritual slaughter, and livestock being sold as a source of and supplement to other sources of household incomes).

While two-thirds of households vaccinate their livestock against disease, knowledge of animal diseases, the purpose of vaccines and the diseases which require vaccinations was limited. Farmers' recognition of the need for improved knowledge around livestock diseases and animal healthcare is indicated by the significant percentage of farmers requesting training in these areas. Use of animal health services was limited to half the sample and there is a clear need for more support from these services as well as perhaps alternate sources for obtaining livestock knowledge.

The gendered nature of farming

Farming in this community is a gendered activity. From evidence collected in the analysis of the survey data, men are primarily the owners of stock; and except for chicken farming, a mixed gender activity, men are more likely to be engaged in stock farming activities. In cases where men are not available, hired workers usually take the role managing day-to-day farming activities. What we found is that these are poor farming communities, and while gendered disparities do exist, both men and women in the communities are a) equally poorly educated, b) equally lacking in essential knowledge about the causes, prevention and treatment of animal diseases, and c) subject to the effects of generally low household incomes (with the majority of both male and female headed households earning between R0 and R4000 a month)[34]. Our findings show farming to be a male dominated activity in the following ways:

- It is mostly male-headed households who sell livestock products

- It is mostly males (both farmers and hired workers) who manage day-to-day farming activities
- The fact that men's farming experience is significantly lengthier than women's

Stock loss through diseases

Diseases are the main source of loss to stock farmers in the area surveyed. Death through sickness has been found to be substantial especially for cattle, resulting in a massive financial loss every year. This farming community is concerned about this loss, which is reflected in the high proportion of their meagre income that is spent on curative medicine. At the same time, the data shows that some of the low cost interventions that could result in a substantial reduction of deaths are not explored to the maximum. For instance, while this community is knowledgeable about symptoms that lead to livestock dying, evidence is that there is very little knowledge of the underlying causes of these ailments.

Sharing of knowledge with this community would go a long way in reducing livestock losses. Secondly, evidence shows that few farmers are engaged in preventative measures like regular cleaning of sheds and nutritional supplements to improve livestock health, which farmers could be assisted with potentially through subsidies (or other creative measures). These suggested interventions do not in any way lessen the fact that there is a need for a holistic intervention to reduce the disease burden in the area. Farmers themselves have voiced the need for animal medicine subsidies to help poor farmers. Knowledge of the underlying causes of disease would also remove suspicions that some farmers have about vaccines being harmful to their animals.

If vaccination is to be considered a crucial preventative animal health practice for livestock keepers, storage of vaccines needs to be addressed. The effective use of vaccines is impacted on by livestock keeping households' ownership of fridges. The fact that 25% of households in the sample do not own a fridge has implications for lifespan of vaccines, which have to be stored at 4 degrees at all times.

A high percentage of farmers do not use state animal health services (48%), which is problematic as this is supposed to be directed towards communities that cannot afford commercial animal health services. The fact that the majority of farmers who do request state health services have to wait more than 4 hours for an animal health practitioner to attend to their request is a probable reason for low use of state services. Perceptions about the usefulness and necessity of state animal health services are positive and the low actual use can therefore be attributed to problems of access.

A case for encouraging chicken farming

It has been observed from survey results that relatively few farmers are engaged in chicken farming. This is in spite of evidence that chicken are both commercially viable (through selling of eggs and live chickens), and assist in providing food security. This is in addition to the fact that chicken rearing is less capital and labour intensive than for larger livestock, and is more easily converted to cash. This is an option that could be pursued for intervention.

Low commercial farming

Farming in this area is mainly used for non-commercial interests. Thus, very few farmers buy stock from the market or are involved in marketing activities. The increase in stock is mainly through birth (and rarely, if at all, through purchase). Together with this, the selling of livestock products (e.g. milk, eggs, manure for fertilizer, animal hides, etc.) is rare, and virtually no one sells animal products or by-products. While selling of live animals, especially cattle is common, more avenues for commercial activity could be created. This could include creating commercial opportunities and skills.

The fact that almost a third (29%) of farmers indicated they were unemployed, and yet they still engaged in farming activities, confirms the non-commercial nature of livestock keeping, where remuneration is not necessarily associated with the practice of livestock keeping in these communities.

Ritual use and food security

Evidence gathered in this study show that farmers do not make a distinction between livestock for ritual use and livestock as a means of attaining and achieving household food security, with goats most commonly used for this dual purpose. Thus, interventions should take cognisance of this duality. While many survey respondents did not indicate the importance of livestock for 'ritual/ traditional/ religious purposes', it was often said to us that livestock that were slaughtered during rituals were important for feeding families, neighbours and the wider community, which suggests that 'household consumption' and 'ritual purposes' are not mutually exclusive categories.

CHAPTER 6: DISCUSSION AND RECOMMENDATIONS

Introduction

This study forms critical formative work in the field of farming and gender. There is a need for a more comprehensive, large scale study (using a combination of quantitative and qualitative methodologies) on farming practices and knowledge within rural contexts in South Africa. Such a study needs to be designed and implemented with great care due to what appears to be a low level of education in these contexts.

This study produced a wealth of information that provide evidence for our untested assumptions indicated at the outset of this study: (1) in rural contexts such as the areas of Marble Hall and Rhenosterkop, small-scale livestock farmers and their households experience a number of socio-economic challenges that also have a bearing on combating livestock infectious diseases and ultimately food security; (2) capacity constraints, coupled with insufficient knowledge and poor understanding of animal health by farmers in terms of contemporary science are factors that retard human and social development pathways for these households and communities. As indicated in our introduction, to address the assumptions we (1) produced a detailed literature review (focused on the scholarly, policy and 'grey' literature); (2) conducted in-depth interviews and focus group discussions with farmers and other stakeholders in smallholder livestock production; and (3) conducted a survey to determine household demographic profiles, farmer' knowledge of diseases and preventative animal health practices of farmers. Throughout the study, we explored small-scale livestock farming and keeping through a gender lens, which informs our review of literature, as well as the analysis of qualitative and quantitative findings.

Although the findings are not generalizable to all small-scale livestock farmers in rural contexts across South Africa, the findings support the evidence that gender (as an important socio-economic factor) has bearing on the lives of small-scale farmers, including in relation to animal healthcare issues and ensuring food security; and that importantly, addressing capacity constraints and access to knowledge and appropriate training, can enhance human and social development pathways for such households and communities.

Having explored issues, insights and arguments in a little more depth in the literature review, and the qualitative and quantitative chapters respectively, we now turn to consider several key conclusions and recommendations that are framed in relation to information gleaned from the data. Rather than to restate issues already discussed in each of the data driven chapters (namely, chapters 2, 4 & 5) we opt for triangulation in this concluding chapter. We utilize triangulation as a concept understood in the social sciences which simply means an engagement and interpretation of data that facilitates some form of validation of data through cross verification from two or more sources. Cohen and Manion (2000:254) define triangulation as an "attempt to map out, or explain more fully,

the richness and complexity of human behavior by studying it from more than one standpoint' (see also Hick, 1979; Erzerberger & Prein, 1997; Hussein, 2009). These sources highlight the idea that triangulation enables increasing "the credibility of research results by improving both internal consistency" (Hussein, 2009:10).

Key Findings

The Livestock Sector and development in Africa and South Africa

The livestock sector is increasingly recognised as one of the fastest growing and agriculture's most economically important sub-sectors. Livestock, based on some of the insights of the communities interviewed is seen as a valuable and symbolic commodity for both men and women; viewed as both a cultural asset but also as an economic commodity (the idea that "*cows are a black man's bank"* and that *"farming is actually a traditional bank"* are important contextual insights into the world of small-scale livestock farming) that is not solely related to the purpose of providing food and education. There is an inherent idea that livestock is a marker of a connection to the land, soil and therefore is a form of identity.

Livestock farming is a major contributor to food and nutrition security, thereby also directly contributing to sustainable livelihoods. The sector is critical to pro-poor development and provides a pathway out of poverty. Important though is that there is no definitive evidence that this alone will reduce poverty. While small-holder farmers are important in respect of the sector, too much emphasis upon a small-holder approach might hinder large scale poverty reduction.

In the community households we surveyed in this study we found that most households are poor (were mainly male headed households; with the majority earning between R2000 – R4000 per month); education levels are low (47 % of respondents had no formal education; 20 % had some primary education; 25 % secondary education; 3 % tertiary education; education levels in this sample were similar for men and women); household asset ownership demographics were 62 % owned a stove, 68 % a fridge, 61 % a television and noticeable that 62 % did not own a car (this is statistically significant and corroborates concerns raised by farmers regarding transport). The majority of monthly household spending is allocated (in order of priority) to water and electricity, food, and education.

In respect of household ownership of livestock, the majority owned cattle (n=80; 94%). The three primary reasons provided for keeping cattle are: household consumption (34 %); sale of animals (30%); traditional purposes (10 %).

South African Policy perspectives on small-scale farming

The South African government policy and strategy recognises the significance of agriculture. Nationally, the number of agricultural households that keep 1-10 cattle is 78.6% (Statistics South Africa, 2013a: 6), which tells us that specifically *small-scale* livestock agricultural production is a significant agricultural activity in the country. State policy has prioritized the upliftment and empowerment of women. However, while the international livestock data provides a resoundingly optimistic picture of the future of livestock in enabling a particular growth, development and poverty alleviation trajectory for the poor, agriculture as a sector (in comparison to other sectors) has been on the decline in South Africa. Nationally, 19.9% of households are involved in agriculture (Statistics South Africa, 2013a: 2). Agriculture, which is the 6th biggest sector in terms of employment for women and the 7th in terms of employment for men (out of 10 sectors), accounts for just 3.5% of women employed and 5.5% of men (Statistics South Africa 2013b: 33).

In spite of policy promises and some intervention by the state in the last twenty years to counteract the legacy of apartheid (through new legislation, acts, measures and programmes), the State maintains that a dualistic agricultural system continues to exist between white and black farmers, and that "In 1994, most agricultural land was owned by whites (83 percent) and only 17 percent of the land was available for black people in the former homelands" (The Presidency, 2014:63). This tension between black and white farmers is also located in respect of debates "between centralized, high-value agriculture, with indirect (or much delayed) benefits, versus, disaggregated, low-value agriculture and resource extraction, with short-term benefits…", and that a balance will need to be found between the two "in any future ventures" (Lahiff et al 2012:62). Some commentators maintain that a narrow approach focusing on farm productivity and economic returns of the large-scale commercial farm has to be re-evaluated in the broader context of the sector.

Farmers interviewed in the study expressed resistance to the DOA policy on reducing stocking rates which government claims is the cause of overgrazing, with the result that some farmers are reluctant to disclose their livestock numbers. However, scholars interviewed in our study indicate that the fear of overgrazing compromising grazing is misplaced and incorrectly imposes a commercial model of farming onto smallholder farms. The need for on-going transformation in the agrarian terrain is therefore essential.

Women as Smallholder Farmers and Rural Development

Within the global development agenda small-scale farming and women are increasingly identified as key to the eradication of global hunger. In the sub-Saharan context in particular, women are viewed as the backbone of smallholder agriculture, where the FAO (2011) estimated that women formed about 50 % of the economically active population in agriculture. Women are identified as also key to rural development strategies but

women's role in agriculture in the South African sector is much lower. For instance, an animal health practitioner (male) in the Rhenosterkop area says: "[…] W*ith the livestock farmers we are dealing mostly with the men. It's like the African culture. The man is the head of the house; he is the one who looks after the livestock".*

In the community households we surveyed in this study we found (in respect of the management of day-to-day activities in relation to gender of household head) that men (58 %) are more likely than women (25 %) to manage day-to-day farming activities by themselves. Women (65 %) were more likely than men (32 %) to employ a hired worker to tend to day-to-day farming activities (this was corroborated by some farmers; see chapter 4).

Key obstacles facing women in small-scale livestock farming

In spite of the recognition of women as critical actors in the farming sector, a number of impediments face them. Their invisibility in respect of decision-making processes and their lack of control over livestock assets and income has a negative impact on intra-household welfare and relations and economic development. Additional issues are: lack of ownership (livestock) assets; lack of ownership of land; lack of full extension services, such as credit, training, education; insufficient government support; low literacy rates; constraints related to mobility (which prevents accessing of services, education, etc.); time use in respect of providing nurture and care on the one hand, and balancing this with the responsibilities of farming. According to a state veterinarian in Marble Hall (in response to a question about women's presence in dealing with livestock), in all his/her years of interacting with small-scale livestock farmers "*In all the dipping I have been to, I haven't seen them, in dipping they don't come, I don't know maybe is because maybe men are saying they must stay behind or what and then maybe they're not interested or what."*

While there are mixed feelings by men about the role of women in the sector, a male farmer in Rhenosterkop says that women should farm because livestock is a way of life for all rural people "*and they can also make an income for their household and feed their children".* He goes on however, to acknowledge that there are traditional constraints such as for instance women not being allowed to enter the kraals: "e*ven now if a woman wants to get in, I will stop them".* A male respondent in Marble Hall states that when a man leaves a household and a woman becomes the new head of her household "*she is supposed to take care of everything including the animals".* During a focus group discussion a male farmer in Marble Hall says that while in the past a "*girl couldn't get in[to] the kraal but a boy [could], but now they can if a calf is sick they can give it medication".* These examples illustrate the potential gendered arrangements that require attention in small-scale farming communities.

Sex-disaggregated livestock data

The gendered nature of decision-making processes and women's lack of control is also contingent on better understanding the gender dynamics within the households. While findings suggest that there are complex array of factors (notably issues of power, culture, and received ideas about what constitutes appropriate gendered roles), there is a simultaneous need for sex-disaggregated data for intra-household dynamics to better understand the gendered dynamics within the household context.

Land

Land remains a contentious political, social and economic concern in the post-apartheid context. Over and above the racialised history of land, and the dualistic agricultural economy (in which land features as a key divide), land reform is slow and remains a factor of inequity (in respect of availability and access of suitable arable land for the poor; for women in particular) and more especially in respect of policy reform (for example, no coherent national framework on the allocation of commonage land) exists. Land costs much money and is not always easy to access. The survey component of this study found that 56 % of the sample did not own the land they worked on; 34 % owned the land (and 14 % did not respond).

Water

In addition to land as a necessary commodity in the agricultural and livestock sector, findings indicate that less is said about water in relation to its role for agricultural prospects and policies. Evidence suggests that water supply is on the wane, and water accessibility and consumption is also racialized. While the latter did not feature in the interviews, some participants referenced problems related to rainfall and drought: Farmers in the Rhenosterkop area complained about the lack of rain: "*[Respondent 1:] The rain here is very scarce, but when it starts to rain it becomes heavy rain…[Respondent 2:] And when it becomes dry, it takes a long time to rain and then we have a problem. Like now you see winter is coming, and there is no water. People like to set the field on fire and water might take two days without coming out of the tap, and there is no rain."*

The lack of rain means lack of grazing for cows, and the lack of good grazing means cows cannot produce milk and cannot be milked.

Food Security

While the perception exists that South Africans are well-nourished evidence from the 2011 General Household Survey (GHS) shows that 11.5% – close to 10 million people –

experienced hunger in the 30 days prior to the survey (Hendriks 2013: 2). Besides experiencing hunger, "22.7 percent of the population, or 13.8 million people, has insufficient access to food and many households (21 percent) continue to experience difficulty in accessing food" (The Presidency 2014: 65). The links between poverty, economic growth and food security have not been explored in ways that offer good policy options for enhancing growth in ways that will reduce poverty and improve food security. Findings in our survey sample for this study indicate that 15 % of adults answered 'Yes' and 13 % of children answered 'No' when asked whether anyone in the household went hungry in the past year due to there not being enough to eat.

Obstacles and challenges experienced by small-scale farmers

Stock theft in large quantities is on-going, and some participants interviewed indicated that it is on rare occasions that stolen livestock is recovered and perpetrators rarely caught. In our study some participants indicated police collusion in stock theft (implying that crime has broader systemic problems than merely the problem of stock theft). Theft also left farmers traumatised and stressed (even though the study did not probe the broader dimensions of the trauma and health risks), road accidents, drought, diseases, and lack of sufficient support from government, health management of livestock (including dipping, vaccinations and lack of full access to government veterinary services). The seeming gender implications of livestock theft are also an important finding. For example, a female respondent in Marble Hall suggests that it is her inherent weakness as a woman that resulted in her livestock being stolen: "*my husband… is away with work so they took advantage that I am a woman then they stole them".*

Animal Health, Diseases, Vaccinations and Knowledge Uptake

Smallholder farmers are the worst affected by disease outbreaks, resulting in mandatory slaughter of animals and this ultimately compounds the cycle of poverty for already poor rural communities (disease is for example spoken about as a challenge for many farmers featured in this study). An animal health practitioner in Marble Hall stated that hunger was the main cause of death of livestock, followed by disease. This is backed up by an animal health practitioner in the Rhenosterkop region who states that mid-to-late spring and winter, "*most of the animals die of hunger"*. In a focus group discussion with male farmers in Marble Hall, one respondent states that the problem of disease is worsening: [A]*nimals have so many diseases that we can't keep track of, we need to prevent that. When we investigate they say its lumpy skin and we have to have medication for that and its challenging. Those diseases were not there in the past.*

In the community households we surveyed in this study we found animal death was primarily due to disease (as the main cause of decreases in livestock levels over the past 12 months) were highest among cattle (54 %) and chickens (64 %).

Vaccinations and inoculations are being used less in developing countries to promote animal health due to high costs and lack of AHTs required to implement such services. Findings also suggest that diseases need to be better understood in relation to animal health, socio-economic conditions of communities and households, geographical region, knowledge of diseases (including their proper scientific names, as well as treatment); and appropriate interventions required (including vaccinations). In the community households we surveyed in this study we found knowledge of diseases (for example heartwater, gall sickness, redwater) was very low and many respondents either did not know or did not wish to respond (33 %). Similarly knowledge of zoonotic diseases showed up as 87 % (reflecting either that respondents did not know or could not provide an answer). In respect of vaccine use and knowledge we found 43 % of households indicated there is no difference between medicines and vaccines; 23 % indicated that vaccines prevent diseases while medicines were used to treat diseases (there were also a large number of non-responses, many of which indicate that respondents 'did not know').

Qualitative insights indicate, that in spite of many roles and tasks women face, as one State Veterinarian reported, women may even have more understanding of their animals than men, but are faced with competing challenges in terms of a) physical strength and b) time constraints where women's household activities prevent them from having time to regularly oversee their animal's wellbeing: "*they won't find time to check after the animals to see which animals are sick so they only depending from the headbo[ys] to see which animal is sick".*

Lacking "manpower", the state vet says, means that women rely on their headboys, neighbours or male relatives to take their animals to the dip tank and also to inject their animals. More important, qualitative insights indicate that women are also looking to be empowered in terms of disease knowledge. An AHT in Marble Hall states that a major constraint on women is the lack of knowledge about animal health, as well as the fact that mothers are concerned with their family's wellbeing so "*they are not in the fields or where the animal are grazing looking after the animal".* The technician says that when faced with a sick animal women will usually call a man to assist them with the problem. As one AHT reported in our study, women require significant help: "*They know less….With livestock they don't know much….. when you find a woman that is doing farming you know you have to do everything even if you can explain to her but they don't have those guts to assist.*"

In the community households we surveyed in this study we found that training needs as indicated by farmers reflected the following: 50 % said they wanted training in animal feeding and nutrition; 58 % said they wanted training in understanding disease symptoms and diagnosis; 57 % wanted vaccination training; while 87 % indicated they did not need financial management training.

Record Keeping

Interviews with farmers and animal health technicians indicate that many farmers do not have meticulous record keeping which compromises animal health and ultimately their own understanding of the health history of their animals. The community households we surveyed in this study indicated that 75 % of households do not keep records of entries and exits of animals, vaccination records, records of sick animals, or livestock calendars.

Animal Health Services

While there is widespread recognition in the literature that animal health services are critical to the health and well-being of livestock farmers, there are mixed views arising in the study from both farmers and animal health practitioners in terms of what happens in practice. Many do not actively consult professional advice even if the services are available, preferring to talk among their peers. The apparent reluctance of some farmers to properly manage the health of their livestock is explained by one of our respondents as resulting from a lack of economic incentives (with the implication that policies and policy makers and implementers too need to see things in a sense, 'the other way around', i.e. in terms of animal health not being the first step to something else but rather the outcome and result of general prosperity):

> …[I]*f a farmer cannot sell the product and have money out of it, then he is not going to manage it right, he's not going to buy medicine and he's not going to put effort into the management, that's what happens .So that's a key thing if you can make money out of something then you make sure it's healthy and then is protected.*

In another example, a DOA official, indicated there was mistrust of and scepticism about the efficacy of vaccines that leads to farmers not being cooperative with animal health practitioners:

> *[T]here's this allegation […] let's say maybe [the AHT] has gone to vaccinate some of the cows then you will find out that there are some that would be dying but not due to [the AHT] but due to certain diseases then they associate and say the vet person has been here he's killing our cattle that's why some of them are adamant not to come.*

Also insightful are perspectives provided by service personnel (such as state vets, DOA officials and AHTs) who indicate constraints in respect of poor leadership that results in lack of implementation and poor service delivery; low staff morale and last minute cancellations of appointments with farmers. Some farmers complained that their reluctance to access AHTs and health services related for example to the slow pace of

responses from such officials (late arrivals result in animal deaths); their own state of poverty.

In the community households we surveyed in this study we found 52 % of respondents utilized animal health services (either AHTs or state vets) in the 12 months preceding the study. 61 % of respondents indicated it took more than 4 hours for an AHT to respond to requests for assistance.

Recommendations

The main recommendations are listed below and are premised on extrapolating the critical themes and issues arising from findings that triangulate insights from the literature review, in-depth interviews and focus group discussions and the survey.

Animal Health, Diseases, Vaccinations and Knowledge Uptake

Animal disease prevention, and particularly vaccination, is central to achieving and maintaining long-term food security. State intervention (in partnership with research, educational and multilateral institutions) is required to ensure appropriate and targeted resources, programming and services that take into account training needs, knowledge gaps, and scientific development to scale up. While the broader problem of poverty may not be easily resolved, it requires a multidimensional approach by state actors to plan ahead to ensure early detection of diseases, have plans in place to ensure empowerment of farmers, protection of animal health and knowledge uptake of livestock communities. Training should take into account knowledge that enhances skills and information retention, and should consider as key to effective knowledge transmission, the relationship/s between animal health practitioners and farmers. Such training should prioritize women (not to the exclusion of men) and be in the context of greater financial and resource support from the state for small-scale livestock farmers.

Effective disease prevention includes addressing the following:

- Relationships of trust and not antagonism between animal health practitioners and farmers, particularly because processes of knowledge uptake and implementation of preventative practices (including understanding and use of vaccines) depends on this.
- Government subsidization of the costs of medications and vaccines, which would address the disincentive to invest in animal health in poor contexts, and incentivize towards greater productivity by impacting positively on the state's willingness to assist farmers.
- Better geographical access to medications and vaccines for farmers, as distances currently travelled to access these increases already prohibitive overall costs.

Gender-sensitive approaches to livestock farming

Gender-sensitive and progressive approaches to development is not understood to set women and men in opposition to one another, but rather is aimed at improving the gendered arrangements of households and communities to improve household security and well-being of families and communities. Combined with gendered mainstreaming, improvements can be made to individual and household well-being, strengthening women's and men's needs and interests in the sector, improving social protection, and improving intra-household income management and economic benefits of livestock markets to women (World Bank, 2009). While the gender and care arrangements of households and communities cannot be changed overnight, a more targeted and focused training programme should be developed. Developing a training programme that adopts a gender mainstreaming model with a defined curriculum (working closely with small-scale farmers, policy makers, relevant civil society organisations and vaccine specialists) is a useful strategy. Such an intervention might require scoping of other sites to make comparative assessments and then piloted in selected communities to monitor and track change over a period of time (change related to patterns, trends, knowledge uptake, skills development, and behaviour modification in relation to impact pathways and changing relations in respect of gender).

Key points related to women's participation in small-scale livestock keeping:

- Access to land has already enabled women to gain a measure of independence and control over their livelihoods.
- Receding gendered taboos about women's involvement with livestock and presence around/in kraals offers important avenues to support women in gaining independence, empowerment, self-esteem and assets through smallholder livestock keeping.
- Greater overall improvement in rural livestock communities, in terms of access to medications, more efficient provision of animal health services, a stronger demonstration of the financial benefits of livestock keeping, improved participation of women in knowledge transfer initiatives (from state health providers), need to be effected in order for women to become more visible, accepted, and normalized as livestock keepers.

Policy Considerations for smallholder livestock farming in the context of poor rural communities in South Africa

While policy is in place to prioritize women and reversing the historical divisions based on apartheid, the State's promise that "smallholders would be strengthened and their numbers increased (such that) rural households would produce their own food" (The

Presidency, 2014:63) has not fully materialised and requires more concrete and tangible attention in respect of policy review. Critical in this regard is the need for urgent attention to be given to resolving inequities in terms of land ownership (based on racial divisions) to address the needs of both small-scale and commercial farming for black farmers in general, and for women in particular.

The bigger policy question that requires resolution by the State, small-scale and commercial farmers, and the private sector, is to "transcend the rather facile dichotomy between smallholders and commercial farmers, and look, instead, to the ways in which agriculture is socially organized" (Atkinson, 2013:33).

There is a crucial need for a reconceptualization of government policies towards smallholder livestock keepers. The first step in this process needs to encompass fresh, empirically and research-based, thinking on how government policy should address smallholder livestock keeping in its policies. Right now, smallholders seem to occupy the opposite end of a convenient dichotomy (with 'commercial' farmers at the other end of the dichotomy), which government uses to make its case for a 'dualistic agricultural economy'. Irrespective of the fact that such a dichotomy continues to exist, smallholder livestock farming should be thought of within different overarching frames, in order for government policy towards smallholders to become consultative, responsive to farmers' needs and nuanced, and to positively impact on smallholder livestock communities.

The following emerges from our study, and provide a critique of the current framework within which smallholder livestock keepers are cast as actors, and recommendations for how this could and should change:

- Smallholder livestock keeping in rural communities is primarily a household sustaining strategy in the context of significant poverty, and not an economic, profit-driven one. Here, some suggest that smallholder livestock keeping should be a part of government social welfare (poverty eradication) strategies, rather than a part of economic growth strategies (Alcock 2013). Studies arguing the low productivity of smallholder agriculture (Collier and Dercon 2014) seem to support this approach as well.
- Our own findings support this approach as qualitative and quantitative findings together suggest that many smallholder farmers engage in livestock keeping out of a) economic necessity, b) as a 'natural' continuation of family tradition, c) as an insurance in times of necessity and emergencies ('livestock as a bank'), and, d) as a means of social reciprocity and building familial and communal cohesion. Smallholder farmers need to be supported in sustaining their households for these socioeconomic and social identity reasons.
- Government's imposition of a 'commercialization' model on smallholder farmers does not take adequate account of the purpose and functions of livestock keeping for most smallholder farmers (as part of household sustaining strategies).

- Dichotomies between 'smallholder' and 'commercial' farmers, while capturing the fact that historical, racialized divides continue to exist, remain unhelpful in informing policy because a) they are not accompanied by creative thinking about how to empower smallholder livestock keepers, b) they do not properly and consultatively consider the meanings and goals of progress for smallholder livestock keepers, for farmers and poor rural communities, c) they problematically continue to necessitate a linear, one-dimensional progression from 'smallholder' to 'commercial' farmer.
- While government has created a 'middle' category of 'emerging' farmers (something that needs to be studied further), these farming projects are again not thought-through with enough care and consultation, resulting in many projects failing, the failure of farmer cooperatives due to poor management, inadequate support and group dynamics, and a push for farmers to graduate quickly towards commercialization without adequate recognition of the significant barriers and challenges to accomplishing this.
- The focus on emerging farmers, and the emphasis on generating 'success stories' of individual black farmers who successfully commercialize, has negative impacts on smallholder, poverty-stricken livestock keepers who become considered less important for policy initiatives and whose inability to commercialize is rendered a 'failure' for which farmers are themselves often blamed (the ways in which government officials we spoke to in the Department of Agriculture confirms the negative and paternalistic assumptions imposed on poor farmers who are often characterized as unwilling to "learn").
- Government restrictions on stocking rates for smallholder livestock keepers needs to be reconsidered as a primary policy initiative, due to the criticisms from academics (Cousins 1996), and the general antagonism and mistrust felt towards the state by smallholders in response to such policies. Government needs instead to consider consultative policy approaches to smallholder livestock farming.
- More nuanced policy is required in establishing progressive development pathways for different categories of smallholder livestock keepers rather than a one-size-fits-all 'commercialization' economic model. Nuanced policy should filter down to the provincial, district and municipal levels, impact on how state officials interact with farmers, and in ways that value all categories of smallholders equally and equitably.
- Animal healthcare policies and initiatives by the state also need to be conceptualized within more consultative and responsive frameworks, where smallholder livestock keepers are not brandished and dismissed as lazy, or simply stubbornly unresponsive.

Other policy interventions that are recommended include:

- Stimulation of land reform initiatives to show more tangible results that address poverty reduction and food production, prioritize women's land rights, and thereby further stimulate economic growth and employment in the agricultural sector.

- Attention is required to prioritize coordination between the water and food sectors because even though State policy (including the NDP) has proposed a substantial increase in the productivity of the agricultural sector, this is not matched by consideration of critical water shortages in the country. Over and above accessibility, availability and consumption, the water pricing strategy needs to take into account historical racialized imbalances to ensure appropriate and targeted redistribution to the development of rural communities. Additionally, aligning the water and land question to broader attention to climate change interventions is essential for planning purposes.
- Public and private partnerships need to be revisited in terms of how they are formulated and implemented, particularly in light of significant and widespread failures in joint partnerships, and significant gaps and limitations need to be addressed.
- Crime prevention strategies formulated in the social security cluster policy environment should ensure interventions that protect commercial and small-scale farmers from increasing stock thefts (these have both local and international implications; especially in the latter where rural communities border neighbouring countries). Combined with this there should be interventions that prioritize infrastructure development (including improved conditions of roads to ensure better transport and access to and from farmers by animal health practitioners), and for small-scale farmers to better house livestock (to keep them safer, healthier and to protect against theft).
- Critical interventions required by the State point to increased budgets and resources to prioritize development in the small-scale livestock sector.

Food Security

Given that the communities featured in this pilot study could be described as mostly food secure and largely livestock keeping communities, the connection between food security and livestock keeping must continue to feature strongly as a policy, programmatic and research issue in order for future interventions to be based on on-going understanding of community needs, challenges and scientific developments.

Research and Communication

There is a need for more sex-disaggregated livestock data to understand intra-household relations. Additionally, while there is much rich information and data emerging in this pilot study, there are limitations in respect of its sample size and focus on two small communities. Therefore no generalised perspectives from this baseline can be made about the whole country. If we are to fully have a picture of trends, issues and obstacles in the small-livestock sector and its connection to food insecurity and poverty reduction, a more representative sample and broader reach of sites is required. Opportunities also exist in

respect of identifying responses that capitalize on local knowledge of men and women to strengthen knowledge and skills uptake to decrease animal losses, increase the sustainable livelihood of the farming communities, and ultimately increase food production and supply in healthy environments (Beinart & Brown, 2013). Combined with research information, appropriately designed learning materials and teaching aids would be useful tools in enhancing pedagogical interventions. On-going research is recommended that will inform programmatic and policy development.

Conclusions

Our findings, although limited to the cross-sectional perspectives of two livestock keeping communities in adjacent provinces in the North-East of South Africa, provide important and valuable insights into a number of areas that should be addressed. These findings suggest that we have scope to learn lessons and consider options for future work and interventions in the broad context of small-scale livestock farming, vaccine development initiatives in Africa, and ultimately combating food insecurity. A study of this scope, in spite of its limitations, confirms the need to integrate animal health, food security and gender empowerment in research, policy and programmatic planning.

ENDNOTES

[1] Personal communication with leading academic and researcher on issues around land reform and agrarian development, May 2014. This will be further discussed in the qualitative chapter.
[2] Gender-accommodating implies a neutral approach to gender; gender exploitative suggests an approach that ultimately results in a worsened gender disparity, and gender-transformative implies an approach that positively transforms the gendered dynamics.
[3] 'Why livestock matter', ILRI (International Livestock Research Institute), https://ilri.org/whylivestockmatter (accessed August 2014).
[4] See also, the FAO's report, http://www.fao.org/fileadmin/templates/cfs/Docs1011/CFS37/documents/CFS_37_Final_Report_FINAL.pdf. Also, the International Food Policy Research Institute: http://www.ifpri.org/sites/default/files/pubs/pubs/ib/ib33.pdf. Also: CARE, 4 June 2013, 'Small-scale farmers could end world hunger' (accessed online, February 2014), http://reliefweb.int/report/world/small-scale-farmers-could-end-global-hunger . See also this report from the CEO of CARE International UK and Chair of The Hunger Alliance, Geoffrey Dennis, on investing in small-scale women farmers: 4 June 2013, http://community.businessfightspoverty.org/profiles/blogs/geofffey-dennis-hunger-alliance (accessed online January 2014).
[5] CARE, 4 June 2013, http://reliefweb.int/report/world/small-scale-farmers-could-end-global-hunger
[6] FAO. 2014. 'The Female Face of Farming', http://www.fao.org/gender/infographic/en/.
[7] African Farmers' Association of South Africa.
[8] Government has often prioritized women in its upliftment and empowerment initiatives across all sectors (The Presidency, 2014). This has not however shielded the majority of women from poverty and unemployment, and African women have been particularly affected. Data shows that the highest unemployment rates in the country remain among African women (Statistics South Africa, 2013b:52), well above the national averages on both the expanded definition and the less strict one. Where national averages for female unemployment are 34.6% or 46% (expanded definition), unemployment for African women is at 41.2% and 52.9% respectively (Ibid).
[9] The figures and findings provided in the Statistics South Africa document on 'Agricultural Households' does not specify clearly whether the study counts commercial as well as subsistence/ smallholder agriculture. In the 'Introduction' section, the statistician-general states: "The main objective was to identify all households involved in agriculture in the country in order to plan a frame for a proper agricultural census" (Statistics South Africa 2013a: 1). 'Agricultural household' is defined as "A household involved in agriculture" (Statistics South Africa 2013a: 22), While this may seem to suggest that both commercial and smallholder/ subsistence agricultural activities were counted, the report also states that one of its objectives was to fill in information gaps because "…the country lacked information on smallholder and subsistence agriculture" (Statistics South Africa 2013a: 1). "In addition, the agricultural sector lacked a comprehensive frame (farmer list) that covered all agricultural activities in the country as the current census of commercial agriculture was partially covering the sector" (Statistics South Africa 2013a: 1).
[10] The 1913 Act dispossessed African people of arable land, leaving them with a mere 7%, and allocating the best agricultural lands to whites. This act was the most significant in creating and producing a racially oppressive system of land ownership, and other acts such as those mentioned above worked to reinforce the dispossession.
[11] "FAO-ZA recommits to strengthening relations with NERPO", 04 September 2012, http://www.nerpo.org.za/news_detail.asp?NID=164&archive=N .
[12] "FAO-ZA recommits to strengthening relations with NERPO", 04 September 2012, http://www.nerpo.org.za/news_detail.asp?NID=164&archive=N .
[13] South African Agriculture: http://www.southafrica.info/business/economy/sectors/agricultural-sector.htm#.U-HlguOSySo.
[14] It should be noted that the interchangeable use of 'Rhenosterkop' and 'Siyabuswa' areas is a result of two somewhat different ways of representing the geography of the areas. Older demarcations slice areas up according to farm areas (Rhenosterkop, see Map 2) while newer demarcations follow municipal ward boundaries.
[15] http://www.mpumalanga.gov.za/about/province.htm. (Mpumalanga provincial government website).
[16] http://www.mpumalanga.gov.za/munic/municipality_nkangala.htm. (Mpumalanga provincial government website).
[17] See 'Websites' in References section.
[18] See 'Websites' in References section.

[19] See 'Websites' in References section.
[20] Analysis of the demographic section refers to the gender of the respondent, while analysis in the section following the demographic profile section (Farming Activities and Facilities onward) relate to the gender of the household head, where the household head was a respondent. Full household rosters (detailing the particulars of each member of each household, as required by the questionnaire) were not provided in many cases. As a result, where respondents were not the household head, a number of assumptions were made. Where primary respondents indicated they were the partner/spouse, heterosexual relationships have been assumed to determine the gender of the household head. Where primary respondent was a child of the household head, the gender could not be determined. In this case the gender of the respondent is used.
[21] Non-response recoded as "Do not own asset"
[22] Only questionnaires that were consistently and accurately captured for questions related to livestock ownership and related questions are included in the analysis.
[23] Non-response recoded and "Do not engage in activity"
[24] Watering of animals refers to provision of water for drinking.
[25] Non-response recoded as "Do not sell product"
[26] Non-response recoded as "Did not experience a change"
[27] Non-response recoded and "Do not engage in activity"
[28] Non-response recoded as "Did not experience a change"
[29] Non-response recoded and "Do not engage in activity"
[30] No response recoded as "did not experience a change"
[31] Non-response recoded and "Do not engage in activity"
[32] Non-response recoded as "did not experience a change"
[33] Non-response recoded and "Do not engage in activity"
[34] The household income data is not robust and wholly reliable; however it can be used as an indicator.

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ANNEXURES

ANNEXURE A: Quantitative findings appendices, Chapter 5

Appendix A: Cattle

Table 1: Household engagement in cattle related activities
*1 Household

	Portion of households that own cattle that engage in this activity (%)	Main person responsible for this activity (row%)						
		Adult male	Adult female	Children	Hired worker	All/any adult	All/Any household member	Other
Grazing	95	44	0	0	52	2	0	0
Feed preparation	68	56	6	2	31	4	0	0
Watering animal	74	56	3	2	31	5	0	0
Milking	9	57	0	14*	14*	0	0	0
Milk processing	5	25*	25*	0	25*	0	0	0
Caring for sick animal	87	54	6	3	26	1	1	3
Collection of Farm yard manure	77	53	6	0	34	2*	2*	2*
Animal shed cleaning	61	57	10	4	22	2*	2*	0
Marketing of live animals	17	43	7*	7*	14	7*	0	7*
Marketing of livestock products e.g., meat, manure	7	33	17*	0	0	0	0	17*

Table 2: Diseases affecting Cattle livestock and associated outcomes

				Outcome		
		Number of households reporting	Portion of households reporting	Died	Survived	Slaughtered
Most frequent disease	**Coughing and sneezing**	5	6.8	20	80	0
	Diarrhoea	8	10.8	33	67	0
	Nasal discharges	2	2.7	50	50	0
	Respiratory problems	1	1.4	0	100*	0
	Swelling of the joints, wattle and foot pad	17	23.0	33	67	0
	Twisting head and neck	1	1.4	0	100*	0
	White diarrhoea	1	1.4	0	100*	0
	Decreased Apetite	1	1.4	0	100*	
	Red skin	1	1	0	100	0

	Other (Specify)	24	32	48	52	0
	Leotwana/letwana	1	2.7	50	50	0
	Heartwater	1	1.4	100*	0	0
	Ticks	1	1.4	0	100*	0
	Eye Problems	1	1.4	100*	0	0
	gal disease	2	1.4	0	100	0
	knop ver	1	2.7	100*	0	0
	burnt lungs	1	1.4	100*	0	0
	dry morothwane	2	1.4	100	0	0
	intestinal worms	1	2.7	0	100*	0
	Limping	1	1.4	-	-	-
2nd most frequent disease	**Diarrhoea**	2	2.5	0	100	0
	Nasal discharges	5	6.3	0	100	0
	Swelling of the joints, wattle and foot pad	11	13.8	14	86	0
	Twisting head and neck	1	1.3	100*	0	0
	Barking like cough	1	1.3	100*	0	0
	Other (Specify)	1	1	-	-	-
	Letwana/Leotwana	4	5.0	50	50	0
	Heartwater	3	3.8	100	0	0
	Earproblems	2	2.5	0	100	0
	Mouth Sores	1	1.3	100*	0	0
	Blackquarter	1	1.3	100*	0	0
	Ticks	2	2.5	-	-	-
	Eye Problems	1	1.3	0	100*	0
	Maawto	1	1.3	-	-	-
	Knop ver	1	1.3	-	-	-
	Dry morothwane	2	2.5	-	-	-
	Limping	2	2.5	-	-	-
	Not applicable/No response	39	48	-	-	-

*1 Household

Appendix B: Chicken

Table 3: Household engagement in chicken related activities

	Portion of households that engage in this activity (%)	**Main person responsible for this activity (row%)**						
		Adult male	**Adult female**	**Children**	**Hired worker**	**All/any adult**	**All/Any household member**	**Other**
Grazing	8	50*	50*	0	0	0	0	0
Feed preparation	67	0	87	6	0	0	0	0
Watering animal	62	7*	87*	7*	0	0	0	0
Caring for sick animal	54	8*	77	15	0	0	0	0
Collection of Farm yard manure	42	0	90	10*	0	0	0	0
Animal shed cleaning	25	83	17*	0	0	0	0	0

Marketing of live animals	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marketing of livestock products e.g., meat, manure	4*	0	100*	0	0	0	0	0

*1 Household

Table 4: Diseases affecting Chicken livestock and associated outcomes

		Portion of households reporting	Outcome		
			Died	Survived	Slaughtered
Most frequent disease	**Bird flu**	4*	100*	0	0
	fowl pox	4*	100*	0	0
	Diarrhoea	8	100	0	0
	White diarrhoea	4*		100*	0
	Liver disease	4*	100*	0	0
	Sores on head	4*	100*	0	0
	No Response	71	-	-	-
2nd most frequent disease	**Bird Flu**	4*	100*	0	0
	Fowl Pox	4*	100*	0	0
	Not applicable/No response	92	-	-	-

*1 Household

Appendix C: Sheep

Table 5: Household engagement in sheep related activities

	Portion of households that engage in this activity	Main person responsible for this activity						
		Adult male	Adult female	Children	Hired worker	All/any adult	All/Any household member	Other
Grazing	57	75	0	0	0	25*	0	0
Feed preparation	29	100	0	0	0	0	0	0
Watering animal	57	75	0	0	0	25*	0	0
Milking	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Milk processing	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Caring for sick animal	57	75	0	0	0	25*	0	0
Collection of Farm yard manure	57	75	0	0	0	25*	0	0
Animal shed cleaning	29	50*	0	0	0	50*	0	0
Marketing of live animals	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Marketing of livestock products e.g., meat, manure	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*1 Household

Appendix D: Goats

Table 6: Household engagement in goat related activities

	Portion of households that engage in this activity	Main person responsible for this activity						
		Adult male	Adult female	Children	Hired worker	All/any adult	All/Any household member	Other
Grazing	54	33	0	0	0	8	50	0
Feed preparation	50	36	9*	0	45	0	0	0
Watering animal	68	33	0	7*	40	13	0	0
Milking	4*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Milk processing	4*	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Caring for sick animal	54	50	0	8*	33	8*	0	0
Collection of Farm yard manure	50	36	0	9*	45	9*	0	0
Animal shed cleaning	36	25	0	12*	50	12*	0	0
Marketing of live animals	23	40	0	20*	40	0	0	0
Marketing of livestock products e.g., meat, manure	4*	100*	0	0	0	0	0	0

*1 Household

Table 7: Diseases affecting Sheep/Goat livestock and associated outcomes

		Portion of households reporting	Outcome		
			Died	Survived	Slaughtered
Most frequent disease	Anaplasmosis	4*			0
	Internal Parasites	4*	0	100*	0
	Foot abscesses and foot rot	4*	0	100*	0
	Arthritis	4*	0	100*	0
	Heartwater	15	33	67	0
	Pneumonia	4*	100*	0	0
	Stoma	4*	-	-	-
	Constipation	4*	-	-	-
	Other	4*	0	100*	0
	No Response	54	-	-	-
2nd most frequent disease	Heartwater	11	100	0	0
	Flystrike	4*	100*	0	0
	Worms	8	-	-	-
	Not applicable/No response	77			

*1 Household

Appendix E: Pigs

Table 8: Household engagement in pig related activities

	Portion of households that engage in this activity	Main person responsible for this activity						
		Adult male	Adult female	Children	Hired worker	All/any adult	All/Any household member	Other
Grazing	33*	0	0	0	0	100*	0	0
Feed preparation	100	33*	33*	0	0	33*	0	0
Watering animal	100	33*	33*	0	0	33*	0	0
Caring for sick animal	100	33*	33*	0	0	33*	0	0
Collection of Farm yard manure	67	0	50*	0	0	50*	0	0
Animal shed cleaning	33*	0	0	0	0	100*	0	0
Marketing of live animals	33*	100*	0	0	0	0	0	0
Marketing of livestock products e.g., meat, manure	33*	100*	0	0	0	0	0	0

*1 Household

Table 9: Diseases affecting pig livestock and associated outcomes

		Portion of households reporting	Outcome		
			Died	Survived	Slaughtered
Most frequent disease	Erysipela	33*	0	100*	0
	Diarrhea (caused by E.coli)	33*	100*	0	0
	internal parasite	33*	0	100*	0
2nd most frequent disease	Diarrhea (caused by E.coli)	33*	100*	0	0

*1 Household

Appendix F: Sale of livestock

Table 8: Breakdown of sale of livestock

	Primarily sells livestock		Primarily gets money from sale of livestock	
	N	%	N	%
Household head	48	56	38	45
Spouse	3	3	2	2
Elder men in household	1	1	0	0
Elder women in household	2	2	2	2
Jointly household head and spouse	2	2	7	8
Shared by all members	0	0	6	7
Other	1	1	0	0
Not specified	28	33	30	35

*1 Household

Appendix G: Household Spending

Table 9: Breakdown of household spending

		Food		Clothing		Education		Water and Electricity		Rent (house)	
		N		N		N		N		N	
Households that spend on item (%)	**Yes**	76	89%	25	29%	25	29%	68	80%	5	6%
	No	0	0%	7	8%	11	13%	3	3%	16	19%
	Not Specified	9	11%	53	62%	49	58%	14	16%	64	75%
Of those that reported spending on item, amount spent in an average month (%)	**Less than R200**	7	9%	1	4%	2	8%	20	30%	0	0%
	R200-R500	9	12%	3	12%	4	16%	31	46%	3	60%
	R500-R1000	28	37%	5	20%	2	8%	8	12%	0	0%
	R1001-R1500	15	20%	2	8%	3	12%	2	3%	0	0%
	R1600-R2000	4	5%	1	4%	1	4%	0	0%	0	0%
	R2001-R2500	2	3%	2	8%	1	4%	0	0%	0	0%
	More than R2500	1	1%	2	8%	7	24%	0	0%	0	0%
	Did Not answer	10	13%	9	36%	5	20%	6	9%	0	%

*1 Household

Table 9: Spending on farming-related items

		Fertiliser		Vegetables		Animal seeds		Licks		Vaccines		Medicine		De-worming		Tick Dips		Terramycin	
		N		N		N		N		N		N		N		N		N	
Households that spend on item (%)	**Yes**	7	8%	7	8%	24	28%	9	11%	45	53%	31	36%	31%	36%	29	34%	45	53%
	No	12	14%	11	13%	10	12%	16	19%	7	8%	5	6%	7	8%	10	12%	7	8%
	Not Specified	66	78%	67	79%	51	60%	60	71%	33	39%	49	58%	47	55%	46	54%	33	39%
Of those that reported spending on item, amount spent in an average month (%)	**Less than R200**	2	29%	4	57%	3	12%	2	22%	9	20%	4	13%	10	32%	10	34%	6	13%
	R200-R500	3	43%	0	0%	7	29%	4	44%	22	49%	18	58%	13	42%	5	17%	27	60%
	R500-R1000	2	29%	2	29%	9	37%	1	11%	9	20%	5	16%	3	10%	0	0%	8	18%
	R1001-R1500	0	0%	0	0%	0	0%	0	0%	1	2%	0	0%	0	0%	0	0%	0	0%
	R1600-R2000	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	R2001-R2500	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	More than R2500	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Did Not answer	0	0%	1	14%	4	17%	2	22%	4	9%	4	13%	5	16%	4	14%	4	9%

Appendix H: Vaccination

Table 10: Reasons for not vaccinating

Statements	Agree		Disagree		Did not specify	
	N		N		N	
Vaccines are not readily available	3	10%	18	62%	8	28%
Vaccines cause harm/death/negative effects to animals	2	7%	19	65%	8	28%
Vaccines are too expensive	7	24%	14	48%	8	28%
Other remedies and medicines work just as/more effectively	0	0%	21	72%	8	28%
Vaccines are not necessary	0	0%	21	72%	8	28%
I see no positive results from using vaccines	0	0%	21	72%	8	28%
There are no disease outbreaks in this area	0	0%	21	72%	8	28%
Vaccines are for diseases that are rare and do not affect my animals	0	0%	21	72%	8	28%
There is no one to administer the vaccines	2	7%	19	65%	8	28%
I don't know enough about vaccines	2	7%	19	65%	8	28%

ANNEXURE B: Survey Questionnaire

For Office Use only

Unique ID	Fieldworker ID	Date	Start time

The Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security

HOUSEHOLD SURVEY QUESTIONNAIRE

SECTION A: HOUSEHOLD DEMOGRAPHIC QUESTIONS

1. This section covers particulars of each person in the household

(*Please complete the Information on every person residing in this house for at least four nights a week* **starting with the household head**)

	A	B	C	E	F	G	H	G	F
	List of names of all h/hold members	**Relation to head of H/hold**	**Gender**	**Age in years**	**Educational Level**	**Race**	**Employment status**	**Years of farming experience**	**Member of a livestock farming association**
	Name and Surname	**1**= Spouse/partner **2**= Son **3**= Daughter **4**= Grandchild **5**= Cousin **6**= Niece **7**= Nephew **8**= Uncle **9**= Aunt **10**= Grandfather **11**= Grandmother **12**= Other	**1**= Male **2**= Female		**1**= No formal **2**= Primary **3**= Secondary **4**= Tertiary	**1**= African **2**= White **3**= Coloured **4**= Indian **5**= Other	**1**= Work off the farm full time **2**=Work on the farm full time **3**= Work on the farm part time and off the farm part time **4**= Work on the farm but within the home **5**= Unemployed **6**= Sick disabled and unable to work **7**= Student / pupil/ learner **8**= Other	**99**= Not applicable	**1**= Yes **2**= No
01.	Household Head								
02.									
03.									
04.									
05.									
06.									
07.									

08.									
09.									
10									

SECTION B: FARM ACTIVITIES AND FACILITIES

2. Who primarily manages the day to day activities on the farm?

Self 1 | Spouse 2 | Household Head's father 3 | Household heads mother 4 | Son/son-in-law 5 | Daughter/ daughter-in-law 6 | Hired Worker 7 | Other (specify)

3. Does the farm you work on belong to you or someone in your family?

Yes 1 → **Continue to question 4** **No** 0 → **Go to question 6**

4. Who owns this farm?

Spouse 1 | Household Head's father 2 | Household heads mother 3 | Son/son-in-law 4 | Daughter/ daughter-in-law 5 | Other (specify)

5. What is the size of your farm? **Square Kilometres** → **Go to question 8**

6. Who do you rent/lease your land from?

Municipality 1 | Tribal Authority 2 | Private owner 3 | Other (specify)

7. How much rent do you pay per year? **R**

8. Do you rent out any portion of your land (including sharecropping)?

Yes 1 → **Continue to question 9** **No** 0 → **Go to question 10**

9.1 What is the size of the farm area you rent out? **Square Kilometres**

9.2 How much rental income do you earn per year? **R**

10. Do you use any community/ public land for grazing

Yes 1 **No** 2

11. Please indicate which crops are grown in the two major seasons in the last 12 months

	Crop Grown		Season	Area Allocated	Purpose	Fed to which species
	1=wheat 2=rice 3=gram 4=lentil 5=barley 6=oats 7=rapeseed/ mustard 8= cotton 9=sorghum	10=millet 11=groundnut 12=maize 13=other oil seeds 14=fodder 15=vegetables 16=sugarcane 17=pasture 18=others, specify	**1=** spring/ summer **2=**Autumn/Winter		1= home consumption 2= sale 3= home consumption and sale 4= animal feed 5= other	0=not used for feed 1= cattle 2=buffalo 3=sheep 4=goat 5=pig 6=chicken 7=all species kept 8= Other
01.						
02.						
03.						

04.						
05.						

12. Please indicate if you have any of these items and if so, who owns them.

Household assets	How many are owned	Who owns it (mark all that apply)	Farm Assets	How many are owned	Who owns it (mark all that apply)
		1=Head, **2**=Spouse **3**= Household (All) **4**=Head's father **5**= Head's mother **6**=Son/ son-in-law **7**=Daughter/daughter-in-law **8**= Other			**1**=Head, **2**=Spouse **3**= Household (All) **4**=Head's father **5**= Head's mother **6**=Son/ son-in-law **7**=Daughter/daughter-in-law **8**= Other
Stove			Automated insecticide/ water spray		
Fridge			Ploughing Tractor		
Television			Water Pump		
Car			Animal Shed		

13. Which livestock do your household own, who owns them and why do you keep them?

Livestock	How many are owned	Who owns it (mark all that apply)	Reason for rearing
		1=Head, **2**=Spouse **3**= Household (All) **4**=Head's father **5**= Head's mother **6**=Son/ son-in-law **7**=Daughter/daughter-in-law **8**= Other	**1**= Household Consumption **2**=Sale of Animals **3**=Sale of animal by-products **4**=Wealth status **5**=Religious/traditional practices **6**=Other
Cattle			
Chicken			
Sheep			
Goat			
Pig			
Other (specify):			

14.1 Do you sell any products from your livestock?	**Yes** 1 **➔Continue to question 14.2** **No** 0 **➔Skip to question 15**

14.2 Please indicate what type of products are sold for each of the following animals

Cattle	None	0	Wool	1	Meat	2	Milk	3	Yoghurt	4	Cheese 5
Sheep	None		Wool		Meat		Milk		Yoghurt		Cheese

		0		1		2		3		4		5
Goat	None	0	Wool	1	Meat	2	Milk	3	Yoghurt	4	Cheese	5
Chicken	None	0	Meat	1	Eggs	2						
Pig	None	0	Meat	1								

14.3Where are these products primarily sold?

Market	1	Seller's premises	2	Buyers premises	3	Other	4

14.4 Who primarily sells these products?

Household head	1	Spouse	2	Elder men in household	3	Elder women in household	4	Jointly head and spouse	5	Shared by all members	6	Other	7

14.5 Who primarily gets the money from the sale of these items

Household head	1	Spouse	2	Elder men in household	3	Elder women in household	4	Jointly head and spouse	5	Shared by all members	6	Other	7

15.1 Do use any products from your livestock for household consumption?	**Yes** 1 **→Continue to question 15.2 No** 0 **→Skip to question 16**

15.2 Please indicate what type of products for each of the following animals are used

Cattle	None	0	Wool	1	Meat	2	Milk	3	Yoghurt	4	Cheese	5
Sheep	None	0	Wool	1	Meat	2	Milk	3	Yoghurt	4	Cheese	5
Goat	None	0	Wool	1	Meat	2	Milk	3	Yoghurt	4	Cheese	5
Chicken	None	0	Meat	1	Eggs	2						
Pig	None	0	Meat	1								

16.1 Do you keep any written records of animal entries and exits due to deaths, births theft etc.?	**Yes** 1 **→Continue to question 16.2 No** 0 **→Skip to question 17**

16.2 Which of the following records do you keep?

Number of animal births	1	Number of animal deaths	2	Vaccination records	3	Records of sick animals	4	Livestock calendar	5

17.1 Have the levels of your livestock (cattle, sheep, goat and pig) decreased in the <u>past year</u> either through death, sale, gifting or stock theft?	**Yes** 1 **→Continue to question 17.2 No** 0 **→Skip to question 17.3**

17.2 Please complete the table for all events that have occurred in the last <u>12 months.</u>

Livestock	Number of animals	Cause for Exit

		DEATH 1=Death due to disease 2=Slaughter due to disease 3=Slaughter for home consumption 4= Lost/killed by predators/accident 5=Death due to poor Management 6= Natural death	SALE 7=Sale- urgent money requirement (school fee, medicine etc..) 8= Sale – as a business 9= Sold due to old age 10= Sale to raise funds to start business (non- livestock related) 11= Sold to raise funds to invest into livestock enterprise 12= Given away (gift/ dowry)	GIVEN AWAY 13= Given away (ceremonies/ festivals) 14= Given to poor household (traditional practice) 15= Given to owner (traditional practice) 16=stock theft 17=other, specify
Cattle				
Sheep				
Goat				

17.3 Have the levels of your poultry (chickens) decreased in the past 3 months either through death, sale, gifting or stock theft?	**Yes** 1 **➔Continue to question 17.4** **No** 0 **➔Skip to question 18**

17.4 Please complete the table record for all events that have occurred in the last 3 months.

Livestock	Number of animals	Cause for Exit		
		DEATH 1=Death due to disease 2=Slaughter due to disease 3=Slaughter for home consumption 4= Lost/killed by predators/accident 5=Death due to Management 6= Natural death	SALE 7=Sale- urgent money requirement (school fee, medicine etc..) 8= Sale – as a business 9= Sold due to old age 10= Sale to raise funds to start business (non- livestock related) 11= Sold to raise funds to invest into livestock enterprise 12= Given away (gift/ dowry)	GIVEN AWAY 13= Given away (ceremonies/ festivals) 14= Given to poor household (traditional practice) 15= Given to owner (traditional practice) 16=stock theft 17=other, specify
Chicken				

18.1 Have the levels of your livestock (cattle, sheep, goat and pig) increased in the past year either through either through birth or purchase?	**Yes** 1 **➔Continue to question 18.2** **No** 0 **➔Skip to question 18.3**

18.2 Please complete the details for each livestock group

	Type of entry	Number of animals	Animal type	Total Price paid	Where bought
	1=Birth 2= Purchased 3= Gifts/exchanged 4= Got animal from wild 5= Got animal from rich household (traditional practice) 6= Got animal from poor household (traditional practice) 7= Other		1= Adult male for breeding 2= Adult male, not for breeding 3= Adult female 4= Female young 5= Male young 6= Other		1=Government livestock programme 2= Market 3= Seller's premises 4= Other
Cattle				R	
Sheep				R	
Goat				R	

Pig				R	

18.3 Have the levels of your poultry (chickens) increased in the past year either through either through birth or purchase?	**Yes** 1 **➔Continue to question 18.4** **No** 0 **➔Skip to question 19**

18.4 Please complete the details for chickens

	Type of entry	Number of animals	Total Price paid	Where bought
	1=Birth 2= Purchased 3= Gifts/exchanged 4= Got animal from wild 5= Got animal from rich household (traditional practice) 6= Got animal from poor household (traditional practice) 7= Other			1=Government livestock programme 2= Market 3= Seller's premises 4= Other
Chickens			R	

18.5 Who primarily sells the livestock?

Household head	Spouse	Elder men in household	Elder women in household	Jointly head and spouse	Shared by all members	Other
1	2	3	4	5	6	7

18.6 Who primarily gets the money from the sale of these items

Household head	Spouse	Elder men in household	Elder women in household	Jointly head and spouse	Shared by all members	Other
1	2	3	4	5	6	7

19. Please indicate if this household receives income from any of the following categories. If so, please indicate who has control over that particular income source.

Main sources of income	Do you obtain income from this source?	Controls income
	0= No **1=**Yes	1= Household head 2= Spouse 3= Elder men in household 4= Elder women in household 5= Jointly head and spouse 6= Shared by all members 7= Other
Food grain/ crops/vegetable		
Fruits		
Forest products(herb/medicinal plant/timber)		
Land rent		
Savings money		
Wage income		
Business-shop, trade etc		
Service		
Remittance		
Pension		

20. What is your estimated total monthly household income (before taxes) ?

Less than R2000 per month	Between R2, 000 and R4, 000 per month	Between R4, 000 and R8, 000 per month	Between R8, 000 and R16, 000 per month	More than R16, 000 per month
1	2	3	4	5

21. Please indicate how much money is spent on each of the following items in an average month

Household assets	**Money spent on item**	**Amount spent**	**Farm Assets**	**Money spent on item**	**Amount spent**
	0= No **1=**Yes	1=less than R200 2=R200-R500 3=R500-R1000 4=R1001-R1500 5=R1600-R2000 6=R2001-R2500 7=more than R2500		**0=** No **1=**Yes	1=less than R200 2=R200-R500 3=R500-R1000 4=R1001-R1500 5=R1600-R2000 6=R2001-R2500 7=more than R2500
Food			Fertiliser		
Clothing			Vegetables		
Education			Animal seeds		
Water and Electricity			Licks		
Rent (house)			Vaccines		
			Medicine		
			De-worming		
			Tick Dips		
			Terramycin		

22. How much time, in an average week do you spend on the following farm-related activities

• Livestock Farming	Less than 10 Hours	2	10-20 Hours	3	20-40 Hours	4	40 Hours or more 5
• Crop farming	Less than 10 Hours	2	10-20 Hours	3	20-40 Hours	4	40 Hours or more 5

23. Please indicate if this household engages in any of the following farm-related activities. If so, please indicate who is in charge of that particular activity										
	Cattle		Sheep		Goats		Pigs		Chicken	
	Is this activity done	**Main person responsible for this activity**	**Is this activity done**	**Main person responsible for this activity**	**Is this activity done**	**Main person responsible for this activity**	**Is this activity done**	**Main person responsible for this activity**	**Is this activity done**	**Main person responsible for this activity**
	0= No **1=**Yes	1= adult male 2= adult female 3= children 4= hired worker 5= all or any Adults 6= all or any household members 7= Other	**0=** No **1=**Yes	1= adult male 2= adult female 3= children 4= hired worker 5= all or any Adults 6= all or any household members 7= Other	**0=** No **1=**Yes	1= adult male 2= adult female 3= children 4= hired worker 5= all or any Adults 6= all or any household members 7= Other	**0=** No **1=**Yes	1= adult male 2= adult female 3= children 4= hired worker 5= all or any Adults 6= all or any household members 7= Other	**0=** No **1=**Yes	1= adult male 2= adult female 3= children 4= hired worker 5= all or any Adults 6= all or any household members 7= Other
Grazing										
Feed preparation										
Watering animal										
Milking										
Milk processing										
Caring for sick animal										
Collection of Farm yard manure										
Animal shed cleaning										
Marketing of live animals										
Marketing of livestock products e.g., meat, manure										

24.1 Please provide details of the 2 most frequent animal health problems that affect your cattle herd? (list most important one first)

		Disease/ condition code			**If disease unknown, what are the 2 main symptoms**	**Outcomes**
		1=Circling 2= Coughing and sneezing 3= Decreased egg production 4=Diarrhoea 5= Drop in egg production 6= White diarrhoea 7= Nasal discharges	8=Respiratory problems 9= Soft shells and deformed eggs 10= Swelling of the joints, wattle and foot pad 11= Twisting head and neck 12= Vent picking	13= White diarrhoea 14=Barking like cough 15= Decreased appetite 16= Depression 17= Red skin 18= Infertility 19= other (specify)	**(Note to interviewer – Hand interviewee card and ask them to select two options)**	1 = Died 2 = Survived 3 = Slaughtered
Cattle	1st disease					
	2nd disease					

24.2 Please provide details of the 2 most frequent animal health problems that affect your sheep floack/goat herd? (list most important one first)

		Disease/ condition code			**If disease unknown, what are the 2 main symptoms**	**Outcomes**
		1=Anaplasmosis 2=Internal Parasites 3=Foot and mouth disease 4=Pulpit kidney 5=Orf/ vuilbek 6=Bluetongue, bloutong, 7=Foot abscesses and foot rot 8=Arthritis 9=Sheep-scab	10=Heartwater 11=Flystrike 12=Abscesses 13=Mastitis 14=Worms 15=Redgut/ rooiderm/ enterotoxaemia 16=Pneumonia 17=Tetanus	18=Milk fever 19=Ketosis 20=Anthrax 21=Bronchitis 22=Dysentry 23=Goat/sheep pox 24= Dermatitis 25= PPR 26==Other	**(Note to interviewer – Hand interviewee card and ask them to select two options)**	1 = Died 2 = Survived 3 = Slaughtered
Sheep/Goat	1st disease					
	2nd disease					

24.3 Please provide details of the 2 most frequent animal health problems that affect your Pig herd? (list most important one first)

		Disease/ condition code			**If disease unknown, what are the 2 main symptoms**	**Outcomes**
		1= Classical swine fever 2=Pasteurellosis	3= Salmonellosis 4=Erysipela	5=Diarrhea (caused by E.coli) 6= other, specify	**(Note to interviewer – Hand interviewee card and ask them to select two options)**	1 = Died 2 = Survived 3 = Slaughtered
Pig	1st disease					
	2nd disease					

24.4 Please provide details of the 2 most frequent animal health problems that affect your chicken brood? (list most important one first)

		Disease/ condition code	**If disease unknown, what are the 2 main symptoms**	**Outcomes**

		1= Newcastle disease 2=Bird flu 3=fowl pox 4=Coccidiosis	5=Fowl Cholera 6=Infectious Bursal Disease (Gumboro)	7=Infectious Bronchitis 8=Pullorum (Salmonella) 9= Other (specify)	**(Note to interviewer – Hand interviewee card and ask them to select two options)**	1 = Died 2 = Survived 3 = Slaughtered
Chicken	1st disease					
	2nd disease					

25. Do you engage in any preventative animal health practices?

Yes 1 **→Continue to question 26** **No** 2 **→Skip to question 28**

26. Which preventative measures are taken to stop animals falling ill/ disease spreading? Tick all that apply
(Note to interviewer: DO NOT read options out to interviewee)

Dipping 1 | Resting pastures 2 | Cleaning manure off pastures 3 | Fencing 4 | Isolation of sick animals 5 | Other (Specify) 6

27. How often do you take your animals to the dip tank?

once a week 1 | once every 2 weeks 2 | once a month 3 | once every 2 months 4 | Less than once every 2 months 5

28. Are any of your cows branded because of a disease they carry?

Yes 1 **No** 0 I don't keep any cows 99

Continue to question 29 **Skip to question 30**

29. Which diseases are they branded for?

TB 1 | Brucellosis 2 | Other (specify) 3

30. Which animal diseases are caused by ticks? [i.e. tick-borne diseases]

Heartwater 1 | Gallsickness 2 | Redwater 3 | Other (specify) 4

31. Which animal diseases are caused by bacteria?

Pneumonia 1 | Botulism 2 | Other (Specify) 3

32. How do you prevent tick-borne diseases [such as redwater, gallsickness and heartwater]? Tick all that apply

Tick control 1 | Vaccination 2 | Administering Berenil or Imizol to keep the cattle calm 3 | Tetracycline injections, 4 | Other (specify) 5

33. Which diseases are passed on from cattle/ animals to people [zoonotic diseases]?

Brucellosis 1 | TB 2 | Cattles measles 3 | Anthrax 4 | Rabies 5 | Other (specify) 6

34. What causes abortions?

Bacteria		Viruses		Rough handling		Deworming drugs		Vaccines		Other (specify)	
	1		2		3		4		5		6

35.1 Did you use animal health services (AHT and / or State veterinarian) in the last 12 months?	**Yes** 1 **➔Continue to question 35.2**	**No** 2 **➔Skip to question 36**

35.2 Are you satisfied with the services you receive from animal health practitioners such as AHTs and State veterinarians?	**Yes** 1	**No** 2

35.3 When an animal is sick and you request the services of the state veterinarian or AHT, how long do they take to get to you?

30 minutes	An hour	1-2 hours	3-4 Hours	More than 4 hours
1	2	3	4	5

35.4 Which of the following is <u>TRUE</u> of your experience of state animal health services (from AHTs and State veterinarians)?

	Statement	True **0=** No **1=**Yes
1	They are helpful and provide an essential service	
2	They assist me when my animals are sick	
3	They are unable to help because I do not have medicines and vaccines for them to administer	
4	The state veterinarian or AHT will provide me with medicines and/or vaccines when I need them for my animals	
5	There is insufficient animal health services support	

36.1 Do vaccinate your livestock?

Yes	No	Sometimes	I have in the past but not anymore
1	2	3	4

↓

Continue to Question 36.2 **Skip to Question 36.3**

36.2 Why don't you vaccinate your livestock?

	Select all that apply
Vaccines are not readily available	
Vaccines cause harm/death/negative effects to animals	
Vaccines are too expensive	
Other remedies and medicines work just as/more effectively	
Vaccines are not necessary	
I see no positive results from using vaccines	
There are no disease outbreaks in this area	
Vaccines are for diseases that are rare and do not affect my animals	
There is no one to administer the vaccines	
I don't know enough about vaccines	
Other	

36.3 Why do you vaccinate your livestock?

Vaccines are readily available	Vaccines cure animal diseases	Vaccines are easy to use	Vaccine use is encouraged by the State veterinarian/ AH	I see the positive results of using vaccines	Vaccines are a preventative animal health measure	Other
1	2	3	4	5	6	7

36.4 Who administers these vaccines?

State veterinarian 1 | Animal Health Technician (AHT) 2 | Farmer him/herself 3 | Another farmer/neighbour 4 | Farmer association head (formal knowledge) 5 | Other) 6

36.5 Which diseases do you vaccinate against and how often do you vaccinate?

	Disease vaccinated against	How often vaccine is administered 1= Every 6 months 2= Once a year 3= Once every 2 years 4= When vaccines are available 5= When money is available to buy the vaccine 6= Other
Cattle		
Sheep		
Goat		
Pig		
Chicken		

36.6 Who administers these vaccines?

State veterinarian 1 | Animal Health Technician (AHT) 2 | I buy it at a store 3 | I buy it communally with other farmers 4 | an NGO 5 | Other (specify) 6

36.7 How much do you usually pay for a vaccine?

R

37. What is the difference between medicines and vaccines?

No difference 1 | Vaccines prevent disease, medicines treat disease 2 | Vaccines are too expensive 3 | I am not sure 4 | I don't know 5 | Other) 6

38. As a livestock farmer, which of the following do you need assistance with?

Veterinary services 1 | Financial services (access to credit etc.), 2 | Subsidizing of medicines 3 | Dipping 4 | Access to water and other resources 5 | Drought relief programmes 6 | Other (specify) 7

39. What types of training would you like to receive to improve your abilities as a livestock farmer?

Animal feeding and nutrition 1 | Disease symptoms and diagnosis 2 | Vaccination training 3 | Financial management 4 | Other (specify) 5

40. In the last 12 months did any adult in this household go hungry because there wasn't enough food to eat?	**Yes** ☐ 1 **No** ☐ 2
41. In the last 12 months did any child in this household go hungry because there wasn't enough food to eat?	**Yes** ☐ 1 **No** ☐ 2

42. Please indicate which of the following foods you ate yesterday and which meal you had it for. (Note to interviewer: First read out the 5 meal times followed by one group name at a time and two examples from the list of foods. If respondent is unclear of the food group, provide more examples from the list provided.)

Group	Foods	Breakfast	Mid-morning Snack	Lunch	Mid afternoon Snack	Supper	After supper Snack
Cereals	Corn/maize/samp, rice, wheat, sorghum, porridge, phutu, bread, pasta, breakfast cereals, oats, Mabella, Morvite, fortified cereals						
White roots and tubers	Potato, white sweet potato						
Yellow/orange vegetables	Carrot, butternut, pumpkin, orange-fleshed sweet potato						
Dark-green leaves	Spinach, imifino, morogo						
Vegetables other than dark-green leafy and yellow/orange	Beetroot, brinjals, broccoli, brussels sprouts, cabbage, cauliflower, gem squash, green beans, onion, peas, tomato, turnip, thepe						
Yellow / orange fruits	Apricot, mango, pawpaw, sweet melon, yellow flesh peach, yellow flesh plums, 100% fruit juice made from these						
Fruit other than yellow / orange fleshed	Apple, avocado, banana, berries, fig, granadilla, grape, guava, lemon, litchi, maroela, melon, orange, naartjie, peach, pear, pineapple, strawberry, watermelon, 100% fruit juice made from these fruits						
Organ meat (offal)	Liver, kidney, heart, spleen, lungs, chicken giblets, malomogudo (offal), intestines						
Meat and poultry (flesh meats)	Beef, goat, lamb, mutton, pork, venison, game, chicken, birds, ostrich, insects, mopani worms, chicken head/feet, sheep head						
Eggs	Any type of egg						
Fish and seafood	Fresh, frozen fish or canned fish (sardines, pilchards, tuna), dried fish, shellfish						
Legumes, nuts and seeds	Dried beans, dried peas, lentils, nuts, peanuts, seeds (or foods made from these e.g. peanut butter)						
Milk and milk products	Milk, sour milk, cheese, yogurt, custard, or any other milk products, or any drinks made with milk						
Fats and oils	Oils, fats, margarine or butter added to foods or used for cooking						
Spices and condiments	Spices (salt, pepper, etc), condiments (e.g. chutney, tomato sauce)						
Drinks	Coffee						

Drinks	Alcoholic drinks								

Thank you for your participation and time in the completion of this survey!

Form for completion BY INTERVIEWEE after the interview

Start time (Copy from page 1)	
End Time	
Were you happy to spend the amount of time answering the questions as you did?	
What was your overall impression of the questionnaire?	
Are there any questions in particular you struggled with? (Interviewer to add additional notes if they noticed anything while conducting the interview)	
Are there any question in particular you found to be incorrect/inaccurate?	
Is there any question/topic that you feel was excluded and should be included in the main study?	

Do you have any other comments to share?

ANNEXURE C: In-depth interview guide – Female Farmer

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDERS

Female Farmer

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1) Can you please tell us about the area in which you live? How long have you been a small-scale livestock farmer?
2) Which animals constitute your livestock?
3) Do you enjoy farming with livestock? Why?
4) Do you own land in which your farming activities occur? If no, who owns such land?

Meanings and symbolic significance of animals

5) In your opinion which animals do a farmer such as yourself are important to keep as livestock? (Trying to establish reasons for owning livestock – e.g. commercial purposes, to pay school and hospital fees, social prestige etc.)
6) Do you have a preference for a particular type of livestock? If so, why? (Which animals are good to have/ easy to keep? Why?)

7) Do you cultivate your livestock for commercial purposes? If so, please describe when and how is the sale of your animals conducted, and why?
8) In your daily farming activities how much time is spent cultivating your livestock. Is this exercise conducted by yourself without the assistance of others or do you receive help.

Household farming and economic activities

9) Do your animals provide you and your family with food?
10) How often do you/ does your family eat meat, eggs and milk? How often do the children eat these?
11) Who milks the cattle, sheep or goats? Who collects the eggs from your chickens?
12) Do you also sell these products (meat / milk / eggs)?
13) Do you ever use the eggs, milk and meat to make other products, such as cheeses or yoghurts, or wools? If yes, who would make these?
14) Is farming your main source of income? Is it a good source of income for your family?
15) What other sources of income do you have? Does your family receive any social grants, or remittances from family members?
16) What are the main things you spend money on every week/ month? (Probe for a list, example, food, children's education, clothing, animal feed… etc.)
17) Are you able to save money in your household? What do you save for/ towards?
18) How do you do banking? How do you access cash?

Challenges and support services in livestock farming

19) What are some of the difficulties that you face as a livestock farmer? (Is stock-theft a major problem?)
20) What type of assistance do you require as a farmer?
21) Are there any government programmes for livestock farming in your area that you are aware of? If yes were/are you able to participate in any of these? What do you think of them?

22) Are there any farmer cooperatives or associations in your area? If yes, are you participating in them, what are these? Do you know who set them up?
23) Are there any NGOs working with farmers in your area that you are aware of? What do they do here? What kinds of assistance do they offer you?

Perceptions of women and livestock farming

24) How do you feel about women being livestock farmers?
25) Based on your custom are there any spaces in the farm where women are not allowed to enter (e.g., the kraals)
26) In your household, do women help with such tasks as milking cows etc.? Do women help with looking after (animal healthcare) for animals?

Diseases and animal health

27) How is the weather in this area? Is it good for you as a farmer and for your animals?
28) Is drought/ rainfall a big problem? When/ which time of year do you face drought? And when is there too much rainfall?
29) Is disease a major problem? Have you experienced disease outbreaks? When and how were you/ your animals affected?
30) When do most animal diseases happen? (There is usually a connection between deaths and disease and particular times of year/ seasons).
31) What are the most common diseases experienced? (Need to get names of diseases in the vernacular).
32) What are the symptoms of the disease?

Primary animal healthcare

33) Who do you speak to and obtain advice from in the event of the sickness of your animal/s?
34) What kinds of preventative practices do you have in place in order to prevent animals falling sick? Are any of the following preventative measures taken: dipping, resting pastures, cleaning manure off pastures, fencing?

35) Are animals given licks (nutritional supplements)? (What concept of animal welfare exists?)
36) If yes, is there household money available to buy these? Are they bought only IF there is leftover money at the end of the month? Are they bought with communal farmer funds or individual farmer funds?
37) Is the allocation of the household income more towards cultivation of livestock?
38) Do you spend money on: a) Tick dips, b) de-worming, c) terramycin (antibiotic)?
39) How often are your animals dipped? Who does the dipping/ provides the dip?
40) How accessible is medicines for your animals? Probe – in terms of physical distance the farmer has to travel to the place where these are sold; in terms of the price of the medication; in terms of the farmers' level of income.

Health services

41) How often do you require the assistance of AHT?
42) How often are you visited by the state veterinarian? Does the vet come to you or do you travel to the vet? How long does it take the vet to get to you?
43) Is it good to be visited by the state vet/ AHT? Why?
44) In what form do you obtain information about diseases/ medication/ vaccines from the AHT/ State vet? (Do they give you pamphlets with information? Are you able to read and understand the information pamphlets given by AHTs/ vets?)(Do you prefer pamphlets or do you prefer one-on-one personal contact?).

Traditional practices and knowledge

45) How important is traditional medicine in livestock farming especially when treating your sick animals? Which herbs do you use and how are these useful?
46) Would you consult a traditional healer if your animal is sick? Or if your animals were aborting, perhaps? Or to enhance animal fertility?
47) Do many animals abort? What causes abortions to happen?

Vaccines

48) Do you know what a vaccine is? What is the difference between vaccines and medicines?
49) Where do you obtain vaccines?
50) Are you able to afford vaccines? How much do you pay for [name of vaccine]?
51) How often do you vaccinate your animals, and for which diseases?
52) Who administers the vaccine? Is it you, another farmer, a state vet, or an AHT?
53) Do you keep any records of vaccinations and other medical information of the animals etc.? (What records are kept and in what form?).

Final Question

54) Is there anything you would like to add, that we may have missed or may have been overlooked?

Land and grazing

55) How often do your cattle graze? Do they graze around the area only? Are they taken to far-out land to graze? How much land is available for grazing? How many farmers are sharing this grazing land? Is there some kind of agreement among farmers about how to graze, when to graze etc.? Does anyone (if yes, who) regulate how grazing happens?
56) How often do your cattle eat bones? Are there many bones on the veld? Are there many deaths related to animals eating bones? (There is a relationship between phosphorous deficiency in the soil, and nutrient deficiency in the grass, which causes animals to eat bones for these nutrients. They usually develop botulism which may be fatal).
57) How does breeding occur? Are animals allowed to roam freely or is there some control over breeding?

ANNEXURE D: In-depth interview guide – Male Farmer

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDERS

Male Farmers

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1) Can you please tell us about the area in which you live? How long have you been a small-scale livestock farmer?
2) Which animals constitute your livestock?
3) Do you enjoy farming with livestock? Why?
4) Do you own land in which your farming activities occur? If no, who owns such land?

Meanings and symbolic significance of animals

5) In your opinion which animals do a farmer such as yourself are important to keep as livestock? (Trying to establish reasons for owning livestock – e.g. commercial purposes, to pay school and hospital fees, social prestige etc.)
6) Do you have a preference for a particular type of livestock? If so, why? (Which animals are good to have/ easy to keep? Why?)
7) Do you cultivate your livestock for commercial purposes? If so, please describe when and how is the sale of your animals conducted, and why?

8) In your daily farming activities how much time is spent cultivating your livestock. Is this exercise conducted by yourself without the assistance of others or do you receive help.

Household farming and economic activities

9) Are the animals you keep as livestock a source of food to you and your family?
10) How often do you/ does your family eat meat, eggs and milk? How often do the children eat these?
11) Who milks the cattle, sheep or goats? Who collects the eggs from your chickens?
12) Do you also sell these products (meat / milk / eggs)?
13) Do you ever use the eggs, milk and meat to make other products, such as cheeses or yoghurts, or wools? If yes, who would make these?
14) Is farming your main source of income? Is it a good source of income for your family?
15) What other sources of income do you have? Does your family receive any social grants, or remittances from family members?
16) What are the main things you spend money on every week/ month? (Probe for a list, example, food, children's education, clothing, animal feed… etc.)
17) Are you able to save money in your household? What do you save for/ towards?
18) How do you do banking? How do you access cash?

Challenges and support services in livestock farming

19) What are some of the difficulties that you face as a livestock farmer? (Is stock-theft a major problem?)
20) What type of assistance do you require as a farmer?
21) Are there any government programmes for livestock farming in your area that you are aware of? If yes were/are you able to participate in any of these? What do you think of them?
22) Are there any farmer cooperatives or associations in your area? If yes, are you participating in them, what are these? Do you know who set them up?

Are there any NGOs working with farmers in your area that you are aware of? What do they do here? What kinds of assistance do they offer you?

Perceptions of women and livestock farming

23) How do you feel about women being livestock farmers?

24) Based on your custom are there any spaces in the farm where women are not allowed to enter (e.g., the kraals)

25) In your household, do women help with such tasks as milking cows etc.? Do women help with looking after (animal healthcare) for animals?

Diseases and animal health

26) How is the weather in this area? Is it good for you as a farmer and for your animals?
27) Is drought/ rainfall a big problem? When/ which time of year do you face drought? And when is there too much rainfall?
28) Is disease a major problem? Have you experienced disease outbreaks? When and how were you/ your animals affected?
29) When do most animal diseases happen? (There is usually a connection between deaths and disease and particular times of year/ seasons).
30) What are the most common diseases experienced? (Need to get names of diseases in the vernacular).
31) What are the symptoms of the disease?

Primary animal healthcare

32) Who do you speak to and obtain advice from in the event of the sickness of your animal/s?
33) What kinds of preventative practices do you have in place in order to prevent animals falling sick? Are any of the following preventative measures taken: dipping, resting pastures, cleaning manure off pastures, fencing?
34) Are the animals sheltered at night? If yes, what type of shelter is provided?

35) Are animals given licks (nutritional supplements)? (What concept of animal welfare exists?)
36) If yes, is there money available to buy these?
37) Is the allocation of the household income more towards cultivation of livestock?
38) Do you spend money on: a) Tick dips, b) de-worming, c) terramycin (antibiotic)?
39) How often are your animals dipped? Who does the dipping/ provides the dip?
40) How accessible is medicines for your animals? Probe – in terms of physical distance the farmer has to travel to the place where these are sold; in terms of the price of the medication; in terms of the farmers' level of income.

Health services

41) How often do you require the assistance of AHT?
42) How often are you visited by the state veterinarian? Does the vet come to you or do you travel to the vet? How long does it take the vet to get to you?
43) Is it good to be visited by the state vet/ AHT? Why?
44) In what form do you obtain information about diseases/ medication/ vaccines from the AHT/ State vet? (Do they give you pamphlets with information? Are you able to read and understand the information pamphlets given by AHTs/ vets?)(Do you prefer pamphlets or do you prefer one-on-one personal contact?).

Traditional practices and knowledge

45) How important is traditional medicine in livestock farming especially when treating your sick animals? Which herbs do you use and how are these useful?
46) Would you consult a traditional healer if your animal is sick? Or if your animals were aborting, perhaps? Or to enhance animal fertility?
47) Do many animals abort? What causes abortions to happen?

Vaccines

48) Do you know what a vaccine is? What is the difference between vaccines and medicines?
49) Where do you obtain vaccines?
50) Are you able to afford vaccines? How much do you pay for [name of vaccine]?
51) How often do you vaccinate your animals, and for which diseases?
52) Who administers the vaccine? Is it you, another farmer, a state vet, or an AHT?
53) Do you keep any records of vaccinations and other medical information of the animals etc.? (What records are kept and in what form?).

Final Question

54) Is there anything you would like to add, that we may have missed or may have been overlooked?

Land and grazing

55) How often do your cattle graze? Do they graze around the area only? Are they taken to far-out land to graze? How much land is available for grazing? How many farmers are sharing this grazing land? Is there some kind of agreement among farmers about how to graze, when to graze etc.? Does anyone (if yes, who) regulate how grazing happens?
56) How often do your cattle eat bones? Are there many bones on the veld? Are there many deaths related to animals eating bones? (There is a relationship between phosphorous deficiency in the soil, and nutrient deficiency in the grass, which causes animals to eat bones for these nutrients. They usually develop botulism which may be fatal).
57) How does breeding occur? Are animals allowed to roam freely or is there some control over breeding?

ANNEXURE E: In-depth interview guide – State Veterinarians and Animal Health Technicians

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDER

State Veterinarians and Animal Health Technicians

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1. Please tell us a little bit about your work, particularly your engagement with small-scale farmers.
2. What kind of training have you had to become an AHT? How did you become an AHT?

Small-scale livestock farming in Limpopo

3. Is there a specific policy document that governs your engagement with animal healthcare and disease control?
4. Are there gaps in this policy that you can identify?
5. Do you meet with the small-scale farmers in Limpopo? When and in what capacity? How often? (quantify this). Where do you meet with farmers?
6. Are the numbers of households in small-scale farming communities who own livestock increasing or decreasing?

7. What are some of the obstacles facing small-scale farmers?
8. What are some of the diseases that affect small-scale farmers? What are the English names, and what are the names in the vernacular?
9. What is your knowledge of farmers and their usage of traditional medical practices in treating disease? Is there conflict between these practices and modern medical practices? Do farmers use these in conjunction with each other?
10. Do you keep a record of the numbers of farmers and how many animals (cattle/ sheep/ goats etc.) they keep?
11. What kinds of animal healthcare training programmes are offered to small-scale farmers?
12. Is there a relationship between poor animal healthcare and human health?

Women in small-scale livestock farming

13. How would you define the role of women in small-scale livestock farming? Is it an important role? How does the role of women compare to men's roles in your opinion?
14. Do you personally deal with women and in what capacity? As farmers or as part of a farming household? Do you know how many women farmers there are in the areas you work in?
15. What are the constraints faced by women farmers?
16. In your experience and engagement with small-scale farmers in the area, do women deal with animal healthcare? Who in your opinion is better equipped to address animal health problems, is it men or women and why?
17. Who has better knowledge of animal healthcare, men or women? What is women's knowledge of animal healthcare?
18. Are animal healthcare training programmes available for women farmers?
19. Are there farming organizations or associations for women in the communities you work with in Limpopo? What are these and how do they assist women?
20. What is the position and role of women within small-scale farming *households* in these areas? Do you think women in rural areas experience an unfair burden in terms of household work and care work?

Diseases/ vaccinations/ animal healthcare

21. What are the main causes of death of livestock among the small-scale farming communities here?
22. When was the last disease outbreak? What was the disease? Do you have record-keeping which shows how many animals were lost for small-scale farmers?
23. How do you intervene to assist small-scale farmers when there are disease outbreaks?
24. Are there records of animal deaths and the reasons for these? Do farmers report/ are they required to?
25. How is monitoring of diseases and disease outbreaks taking place?
26. Where do farmers get medication from, and are those places accessible to farmers?
27. Are medicines affordable to farmers?
28. What preventative measures are in place to deal with disease among small-scale farmers?
29. What vaccination programmes are offered to farmers?
30. Do farmers vaccinate and what prevents them from vaccinating?
31. What will make animal healthcare more effective for small-scale farmers?
32. What are some of the long term solutions to disease and animal healthcare issues?
33. What are the constraints faced by AHTs and State Vets in providing animal healthcare for small-scale farming communities?
34. As an AHT / State Vet, what do you need to help you do your work better? Who do you think should provide this?

Final Question

35. Is there anything you would like to add, that we may have missed or may have been overlooked?

ANNEXURE F: In-depth interview guide – Government officials (DOA, DLRD etc.)

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDER

Government officials – DoA, DLRD

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1. Tell us a little about your job in the Department of [Agriculture/ Rural Development], what is it that you do? What is your engagement with small-scale livestock farming issues?
2. Please tell us about the relevant policies that guide the work of the Ministry/ Department in relation to small-scale livestock farming.
3. What are the big issues, the obstacles, challenges and constraints for small-scale farmers?
4. Is gender relevant to small-scale farming? How and why? Are policies address issues of gender in livestock farming, and if so, how?
5. What is your understanding of commercial livestock farming? What is your understanding of small-scale livestock farming? What is the relationship/ what are the differences between these?

6. Do you meet personally with the small-scale livestock farmers in Limpopo? When and in what capacity? How often? (Quantify this).

Small-scale livestock farming in Limpopo

7. Can you please tell us how many small-scale livestock farmers there are in Limpopo Province? Does the Department have a system in place which captures number of farmers and animals (cattle/ sheep/ goats etc.) in the province/ country?
8. Are the numbers of households in small-scale livestock farming in Limpopo Province increasing or decreasing?
9. What is the role/ importance of small-scale livestock farmers in terms of the agricultural economy of the province? Is small-scale *livestock* farming prioritized in terms of government policy and planning at the provincial level? (How and why?) Is this importance expected to increase (in terms of policy directives)? How (in which specific directions) and why?
10. What are some of the obstacles facing small-scale farmers in order for them to be more productive? Does government policy in terms of small-scale livestock production encourage farmers to become commercial farmers? How do farmers respond to this?
11. Are policies dealing with the upliftment of small-scale livestock farmers working, are they effectively implemented and achieving their objectives?

Women in small-scale livestock farming

12. Do you think women are important to the agricultural sector in Limpopo province/ South Africa? (If so How/ why?). How does the role of women compare to men's roles in your opinion?
13. How many women are there in the small-scale livestock farming economy of the province?
14. Do you or your department personally deal with women small-scale livestock farmers and if so in what capacity?
15. What are the constraints faced by women who are involved in small-scale livestock farming?

16. What is generally the role of women in the *household* in small-scale livestock farming communities in the province/ country? Do women engage with animal healthcare within farming households?
17. What kinds of support structures and programmes exist for women in agricultural development initiatives in South Africa/ Limpopo? How have women been empowered in recent years? How have government programmes in small-scale livestock farming helped women?

Land ownership

18. Is this a land reform area, and if so, what does that entail in a practical sense?
19. How much land has been allocated for agricultural activity (commercial and small-scale)? How much land is for crop farming and how much for livestock farming? (Are these in conflict at all?)
20. How does land ownership in farming communities in [South Africa/ Limpopo] work?
21. How does a small-scale livestock farmer get access to land?
22. Do/ Are women farmers (able to) own land? What are the issues, challenges etc in relation to women owning farm land?
23. How do commercial and small-scale livestock farmers share grazing land? What kinds of restrictions are there on grazing?
24. Is there enough grazing land for small-scale livestock farmers? Is overgrazing a problem?
25. How is the soil improved after degradation?
26. What other problems arise from communal land use? (*Explore issues of contagion (easier spread of disease) and uncontrolled breeding*)

Training programmes for small-scale livestock farmers

27. Are there rural development programmes in which the small-scale livestock farming communities in Limpopo are involved?
28. What kinds of farmer training programmes (including animal healthcare programmes) are offered to small-scale farmers? Are these open to women farmers as well?

29. Have any farmer cooperatives been set up by local government? If not, is there a potential for cooperatives? Is it a good idea? What have been the successes and failures, challenges and constraints to such programmes in the past and presently?
30. Have these helped uplift the community? In what kinds of ways?
31. Are there NGOs working in the area? What are they doing? What kinds of teaching/ learning/ farmer development programmes are they running?

Diseases/ vaccinations/ animal healthcare

32. Are there Government Veterinary Services for small-scale livestock farmers in this province? What services do they offer farmers?
33. Are these services effective? How near/ far are the closest veterinary services for this community?
34. What are the main causes of death of livestock among the small-scale farming communities here? When was the last disease outbreak? What was the disease?
35. Do you have record-keeping which shows how many animals were lost due to the outbreak for both commercial and small-scale farmers in the province?
36. Do farmers/ are they required to report animal deaths from various diseases?
37. How does the Department intervene to assist small-scale farmers when there are disease outbreaks? (What is the procedure, from policy that is used to assist the farmers?)
38. How is monitoring of diseases and disease outbreaks taking place?
39. What preventative measures are in place to deal with disease among small-scale farmers?
40. What vaccination programmes are offered to farmers?
41. Are there particular challenges with animal healthcare that are gendered? Is the management of disease gendered? For instance, are there differences in how women/ men farmers engage diseases/ animal healthcare?

Concluding policy question

42. What are the gaps, and the problems that have been encountered in terms of policies and policy implementation (in relation to animal healthcare and disease control and women in small-scale livestock farming)? And what are the possible solutions to these?

Final Question

43. Is there anything you would like to add, that we may have missed or may have been overlooked?

ANNEXURE G: In-depth interview guide – Farmer Association Heads

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDER

The Head of Association of Farmers

Although we have formulated a list of questions, these are merely points of discussion that will guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. There are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1. Please tell us a little bit about your work and in particular your engagement with small-scale farmers. How do you understand your role as the leader of this community of small-scale livestock farmers (as association head)?
2. What does the association do? How many small-scale livestock farmers have joined your association?
3. How is your organization constituted? Is this a voluntary association? Is this association/ organization like a farmer's union?
4. Do you keep a record of the numbers of farmers and how many animals (cattle/ sheep/ goats etc.) each farmer owns in your organization, or in the area?
5. As head of the association, what is your engagement with government officials? (Who in government do you engage with, on what kinds of issues, and how often? How responsive is government?)

6. Beside government, is there any organization (e.g., NGOs) that your association deals with or approaches for assistance?

Small-scale livestock farming in Limpopo

7. How important do you think small-scale livestock farmers are to the economy of the province and what gives them significance/ importance?
8. Are the numbers of households in small-scale farming communities who own livestock increasing or decreasing? Why?
9. What are some of the challenges and obstacles facing small-scale farmers in your association?

Women in small-scale livestock farming

10. How would you define the role of women in small-scale livestock farming? Is it an important role? How does the role of women compare to men's roles in your opinion?
11. Do you personally deal with women who work in small-scale livestock farming and in what capacity? (Are these women farmers or are they part of a farming household?)
12. What is the position and role of women within small-scale farming *households* in your area? (What are the main activities women engage in – e.g. household work?)
13. Do you know how many women farmers there are in the communities you engage with?
14. How many women farmers are there in your association?
15. What are the constraints faced by women who are involved in livestock farming?
16. Are there farming organizations or associations for women in the communities you work with in Limpopo? What are these and how do they assist women?
17. In your experience and engagement with small-scale farmers in the area, do women deal with animal healthcare? Who in your opinion is better equipped to address animal health problems, is it men or women and why?
18. Who has better knowledge of animal healthcare, men or women? What is women's knowledge of animal healthcare?
19. What recommendations could you offer to improve and empower women in small-scale livestock production and to improve (animal) healthcare and disease prevention?

Land ownership

20. How does land ownership in Limpopo work? Is this a land reform area, and if so, what does that entail in a practical sense?
21. How does a small-scale livestock farmer get access to land?
22. Do/ Are women farmers (able to) own land? What are the issues, challenges etc. in relation to women owning farm land?
23. How do commercial and small-scale livestock farmers share grazing land?
24. Is there enough grazing land for small-scale livestock farmers? Is overgrazing a problem?
25. How is the soil improved after degradation?
26. What other problems arise from communal land use? (*Explore issues of contagion (easier spread of disease) and uncontrolled breeding*)

Training programmes for small-scale livestock farmers

27. Have there been/ Are there rural development programmes in which the small-scale livestock farming community is involved?
28. What kinds of farmer training programmes are offered to small-scale farmers? Are these open to women farmers as well?
29. Have any farmer cooperatives been set up by local government? If not, is there a potential for cooperatives? Is it a good idea? What have been the successes and failures, challenges and constraints to such programmes in the past?
30. Have these helped uplift the community? In what kinds of ways?
31. Are there NGOs working in the area? What are they doing? What kinds of teaching/ learning/ development programmes are they running?

Diseases/ vaccinations/ animal healthcare

32. When was the last disease outbreak? What was the disease? Do you have record-keeping which shows how many animals were lost for small-scale farmers?
33. How does the association intervene to assist small-scale farmers when there are disease outbreaks?

34. What are the main causes of death of livestock among the small-scale farming communities here? Are there records of animal deaths and the reasons for these? Do farmers report/ are they required to?
35. Are there Government Veterinary Services for small-scale livestock farmers here? What services do they offer farmers? Are they good/ effective/ helpful?
36. What recommendations would you give for improvement of services for animal healthcare?

Final Question

37. Is there anything you would like to add, that we may have missed or may have been overlooked?

ANNEXURE H: In-depth interview guide – Researchers & Academics

IN-DEPTH INTERVIEW GUIDE – KEY STAKEHOLDER

University – based Academic Researcher

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory question

Pleased tell us about your work, what is it that you do, and how it is related to [gender / small-scale livestock farming /…. etc.].

Small-scale livestock farming in Limpopo

1. What is your knowledge of small-scale livestock farmers in [South Africa/ Limpopo Province]?
2. How does your own work and research relate to small-scale livestock farming in the country/ province? What is your knowledge of the role of small-scale farmers in terms of the agricultural economy of the country/ province?
3. Can you tell us something about the trends of small-scale livestock farming? Is there an increase or decrease?
4. How important are small-scale livestock farmers to the economy of the province and what gives them significance/ importance?
5. What is your view of government's policies around small-scale agriculture and more specifically small-scale livestock farming? Do you think small-scale livestock farming is

prioritized in terms of government policy or planning at the provincial level? If so, in what ways?

6. How important is small-scale livestock farming in relation to poverty alleviation, and enhancing food security, not only in Limpopo but the entire country?
7. Typically, what have you observed to be barriers that small-scale livestock farmers face and what measures can be effect to enhance the productivity of the farmers?
8. Do you think small-scale livestock farmers find the enterprising of their livestock in commercial terms of interest?
9. In your capacity as an academic researcher what have you observed to be major gaps in this sector?
10. What are the potential solutions which are informed by scholarly research and implemented into programs of actions may be effected?

Women in small-scale livestock farming

11. Do you think women are important to the agricultural sector in Limpopo province/ South Africa? (If so How/ why?)
12. How many women are there in the small-scale livestock farming economy of the province?
13. How would you define the role of women in small-scale livestock farming? Is it an important role? How does the role of women compare to men's roles in your opinion?
14. Do you think women have an important role to play in the development of small-scale livestock farming and production? What are some of the issues women have as small-scale livestock farmers, as opposed to men?
15. Are there any establishments of women-led farming organizations or associations that you may be aware of in the communities in Limpopo? What are these and how do they assist women?
16. What is the position of women within small-scale livestock farming households in these areas? What are some of the power dynamics between men and women within households in these areas?

17. What kinds of support structures and programmes exist for women who are small-scale farmers?

18. How have resources (material or otherwise) been distributed in order to enable women who are involved in small-scale farming to function optimally? For example, how have government programmes helped women and children?

Land/ land ownership

19. Is this a land reform area, and if so, what does that entail in a practical sense?
20. How much land has been allocated for agricultural activity? How much land is for crop farming and how much for livestock farming? (Are these in conflict at all?)
21. How does land ownership in Limpopo work?
22. How does a small-scale livestock farmer get access to land?
23. How many animals are there on the land?
24. Do/ Are women farmers (able to) own land? What are the issues, challenges etc in relation to women owning farm land?
25. How do commercial and small-scale livestock farmers share grazing land? What kinds of restrictions are there on grazing?
26. Is there enough grazing land for small-scale livestock farmers? Is overgrazing a problem?
27. How is the soil improved after degradation?
28. What other problems arise from communal land use? (*Explore issues of contagion (easier spread of disease) and uncontrolled breeding*)

Final Question

29. Is there anything you would like to add, that we may have missed or may have been overlooked?

ANNEXURE I: Focus group discussion guide – Male Farmers

Focus Group Discussion Guide

Male Farmers

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1) Please tell us about your experience as small-scale livestock farmers.
2) Are there any aspects of your farming that relate to growing vegetable crops? If so why is this important?
3) Is livestock farming important in this community? Probe _ (establish if there is any symbolic importance towards owning animals or the commercial value of livestock as it relates to food security in the household or other purposes such as paying school and hospital fees, social prestige)
4) In your experience as a livestock farmer are there any animals which are important for you to own and why?
5) Please describe the circumstance that could result in you selling your livestock.

6) Can you please explain to us the daily activities regarding farming livestock? Probe _ what entails the daily tasks associated with animal husbandry? For example, grazing, milking cows, collecting eggs etc.? Who grazes the cattle, sheep or goats? Who collects the eggs from your chickens?

Women and small-scale livestock farming

7) How do you feel about women being livestock farmers?
8) Based on your observation are women who are small-scale livestock able to own cattle in your community? If no, _ are you aware of any barriers that may explain this situation?
9) Do you know if women who are small-scale farmers are able to own land?
10) What is your own ability to own land? What are the issues with land ownership in your experience?
11) Based on your general experience do you find that women show interest in farming? Probe _ e.g., do women in your household assist you in any farming related activities
12) In the instance where women in your household do help with farming related activities are there any spaces based on your customs where they are not allowed to enter (e.g., the kraals)

Challenges and support services in livestock farming

13) What are some of the difficulties that you face as a livestock farmer? (Is stock-theft a major problem?)
14) What type of assistance do you require as a farmer?
15) Are there any government programmes for livestock farming in your area that you are aware of? If yes were/are you able to participate in any of these? What do you think of them?
16) Are there any farmer cooperatives or associations in your area? If yes, are you participating in them, what are these? Do you know who set them up?
17) Are there any NGOs working with farmers in your area that you are aware of? What do they do here? What kinds of assistance do they offer you?

Household farming and economic activities

18) Do your animals provide you and your family with food?

19) Do you sell your animals? When would you sell an animal and why?
20) Do you also sell animal products (meat / milk / eggs / wool etc.)?
21) Do you ever use the eggs, milk and meat to make other products, such as cheeses or yoghurts, or wools? If yes, who would make these?
22) Is farming a good source of income for your family? Why?

Health services and Animal healthcare

23) Who do you speak to and obtain advice from in the event of the sickness of your animal/s?
24) Do you care for the health of your animals? How?
25) What are your relationships with the AHT and State vet?
26) Is it good to be visited by the state vet/ AHT? Why?
27) How is your household income distributed in relation to your livestock? What do you have to buy for your animals? (Probe for: animal feeds? Nutritional supplements/ licks? Medicines/ vaccines?)
28) Do you buy: a) Tick dips, b) de-worming, c) terramycin (antibiotic)?
29) How accessible is medicines for your animals? Probe – in terms of physical distance the farmer has to travel to the place where these are sold; in terms of the price of the medication; in terms of the farmers' level of income.

Traditional practices and knowledge

30) How important is traditional medicine in livestock farming especially when treating your sick animals? Which herbs do you use and how are these useful?
31) Would you consult a traditional healer if your animal is sick? Or if your animals were aborting, perhaps? Or to enhance animal fertility?

Vaccines

32) Do you know what a vaccine is? What is the difference between vaccines and medicines?
33) Which diseases are you vaccinating against?
34) Where do you obtain vaccines?
35) Are you able to afford vaccines? How much do you pay for a vaccine?

36) How often do you vaccinate your animals, and for which diseases?
37) Who administers the vaccine? Is it you, another farmer, a state vet, or an AHT?
    Do you keep any records of vaccinations and other medical information of the animals etc. (What records are kept and in what form?)

Final Question

38) Is there anything you would like to add, that we may have missed or may have been overlooked?

General questions

39) Are there women-led organizations or associations in the community? What are these and how do they assist women? Are there community groups which women join? What are these and how, and with what, do women assist each other through them?
40) Are there NGOs working in this area? What do they do here? What kinds of assistance do they offer you?
41) Are there any other development projects or programmes in this community for women?
42) What are the challenges and difficulties women face in this area?

ANNEXURE J: Focus group discussion guide – Female Farmers

Focus Group Discussion Guide

Female Farmers

Although we have formulated a list of questions, these are merely points of discussion that would guide our engagement with you in a way that would help us to attain information related to small-scale livestock farming, as well as issues related to gender and animal healthcare. Please do not view this meeting as an interview but rather a forum for discussion. Indeed, there are no right or wrong answers as we do not expect you to be an expert on all of these issues; however we are interested in gaining the insights you can offer, in whichever area that may be.

Introductory questions

1) Please tell us about your experiences as small-scale livestock farmers.
2) Do you own animals or grow vegetable crops? Or both? What is preferable? Why?
3) Can you please explain to us the daily activities regarding farming livestock? Probe _ what entails the daily tasks associated with animal husbandry? For example, grazing, milking cows, collecting eggs etc.? Who grazes the cattle, sheep or goats? Who collects the eggs from your chickens?

Gender and livestock farming

4) How do you feel about women being livestock farmers?
5) In your experience as a livestock farmer are there any animals which are important for you to own and why?
6) Do women own cattle in this community? If no, why? If yes,

a. What are the kinds of obstacles, constraints or challenges that women face in cattle ownership?
b. Is it important to you to own cattle? Why? (Trying to establish reasons for owning livestock – e.g. commercial purposes, to pay school and hospital fees, social prestige etc.)

7) Based on your custom and traditional beliefs are there any spaces in the farm where women are not allowed to enter (e.g., the kraals)
8) Are women able to own/ do they own land? Would it be important to you to own land? (is there area of land owned will determine what kinds of animals women – are able to – keep?)

Household farming and economic activities

9) Are the animals you keep as livestock a source of food to you and your family?
10) Do you cultivate your livestock for commercial purposes? If so, please describe when and how is the sale of your animals conducted, and why?
11) Please describe what is the function of animal products (meat / milk / eggs / wool etc.)?
12) Is farming a good source of income for your family? Why?

Challenges and support services in livestock farming

13) What are some of the difficulties that you face as a livestock farmer? (Is stock-theft a major problem?)
14) What type of assistance do you require as a farmer?
15) Are there any government programmes for livestock farming in your area that you are aware of? If yes were/are you able to participate in any of these? What do you think of them?
16) Are there any farmer cooperatives or associations in your area? If yes, are you participating in them, what are these? Do you know who set them up?Are there any

NGOs working with farmers in your area that you are aware of? What do they do here? What kinds of assistance do they offer you?

Health services and Animal healthcare

17) Who do you speak to and obtain advice from in the event of the sickness of your animal/s?

18) Do you care for the health of your animals? How?
19) What are your relationships with the AHT and State vet?
20) Is it good to be visited by the state vet/ AHT? Why?
21) How is your household income distributed in relation to your livestock? What do you have to buy for your animals? (Probe for: animal feeds? Nutritional supplements/ licks? Medicines/ vaccines?)
22) Do you buy: a) Tick dips, b) de-worming, c) terramycin (antibiotic)?
23) How accessible is medicines for your animals? Probe – in terms of physical distance the farmer has to travel to the place where these are sold; in terms of the price of the medication; in terms of the farmers' level of income.

Traditional practices and knowledge

24) How important is traditional medicine in livestock farming especially when treating your sick animals? Which herbs do you use and how are these useful?
25) Would you consult a traditional healer if your animal is sick? Or if your animals were aborting, perhaps? Or to enhance animal fertility?

Vaccines

26) Do you know what a vaccine is? What is the difference between vaccines and medicines?
27) Which diseases are you vaccinating against?
28) Where do you obtain vaccines?

29) Are you able to afford vaccines? How much do you pay for a vaccine?
30) How often do you vaccinate your animals, and for which diseases?
31) Who administers the vaccine? Is it you, another farmer, a state vet, or an AHT? Do you keep any records of vaccinations and other medical information of the animals etc.? (What records are kept and in what form?).

Final Question

32) Is there anything you would like to add, that we may have missed or may have been overlooked?

General questions

33) Are there women-led organizations or associations in the community? What are these and how do they assist women? Are there community groups which women join? What are these and how, and with what, do women assist each other through them?
34) Are there NGOs working in this area? What do they do here? What kinds of assistance do they offer you?
35) Are there any other development projects or programmes in this community for women?
36) What are the challenges and difficulties women face in this area?

ANNEXURE K: Consent form - survey

INFORMATION SHEET AND CONSENT FORM: SURVEY

The Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security: A baseline study of small-scale livestock farmers in Marble Hall and Renosterkop (Limpopo) within the context of the ARC's OVI's New Generation Vaccine Programme

Who we are

Hello, I am Name of Researcher. I work at the Human Sciences Research Council. I am part of the research team in a project commissioned by the Agriculture Research Council.

What we are doing

We are conducting research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. We are gathering data and information on gender roles, decision-making in households, as well as vaccine use and disease control in rural livestock production relevant to your community.

Your participation

We are asking you whether you will allow us to conduct one interview with you about your knowledge and opinions of the issues associated with gender, vaccine use and disease control in rural livestock production in two communities in Limpopo. If you agree, we will ask you to participate in one interview for approximately 1 hour.

Please understand that **your participation is voluntary** and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop participating in the research at any time and tell me that you don't want to go continue. If you do this, there will be no penalties and you will not be prejudiced in any way.

Confidentiality

All identifying information will be kept in a password protected computer, it will be separately stored and will not be available to others and will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the ethics committee at the Human Sciences Research Council (All of these people are required to keep your identity confidential). Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Data Curation

All future use of the stored data will be subject to further Research Ethics Committee review and approval.

Risks/discomforts

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

Benefits

There are no immediate benefits to you from participating in this study. However, this study will be helpful to us to promote understanding of the funding situation in civil society organisations working on gender based violence.

If you would like to receive feedback on our study, we will record your phone number on a separate sheet of paper and can send you the results of the study when it is completed sometime after the 31 March 2015. We will also conduct feedback sessions with stakeholders on completion of data collection (at dates to be determined) where we will share with you information based on interviews with you.

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

This research has been approved by the HSRC Research Ethics Committee (REC). If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please call the HSRC's toll-free ethics hotline 0800 212 123

(when phoned from a landline from within South Africa) or contact the Human Sciences Research Council REC Administrator, on Tel 012 302 2012 or

e-mail research.ethics@hsrc.ac.za .

If you have concerns or questions about the research you may contact the project leader, Prof Vasu Reddy at vasureddy@hsrc.ac.za or call him on 012 302 2200

CONSENT FOR PARTICIPATION

I hereby agree to participate in research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.

……..

Signature of participant **Date**:……..

CONSENT FOR DATA CURATION

I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage.

……..

Signature of participant **Date**:……..

ANNEXURE L: Consent form – In-depth interviews

INFORMATION SHEET AND CONSENT FORM: IN-DEPTH INTERVIEWS

The Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security: A baseline study of small-scale livestock farmers in Marble Hall and Renosterkop (Limpopo) within the context of the ARC's OVI's New Generation Vaccine Programme

Who we are

Hello, I am Name of Researcher. I work at the Human Sciences Research Council. I am part of the research team in a project commissioned by the Agriculture Research Council.

What we are doing

We are conducting research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. We are gathering data and information gender roles, decision-making in households, as well as vaccine use and disease control in rural livestock production relevant to your community.

Your participation

We are asking you whether you will allow us to conduct one interview with you about your knowledge and opinions of the issues associated with gender, vaccine use and disease control in rural livestock production in two communities in Limpopo. If you agree, we will ask you to participate in one interview for approximately 45 minutes.

Please understand that **your participation is voluntary** and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop participating in the research at any time and tell me that you don't want to go continue. If you do this, there will be no penalties and you will not be prejudiced in any way.

Confidentiality

All identifying information will be kept in a locked password protected computer and will not be available to others and will be kept confidential to the extent possible by law. The records

from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the ethics committee at the Human Sciences Research Council (All of these people are required to keep your identity confidential). Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

We are asking you to give us permission to tape-record the interview so that we can accurately record what is said. We will not record your name anywhere and no one will be able to connect you to the answers you give. Your answers will be linked to a fictitious code number or a pseudonym (another name) and we will refer to you in this way in the data, any publication, report or other research output.

Data Curation

All future use of the stored data will be subject to further Research Ethics Committee review and approval.

Risks/discomforts

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

Benefits

There are no immediate benefits to you from participating in this study. However, this study will be helpful to us to promote understanding of the gendered dimensions of farming systems and rural farmer households in the context of food security.

If you would like to receive feedback on our study, we will record your phone number on a separate sheet of paper and can send you the results of the study when it is completed sometime after the 31 March 2015. We will also conduct feedback sessions with stakeholders on completion of data collection (at dates to be determined) where we will share information with you based on our interviews.

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

This research has been approved by the HSRC Research Ethics Committee (REC). If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please call the HSRC's toll-free ethics hotline 0800 212 123 (when phoned from a landline from within South Africa) or contact the Human Sciences Research Council REC Administrator, on Tel 012 302 2012 or

e-mail research.ethics@hsrc.ac.za .

If you have concerns or questions about the research you may l contact the project leader, Prof. Vasu Reddy at 012 302 2200 or vasureddy@hsrc.ac.za

CONSENT FOR PARTICIPATION

I hereby agree to participate in research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.

……..

Signature of participant **Date**:……..

CONSENT FOR TAPE RECORDING

I hereby agree to the tape-recording of my participation in the study.

……..

Signature of participant **Date**:……..

CONSENT FOR DATA CURATION

I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage.

……..

Signature of participant **Date**:……..

ANNEXURE M: Consent form – Focus group discussions

INFORMATION SHEET AND CONSENT FORM: FOCUS GROUP DISCUSSIONS

The Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security: A baseline study of small-scale livestock farmers in Marble Hall and Renosterkop (Limpopo) within the context of the ARC's OVI's New Generation Vaccine Programme

Who we are

Hello, I am Name of Researcher. I work at the Human Sciences Research Council. I am part of the research team in a project commissioned by the Agriculture Research Council.

What we are doing

We are conducting research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. We are gathering data and information gender roles, decision-making in households, as well as vaccine use and disease control in rural livestock production relevant to your community.

Your participation

We are asking you whether you will allow us to conduct one interview with you about your knowledge and opinions of the issues associated with gender, vaccine use and disease control in rural livestock production in two communities in Limpopo. If you agree, we will ask you to participate in one focus group discussion for approximately 1 hour.

Please understand that **your participation is voluntary** and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop participating in the research at any time and tell me that you don't want to go continue. If you do this, there will be no penalties and you will not be prejudiced in any way.

Confidentiality

Although confidentiality will be encouraged in group discussions it cannot be guaranteed. It should be clear: 1) Although the research team will adhere to confidentiality and ensure

anonymity of the data and reports, the team cannot guarantee that other participants will regard the information as confidential, but will be urged to do so, and 2) participants should thus be advised not to disclose sensitive personal information in FGDs.

All identifying information will be kept in a locked password protected computer and will not be available to others and will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the ethics committee at the Human Sciences Research Council (All of these people are required to keep your identity confidential). Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

We are asking you to give us permission to tape-record the interview so that we can accurately record what is said. We will not record your name anywhere and no one will be able to connect you to the answers you give. Your answers will be linked to a fictitious code number or a pseudonym (another name) and we will refer to you in this way in the data, any publication, report or other research output.

Data Curation

All future use of the stored data will be subject to further Research Ethics Committee review and approval.

Risks/discomforts

I will make every effort to keep what you say confidential. However, while I ask that other members of the discussion group to keep what is said confidential, I cannot guarantee that they will do so. Thus you need to be aware of what you disclose to the group.

Benefits

There are no immediate benefits to you from participating in this study. However, this study will be helpful to us to promote understanding of the funding situation in civil society organisations working on gender based violence.

If you would like to receive feedback on our study, we will record your phone number on a separate sheet of paper and can send you the results of the study when it is completed sometime after the 31 March 2015. We will also conduct feedback sessions with stakeholders on completion of data collection (at dates to be determined). We will share information with you based on our interviews.

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

This research has been approved by the HSRC Research Ethics Committee (REC). If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please call the HSRC's toll-free ethics hotline 0800 212 123 (when phoned from a landline from within South Africa) or contact the Human Sciences Research Council REC Administrator, on Tel 012 302 2012 or

e-mail research.ethics@hsrc.ac.za .

If you have concerns or questions about the research you may contact the project leader, Prof. Vasu Reddy at vasureddy@hsrc.ac.za or call him on 012 302 2200

CONSENT FOR PARTICIPATION

I hereby agree to participate in research on the **Gendered Dimensions of Farming Systems and Rural Farmer Households in the context of Food security**. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.

……..

Signature of participant **Date**:……..

CONSENT FOR TAPE RECORDING

I hereby agree to the tape-recording of my participation in the study.

……..

Signature of participant **Date**:……..

CONSENT FOR DATA CURATION

I understand that the information that I provide will be stored electronically and will be used for research purposes now or at a later stage.

……..

Signature of participant **Date**:……..