Socio Economic Determinants of Livestock Management Strategies at the Interface of Rural and Protected Areas: A Case of Hwange Communal Area, Ward 15

By

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Abstract

Livestock is key to the wellbeing of rural communities even those at the periphery of Protected Areas. Limited grazing opportunities in Hwange rural land drive people to exploit resources in bordering Hwange National Park and Sikumi Forest. Men drive domestic animals such as cattle into the Park. It is the aim of this study to understand decision-making processes behind driving cattle into the Protected Areas and to understand socio economic determinants of livestock management at the periphery of Protected Areas. Study site villages included Magoli, Mabale, Chezhou, Dingane and Sialwindi. A control study site was chosen in Kamativi to have a comparison of the management strategies with emphasis on opportunities and constraints. A combination of both quantitative and qualitative approaches was used in the study. A structured questionnaire was administered to solicit perceptions of cattle owners, (N=114). Focus Group Discussions (FGDs) and Key Informant Interviews were conducted to gain further insights on decision making and implications thereof. Results from this study show that men are favorites when it comes to cattle ownership and are the main decision makers on when and where to drive their cattle, when to buy or sell livestock and so on. Social and cultural practises are longer dominant because most farmers are now Christians and no longer have faith in traditional beliefs. It was proven advantageous staying next to a protected area as farmers will have access to forage and water sources inside the park but there are economic impacts associated with that. However, as much as farmers may enjoy access into the Protected Areas, they tend to face many constraints. Constraints include transmission of diseases from wildlife, predation, lack of immediate efficient markets to sell livestock and debasing veterinary services that has contributed to the dwindling livelihoods and numbers of livestock kept. It is therefore recommended that men, who are mostly owners of cattle be invited as stakeholders in meetings to do with negotiations of coexistence of cattle and wildlife at the periphery of Protected Areas. Research specialist and extension services are required to enlighten farmers on the dangers of driving cattle inside the park and how this will affect their livelihoods in the long run.

Key words: Protected Areas, livestock management, socio economic determinants, decision making

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Dedication

I dedicate this thesis to the Most High God for giving me life and strength to do this study.

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Acronyms

CA	**Communal Area**
CAMPFIRE	**Communal Areas Management Program for Indigeneous Resources**
CASS	**Centre for Applied Social Sciences**
CBNRM	**Community Based Natural Resources Management**
CIRAD	**Centre de cooperation Internationale en Recherche Agrinomique pour le Developpment (Agricultural Research for Development)**
DVS	**Department of Veterinary Services**
FAO	**Food and Agricultural Organisation of the United Nations**
FMD	**Foot and Mouth Disease**
GLTFCA	**Great Limpopo Trans-frontier Conservation Area**
HNP	**Hwange National Park**
KAZA TFCA	**Kavango Zambezi Transfrontier Conservation Area**
NGOs	**Non-Governmental Organizations**
PA	**Protected Area**
RDC	**Rural District Council**
RP-PCP	**Research Platform- Production and Conservation in Partnership**
SESs	**Socio Ecological Systems**
SF	**Sikumi Forest**
TFCAs	**Transfrontier Conservation Areas**

CHAPTER ONE

1.0 Introduction and Background

Livestock play significant economic and socio-cultural roles for most of Zimbabwe's rural based households. The roles include food, income, asset saving, employment, soil fertility, livelihoods, transport and draught. On economic aspect, cattle provide draught power, manure, meat and transport and are a source of income to farmers and providing security in times of financial needs, and general risk aversion (Barret, 1992). Cattle also play important roles in cultural events such as marriage, maturity rituals, funerals, weddings and restitution all critical aspects of rural lives in Zimbabwe (Bayer et al 2004 According to Shackleton et al., (1999), some farmers keep cattle for prestige and pleasure, as well sources of respect and power..

Mombeshora (1985) states that livestock farming provides a global role in improving the quality of human life in the 21st century and is expected to be even more important in terms of food security in the future. Rukuni and Escher (1994) concur in that both crop farming and livestock production play an important role in the economy of Zimbabwe, providing an income for about 75% of the population and contributing over 40% of national earnings from exports. Animals provide approximately 80% of the draught power used for communal farming in developing countries (Nyathi, 2008). Governments and agencies concerned with agricultural production and development now recognize the importance of livestock.

Hwange community is largely populated by the Nambya people. The geography or environment of the area is characterised by isolated pockets of land suitable for cultivation that leads people engaging in extensive livestock rearing and stream bank cultivation. Limited grazing opportunities in rural land drive people to exploit resources in bordering Protected Areas, changing land use patterns. People living in Magoli and Chezhou villages are adjacent to two Protected Areas, Hwange National Park and Sikumi Forest. People living adjacent to Protected Areas have no clear rights to economically valuable resources (Anderson et al,. 2013). Regulations often preclude the opportunity for villagers to sustainably use natural resources. Thus, Protected Areas, considered today as a major tool for wildlife conservation and a refuge for domestic animals, are facing an increasing competition for space and resources. The

contribution of Protected Areas to local well-being is dependent on multiple socio-cultural factors which influence the services (and dis-services) perceived as being provided by these areas. The distance to Protected Areas determines the decisions to drive cattle inside the Park or not and controls the intensity of fluxes like access to pastures and water.

This study was conducted almost three decades after the launch of Communal Areas Management Programme for Indigenous Resources (CAMPFIRE). There are on-going debates on interactions between Protected Areas and communal land in environmental and social sciences. These interactions can be studied between types of land use between men and wildlife, cattle and wildlife and even between men and men. All these can be determined on conscious decisions made by farmers on where to drive their cattle. When they are no longer available outside, pastures and water needed by livestock can be found inside Protected Areas, legally or not, leading to conflictual situations of disease transfers, safety of the cattle and men. Men drive domestic animals such as cattle, therefore if we are to improve our knowledge about interactions at the interface, socio economic determinants of keeping livestock and livestock management strategies are to be studied and understood. Studying these relations will help explore any positivity or negativity these relations imply and feed on the country's policy for sustainable development.

This study therefore hypothesizes that decision-making or ability to make them (power) play a key component of livestock keeping. Therefore, it is of significance to know who is responsible for the overall decisions related to movement of livestock in and out of Protected Areas. Not only do decisions concerning livestock management reflect the biological needs of cattle, but they also integrate individual histories of owners and managers, general production strategies, rights of access and relationships between the different stakeholders and this will explain decisions to do with herding, buying and selling of livestock.

1.1 Statement of the Problem

Making a living on the fringe of Protected Areas can be a risky business for poor communal farmers as it is often dependent on the low and erratic rainfall that usually characterizes these areas. There is also risk of loss of livestock to wild predators or diseases and even loss of human

life to wildlife as the boundaries of Protected Areas are permeable to various degrees. Killing of livestock by wild predators is a problem for most communities living at the edge of Protected Areas in Southern Africa. The fact that people are seldom compensated for losses incurred by wildlife is a major source of dissatisfaction.

Maphosa (2010) records that Hwange communal lands were then characterized by farmers decreasing the number of cattle owned by an individual. This has affected a lot of people in this community and has seen their livelihood dwindling as they will be expected to look for alternative forms of livelihood. However, the assumption is that staying at the periphery of these two Protected Areas would see a better management of livestock and improved ways of living as these two areas act as a haven for livestock production as they provide alternative grazing and water sources. Irrespective of challenges of predation and diseases, the gap remains on the processes and reasons why people still drive their cattle into the Protected Areas despite the risks and regulations banning such practises. Academic analysis is still deficient in putting forth reasons behind decisions made by these communal farmers on why they keep on driving their cattle into the Protected Areas. Questions asked to unravel these decision making processes include who owns the cattle, how were the cattle acquired, who is the decision maker concerning cattle, what are the opportunities and constraints of keeping cattle next to a Protected Area? All these questions will be answered by pursuing the following objectives.

1.2 Main objective of the study

- Understanding dynamics of access, ownership and management of cattle (decision-making) by smallholder farmers living adjacent to a Protected Area.

Sub objectives

- Analyse cattle ownership patterns, cattle inheritance systems, generational trends and if there are differences in the management of cattle.
- Examine the decision- making processes over cattle keeping, use, herding and disposal
- Document how people living at the edge of Protected Areas manage cattle.
- Analyse opportunities and constraints for managing cattle in area under study.

1.3 Justification of study

This study contributes to knowledge in terms of understanding dynamics of access, ownership and management of cattle by smallholder farmers living adjacent to a Protected Area. Cumming (2005) further notes that smallholder livestock keepers represent around 20 percent of the world's population and their decisions are key for the wellbeing of rural communities. Due to the anticipated increase in human population, most of which has been projected to take place in developing countries, livestock production will increasingly be affected by competition for natural resources, particularly land and water, as well as for food and feed. Over and above these challenges will be the need to operate in a carbon-constrained economy (Thornton, 2010).

Livestock farming has great potential to alleviate household food insecurity and poverty in most of the world's communities, Richards (2010). The role played by smallholder livestock farmers in livestock production is a very crucial one, thus it is essential to appreciate decision-making processes that will help in the reformulation of policies aimed at coexisting of humans, domestic and wildlife at the edge of Protected Areas (McDermott *et al*., 1999). The social contribution of the study is that it will assist farmers to come up with their own solutions on how best to manage their livestock and revive their livelihoods.

1.4 Hypothesis

Farmers make conscious decisions to drive their cattle inside the Park and Forestry and this is believed to have positive implications in their lives.

1.5 Study Areas

The study sites are located in Hwange and Kamativi in Matebeleland North Province in Zimbabwe. The areas are within the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA). Villages include *Magoli* and *Sialwindi* (Hwange Rural Ward 15). They are situated at the northern interface of the Hwange National Park and Sikumi Forest. A control study site was chosen further away from the Protected Area (>50km, Kamativi village 21 and 22) to have a comparative analysis of the management strategies (constraints and opportunities).

1.6 Methodological Issues

The research study utilised both qualitative and quantitative approaches. Questionnaires were used for the quantitative approach. Phenomenological, Focus Group Discussions and Key Informant interviews were used to gain further insights on decisions to drive cattle inside the Park and Forest. The study thus engaged in methodological triangulation. The flexibility of mixed method research and the adaptability of different methods to ever widening arcs of inquiry is one of its greatest strengths. Both primary and secondary sources of were used. Secondary data included veterinary records, published scientific papers analysing data from maps, policy documents and village records.

1.7 Data Analysis

1.7.1 Statistical data analysis

Data collected from the field using questionnaire method was be coded and analysed using SPSS 16.0. For hypothesis testing, Chi-square tests were utilised to test the independence or association between variables. The quantitative analysis included descriptive statistics such as frequency tables, percentages, and inferential statistics and chi-square tables.

1.7.2 Non-statistical data analysis (Thematic Analysis)

Data collected from the field using qualitative methods such as focus group discussions and key informant interviews, was processed, organized and analysed using themes. Thematic analysis moves beyond counting explicit words or phrases and focuses on identifying and describing both implicit and explicit ideas within the data.

1.8 Limitations

The study was associated with challenges. Firstly, long distance from Harare to Hwange for data collection. There was also a challenge of gate keeping by leadership, as they did not allow the researcher to just smoothly proceed and talk with villagers. Different protocols had to be observed with all leadership and a consensus had to be reached between the researcher and leadership.

Respondents may give misleading information on the distributed questionnaire because it covers information that also may be asked by donors, hence they may misconceive the intention of the researcher. The study compares two areas that have different socio economic backgrounds so respondents may have problems in relating to some questions that may seem irrelevant to them. On key informant interviews, some participants, for example, Veterinary and Forestry Officers may want to protect their interests thereby giving biased information and this may alter the outcomes of the research.

On addressing the limitations, the researcher had funding from RP-PCP (SAVARID) to conduct the study. The researcher also had to observe all protocol by paying courtesy visits to the Hwange District administrator and Chief Nelukoba who then wrote letters and gave permission to proceed to interview villagers. The researcher triangulated methods, used focus group discussions and informal interviews to verify the information got from questionnaires. As for the key informants like Veterinary Department and Forestry Commision Officers, the researcher also had to verify with the current records and documents relating to communities and livestock that was available at the time of the interview.

1.9 Organization of the study

The thesis is organized into Five Chapters. Chapter One provides detailed information on the introduction and background to the study, it brings out the statement of the problem under investigation, the objectives, research questions, hypothesis, justification and organization of the study and limitations of the study. Chapter Two provides literature review, which brings out issues related to the study. Third chapter presents concepts, methodological issues, and nature of the study area, methods, sampling design, ethical considerations and data analyses procedures. Chapter Four provides the major findings of the study. Chapter Five discusses findings, concludes and recommends strategies likely to bring sustainable and coexistence on the edge of Protected Areas.

CHAPTER TWO

Literature Review

2.0 Introduction

This chapter reviews literature from a wide range of sources on livestock production, environment, decision making, rural livelihoods and natural resources management. The chapter also reviews literature on the Socio Ecological Systems Framework in livestock keeping in area under study. The importance is viewed in terms of its contribution to the reformulation of policies promoting coexistence between Protected Areas, communal areas, and food security for the rural poor. This chapter also focuses on the challenges affecting livestock production, which are the economic impacts that come with keeping livestock at the edge of National Park and the effects of the prohibitive nature of the Protected Areas in terms of accessing grazing areas.

2.1 Cattle Keeping and Grazing Management Systems

Cattle keeping and the grazing system in communal areas entails grazing animals in designated grazing areas during the growing season and kraaling them at night. Animals are allowed free access to crop residues and stubble after harvesting. There are no strict regulations governing the use of these resources. Chimonyo et al (1999) note that in the lower rainfall areas, where human and animal populations are sparse, cattle are sometimes neither herded nor kraaled at night. They are allowed to graze freely away from homelands. This system of management as a whole tends to lead to abuse and difficult decision making for the proper management of the resource.

Cattle management systems and production in communal farming systems differ significantly with commercial systems. Mapiye (2006), postulates that reasons for keeping livestock in communal systems are very diverse. Herding of cattle is the most common method of cattle rearing in Zimbabwe. He goes further to state that in cases where there is limited grazing land, all the cattle from the entire village may be considered as a single interbreeding flock with no attempts of controlling mating. After crops have been harvested in the fields, communities tend to let loose their cattle herds to feed on crop residues. At the beginning of the rainy season, cattle now have to be herded. Tavirimwa et al (2012) reports that communal cattle farmers are rarely

supplemented comparing with commercial cattle, thus they depend on these crop residues for feed most part of the year.

Minimum availability of pasture in terms of both quantity and quality is indicated to as the major cause of poor livestock production in communal areas (Hamudikuwanda, 1988; Smith, 1988). The time when the feed is in shortest supply is in winter or the dry season. Likewise, farmers in rural areas that are feed deficit drive cattle much further away from the homesteads during exceptionally dry seasons depending on spatial distribution of forage patches and availability of water (Maphosa, 2013). Masikati (2010) and Maburutse et al (2012) report that cattle travel distances of about 14km to water points and they are driven by owners.

An investigation by Ndebele et al (2007) revealed that indigenous cattle breeds are better able to survive in patchy pastures and can walk for longer distances in search for water and feed during the dry period of the year when compared to the imported breeds. Richards (2010) commends that it is superlative that such breeds be kept and utilised in the communal areas that are characterised by highly variable spatiotemporal availability of grazing land like Hwange.

Grazing in the communal areas of Zimbabwe is characterised by collective use of grazing resources. It is the communal system of land tenure that allows such practises. According to Gapare (1988), technical inputs are limited by this land tenure system. Thus, Enock (2005) further notes that a communal area farmer is not at liberty to try recommended technologies since grazing land is under communal use. Notwithstanding the aforementioned, it must be stated that communal area management systems are dynamic and changing with time.

Kirakowski (2002) postulates that pasture needs for grazing livestock fuel massive habitat conversion and degradation, while concentrated feedlots release antibiotics, excessive nutrients, and hormones into the environment. The box below illustrates an attempt to design a sustainable grazing strategy for the benefit of Matebeleland rural farmers.

Box 1: African Holistic Management Centre Grazing Strategy

Box 1*: At the African Holistic Management Centre (AHMC) in Dimbangombe, (near Victoria Falls), around 400 cattle and 100 small livestock are herded together in compact areas. Many of the cattle belong to community members from Hwange, where forage and water are becoming scarce due to a lack of grazing management. By mimicking the behaviour of wild herds and keeping the livestock moving, the AHMC minimize overgrazing, leading to an increase in ground cover. This system is called planned grazing. In trying to employ this technique in Hwange, the livestock are also kept together in a compact, mobile kraal overnight (bomas in Hwange, this is a new system introduced by Hwange Lion Research). After 7 days, the kraal is moved, leaving behind a manured and hoof-trampled area. This is perfect for regeneration of grasses and seedling growth. The planned grazing strategy uses the livestock to improve soil aeration, soil fertility and rainwater penetration. It also gives the grasslands time to regenerate.*

2.2 Contribution and Importance of Livestock

Richards (2010) states that livestock are also crucial to meeting the Millennium Development Goals (MDGs), as 70% of the rural poor rely on some form of livestock for their livelihoods. The challenge is to maximize the promise and minimize the pitfalls of livestock and an eco-agricultural vision might just deliver that. Hwange communal lands in Zimbabwe are a promising example of a landscape management strategy that has livestock as an integral and necessary part. Assan (2013) comments that typical of rural life in Sub-Saharan Africa, the Hwange communities live amid increasing desertification, drying rivers, AIDS, infectious diseases and the exodus of the youth. The continuing loss in land quality, water and biodiversity that sustain agriculture, forestry, livestock, wildlife and tourism in the region has jeopardized their livelihoods (Khombe, 2002).

Livestock production has been known to reduce poverty among vulnerable and marginalised people. According to Heffernan (2004), attempts to put a more human face on poverty, usually portray the poor as victims of a hostile political, institutional, social and economic environment. Becks (2005) also notes that if considerations to eradicate poverty among poor livestock keepers arise, the capabilities and agency of the poor are not ignored. Livestock are the main means to

enhance the poor people's potential. Vulnerability of households to normal seasonal food and income deprivations are reduced through selling and consumption of animal products.

Maburutse et al (2010) postulate that livestock production will be sustainable if there is harmony among the stockman, livestock and the environment. The attitude and goal of the stockman are reflected in his management and breeding practises. FAO (2008) states that the adaptation of the livestock to their environment is reflected in their productive efficiency. One can therefore note that it is the relationship among man, cattle and veld that can determine cattle production systems. Betterncourt (2013) believes human beings, through their control of the breeding and management of livestock as key to the question of harmony between man and his immediate environment. As such, the human being is either the problem or the solution. It is the type and quality of his or her stock and land that are a reflection of his attitude and ability.

Enock (2005) states that anthropogenic activities of man like domesticating grazing animals have had a terrific effect on the ecology of this planet. Results of overgrazing have generally been deleterious and in certain instances cataclysmic. The notch and quickness of environmental degradation caused by destructive grazing practices depends largely on the seasonality of rainfall and humidity (Thornton 2010). Low rainfall has erroneously attributed to land degradation and this has affected keeping and management of livestock in areas of low rainfall. As an example, Gambiza and Nyama (1999) record from a 1000 ha property in the Bandelierkop area of South Africa show that 1100 head of cattle were carried in 1923 and the same area can barely keep 100 head of cattle today.

2.3 Value of Cattle Production in Communal Areas

Ndlovu et al (2004) and Masikati (2010) point out that communal cattle realize numerous roles that include providing milk, manure, draught power. Cattle serve as an indication of one's wealth status (Chimonyo et al., 1999). On the other hand, Maburutse et al., (2012) points out that they are also key in the provision of meat and hides as terminal products. Cattle in Matebeleland are used as investments and a status symbol (Ndebele et al., 2007). At the apex, cattle generate income among communal households through sales of the animals and their products. Improvement in cattle production and innovative value addition of cattle can create employment

for people as individuals are hired to process and sell cattle and their products at various points of the production chain.

Cattle also play a pivotal role in socio-cultural function such as brideprice or lobola payments and appeasement of ancestors (Maburutse et al., 2012). Mavedzenge et al., (2006) adds that cattle can also be exchanged or loaned to neighbours to enhance kinship ties. However, the actual contribution of cattle at household level is not well known because the current valuation systems rely on monetary standards, which ignore the nonmonetary contribution of cattle to households such as provision of manure, drought power and milk (Chimonyo et al., 2000). Information on the real contribution of livestock to human food security and livelihoods is scarce (Gwaze et al., 2009). It is therefore important for social ecologists and agro-economists to come up with scientific models that incorporate non-monetary contributions or values of cattle in terms of contribution to communal livelihoods.

Cattle markets have long been a main way of investing capital for people living in the communal lands of Zimbabwe (Giller et al., 2013). This has also been noted to have increased in response to the economic crisis, which affected the economy of the country during the last decade (Zishiri, 2012) Limited cattle trade possibilities in most areas bordering conservation areas classified as Foot and Mouth Disease infected areas compound the problem of increasing cattle populations.

According to Barret (1992), although commercial off take from Zimbabwe's communal cattle herd is low, smallholder farmers are productive and logical in their cattle herd management. The role of cattle varies from one region to the other in Zimbabwe, but commonly cattle are kept for economic reasons, firstly to provide draught power and manure for tillage and secondly to provide milk and meat for local consumption. Communal cattle in Zimbabwe are sold for fattening or slaughter in the commercial sector to raise cash. Investment of crop income in cattle ownership leads to capital growth as the herd grows through reproduction (Barret 1992).Livestock are mostly viewed as a form of financial, social and natural capital, and as a form of the financial capital they are a means of increasing household income and obtaining food products (World Bank (2000; McLeod et al 2001).

Building and strengthening of social networks can also be realized through cattle ownership and management strategies. Betterncourt (2013) defines social capital as about the value of social networks bonding similar people and bridging between diverse people with norms of reciprocity. Many poor households either share or loan cattle with neighbors and relatives. In case of absentee owners, the remaining family members can keep livestock. Livestock social functions correspond to the symbolic values associated to each species and the use of animals for the fulfillment of a set of rituals and social obligations of families and communities. Livestock gives social status when it demonstrates wealth. .Grahn and Leyland (2005) comment that economic status is realized when cattle facilitate the access to informal credits and loans to the households. Cattle are also used in traditional rituals, ceremonies and festivities and are given as a gift in worships, for example, installation of ancestral spirits, ritual slaughter, and bride wealth. In addition, some cultures, consider certain animals to be sacred (cattle in India) and in others cultures (pigs in Muslim countries) animals are impure (Ouma et al., 2003).

Livestock ownership in Sub Saharan Africa is deeply rooted in culture, Rwelamira et al., (1999). Thus, the control of household livestock is culture and context specific. Men are traditionally responsible for the keeping and marketing of large animals such as cows, horses and camels whilst women claims control over small ruminants such as goats, pigs and specially poultry. Decisions to manage these livestock also follow suit. However according to Heffernan (2004), livestock ownership involves costs for the poor farmers such as high expenditures for animal healthcare for those that own and keep livestock.

In countries such as Tanzania, Zambia and Malawi, women involvement in cattle management is limited but they do have access to animal power for cultivation limiting through hiring and borrowing which may obstruct production (Heffernan 2004).Widows, divorced and abandoned women lose the right to livestock through patriachical inheritance systems and are accordingly economically and culturally marginalized (Van Dach et al., 2007).

2.4 Age, Decision Making and Livestock Production

Mavedzenge et al., (2006) postulate that in Africa, men do decisions at household level. This is accredited to the patriachical nature of the African societies. Men are regarded as heads of

households; therefore, they are responsible for key decisions like cattle and crop field management whereas women are responsible for decisions to do with kitchen utensils. McLeod (2001) argues that age is importance when it comes to cattle ownership. He further comments that young men who have not reached thirty years rarely own livestock as they still under responsibility of their parents. Older men over the age of sixty five are the ones that own most livestock. Ncube et al (1992) comments that men over sixty five years, when given retirement packages they buy cattle as a form of investment. Women will then inherit their husband's cattle and takeover decision making processes concerning that livestock.

2.5 Climate Change and Livestock Management

Thornton et al., (2010) point out that climate change may have substantial effects on the global livestock sector. Changes in management of livestock are inevitable because of climate change. Amassed climate variability will undoubtedly upsurge livestock production risks as well as reduce the ability of farmers to manage these risks. Steinfield et al. 2006) argues that offering relatively fewer cost-effective options than other sectors such as energy, transport and buildings, agriculture has not yet been a major player in the reduction of greenhouse gas emissions. UNFCCC (2008) note that trends will change in the future although guidance will be desirable from rigorous analysis. As an example, livestock consumption patterns in one country are often associated with land-use changes in other countries, and these have to be included in national greenhouse gas accounting exercises.

Changes in climate may have impacts not only on the spreading of vectors of diseases. It is also paramount to realize that some diseases are concomitant with water, which may be worsened by flooding and complicated by inadequate water access. King et al., (2006) argue that while the direct impacts of climate change on livestock disease over the next two to three decades may be relatively muted, there are considerable gaps in knowledge concerning many existing diseases of livestock and their relation to environmental factors, including climate. Mashoko et al., (2007) note that droughts have proved to force people to move together with their livestock, potentially exposing them to environments with health risks to which they have not previously been exposed. Nevertheless, there is bourgeoning literature on adaptation options, including innovative ways of using weather information to assist rural communities in managing the risks

associated with rainfall variability, design and piloting of livestock insurance schemes that are weather-indexed.

2.6 Living on the Edge and Livestock Keeping

Anderson et al., (2013) note that many people living on the edge of protected wildlife areas now find themselves residing in newly designated Trans Frontier Conservation Areas (TFCAs), but with little clue as to what it actually means. With conservation in these areas still ill defined, they continue to live on the wildlife frontier and are exposed to the risks that come with it. In the academic and policy discourse on transboundary conservation, local peoples may be referred to as beneficiaries or victims, but they are not merely marginal in the policy process. They live on the edge in a number of ways. First, making a living on the fringe of Protected Areas can be a risky business as it is often dependent on the low and erratic rainfall that usually characterizes these areas. Second, there is risk of crop destruction and loss of livestock to wild predators or diseases and even loss of human life to wildlife as the boundaries of Protected Areas are permeable to various degrees. Giller et al., (2013) postulate that water sources become a major focus of competition between people, livestock and wildlife particularly during the long dry season.

From being regarded as marginal and even dangerous zones threatening the political economy of the state's core in early colonial times, the edge has increasingly become redefined as an area of opportunity (Dzingirai et al, 2013). He further notes that as with illegal cross border migration and commodity trade, cattle management, theft and rustling is not a new phenomenon on the edge. It has been part of the livestock economy and increased border controls and fences have not been able to eliminate it. At the other extreme, a highly regulated formal marketing system, with the state controlled Cold Storage Company as the predominant buyer has played an important role in suppressing cattle rustling and theft. However, this is no longer the case for Hwange communal areas.

The post 2000 period saw a rapid rise in cattle theft and cross border movements of cattle in the South East lowveld. First, the formal cattle market collapsed, because of fast track land reform. Even in the 1990s, smallholder cattle keepers still relied for their sales on nearby large-scale

commercial enterprises trading large volumes. As the latter category fell away because of the land reform programme, the formal marketing structure also collapsed. Rapid economic decline accompanied by commodity shortages and hyperinflation undermined the sale of cattle within Zimbabwe in favour of selling on the Mozambican side of the border. During the years 2002 to 2008, cattle were bought at prices between (US$500 and US$1000) in Mozambique as compared with an equivalent of US$100 in Zimbabwe. Cattle rustling thus became more lucrative, but also cattle owners preferred to sell across the border.

Dzingirai (1999) identified four important categories of people living in the Lower Zambezi Valley, further pointing to community heterogeneity on the edge. For example, he identified people he described as home seekers, and these are people largely of foreign origin who used to work in former commercial farms and moved into the area to look for homes. This is evident in Hwange as 51% of the people were not born there (Mulaudzi, 2011). The second group of people is generally referred to as accumulators, largely because they are strictly not connected to the area and do not care what happens to natural resources. Thirdly, there are traditionalists who prefer land related discussions to be conducted by relevant kinship groups. This group of people has rejected fencing off wildlife areas as this is interpreted as taking away meat from people. It will also mean taking away grazing land for livestock keepers. The fourth group comprises modernists who are largely the young and educated farmers. The modernists are largely kin on harnessing any initiative that brings financial or other returns to them and will only support livestock keeping and wildlife initiatives if proven they will surpass other options in revenue generation. Le Bel et al., (2011) found that Hwange Communal Area has 12 distinct ethnic groups, Ndebele, Tonga, Nambya, Chewa, Chikunda, Nyanja, Doma, Zezuru, Kalanga, Mlubale, Karanga and Shangwe with Ndebele being the majority.

Anderson et al., (2013) note that a number of the farmers living close to the park acknowledged sending their cattle in the protected area during the dry season. In the Hwange National park system, the use of grazing land and peripheral permanent waterholes within Protected Areas (mostly Forestry land) was negotiated by communities during extreme dry spells of the early 1990s (up to 3km inside the park). Livestock keepers continue to access these grazing areas and waterholes despite repeated warnings from the Forestry Commision, and have increased their use

in recent years. Communities now claim a quota ranging up to 10km and this has been another source of conflict between communities and the Forestry Commision.

Park boundaries encompass some of the areas used by the local people, especially the southern region of Gonarezhou National park (Murwira cited in Anderson et al 2013). The establishment of the park resulted in a steep resource gradient with grazing resources for livestock being more abundant in the protected area compared with the surrounding communal land, especially during the end of the dry season. The existence of steep resource gradients has often prompted the movements of livestock and livestock and wildlife, as well as people, across boundaries that separate farming and wildlife activities, resulting in human wildlife conflicts. Movements by unattended animals, both wild and domestic, rely on ecological tradeoffs along a gradient of resources.

Grazing and browsing resource gradient that exists between communal lands and the Protected Areas of Southern Africa plays an important role in influencing cattle farmers grazing strategies, particularly during the dry season when grazing is scarce. De Garine-Wichatitsky et al (2013) contend that accessing water and grazing resources during droughts is a matter of survival for livestock in the semi-arid ecosystems of Southern Africa. Competition with wildlife for these scarce resources can exacerbate such scarcities for people living on the edge of Protected Areas. At the same time, the protected area may provide an alternative source of grazing, and thus a buffer during the difficult periods.

The boundary of the Hwange National Park and the neighboring communal area was well delimited by a veterinary fence until 2003 (Anderson et al, 2013). It collapsed due to a combination of lack of maintenance and local community pressure to access grazing lands located inside the Sikumi Forest Area. The removal of fences and the creation of an Open Africa or Boundless Southern Africa to satisfy both ecological and social concerns have, in turn, considerable implications for social and disease dynamics at the interface of Protected Areas and surrounding areas. Anderson and Cumming (2013) note that boundaries are ubiquitous components of the world we live in and exist wherever there is discontinuity or asymmetry, within or between objects whether at an atomic, cellular, organismal, local, regional or global

level. Boundaries are not confined to the physical, biophysical and geographical spheres. They are also present in behavioral and social interactions between people that arise as a result of language, religious beliefs, decisions, ethnicity and culture, scientific disciplines, class distinctions, access to technology and resource access rights.

Maburutse (2012) points out that although only 73 percent of the households in the communal areas own cattle, 48 percent of those living on the edge of Protected Areas, cattle keeping has important socio-economic and cultural functions. Both cattle owning and non-cattle owning households indicated that they derived direct and indirect benefits from cattle farming in the area. Of the households without cattle, all were interested in cattle farming and cited problems of not having cash to purchase livestock and problems with wildlife as the main reason why they would not own cattle. Some of the households without cattle at the time of the survey had owned cattle and lost them due to wildlife and drought in previous years.

Besides Protected Areas being a haven for livestock farmers, transfrontier aggregations can overcome the socio economic marginalization associated with relegation to boundary areas, turning these areas in many instances into centres of agricultural and industrial growth, associated with transportation and communications networks that across barriers to commerce and social impact. Dzingirai, 2004 notes that living on the edge comes with new opportunities in terms of ecotourism and job creation for local people. This creates visions of a true win- win situation where transfrontier conservation areas promote both conservation and rural development. A honey pot effect has been described where national park creation leads to disproportionate population growth on the edge because of emerging opportunities associated with conservation areas (Wittemeyer et al, 2008).

2.7 Livestock, Diseases and Wildlife Interactions

Disease transmission is arguably one of the major obstacles to the coexistence of wildlife and livestock in sub Saharan Africa (Bourn and Blench, 1999). Movements of both humans and animals occur across the boundaries of Protected Areas often driven by resource gradients. Generally, wildlife/livestock interaction has been defined as the direct or indirect contact of wildlife and livestock with transmission of pathogens bi-directionally between wildlife and

livestock (Bengis et al., 2002). The livestock/wildlife interface can be classified as linear, that is along a fence, or patchy reflecting habit preferences of a disease host or at shared water and grazing points and such cases are popular in savannah ecosystems of Africa. Cleaveland, (2006) asserts that the transmission of disease pathogens can be indirect. Wildlife and livestock behaviors in terms of feeding are different whereby wildlife tend to avoid contact with livestock and humans. Anderson et al (2013) argue that, for instance, buffaloes and other wildlife are observed at night and early in the morning watering and grazing exactly where livestock are observed at different times. This entails that disease transmission is not always direct physical interaction but can be due to indirect contact through the soil, forage, and water with which the other animal has had contact and left discharges such as urine, saliva. Faeces, nasal or ocular discharge or through common insect vectors (Fenner 1982)

Community based animal health systems for instance, have been advocated as a way to improve the livelihoods of remote, marginalized and undeserved livestock keeping communities, through improved productivity and access to markets (Grahn and Leyland, 2005,). The current schemes implemented regarding livestock health, including vaccinations, acaricide treatments or other prophylactic actions, do not address local priorities as perceived by livestock keepers themselves. Keeley and Scoones (2003) argue that this is largely because livestock disease management is driven by government veterinary services at the national level, which often concentrate their limited resources on control of transboundary animal diseases to allow international trade, which is regulated by policies negotiated at the international level. The perception of livestock keepers regarding locally important diseases and the potential role played by wildlife species is rarely appreciated or taken into account when control measures are implemented. One of the main limitations of community based animal health systems is the lack of voice of marginalized communities in policy processes.

Interactions between wildlife and domestic animals present challenges in the livestock economies worldwide, particularly in East and Southern Africa where many communities are closer to the wildlife areas, Cleaveland et al., (2006). Rural poverty has been increased due to the spread of diseases from wildlife to domestic animals, which has declined livestock production, and this has often caused conflicts between people and wildlife especially over the issue of

boundaries created to demarcate communities from wildlife-reserved areas (Mutambanvumi, 2006). The Ngorongoro Conservation area in Tanzania is one example where the Masai cattle had to be moved away from prime grazing lands in the short grass plains to avoid malignant catarrhal fever, which is transmitted from wildebeest calves. However, this change has caused pressure on the highland ecosystems and exacerbated the problem of tick-borne diseases (Field et al 1997). Communities adjacent to Serengeti National Park in Tanzania present an inverse relationship between livestock ownership and involvement in game meat hunting. Game meat from livestock development programs could be a source of protein in these areas to avoid the demand for wildlife meat but the production of livestock is much constrained by the transmission of diseases from wildlife such as trypanosomiasis (IFAD, 1995).

On predation levels, de Garine Whitatisky et al (2013) comment that farmers explain that in some cases cattle were lost and spent nights outside the kraal, which exposed them to a greater risk of being killed by wild predators. Loss of cattle affects household's direct and indirect benefits from livestock.

2.8 Livestock Management Policies and Institutions

Government policies may be an assistance or hindrance to animal production. Transfrontier Conservation Areas and their requirements provide ideal testing grounds for what Keeley and Scoones (2003) call the deliberative approach. The approach places more emphasis on developing methods and institutions that promote communication and address policy issues through inclusive process of argumentation. National governments can have a significant influence on the development of livestock production through economic and political measures, as well as by promoting expansion of infrastructure and services (van Dach et al 2007).

In rural areas, poor livestock farmers often regard themselves as sidelined by the state in terms of functioning infrastructure and effective service sector to support animal production, van Dach et al., (2007). He adds that despite marked improvements in recent years, effective veterinary and extension services for livestock producers have not been provided everywhere. In Africa, government interventions in the market have primarily been in terms of providing abattoirs, meat packing facilities and milk processing plants, van Dach et al., (2007), These interventions impose

prices, grades and standards for livestock products. Such interventions are usually implemented in order to control consumer and producer prices through a monopoly framework. Control would be over grades and quality for standardisation, health or export. The view held is that private trading is exploitative and inefficient. Thus, government monopolies would produce economies of scale.

The Zimbabwean government livestock policy has changed over years. According to Mavedzenge et al., (2006), in Zimbabwe, the reorganisation of the technical departments of the Ministry of Agriculture has created a Livestock Production Department alongside the Veterinary Department. Livestock are again being recognised as important assets for livelihoods as key to moving away from poverty; as a way into lucrative markets; as a source of foreign exchange; as well as essential cultural resources, social safety nets and means of saving.

Mukamuri et al., (2013) argue that Transfrontier Conservation Areas must benefit local peoples and contribute to development goes hand in hand with the assumption that natural resources in these areas are collectively managed. Community based projects often fail because a collective appears to be absent, suspicion among locals, local political conflicts, lack of community participation and lack of interest among locals prevent collective action. Such local level dynamics and struggles are often expressed in ethnic terms, despite the fact that ethnic distinctions are primarily socio historical constructions rather than ontological categories. The construction and entrenchment of ethnic identities does not take place in a vacuum. Ford and Harawa (2010) argue that ethnicity is complex and socially constructed with implications for societal interactions with spatial and temporal dimensions. Mukamuri et al (2000) indicate that people living in rural areas are heterogeneous and their actions are influenced by ethnicity, origin, and other socio-economic variables such as cattle ownership, education and religion.

2.9 Constraints to Cattle Production in Communal Areas

Livestock farming has been faced with many negative factors in various countries globally. According to Mupawenda (2009), livestock production is affected by several social, economic, biological, political and management factors. The problem of drought is one the factors affecting livestock farming. Wreford and Adger (2010) examined the effect of drought and heat wave on

livestock farming in the UK, indicating that the effect of drought may not be felt immediately in the year it occurs. Farmers may sell more stock, resulting in increased production, in the year in which drought occurs, but in the subsequent years, production may decrease as farmers rebuild their herds.

The impending climate change has an effect on livestock farming and it will be harder on the poor people in developing countries (IFAD, 2009). This is due to these countries' dependence on natural resources and agriculture for their survival. Changes in climate patterns will result in food insecurity; resource-poor developing countries that cannot meet their food requirements through market access will be worst affected (FAO 2008). Morgan and Wall (2009) believe that livestock tend to suffer from increasing production losses because of diseases caused by parasites, and that insufficient attention has been paid to mechanisms that could mitigate such increases, and how they can best be exploited.

Livestock marketing, in most communal areas, is poor and characterised by absent or ill-functioning markets (van Rooyen 2007). A baseline study by the International Crop Research Institute in Semi-Arid Tropics (ICRISAT) revealed, lack of organised marketing of cattle in Zimbabwe communal areas (Homann and Van Rooyen 2007). Communal farmers resort to the informal way of marketing their cattle where pricing is based on an arbitrary scale, with reference to visual assessment of the animal. Intermediaries are the main buyers and purchase live animals from farmers for resale at cattle auction points and to abattoirs in towns often benefiting more than the farmers themselves do (Mavedzenge et al 2006). Apart from selling to local butcheries, farmers do not have ready markets where they can take their animals to if they need to sell their animals therefore usually end up under-pricing their animals in cases of emergencies (Homann and van Rooyen 2007).

African livestock producers face various barriers to accessing markets including physical barriers, such as poor roads and infrastructure, structural challenges, such as imbalance of power between producers and other value chain actors, and low levels of skills, information and organisation. Typically, in Africa, farmers and pastoralists sell their ruminant livestock to traders in small village markets that have few facilities. Larger secondary markets, located in regional capitals, are dominated by intermediaries, traders and butchers and serve terminal markets.

Terminal markets are located in urban centres and are dominated by medium to large-scale traders. High fees levied by market authorities serve to encourage buying and selling of livestock outside formal markets. Increasingly, livestock are trucked rather than trekked between point of production and terminal markets. Seasonality of supply of animals presents problems for abattoirs and prevents them working at or near full capacity year round.

2.10 Socio Ecological Systems

Halliday and Glaser (2011) define a socio-ecological system as a system composed of organized assemblages of humans and no human life forms in a spatially determined geographical setting. By calling it a system, those with an interest in the situation signal their intention to consider how all these elements interact together. Basurto et al., (2013) claims that the point of entry to the Socio Ecological Systems Framework (SES) initiates with the first tier variables that a researcher would need to define to determine the particular system of interest. These variables will determine the connectedness of the system. Among variables, there are the Resource Units (RU) that are part of the Resource Systems (RS). There are also the Governance Systems (GS) that define and set rules for Actors (A). All of them influence the resultant Interactions (I) and Outcomes (O) and create feedbacks. The Governance System (GS) includes characteristics pertaining to central and local government and factors shaping rules and governance arrangements in Hwange National Park and Sikumi Forest. These determine incentives and behavior for Actors (A) who are communal farmers involved in the management of livestock.

Ecosystems are diverse forms of natural capital and exist at several levels on a spatial scale. Tessema et al (2011) argues that humans who use or are affected by these different ecosystems are organized through diverse forms of social capital at various scales. Proposals to protect these ecosystems by changing the institutional rules of use and by the way these rules are monitored and enforced. However, there is a tendency of frequently focusing on a single level (Basurto et al 2013). Most often, this is at the level of national governments like the Government of Zimbabwe under the Ministry of Environment, Water and Climate. In addition, at all levels, institutions are essential for the long-term protection of ecosystems through proper decision making (Egon (2003). Such interrelated patterns of institutional interface can take the form of authority,

separation, fusion, negotiation or system change with diverse consequences for social-environmental systems.

The straight down interplay of institutions representing groups competing or cooperating for authority over resources requires one to look at questions of subtractability (Berkes et al., 2003). This is when resource appropriation by one user reduces availability to others and exclusion, that is how costly it is to keep potential beneficiaries who are communal farmers out of the benefit stream from an ecosystemic and multiscale perspective. Ndebele (2013) thus notes that local forms of use and regulation of a resource, for example, based on customary rules of use and exclusion, although potentially effective at one level, are affected and in some cases overwhelmed by resource use in a different part of the larger ecosystem where government rules and regulations come in place.

CHAPTER THREE

Methodological, Conceptual Issues and Study Area

3.0 Introduction

This chapter explains the conceptual and methodological issues associated with the study. The concept of the Socio Ecological Systems will be used in explaining decision making processes by farmers. It describes the research design, sampling procedure and the way in which data was collected and analysed. The socio-economic and demographic characteristics of the farmers were determined using descriptive statistics. Descriptive statistics and frequencies were used to determine the prevalent factors affecting livestock farming in Hwange, Zimbabwe. Chi-square cross tabulations were used to determine the level of association between various factors.

3.1 Methodological Issues

Borg and Gall (2007) define research methodology can also be thought of as the guiding principle for unobjectionable research practice. It can also be viewed as the overall plan for collecting and analyzing data, including specifications for augmenting the internal and external validity of the study, (Sarantakos 1998). Leady (1997), concurs in that research methodology is a functioning framework within which signals placed so that their meanings can be seen more clearly. The study methodologies included both quantitative and qualitative methodologies.

3.2 Research Design

A research design is a set of logical procedures that (when followed) enables one to obtain evidence to determine the degree to which a theoretical hypothesis (or set of hypotheses) is/are correct. There are four basic types of research design that include case studies, cross sectional designs, longitudinal designs and experimental designs. This study employed three of these research designs and left out the longitudinal design.

3.2.1 Quantitative Approach

In social sciences, quantitative research is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques. The objective of quantitative research is to develop and employ mathematical models, theories and

or hypotheses pertaining to phenomena. The assumption that guided this choice of methodology was the need for measurable data. The purpose of the study is to measure the socio economic factors that determine livestock management strategies at the edge of Hwange National Park and Sikumi forest respectively. The same measurement will also be done in Kamativi, an area further away from a protected area to compare if the opportunities and constraints differ for these livestock farmers. The approach uses methods that are pre constructed and the same type of questions are asked thereby making comparisons much easier.

This quantitative approach was considered more reliable than qualitative investigation because it controls or eliminates extraneous variables within the internal structure of study and standardized testing can access the data produced. It provides data that can be expressed in numbers. Because the data is in a numeric form, one can apply statistical tests in making statements about the data. These include descriptive statistics like the mean, median, and standard deviation, but can also include inferential statistics like t-tests, ANOVAs, or multiple regression correlations.

Quantitative research is described in terms of empiricism (Leach 1990) and positivism (Duffy 1985) cited in Carr, L.T (1994). This research approach is an objective formal systematic process in which numerical data findings describes tests and examines cause and effect relationships. The study used this methodology together with the qualitative approach in order to have a comprehensive understanding of the phenomena under study. The approach is straight to the point hence it does not give way for unnecessary detail from participants especially in this study where there is a tendency of respondents to explain their challenges to drought and conflicts with authorities.

3.2.2 Qualitative/Phenomenological Approach

Qualitative research on the other hand, asks broad questions and collects word data from phenomena or participants. The researcher looked for themes and described the information in themes and patterns exclusive to that set of participants. This methodology was chosen for this study because of the need to understand farmer’s perceptions on cattle access, ownership, decision making processes and management from their different locations. The aim of qualitative research is to describe certain aspects of a phenomenon with a view to explaining the subject

decision making. It was used as a vehicle for studying the empirical world from the perspective of the subject, not the researcher (Duffy 1987). The approach was important as it brought out the attitudes, behaviors and emotions of the farmers in relation to the opportunities and constraints they face in cattle production against the prohibitive nature of the Protected Areas.

Following data collection, rather than performing a statistical analysis, researcher looked for trends in the data. When it came to identifying trends, researcher looked for statements that were identical across different research participants. The rule of thumb was that hearing a statement from just one participant was an anecdote, from two, a coincidence; and hearing it from three made it a trend. The trends identified that guided in understanding opportunities and constraints and recommendations were drawn from that.

3.3 Sampling Techniques

Purposive sampling technique was employed in the selection of participants. Bernard (2002) defines it as a deliberate choice of an informant due to the qualities the informant possesses. The researcher identifies the problem and sets out on what is to be researched then finds people with knowledge and experience to provide the information. The technique was applied to all the methods such that for the questionnaire the researcher targeted households with cattle and interviewed the owner or the custodian of the herd who had clear information about their cattle. The participants were from Magoli, Chezhou, Sialwindi, Kamativi village 21 and village 22. Every household that had livestock had an equal chance of being selected in the study.

Veterinary officers and representatives were selected for their knowledge on disease management, the provision of drugs, vaccination and their discouragement for farmers to drive their cattle inside the Park. Ordinary farmers were also identified as key informants who are responsible for decisions to drive cattle inside the park and to verify the opportunities and constraints of keeping livestock. Farmers were also identified as to confirm if there were any social, cultural and economic concerns for livestock production. Women were also interviewed and included in the focus group discussions to have their voice heard in terms of livestock production.

3.4 Data Collection Methods/Instruments

In order to achieve the intended objectives, the researcher employed following research instruments including Questionnaires; Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs).

3.4.1 Questionnaire

A Questionnaire is a method for the elicitation, recording and collecting of information and its advantage is that potentially information can be collected from a large portion of a group (Kirakowski, 2000). The instrument had sections covering the demographic patterns of the respondents, livestock ownership patterns, livestock marketing, grazing and watering patterns, herd structure, institutional aspects surrounding livestock management, wildlife/livestock interactions and perceptions on diseases, social and cultural relevance of livestock all of which could answer each of the objectives.

The questionnaire was administered in the all study sites. The researcher first trained one field assistant to help with interpretation of the questions using Nambya to those farmers who were not well versed with Ndebele. One hundred and fourteen (114) questionnaires were administered to farmers in all study sites. The method was quick and easy because respondents were provided with same set of optional answers which they just tick covering many respondents in a short period. Since the study had a short life, this technique was appropriate as there was limited interaction between the researcher and the respondents and was economic.

The method's weakness according to Kirakowski (2000), is that a questionnaire tells you only the users reaction as the user perceives the situation, thus some kinds of questions for instance, to do with time measurement or frequent of event occurrence, are not usually reliably answered in questionnaires. In this study the pre constructed questions did not allow for further detailed information and could not determine the attitudes, behaviors and emotions of the respondents as they gave answers to the questions. Much time was consumed in cases where farmers could not

remember some events like the number of times they drove cattle into the Park and animals predated.

3.4.2 Focus Group Discussions (FGDs)

Focus groups are sometimes used when it is better to obtain information from a group rather than individuals. According to Fern (1982), Morgan and Spanish, (1984), they are small group discussions, addressing a specific topic, which usually involve 6-12 participants, either matched or varied on specific characteristics of interest to the researcher. In this study, FGDs were conducted after pre analysis with the questionnaire. Two (2) group discussions each consisting of eight people and the other consisting of ten people respectively were held with cattle farmers at a central venue at Magoli Community Hall. Both of the discussions consisted of both adult males and females whilst the other one consisted of youths in order to verify intergenerational perceptions towards livestock production. Participants that were interviewed using the questionnaire were requested to participate in these focus group discussions and those who agreed were informed 2 days prior to the meeting so that that they could prepare.

Participants chose any time of the day that they were comfortable with, this was done to avoid inconveniences for some. The technique was open ended and the researcher only facilitated the discussion while giving the lead role to the respondents. Detailed information was gathered concerning the farmers perceptions towards cattle access, ownership and management in relation to the prohibitive nature of Protected Areas and changing Zimbabwean macroeconomic environment. Since the study was conducted in a rural area where most farmers are illiterate, FGDs enabled the farmers and the researcher to ask questions in native languages (Ndebele and Nambya) and elaborate on questions and answers thereby obtaining rich data

However, FDGs have weaknesses, Carey (1995) has it that the method may not represent the views of a larger segment of the population and tough rich data may be difficult to analyze. There were several cases were women did not attend the meetings as males were considered to have the lead role in cattle production which has its roots in their traditional culture. In cases where they attended, they would not fully participate as expected as males took the lead in the discussions. Time management was most difficult for women who had to carry out their

household chores before they could show up to the discussions. Time was consumed as participants gave different sides of issues that were brought up for discussion.

3.4.3 Key Informant Interviews (KIIs)

A KII is loosely structured conversations with people who have specialized knowledge about the topic you wish to understand (Murphy, 2002), the semi-structured interview is usually conducted in a face to face setting that permits the researcher to seek new insights, ask questions, and assess phenomena in different perspectives. The researcher made interview guides for the respondents and conducted them personally. The researcher spent a longer time in the field, which helped in identifying key informants with the help of local people. KIIs were conducted with veterinary service providers for issues on drug availability and use, vaccination and dissemination of information to farmers among others and challenges they face in discouraging farmers to drive cattle inside the Park. A Forestry Commision Officer was also interviewed on how they relate and associate with their immediate communities on allowing cattle to graze inside the Forestry.

Five individuals from communities were also interviewed on their own to clarify issues of gender, age and decisions to drive cattle inside the Protected Areas. This technique was more appropriate than others were because these stakeholders had knowledge on their various institutions hence they could provide in depth information about their situation.

However, there can be a weakness with this method. There can be a bias in the selection of interviewees according to their economic or social standing especially the elites, who may not be able to represent the smallholders' problems (Kumar 1989). There was a lot of bias from those who represented authorities, as all were protective of their positions and presented no weaknesses on their sides. Thus triangulating all methods mentioned above will help to avoid such biases.

3.4.4 Observations

The researcher also used observations and this technique was very useful because it gave the researcher the opportunity to see the difference between what the farmers say and the actual situation. The researcher observed the pastures, dams, where cattle grazed and drank, of which

most of the times was inside the Park or Forest. Observation also allowed the researcher to ask relevant questions based on what he would have observed. The various methods that the researcher used had their own shortfalls. The researcher discovered that using unhurried and unstructured conversations was time consuming as it allowed the respondent to narrate their experiences with little interruption. Therefore, some irrelevant issues would be narrated and the researcher had to be patient as it is disrespectful according to Ndebele and Nambiya traditions to interrupt an elderly person in the midst of a conversation. Observations also had the danger of misinterpretation by the researcher.

3.5 Data Analysis Procedures

Data was analysed using both quantitative and qualitative approaches of analysis. Dey (2005) outlines data analysis as a manner of determining data into its essential components. This is done to reveal its characteristic elements and structure. Thus, data analysis is critical to any research as it is the stage where the raw and meaningless data has meaning breathed into it. Dey (2005) further asserts that when analyzing data, one would want to do more than describe, one would want to construe, to explain, to understand perhaps even to predict based on the findings of the study.

Quantitatively, data was captured and analyzed using the Statistical Package for Social Scientists (SPSS) version 16.0. The package has the capacity to compute data from the field by creating a template with the variables. Variables that were the most representative of the prevailing conditions in the study area were selected for the analysis. Because the data collected was qualitative and quantitative in nature, it was subjected to descriptive statistics. Graphs, pie charts and histograms were used to better explain the relationships that may exist between variables.

The thematic approach to data analysis was used for qualitative data. The data were mainly be categorized in accordance with the research objectives, which formed the thematic areas. These themes and connections were then used to explain the research findings.

3.6 Ethical Considerations

Moore (2005) emphasizes the need to balance ethics and social science research in pursuit of knowledge. To gain entry into the district the researcher sought for permission and followed the local government hierarchy that is going through the District Administrator in Hwange, the respective Councilor for the ward and the village heads to get their permission. One village head was also interviewed to get their views on indigenous knowledge systems of livestock production and the changes in the management strategies and if there are decisions made as a community concerning livestock. To gain entry in to the government departments like the department of veterinary services and livestock production, permission was sought from the District Heads. The researcher also obtained permission from the Chief Nekatambe who advised all people under his jurisdiction to help me in whatever way possible for my study to be a success.

Donors frequently visit the study area and to avoid any misconception about the researcher's identity, the researcher made it clear to the participants about the intention of the project and that it was purely academic. Thus, this led to respondents voluntarily participating and being informed about the procedures involved in the research and challenges likely to arise. Confidentiality was also guaranteed. It was made clear that names would not be disclosed in this study without the participants' consent.

When conducting research, it is vital for the researcher to ensure that information he gets from the respondents does not only benefit him but the community as well such that not any form of information distortion is encountered. The researcher will therefore go back to the communities studied with the findings and possible recommendations for better managing the livestock.

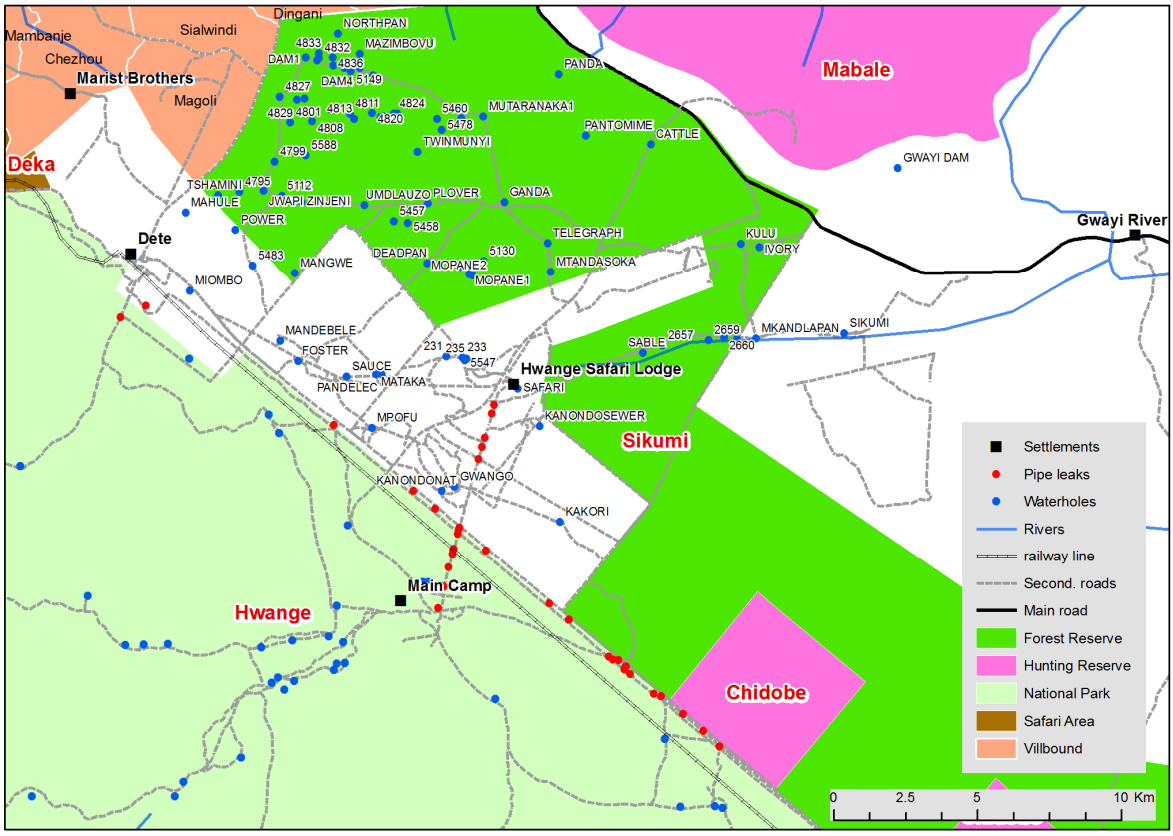
3.7 Study area

The study area is located in Hwange Rural District (Matabeleland North, Zimbabwe) and includes four villages in ward 15. The villages include Magoli, Chezhou, Dingani and Sialwindi, however too much emphasis was made on Magoli and Chezhou as they are slightly closer to the protected area. This communal area is bordered to the south by the Main Camp area of Hwange National Park (HNP), to the east by Sikumi Forest (SF) and to the southeast by the town of Dete.

Chloe Guerbois (2012) notes that the area, classified as agro-ecological region IV and V, is characterized by low fertility soils (mostly Kalahari sands) and erratic low annual rainfall (606 mm, inter-annual CV = 25%).

HNP, a key protected area from the Kavango-Zambezi TFCA, hosts wildlife that has a negative effect on the production of livestock. In the study area farmers make conscious decisions to drive cattle inside Hwange National Park and Sikumi Forest and most problems with wildlife concern diseases and predation for livestock. Proximity to wildlife means occasional interfacing of domestic and wild animals which results in transference of diseases such as Foot and Mouth (FMD) and higher chances of livestock being eaten by wild animals like lions, hyenas and painted dogs.

Fig 3.1 Map of study area



Kamativi is a small mining town in Matabeleland North Province, Zimbabwe. Kamativi is also the name of a tin mine located at the town. The town exists because of the mine. It was selected as a comparison study site as they are also affected by wildlife yet they stay away from the Protected Areas. It is located about 50km away from the aforementioned Protected Areas. Village 21 and 22 that were formed after land reform programme in year 2000 were selected.

The study involved a first visit to Hwange in June 2014 with the Cirad team as to familiarize with the environment. The main objective of this trip was to meet with the authorities and get permission to conduct my research there. This was not a problem as two PhD students, Arthur and Hugo who had worked in these communities and liaising with the leadership, assisted l. It only took me 7 days to familiarize with the communities and was ready to start administering questionnaires and conducting both focus group discussions and key informant interviews. It was followed by a 25 days data collection trip. The researcher had to camp at one of the Village Headmen homesteads for easy access into the communities for case studies. The period was enough to conduct 69 questionnaires and 2 focus group discussions along with 5 key informant interviews. Observations were made by the researcher during the time he went with the herders to herd cattle. Observations were also done during dipping sessions.

The second and final field trip was conducted in June-July 2015 after pre analysis with the questionnaire was completed. Some changes were made in the questionnaire and then administered in two villages namely Magoli and Chezhou. Six (6) kraal interviews were also conducted with different owners of livestock on ownership trends, historical information of existing cattle and so on. The researcher then proceeded to Kamativi for 10 days to administer questionnaires, key informant interviews and kraal interviews. A total number of 22 interviews were administered and 6 kraal interviews.

3.8 Conceptual Framework

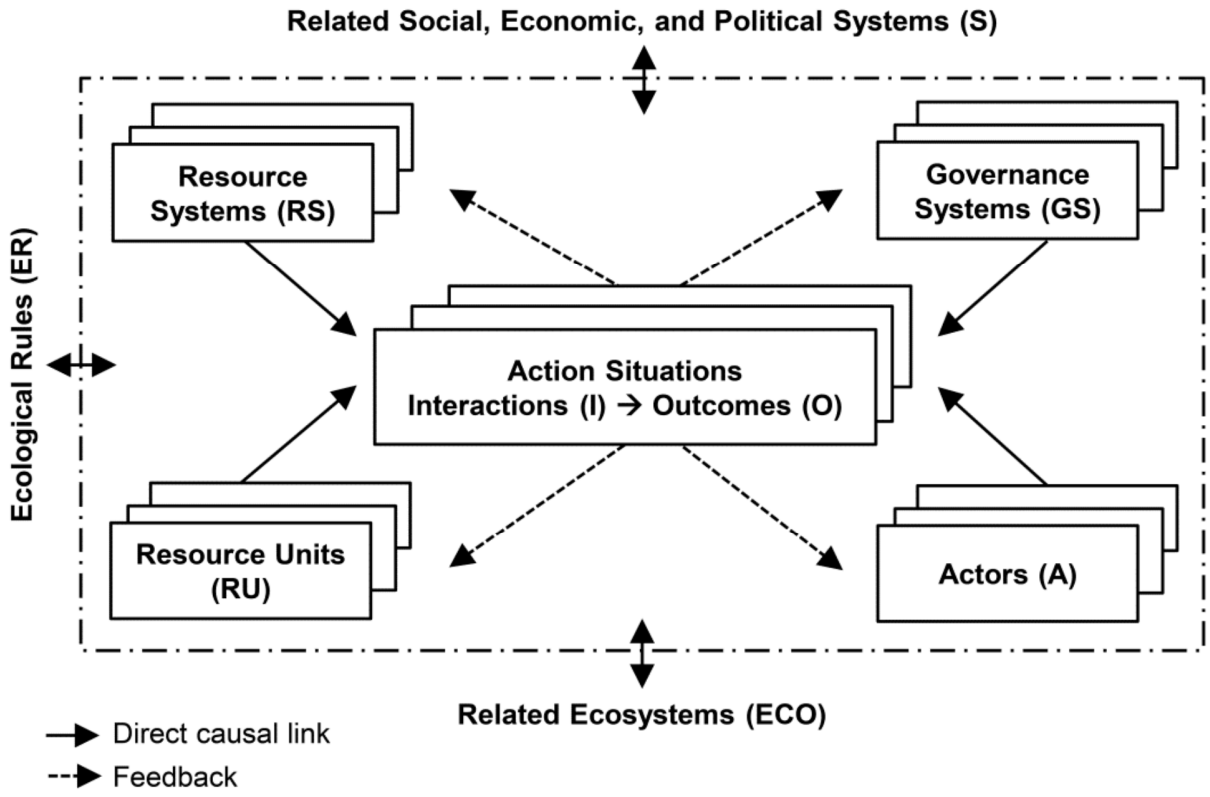
A Socio-Ecological System can be defined as a coherent system of biophysical and social factors that regularly interact in a resilient, sustained manner (Basurto et al 2013). Scholars have used the concept of socio-ecological systems to emphasize the integrated concept of humans in nature

and to stress that the delineation between social systems and ecological systems is artificial and arbitrary.

Fundamental to the SES framework is the presumption that humans can make conscious choices as individuals or as members of collaborative groups, and that these individual and collective choices can, at least potentially, make a significant difference in outcomes. Individual farmers, as decision makers, in the management strategies are key agents in ecological systems. From an ecological perspective, the individual is both a postulate, a basic entity whose existence is taken for granted and a unit of measurement.

As a postulate, an individual has several characteristics. First he requires access to an environment, upon which he or she is dependent for knowledge. Second, he is interdependent with other humans; that is, is always part of a population and cannot exist otherwise. Third, he is time bound, or has a finite life cycle. Fourth, he has an innate tendency to preserve and expand life. Fifth, he has capacity for behavioral variability. Social ecological models are thus applicable to the processes and conditions that govern the lifelong course of human development in the actual environment in which human beings live. Below is the Socio Ecological System or framework with all the tenets that determine decision making by farmers in the Hwange socio ecological environment.

Fig 3.2 Socio Ecological Systems Framework (Ostrom, 1986)



The analysis of the dynamics of the system requires identifying a set of constraints associated with the multiple dimensions of the SES that allows all components to be viable. Farmers are actors in the system being governed and restricted by rules and regulations of the Governance System. There are also resource systems that are the Park and Forestry with the resource units as pastures, wildlife and trees. The co-viability approaches thus explicitly explore the conditions for coexistence between the various components of the system. Thus, Berkes et al., (2003) note that the studied socio-ecological system in this hypothesis is ideal for exploring the study's research questions.

CHAPTER FOUR

Presentation of Findings

4.0 Introduction

This chapter presents findings obtained in the study. Some of the results are illustrated by pie charts and graphs for data that was quantitative. Chisquare tests are used for testing associations between variables. Data for association is presented in tables. For qualitative data, the study used themes that surround farmer's choices of driving cattle inside the Park and Forest. Statements are quoted from farmers as they expressed their views in Focus Group Discussions and Key Informant Interviews.

4.1 Access and Ownership Patterns of Cattle in the Study Area

This presents results for objective one that focuses on cattle ownership patterns.

4.1.1 Gender and Cattle Access

Sex and gender are significant in determining cattle ownership in area of study. Of all the respondents, 72.7% were male and 27.3% were female *(Fig 4.1)*. The study shows that cattle ownership is still skewed along gender lines with males owning most of the cattle. Follow-up interviews confirmed the above gender bias in cattle ownership. The most effective way for poor males to own cattle in the study area is through buying one cow and waiting for it to reproduce.

Ukusisa or *ukufuyisa* is not a common system in all three study sites, Magoli, Chezhou and Kamativi. Indepth interviews revealed two aspects of the *kufuyisa* system. First, a young male is hired to herd cattle in return for a beast or beasts after an agreed period. The reward is also determined by the size of the herd. Second, a person with a sizeable herd of cattle "loans" an excess number to a poor household which then looks after the cattle based on a mutually agreed contract. The contract stipulates the number of cattle the debtor cattle will receive during and after the expiry of the contract.

Female respondents confirmed that they usually do not enjoy the advantages of ukusisa system. Women tend to access or own cattle through inheritance or as part of bride wealth *mombe yehumai* following marriage of a daughter. Women are not working or were not working for

them to save and buy a beast. The latter explains why most young females do not own or have defined access to cattle than their male counterparts. Mostly, females are usually associated with small livestock keeping such as goats and chickens but they have access to cattle products such as milk, meat, draft power and manure. Women are also not favourites when it comes to cattle inheritance. The eldest son is the expected heir of the cattle, unless if there is no son in the family, then the mother can inherit cattle. Fig 4.2 shows the number of cattle owned by men and women. It shows that men are the favourites even in cattle numbers owned.

Fig 4.1 Cattle Ownership by Gender

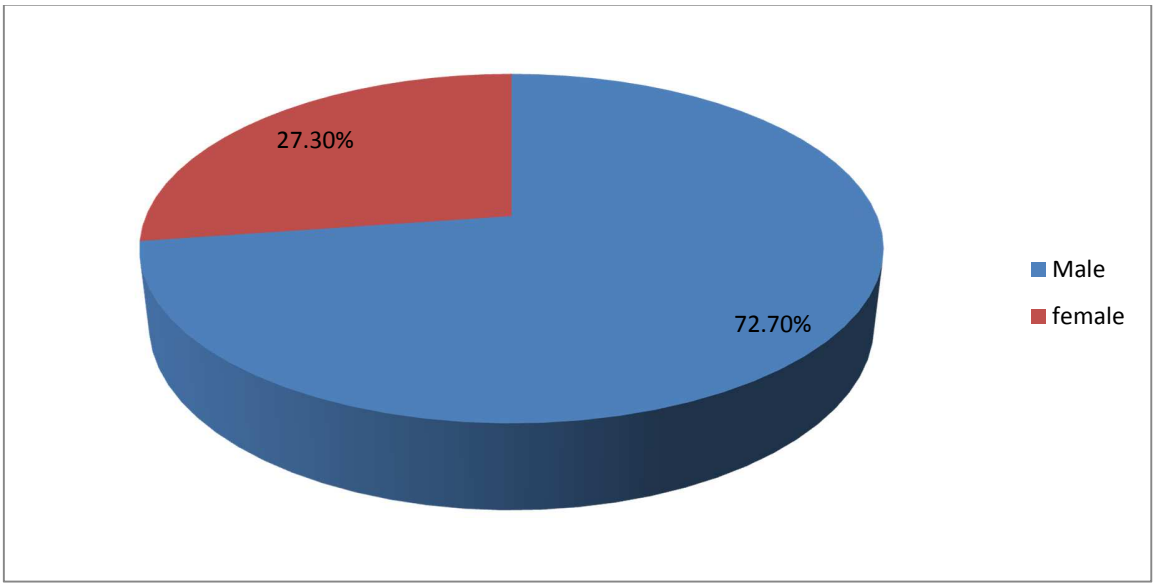
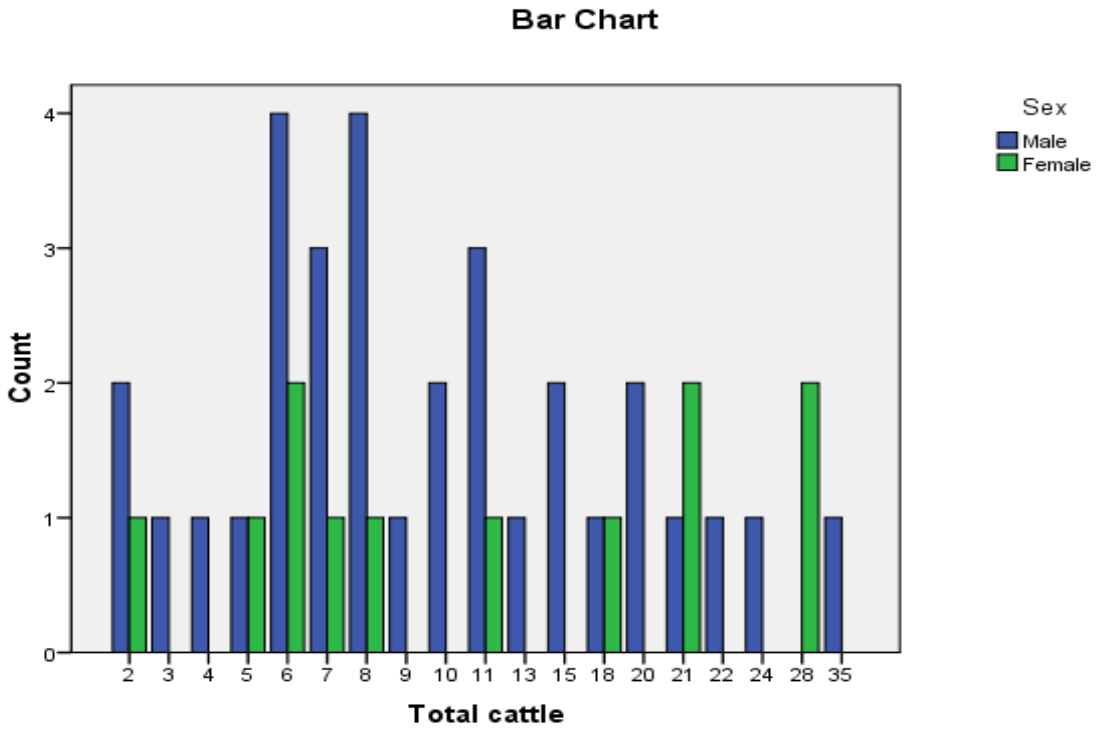


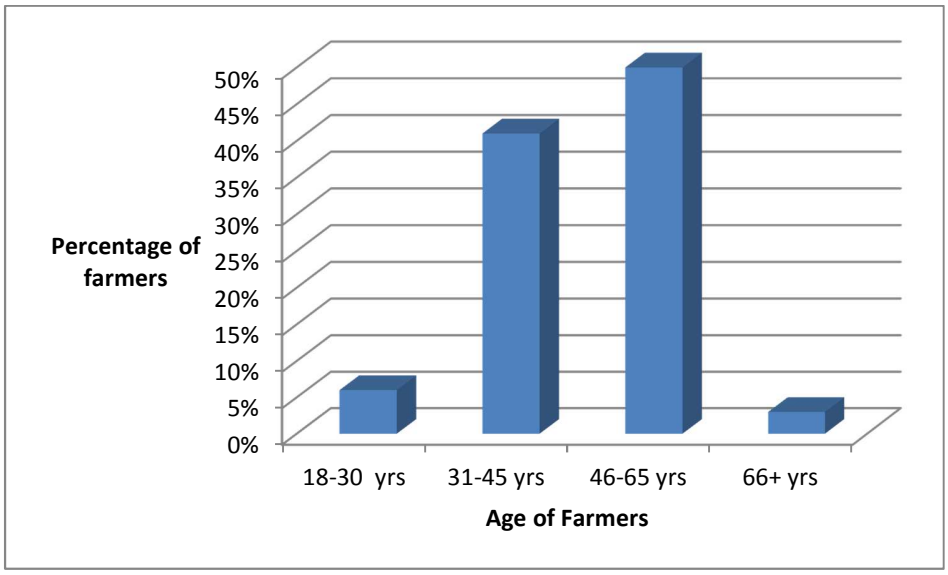
Fig 4.2 Cattle Numbers Owned by Male and Female



4.1.2 Age and Cattle Ownership

Age is also significant in cattle access and ownership in the study area. Farmers between the ages of 45-65 (50%) own more cattle then those below 30years (6%) and above 65years (3%). Those ranging from 31years to 45 years constitute 41% of the total ownership of cattle by age. Those between 31 years to 65 years have been attributed to their ability to work and accumulate cash to buy cattle and can get cattle in form of bride price as their daughters get married. Information got from the interviews state that these men will be working and have income to atleast purchase one cow.

Fig 4.3 Age and Cattle Ownership



4.1.3 Ethnicity and Cattle Ownership

There are different ethnic groups that own cattle both Hwange and Kamativi. In Hwange, most of the owners were Nambiya people with the biggest chunk of 54.5% followed by Ndebele with 27.3% followed by Tonga with 9.1%. Minority ethnic groups like Bemba and Lozwi had 4.5% of ownership each.

Fig 4.4 Magoli and Chezhou Ethnic Groups

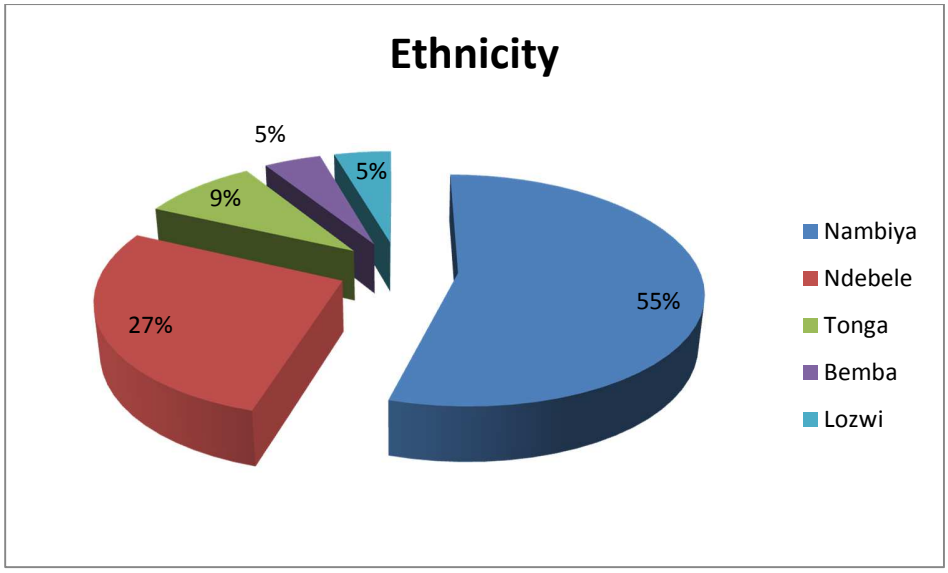
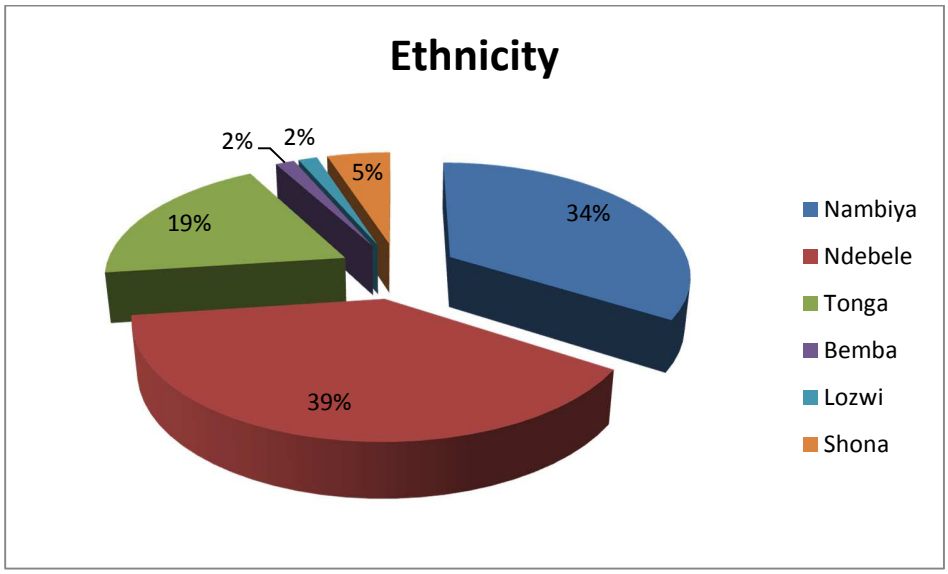


Fig 4.5 Kamativi Village 21 and Village 22 Ethnic Groups



Kamativi is a bit different from Hwange. Most owners of cattle are Ndebele with 38.9% followed by Nambiya with 34%, Tonga with 19.1%. Shona have 5%, Bemba, and Lozwi with 1.5% respectively.

However, it is of importance to find out if there is no association between ethnic group and cattle ownership. Chi-square statistic was used to determine if the measure of association

between cattle ownership and ethnicity. Table 4.2 illustrates the chi-square test. With the value of (chi=3.743, df =5 and p= .587), we accept the null hypothesis that there is no association between ethnic group and cattle ownership because the p value is far much greater than 0.05. Thus, cattle ownership does not depend on one's ethnic group.

Table 4.1 Chi-square Tests (Association between ethnic group and cattle ownership)

	Value	**Df**	**Asymp. Sig. (2 sided)**
Pearson Chi-square	3.743	5	.587
No. of valid cases	96		

4.1.4 Religion and Cattle Ownership

Most of the cattle owners are Christians as compared to traditionalists. Of all the cattle owners, Christians (irrespective of which church one belongs to) were 82% and those who believe in African Traditional Religion constituted 17% and 3% who believe in other religions. Focus Group Discussions also confirmed that most of the people belong to a number of Christian denominations. However, these percentages do not give us a true picture if one's religion really determines him or her to own cattle.

Fig 4.6 Religion and Cattle Ownership

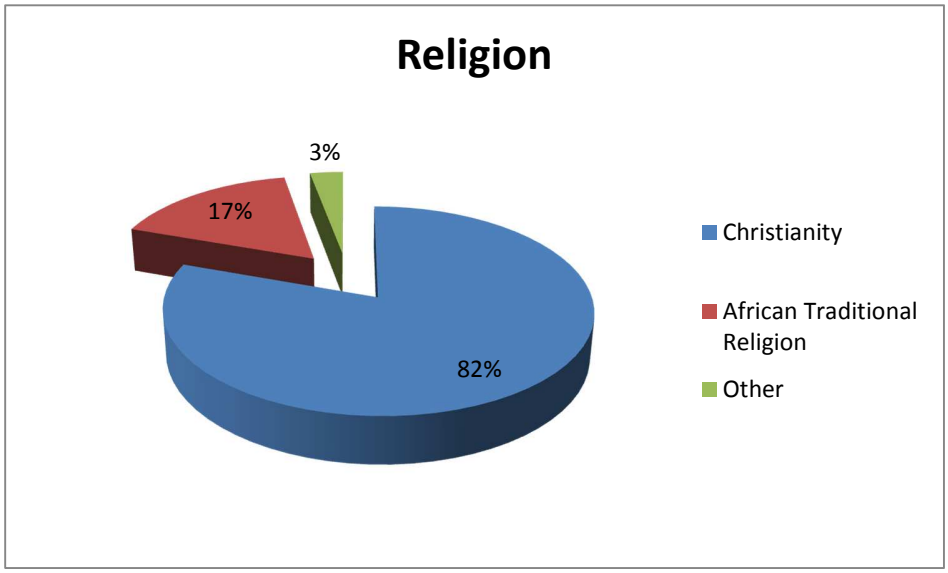


Table 4.2 Chi-square Tests (Association between Religion and Cattle Ownership)

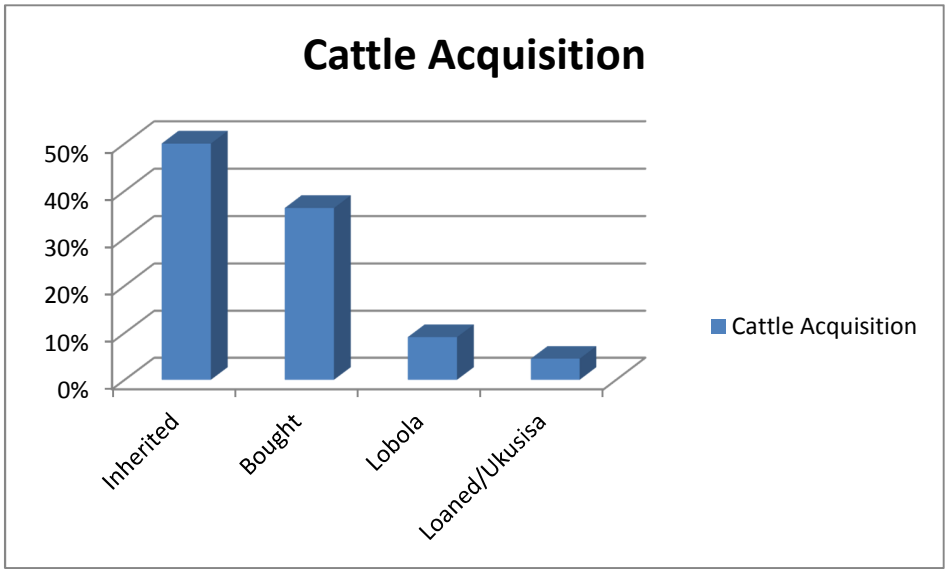
	Value	df	Asymp. Sig. (2 sided)
Pearson Chi-square	2.479	2	.289
No. of valid cases	58		

Thus, Table 4.2 shows that there is no association between religion and cattle ownership. With the chi square value of 2.479, df=2, p= .289, one can accept the null hypothesis that there is no significant association or dependence between religion and cattle ownership.

4.1.5 Forms of Cattle Acquisition

There are a number of ways through which people have acquired and accumulated cattle. Respondents interviewed (50%) expressed that they have acquired cattle through inheritance where the owner dies and then livestock distributed to remaining family members. Of particular interest are the 36.4% who pointed out that they bought their cattle. Those who got their cattle through lobola payments were 9.1% and 4.5 % have loaned cattle.

Fig 4.7 Forms of Cattle Acquisition



Kraal interviews also confirmed that ukusisa is not a common practise in the area under study. For example, Mr. Sibanda noted that farmers no longer loan cattle because their herds have significantly decrease in the past two decades. Nevertheless, most of the farmers also commented that they bought their livestock. The trend is that a farmer buys one or two cows in the beginning and then leaves them to reproduce. The following respondents supported this claim.

Box 2: Respondent's cattle acquisition and management

Melody Moyo (Magoli)

Firstly, there is Melody Moyo. She is 58-year-old woman who resides in Magoli. She is the owner of 7 cattle at the moment. Following is the genealogy of her cows; the first cow is Angola and has given birth three times. The second one is Hlavukazi who is the first-born to Angola. There is Nsundukazi who is the second born to Angola. In the fourth place there is Mpevukazi who is a third born to Angola. The first cow that she owned was called Bata who was the mother to Angola who is the most productive in the kraal. Bata was bought from selling an ox. This exchange was mainly made for reproduction processes in Melody's kraal. The rest of the cattle are still calves and have not been given names at the time of the interview. Melody does not have any oxen. She uses these cows for ploughing and draught power. However, she was bragging that she has potential of having a bigger kraal in the near future as she has reproductive cows. She concluded by echoing that having or buying a cow as she did is more advantageous than buying oxen.

Sibanda J (Chezhou)

There is also Sibanda J. He is a 67-year-old man. He bought 1 cow in 1993 when he was still working in Bulawayo. Sigcebhezana (name of the cow) was bought in Chezhou from one of the village members. She was sold because former owners had divorced and there was no one to keep it, thus she was sold and the money shared equally between the divorcees. She is the one cow that reproduced the whole herd of cattle that this man owns. At the time of the interview, there were 9 existing cattle in the kraal. He complained of most of his cattle dying whilst there were still calves otherwise, he will be having a herd of closer to 20 cattle. He is still not aware of the cause of these deaths but he suspected witchcraft. For the past 5 years, no cow has been sick just the mysterious deaths of the calves.

Sibanda N (Village 21)

He is a 45-year-old man. He has been living in this place for 15 years and was born in Tsholotsho. He is the owner of 29 cattle. He herds his own cattle and mainly uses oxen for

draught power and get milk from cows. He bought the first 2 cows that then reproduced. He bought them in 1986. He inherited 4 cattle from his father and moved to this place in 2000.

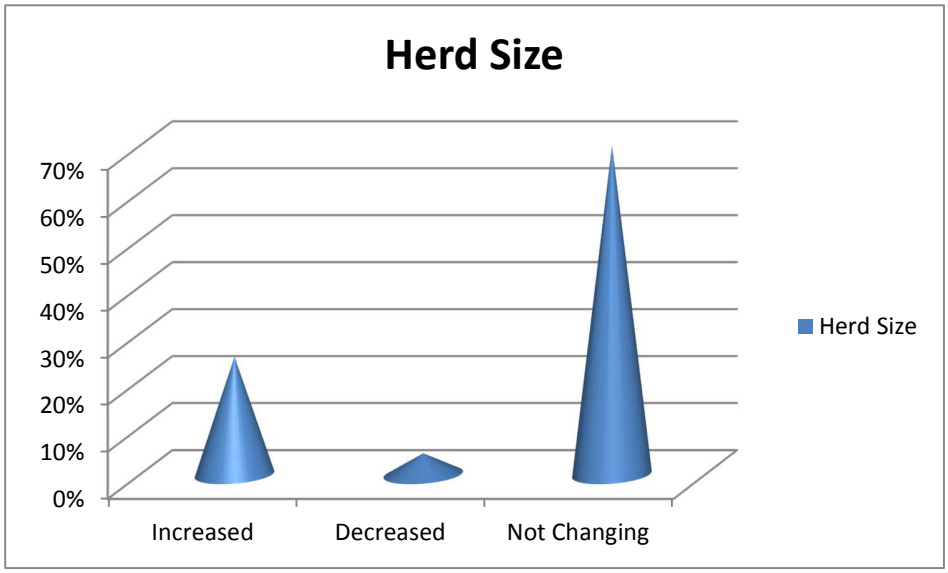
Ngwenya C. (Village 22)

The ownership of cattle in this homestead is multiple. The father owns 17 cattle, the wife owns 8 and the son owns 2. In total, there are 27 cattle in this household. The father bought 5 cattle in 1973 when he was working in Kamativi mine. He stopped working in 1997 and focused on keeping livestock and farming. He commented that that he lost 11 cows in 2009 due to drought. 6 of these cows died soon after giving birth. Prominent diseases in the area include lumpy skin and the black leg.

4.2 Herd Sizes

There is no difference in the size of the herds from period 2010 to 2015 for people living in Magoli and Chezhou and those living in Kamativi. Farmers were asked whether their herd was increasing, decreasing or unchanging. The decrease in cattle herds has been attributed to the different coping strategies on diseases, predation, theft and predation. Poverty and lack of financial capital has made farmers to lack drugs to treat their cattle from diseases. This was confirmed in both Focus group and informant interviews.

Fig 4.8 Herd size (Increasing, Decreasing and Not Changing)



The average number of cattle owned by farmers in both study areas was nine (9). Thus, the highest number of cattle owned by an individual in Magoli and Chezhou is thirty three (33). In Kamativi, the highest number of cattle owned is twenty eight (28). However, most of the farmers interviewed range from two (2) to fourteen (14) cattle respectively. These herd sizes seem to be stagnant from 2010, they are not changing either for the increase or for the decrease. Cattle numbers may fluctuate among members but the average has been almost the same over the past five years.

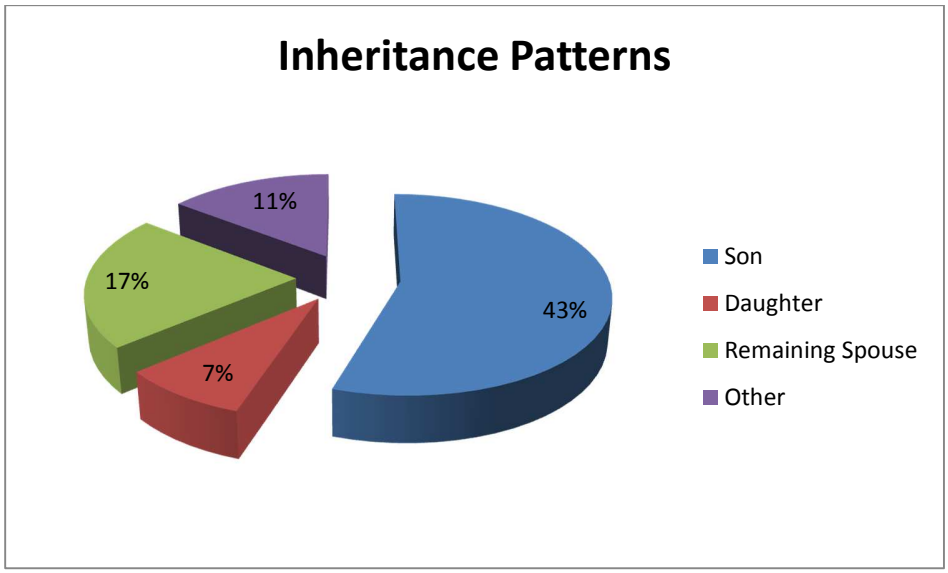
Table 4.3 Average Number of Cattle Owned

Area of residence	No. of Households interviewed	Total number of livestock recorded	Average number of livestock
Magoli and Chezhou	92	867	9.42
Kamativi Village 21 and 22	24	226	9.41

4.3 Inheritance Patterns

The interviews show that son is usually the most preferred heir of livestock if the father dies.

Fig 4.9 Inheritance Patterns



Those who said the son is the heir constituted 43.2% followed by the remaining spouse on 38.6%. There is a slight difference between these two, however focus group discussions confirmed that the son is the most preferred heir. One of the participants in a focus group discussion said that:

Box 3: Statement from a Focus Group Discussion

"The son is the one who carries the legacy of the family thus it is wise and smart to leave him all the inheritance in order to keep up the family legacy and prestige".

Daughters are the least mentioned recipients of livestock through inheritance. Respondents (6.8%) who mentioned that the daughter can be the heir of livestock do not have sons and cannot leave the legacy to the extended family. 11.4% of the respondents said that any member of the extended family can be the heir of livestock if the owner dies. Focus group discussions and indepth interviews confirmed this. One participant pointed out that:

Box 4: Statement from a Focus Group Discussion

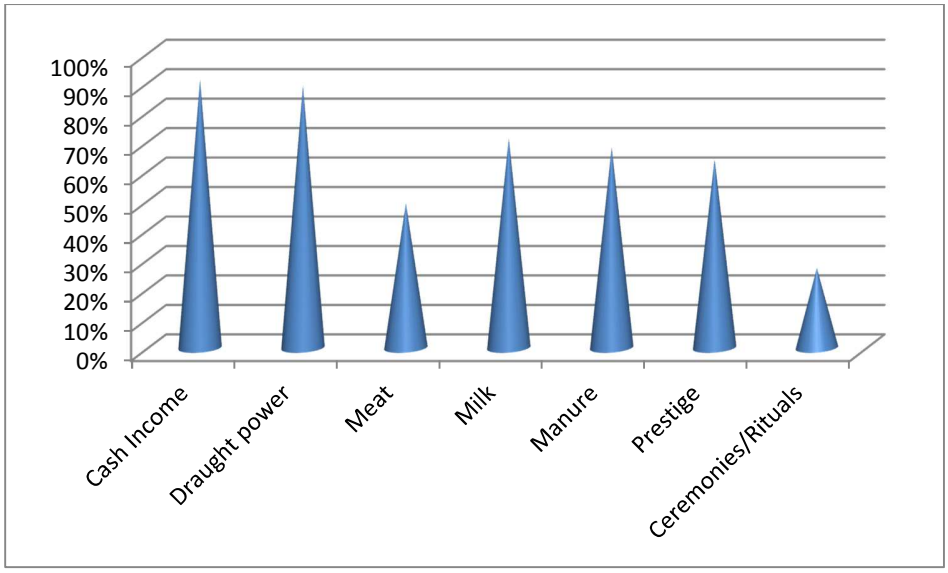
"Sometimes it's best to leave livestock with other family members who have knowledge on how to keep them. He argued that in most cases the son will be either working in town or in the diaspora, thus it is best to leave livestock with the uncles who stay in the same rural area as they will be the best people to take over keeping livestock as they have experience on how to survive in that particular community".

4.4 Drivers of Keeping Livestock

The main driver of keeping livestock in Hwange and Kamativi is for economic purposes (82%), followed by social status (12%) and lastly for cultural purposes (6%). Farmers in both Hwange and Kamativi reported that they keep livestock as an alternative for failure in crop production. They reported that they receive low rains that make it impossible for them to practise crop production. They further reported that their physical environment favours livestock rearing with goats as the first option.

The study shows that a huge number of rural farmers get their cash income for livestock. Ninety one (91%) of the farmers alluded to livestock being crucial for them getting cash income through sales. They also get draught power for ploughing and pulling of scotch carts (transportation) to fetch water and taking people from one point to another. Other roles mentioned are stated in the graph below. The least role mentioned was that of using livestock for traditional rituals and ceremonies (27%).

Fig 4.10 Role of Cattle for Rural Farmers



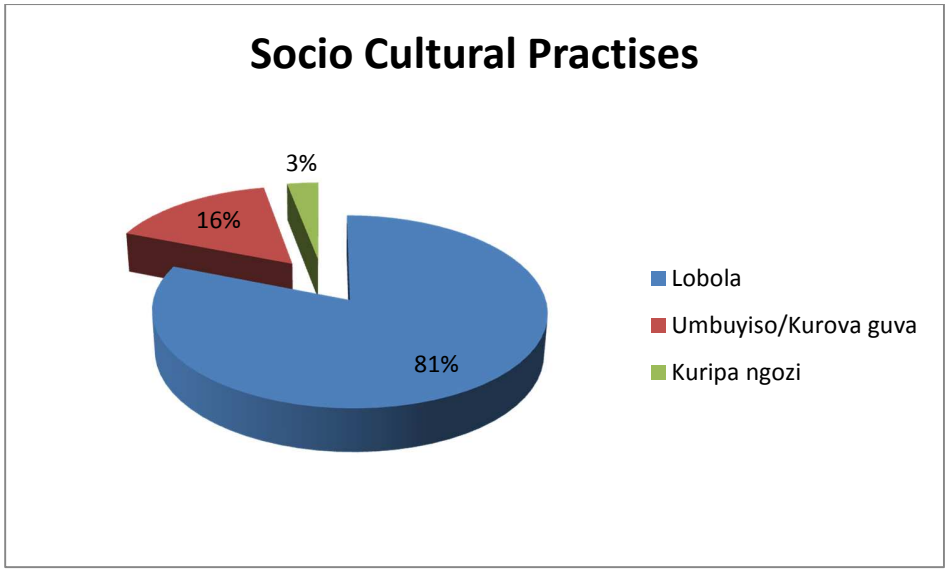
4.5 Socio Cultural Uses or Practises Associated with Cattle

Cattle are still being used for socio cultural practises. Lobola is one of the practises that are still practiced. Eighty one (81 %) of the respondents mentioned that they still use cattle for lobola payments and is still very significant. Those who mentioned using cattle for memorial services like umbuyiso were 16% whereas 3% mentioned Kuripa Ngozi. One of the key informants stated that:

Box 5: Statement from a Key Informant Interview

"*Cattle no longer have any cultural relevance. Most people in this area are now Christians and no longer believe in traditional cultural practises like umbuyiso or kurova guva and kuripa ngozi but payment of brideprice or lobola"*

Fig 4.11 Socio Cultural Uses of Cattle



4.5.1 Ethnicity and Socio Cultural Practices

Belonging to an ethnic group does not determine the performance of socio cultural activities. From the study, we accept the null hypothesis that there is no association between ethnic group and socio cultural activities. The p-value is .67 and is greater that the accepted 0.05 that means that one can then conclude that there is relationship or association between ethnic group and socio cultural activities**.**

Table 4.4 Chi-square Tests (Association between Ethnic Group and Socio Cultural Activities)

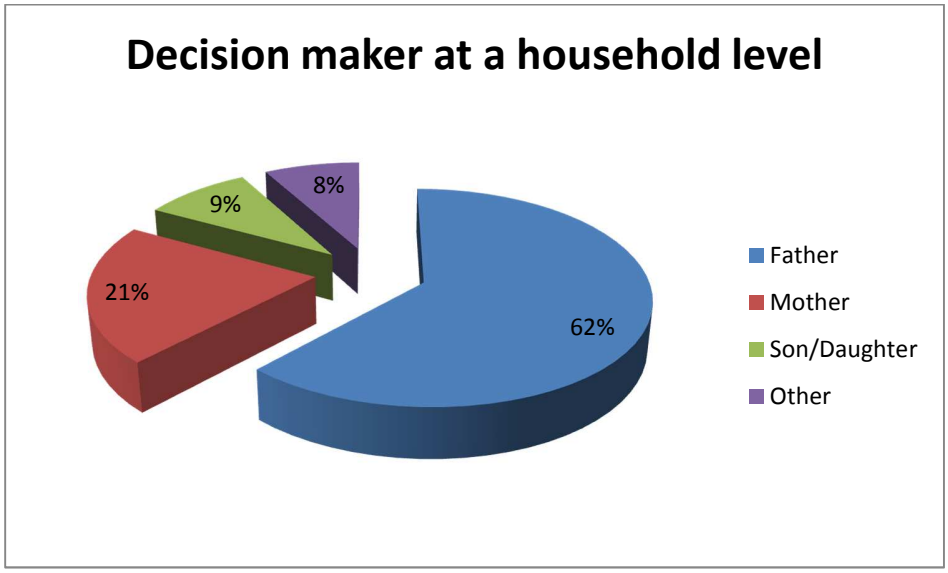
	Value	**df**	**Asymp. Sig. (2 sided)**
Pearson Chi-square	7.614	9	.667
No. of valid cases	93		

4.6 Decision-Making Processes

The study shows that levels of decision-making range from the household level up to the community level. In both Magoli and Kamativi, men are the ones responsible for decision

making at a household level. . Focus group discussions and indepth interviews confirmed that decisions made at household level are those decisions to do with when to sell or buy cattle, when and which beast to slaughter for ceremonies. For example, one of the respondents, Mr Sibanda noted that he is the only one who makes decision concerning all livestock in his homestead. He pointed out that in his absence, no one can make a decision concerning livestock, and they will have to call him wherever he will be for him to make decisions. At one point, there was need for cash to pay tuition fees and he was away in South Africa at that time, his wife had to call him asking permission to sell one cow and pay tuition fees for their son who is studying at National University for Science and Technology (NUST).

Fig 4.12 Decision Making at a Household Level



Only five households had employed herd boys. These herd boys are the ones who make decisions on where cattle would graze on that particular day. Of all the herd boys, the researcher found out that they had different interests in terms of grazing opportunities. On one of the interviews conducted with a herder while herding livestock, he mentioned that:

Box 6: Statement from an Interview with a Herder

"What we do in the bush is our own decisions as we know where there is good pasture and water sources. Owner of the livestock can only make decisions in the kraal and not on what to do in the bush as they have no experience of how it's like where their livestock graze".

Decisions to do with the common property like the grazing land are done at community level and sometimes involve authorities and institutions. This came out clearly in the Focus Group Discussions where the participants agreed on that they agree on a particular time on when to start herding and when to allow livestock to graze in their crop fields. They agree on a date of when everyone will be done harvesting their crops, then they can allow their livestock to graze in the fields. There is no uniform time because of the change of seasons, thus the Village Head convenes a meeting to discuss on a date with the community at large to avoid unnecessary conflicts among households.

4.6.1 Institutions and Communal Decision-Making

Local people note that they have been guided by rules and regulations of the Park that restrict their livestock and people inside the park. The proximity of the study area to the wildlife conservation area also entails mutual consensus between the Park authorities and the communities. Farmers' awareness of wildlife regulations was very high and they have standing memorandums of understanding on how to utilise Hwange National Park and Sikumi Forest. For example, Tendai (Sikumi Forestry Officer) points out that;

Box 7: Statement from an Interview with a Forestry Official

"*There used to be grazing leases where the commission would mark an area where people can get their cattle for grazing. However, now that there are lodges within the forestry through forestry concessions, restriction of people into these areas is on the rise. Thus, there has to be local arrangements with local chiefs and the local forestry area on how best to utilize the forestry for the betterment of their livelihoods. At the moment people are allowed only to enter 10 kilometers into the forestry for grazing and water sources*".

"Farmers pay nothing to access grazing and water in these Protected Areas but it has become a problem as they exceed their 10 kilometers radius. Thus those who exceed this zone will be punished or prosecuted".

However, farmers expressed discontent towards their proximity to these two Protected Areas. They have not received much benefit from observing the rules and regulations of the park.

Wildlife, which is seen outside the Park, is not dealt with as done when Park and Forestry Officials observe inside the park and in the forest whereby the owner faces penalties and punishment cattle. However, respondents did not mention any encounter with Private Conservancies found within the Park and Forestry.

Farmers in Kamativi reported that they mainly communicate with the Department of Veterinary Services and Agritex when it comes to livestock issues. They were the only institutions reported to provide services and information to do with livestock production. Decisions on when to vaccinate and dip cattle come from the Department of Veterinary services. It is of importance to note that there are no strict grazing rules as there is no Protected Area nearby.

4.7 Livestock Supervision and Distance to the Protected Area.

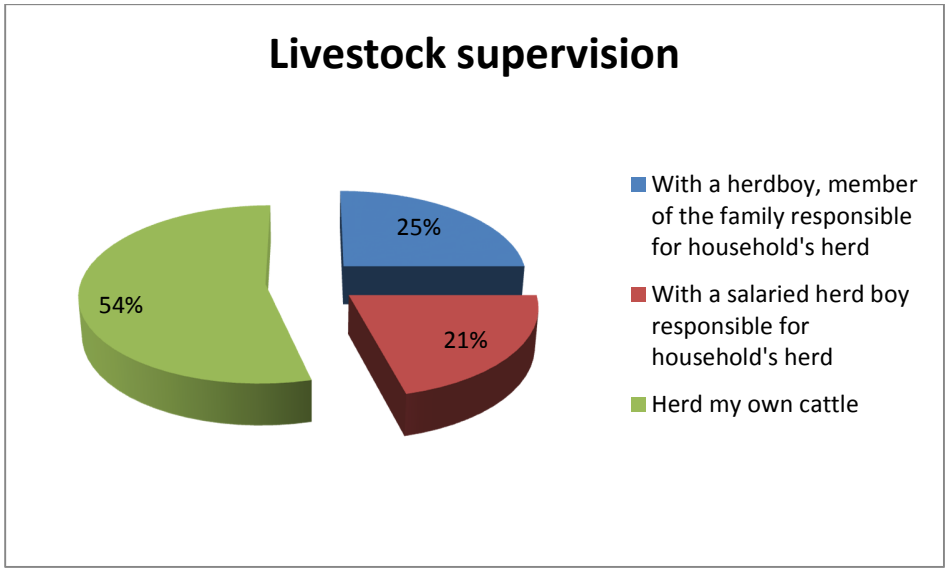
On supervising livestock, most respondents point out that they herd their own cattle. 54.5% of the owners of livestock herd their own livestock. On the other hand, only nine (20.5%) households had a salaried herdboy responsible for taking care of livestock in the bush. Salaries of herdboys were ranging from as little as $25 up to $100. This was determined by the economic status of the household and the herd size. Those with large numbers of cattle of cattle, that is more than thirty were paying $50 and above. The remaining households have herd boys who are not paid to herd livestock. They are family members who in most cases are grandchildren or nephews.

Distance to the Protected Area was not significant in determining supervision and management of cattle. The closest farmer to the Protected Area was less than a kilometer (approximately 850 metres) into Sikumi Forest. The furthest farmer was also in Magoli and stays eight kilometers (8km) away. However, all farmers reported that they do send their cattle into Protected Areas in search of pastures and water. They further reported that this has been their norm for some time and they are not intending to change their behaviour.

Herding practises were the same in Kamativi. The only difference was that farmers in Kamativi did not have their cattle getting into any Protected Area. They reported that that they have enough grazing land since the area was recently resettled. Farmers reported that they have been

in the area not more than ten years and they still have adequate grazing land. Major challenge was that of water sources, thus they end up resorting to Kamativi dam for water. Nevertheless, they complained of the quality of the water saying that it is not good for their cattle's health.

Fig 4.13 Livestock Supervision



Fourteen (14) respondents reported that they use bomas for kraaling their livestock at night. They alluded to that they kraal their cattle together so that they can create nutrient hotspots for their livestock. Other farmers interviewed did not use the bomas as they were not aware of the initiative. An indepth interview with a Research Officer for Hwange Lion Research, who are the custodians of the boma project in Hwange confirmed that use of bomas is still new in the community. Respondents using bomas appreciated bomas and noted that they have an economic value as they no longer have to buy fertilizers for their crops. There was no mention of social and cultural values associated with the bomas.

4.7.2 Membership to Agricultural or Farmers Associations

One of the respondents in Hwange noted that Agricultural Associations represent the lowest civil society levels in terms of agricultural activities, both in livestock and crops. Livestock based Farmers Associations were defined by farmers as groups of farmers who are elected to represent members' interests on provision of veterinary services. They further pointed out that they

discuss all issues pertaining to cattle production in their areas and often seek for external help from veterinary Department, Government and other NGOs operating in the areas on behalf of other farmers. The most disappointing thing is that only 20% of the respondents belong to Zimbabwe Farmers Union. Eighty percent (80%) of the interviewed farmers do not belong to any agricultural association, thus they use their indigenous knowledge systems of crop production and livestock rearing.

4.7.3 Locally Based Veterinary Services

Department of Veterinary Services was found in both Hwange rural and Kamativi. Farmers' capacity to manage cattle diseases is enhanced by their ability to access Veterinary services at a local level. This saves time and costs for the rural poor. The Department of Veterinary Services (DVS) has the ultimate responsibility in the provision of drugs, vaccinations and dissemination of information discouraging farmers to drive their cattle inside the park. All respondents alluded to the fact that there are locally based Veterinary services and they are discouraged in allowing their cattle to be in contact with wildlife like buffalos. Dipping of cattle which used to be twice a month was now conducted once, leaving cattle with infectious diseases yet farmers pay a dipping fee of $1 per beast every year. In an in depth interview with a Dete local veterinary officer, he argued that:

Box 8: Statement from an Interview with a Veterinary Official

"We mainly interact with communities when we are dealing with livestock. We assist communities on how best to manage their cattle and how to keep them outside Protected Areas where they mainly interact with wildlife. We normally conduct farmer trainings and do routine inspections once per dip tank per month. In training farmers, we put them in small groups (10-15 people) whereby we focus on animal health.

Trainings are meant to be conducted 10 times annually, which is not the case. This is capacity building for these farmers. We mainly teach them about diseases, dipping and other operations like de horning and castration. It is individuals that come together and form a group then call a veterinary officer to come and train them. These groups have not been successful because transport has been a hindrance and some programs that may come in for the veterinary officer. This has derailed progress of these groups.

However, our main priority in these communities is to ensure dipping and treating diseases".

Ninety percent (90%) of the farmers reported that they have not heard about the trainings even at the diptank sessions. They only know Department of Veterinary Services as providers of drugs for livestock and not training or capacity building on how to best mange livestock.

4.8 Perceptions on Diseases and Management.

The most perceived challenge faced by farmers who reside adjacent to the wildlife reserve is the stopping or dealing with transmission of disease pathogens from wildlife to livestock through direct and indirect contacts as they share food and water resources. The noted livestock diseases were foot and mouth disease (FMD), heart water; lump skin, blackleg, red water, gall sickness; anthrax; bovine Tuberculosis, Quarter evil and boils.

These diseases were reported in both Magoli and Kamativi. Farmers in Kamativi reported that their livestock interacts with wildlife even if they stay far away from the Park. Wildlife met by herders included elephants, buffaloes, lions and hyenas. Thus, the same diseases reported by farmers at the periphery of Hwange National Park and Sikumi forest were the same as those reported in Kamativi because of these interactions with wildlife.

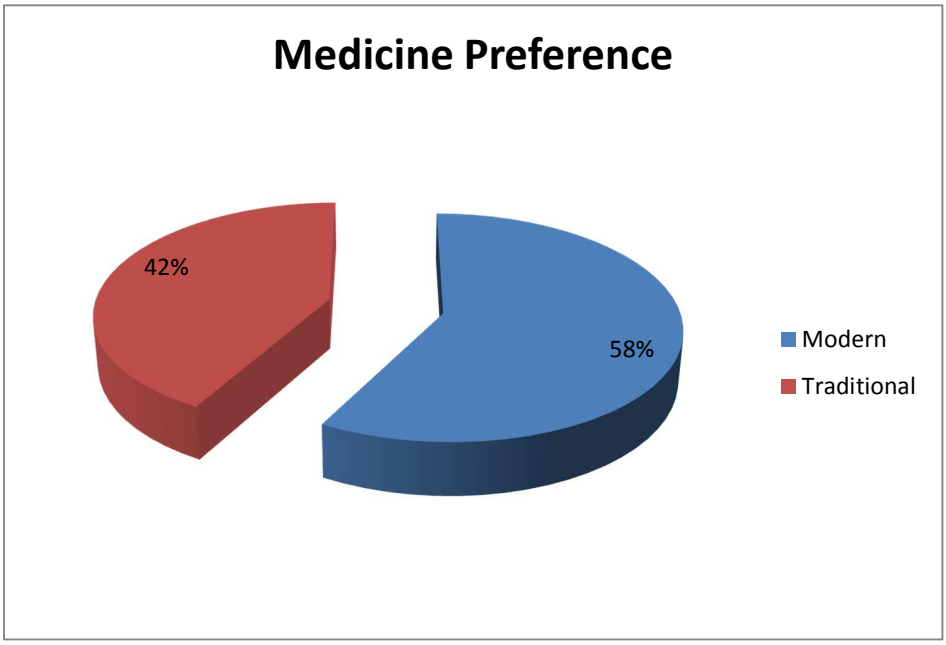
4.9 Medicine Preferences by Farmers

Farmers in Magoli, Chezhou and Kamativi used both traditional and modern medicines. Fifty eight percent (58%) of the respondents state that they prefer using modern forms of medicines whilst 42% prefer using the traditional methods. A participant of a Focus Group Discussion commented that they prefer modern medicine because it is efficient and has been tested and recommended by the Veterinary Department. For those who prefer traditional medicines, they reported that farmers do not have cash to purchase modern medicine. Traditional medicine is also readily available (herbs and leaves from the forest) unlike having to go to Hwange or Bulawayo to purchase the medicine.

Lack of cash and order of family priorities were mentioned as a precursor of preferring traditional medicine. Most farmers are unemployed and rarely get income from remittances and

selling of crops. When they get cash, they would rather buy food for their families at the expense of purchasing drugs for livestock.

Fig 4.14 Medicine Preference in Treatment of Livestock



4.10 Perceptions on Wildlife/livestock Interactions

Humans, livestock and wildlife share habitat in Hwange and Kamativi study area such that wildlife is sometimes observed in the communities and cattle cross over the boundaries into the park. During wet and dry seasons animals that were observed in the home areas were different such that hyenas frequent more in dry season whilst buffalos and elephants were observed during the wet season.

Carnivores such as hyena, lion and wild dogs, greater kudu and common warthog were observed all year long with no effect of season. Losses of domestic animals (cattle, small ruminant and donkeys) to predation were mainly by hyenas and destruction of crops mainly by elephants.Those living further from the park observed fewer animals (warthogs and buffalos) but on rare occasions and have the least livestock losses. All respondents perceived the

interactions as not good for farming as there is increased transmission of diseases from wildlife to livestock.

Table 4.5 Farmer's Perceptions on Diseases.

WILDLIFE OBSERVED BY FARMRERS	**PERCEPTION(important to farmers)**	**PREVALENCE TREND**
Hyena (wet season) Elephant & buffalo (dry season)	**Diseases** – Foot and Mouth ,Lumpskin,Blackleg, Heartwater & Redwater	67%
Hyena, Lions (throughout the year)	Predation	21%

4.11 Opportunities and Constraints

The National Park and the Forestry were reported to be a haven and offer opportunities for farmers at the periphery. The researcher will start by presenting the opportunities mentioned by respondents and then constraints or limitations that they face in keeping livestock.

One opportunity that all respondents mentioned was that of adequate grazing land in the Park and in the Forest. Respondents from Kamativi also alluded to the fact that the grazing land is adequate and people do not have to travel long distances in search of pastures and water sources. All these were also confirmed in the Focus group discussions. One participant in Hwange mentioned that:

Box 9: Statement from a Focus Group Discussion

"There is enough grazing in the forest and l also have an opportunity that l stay next to a borehole, thus my cattle do not have problems in getting water to drink. My children are the ones that pump water for these cows".

However, the constraints or limitations mentioned by people override the opportunity thus explaining why the livestock numbers are decreasing at an alarming rate. Major constraints mentioned by people include diseases, predation, distance to water sources and quality of water. The least mentioned limitation was that of theft. Limitations and constraints faced by respondents keeping livestock were as follows:

4.11.1 Diseases

All respondents from Magoli, Chezhou and Kamativi mentioned diseases as a constraint of keeping livestock in area under study. They are the most perceived challenge faced by farmers who reside adjacent to the wildlife reserve is the transmission of disease pathogens from wildlife to livestock through direct and indirect contacts as they share food and water resources. The noted livestock diseases were foot and mouth disease (FMD), heart water; lump skin, blackleg, red water, gall sickness; anthrax; bovine Tuberculosis. Farmers reported that among diseases, ones that livestock mostly contract from wildlife in order of prevalence were FMD, lumpy skin, anthrax, blackleg, buffalo TB. Foot and Mouth Disease and lumpy skin, which are contracted form buffaloes were the most mentioned by farmers in both areas of study. However, farmers closer to the National Park and Forest indicated lumpy skin and foot and mouth whereas blackleg and heart water were mainly mentioned in Kamativi because of rare encounters with wildlife.

4.11.2 Predation

Lions and hyenas were reported by respondents as major predators of livestock. Respondents complained of these predators coming to the communal areas to attack livestock. In Kamativi, predators are mainly met in the bush where livestock graze. However, only three respondents complained of their livestock being attacked by predators in the past five years thus making them to continue sending their cattle into the Park as they foresee no threat by wildlife.

4.11.3 Markets

Lack of official convenient markets is also a limitation of keeping livestock in area under study. Data gathered from Focus Group Discussions and interviews show that farmers are complaining of inadequate and inefficient markets. Respondents reported that the cattle sale pen in Lupote was closed long back is no longer functional. Thus, they have to resort to selling their livestock to local butchery owners and individuals. This was also the case with Kamativi where there is official cattle sale pen that used to exist in the colonial system. Inadequate external markets were also reported in all study areas. For example, one participant was recorded saying;

Box 10: Statement from a Focus Group Discussion

"We do not have a competitive market when it comes to selling livestock. Thus, only the butchery people tend to buy these cattle and offer mediocre prices. A largest beast, which can be sold for a price of $700, is often sold for $400. Because most of these cattle are sold in times of emergency, farmers will not have any option but to accept what they will have been offered to cover up these emerging expenses. In some cases, farmers tend to go to a slaughter poll in Kamativi to get their beasts slaughtered then sell for themselves. This is usually done when the cash is not immediately needed".

4.11.4 Parks and Forestry Rules and Regulations

Respondents reported that both Hwange National Park and Sikumi Forest have rules and regulations that restrict them access. Villagers said that they are not to be seen herding their cattle or harvesting forest products without authorization from either the Park or Forestry Commision. Participants in a Focus Group Discussion complained of the stringent rules and regulations that deny them access to pastures and water for their livestock. They also reported that they drive their cattle inside the Park and Forest and try not to be caught by Rangers or Officials from the Park or Forest as they avoided fines associated with being caught where you are not supposed to be.

Table 4.6 Benefits of Keeping Livestock at the Periphery and Further Away

Opportunity	**Percentage of farmers who mentioned the opportunity**	
	Magoli and Chezhou	**Kamativi**
Adequate grazing land	84%	100%
Access to clean water sources	89%	91%

Table 4.7 Constraints of Keeping Livestock

Constraint/Challenge	**Percentage of farmers who mentioned the constraint**	
	Magoli and Chezhou	**Kamativi**
Diseases mainly from interaction with wildlife	90%	68%
Predation by lions and hyenas	72%	53%
Inadequate and underperforming markets	100%	100%
Theft of livestock	3%	5%
Bad water quality/unclean water	44%	57%
Inadequate manpower to pump water in boreholes for livestock	51%	N/A

Of these challenges, farmers in Magoli and Chezhou, therefore tend to drive their cattle into the park with the hope that their cattle will fatten and be competitive on the market. Farmers reported too that inadequate manpower to pump boreholes also force them to drive cattle to the waterholes in the park as an alternative. Nevertheless, farmers tend to give a blind eye to the challenges of transmission of diseases, predation and unclean water that also has a negative impact to livestock production.

4.12 Livelihood Strategies by Farmers in Order of Importance

Farmers in all areas of study reported that they still depend on crop farming even if the rains are not enough. They reported that it has always been a norm that rural families have to be sustained by crop cultivation. They further reported that instead of farming maize, they resort to small grains like millet and rapoko that do not require much rain. Livestock rearing came second. Farmers mainly reported that livestock is kept to complement the core activity of crop farming. It is mainly regarded as a status symbol rather than a livelihood base. Most household heads are unemployed and sometimes depend on remittances from other family members working in towns or outside the country.

CHAPTER FIVE

Discussion of Findings, Conclusions and Recommendations

5.0 Introduction

The chapter focuses on discussing the literature reviewed in Chapter Two and findings that were presented in Chapter Four. It also concludes the thesis and gives recommendations that can be taken for policy improvement through relevant and informed decision makers in livestock production.

5.1 Discussion of Findings

Owning and keeping of communal cattle fulfil multiple roles in the lives of communal farmers. Some of these roles are economic, social and cultural in nature. From observations, interviews and talks with local people, it is worthwhile to mention the importance given by households to the livestock roles and social functions. However, many of these functions are often ignored when estimating the total contribution of livestock to wealth and wellbeing of Hwange rural households. The economic value of the livestock social functions are difficult to evaluate and specific research needs to be done in order to better understand and assess the role of livestock in the wellbeing and in development of rural communities in Hwange and to quantify its economic value.

Respondents alluded to cattle as a status symbol even though the economic role took the pole position on owning and keeping of livestock. Cattle generate income among communal households through sales of the animals and their products. It is of importance to note that improvement in cattle production and innovative value addition of cattle can enhance livelihoods and create employment for people as individuals are hired to herd cattle and also to process and sell cattle and their products at various points of the production chain.

Cattle substantiated to play a focal role in socio-cultural function of brides wealth or lobola payments and mollification of ancestors. Cattle exchanged or loaned between relatives and owners prove to neighbours to enhance kinship ties (Mavedzenge et al 2006). Respondents in Hwange and Kamativi still use cattle for lobola payments even though it is now a rare thing to

see people getting married legitimately. People now tend to co-habit with each, especially youth who start families just like that because of economic hardships in raising money to buy cattle for lobola. However, the actual contribution of cattle at household level is not well known because the current valuation systems rely on monetary standards, which ignore the nonmonetary contribution of cattle to households such as provision of manure, drought power and milk.

Cattle ownership is a source of livelihood to the rural farmers. Rwelamira et al (1999), notes that livestock ownership in Sub Saharan Africa is deeply rooted in culture thus the control of household livestock is culture and context specific, men are traditionally responsible for the keeping and marketing of large animals such as cows, horses and camels whilst women claims control over small ruminants such as goats, pigs and specially poultry. In African patriachical societies, men do decisions.

It is of importance to note that cattle are a symbol of status among African men thus all decisions to do with cattle have to come from them to contain their prestige. This is synonymous with the practices in the study area where cattle ownership is male dominated and decision making is mainly for men whilst women are into small ruminant production. According to Tangka et al (2000), gender division of labor and decision making process are influenced by perceived value attached to the different animal species. Women usually have influence on species that provide a form of food security to the family whilst their male counterparts take responsibility on animals that have income generating purposes and have the ultimate decision making role. In general, men control the monetized sector whilst women take precedence on unpaid subsistence sector (World Bank 1993).

Livestock are a primary form of saving and as an investment, it cannot be competed with by other sources and is a quick way for the poor to access income hence it is a means of capital growth, World Bank, (2000) . Farmers in this study area rely more on livestock sales and proceeds for sources of funds to purchase inputs since there is a very insignificant number of farmers formally employed. The proceeds from cattle are central in the management of cattle and in meeting of day to day household expense such as school fees, food, drugs, funeral costs, council levy among others.

Livestock is used in traditional rituals, ceremonies and festivities and is given as a gift in worships (for example, installation of ancestral spirits, ritual slaughter, and bride wealth). Betterncourt et al (2013) notes that livestock social functions correspond to the symbolic values associated to each species and the use of animals for the fulfillment of a set of rituals and social obligations of families and communities. However, these traditional practises are no longer of significance in area under study. Most farmers refer to themselves as Christians who do not abide by any traditional rules and obligations. Rituals like *umbuyiso or kurova guva* in native languages are diminishing day by day.

Mutumwa (2013) avers that livestock numbers owned by communal farmers have decreased significantly from 2007 up to 2013. Hwange and Kamativi communal farmers are not an exception in this trend. Respondents noted that their herds have really dwindled compared to the herds that were owned by their fathers and their grandfathers. The main reasons for such declines were mainly population growth and lack of adequate grazing areas and drugs for livestock. Most land that was for grazing in the past four to five decades earlier has been given to people to start their own homes. This means that households were then forced to drive their cattle into the Park and Forest in order to get pastures and water for their livestock. In so doing, cattle contracted diseases from interacting with wildlife and most cattle died due to lack of medicine to treat these cattle. Predation of livestock also took toll during these interactions and farmers lost a number of their livestock to wildlife.

Making a living on the fringe of Protected Areas can be a risky business as it is often dependent on the low and erratic rainfall that usually characterizes these areas. Second, there is risk of crop destruction and loss of livestock to wild predators or diseases and even loss of human life to wildlife as the boundaries of Protected Areas are permeable to various degrees. Giller et al (2013, p.79) postulate that water sources become a major focus of competition between people, livestock and wildlife particularly during the long dry season. In this study, a number of farmers living close to the park acknowledged sending their cattle in the protected area during the dry season. In the Hwange National park system, the use of grazing land and peripheral permanent waterholes within Protected Areas (mostly Forestry land) was negotiated by communities during extreme dry spells of the early 1990s (up to 3km inside the park). Livestock keepers continue to

access these grazing areas and waterholes despite repeated warnings from the Forestry Commision, and have increased their use in recent years. Communities now claim a quota ranging up to 10km and this has been another source of conflict between Magoli and Chezhou communities and the Forestry Commision.

Droughts due to climate change may force people and their livestock to move, potentially exposing them to environments with health risks to which they have not previously been exposed to. Hwange and Kamativi have experienced droughts for the past two decades and this has affected livestock production. Most respondents complained of changing weather conditions, which affect both their crop and livestock farming, in which they had to resort to the National Park and Forest for pastures and water sources.

According to Enock (2005), market access and market conditions are factors that disrupt livestock keepers whenever they think of selling or commercializing their livestock products to get income. Musemwa et al (2008) stated that poor condition of livestock would lead to cattle buyers not reaching out to them. Giller et al (2013) notes that buying cattle has long been a main way of investing capital for people living in the communal lands of Zimbabwe, but it is possible that this has increased in response to the economic crisis, which affected the economy of the country during the last decade. Limited cattle trade possibilities in most areas bordering conservation areas classified as Foot and Mouth Disease infected areas compound the problem of increasing cattle populations and selling of cattle to other districts or provinces in the country. This has forced farmers to sell their cattle locally at mediocre prices. Main buyers of cattle are butchery owners who offer very low prices to buy cattle. Farmers tend to conform to these prices as most of them tend to sell when they are in desperate need of cash.

The distance from the markets tends to influence transaction costs. The further away the farmers are from markets, the higher the transport costs they incur, In addition, farmers' incur extra transport costs to obtain transporting and selling permits from the police station and veterinary offices, respectively (Musemwa et al 2008). There are no readily available competitive markets and farmers had to rely on intermediaries (butchery owners) whom they reported to have taken advantage of their situation and imposed very low prices on their cattle.

The study area has also presented challenges in accessing veterinary pharmacies, thus very few farmers have managed through friends and relatives who stay in either Bulawayo or Hwange. This has been attributed to the failure of Government Veterinary Department to make the services and medicine available to the rural farmers. Access to these institutions at a local scale could make them purchase drugs and upgrade their production processes. Antonio Rota (2009) asserts that rural areas are difficult to reach due to poor infrastructures few and low levels of economic activities and this has been the main reason why Veterinary Doctors and pharmacies have not come to these areas. Very high transaction costs are incurred to poor farmers in trying to provide the services and the conditions are not tailored for rural areas such that only commercial farmers or those who can afford doctors to write prescriptions to have access to these institutions.

Livestock is also important in building social networks. Betterncourt (2013) defines social capital as about the value of social networks bonding similar people and bridging between diverse people with norms of reciprocity. For many poor households, livestock may be shared or loaned between friends and neighbors or reared for absentee owners (Beck 1994). According to Van Dach et al (2007), ownership of livestock varies across the world, to smallholder farmers, ownership of livestock means more than just having assets but is also for social and cultural significance and recognition, hence, farmers fight to accumulate more livestock especially large animals like cattle.

Social relations are partly defined with reference to livestock. The sharing of livestock with others is often a means to build or reinforce social relationships. Social status in livestock-based communities is often associated with leadership, access to, and authority over natural, physical and financial resources. However, loaning or sharing of cattle is no longer a common practise in area under study because of the dwindling numbers of cattle. Farmers no longer have or keep large numbers of livestock where they can have the advantage to lend out some. Actually, these farmers are struggling to keep those few cattle they are left with.

Different institutions have played crucial roles in the management of cattle in the study area. Basurto et al (2013) note that the vertical interplay of institutions representing groups competing

or cooperating for authority over resources requires one to look at questions of subtractability, that is, whether resource appropriation by one user reduces availability to others and exclusion, that is, how costly it is to keep potential beneficiaries out of the benefit stream from an ecosystemic and multiscale perspective.

There have always been conflicts among institutions like the National Park, Sikumi Forest and the communities at large. There are regulations that deny communities access into these areas yet communities see it as a right for their livestock to access these lands as they belong to them. From a Socio Ecological Systems framework or approach, there is need for good interactions between the Governance Systems and individuals if Resource Systems are to be sustainable. Thus, one can note that there is need for ecological justice, environmental justice and social justice. All the forms of justice have to be in harmony with each other. There is need to balance human nature relationships by distributive justice of social recognition and the environmental advantages among population.

In terms of treating livestock, farmers have to provide dipping and vaccinating chemicals when Government could not carry out the duty due to economic depression suffered by Zimbabwe. Maphosa (2013) avers that in 2010, Government, NGOs, farmers associations, dip committees and the farmers contributed in the management through the provision of various services. This has a remarkable relationship with the study by Lewis (2003), Zambian Government provided veterinary services for free before 1990 when the economy was stable, however the policies changed and farmers had to sponsor themselves of which they failed. NGOs offered help in the reduction of diseases through dipping chemicals but the Government failed to sustain them resulting in increase in diseases. In the case of Matebeleland North, assistance usually comes from NGOs like Caritas and Environment Africa. Researchers from the CIRAD and the RP-PCP team have also assisted with chemicals whenever there was need.

Disease transmission is arguably one of the major obstacles to the coexistence of wildlife and livestock in sub Saharan Africa (Bourn and Blench, 1999). Movements of both humans and animals occur across the boundaries of Protected Areas often driven by resource gradients. The study area’s proximity to Hwange National Park (HNP) and Sikumi Forest poses threats to

disease transmission through the interactions between wildlife and livestock. In wet and dry seasons, farmers observed wildlife such as buffalos, elephants and hyenas in their home areas. They also sent cattle inside the park when they face grazing and water shortages. Bengis et al (2002) similarly asserts that where communities are located close to wildlife conservation areas, wildlife are observed outside the Protected Areas and the most prominent in the transmission of diseases is the buffalo and elephant.

Diseases such as lumpy skin and Foot and Mouth Disease have been reported by farmers to be contracted from buffaloes and the transmission is mainly through shared feeding and water sources. In Magoli and Chezhou, wildlife and livestock share the same grazing land and water sources. Wildlife is usually found within the 10km radius where livestock is allowed to graze and search for water sources. Kamativi is also affected by wildlife, even if it is further away from the Protected Areas, wildlife has also been observed and has transmitted diseases to livestock. According to Fenner (1982) transmission is not always direct physical interaction but can be due to indirect contact through the soil, forage, and water with which the other animal has had contact and left discharges such as urine, saliva, faeces, nasal or ocular discharge or through common insect vectors.

There have been experiences of impairment due to the behavior of different actors in both Magoli and Kamativi. Societies have been in conflicts with the wildlife area being too close to them due to the destruction of crops by elephants and loss of livestock to predation mainly by hyenas and lions as noted by farmers. Parks and Forest authorities have been in conflict with communities who do not follow the rules and regulations of not sending livestock further into the park. Denying farmers access is believed to bring benefits to communities. The benefits that are supposed to be obtained through conserving wildlife are outweighed by the costs they incur when managing diseases and have to look for alternative means of livelihood as their fields will be destroyed by elephants and baboons. The consumption of game meat is also very low. Masikati (2010) identically notes that there are positive and negative aspects to the interface and it has been a source of conflict in many areas, often because of misunderstanding and polarisation of opinion between eco centric and anthropocentric forces in society.

Cleaveland et al., (2006) notes that there exist conflicts between people and wildlife especially over the issue of boundaries created to demarcate communities from wildlife reserved areas. It is of significance to note that the study area is within the CAMPFIRE program that has created boundaries between communities and the Hwange National Park and this has affected access to grazing pastures for cattle as penalties were put across for trespassers. People however violated this rule by sending their cattle inside the park when they face grazing shortages. Other farmers also pointed out that they always send their cattle into the park whether there is grazing shortage or not.

These conflicts have made it difficult to come up with a sustainable development approach for these farmers. There is no balance in economic efficiency by farmers, there is no equity among farmers and ecological or environmental efficiency has been difficult to attain because of the degrading anthropogenic activities like overgrazing. The problem to all this is culture of these communal farmers. Farmers still send their cattle into the Protected Areas despite the challenges being faced because of culture that was left by the ancestors who believed that the Park and Forest belong to them and was given to them by their ancestors. The study show that almost all farmers have been converted to Christianity and no longer believe in ancestors. It is shocking however, how these farmers are so selective when it comes to cultural practises. Mashingaidze (2009) thus states that culture has always remained a wicked problem when it comes to natural resources management and enhancement of rural livelihoods.

It is of importance to note that to amicably solve such conflicts, there is need to identify a Game Theory and a Pareto optimal way of dealing with conflict. Matema (2015) states that in Pareto Optimal treaty, there is an emphasis on win –win situations. The other part benefits without leaving the other worse off. Gains may not be the same but the parties will be satisfied in their own way. However, this study show perceptions of farmers being treated badly and denied access to natural resources and they are not satisfied at all. Since the natural resources are shared between communities and wildlife, there is need to identify stable agreements between parties. Communities under study always have perennial meetings with the relevant authorities in order to come up to an agreement for the benefit of the whole ecosystem. There is multi decision

making about maximizing gain where each player has an interest in the use of the resource. Rational choices are made and there is strategic action in coming up with collective action.

5.2 Conclusion

Cattle are very important in the lives of rural farmers, however their status and value is changing rapidly. The various reasons for owning and keeping livestock confirm that livestock form an integral and indispensable part of social life and sustenance of poor rural communities in Zimbabwe. With most owners, being males aged between forty five and sixty five years, these men make decisions concerning all livestock issues. The main driver of keeping livestock at the edge of a Protected Area is the assumption that the Protected Area will be a haven in terms of pastures and water. Nevertheless, it is of importance to note that keeping livestock at the periphery of a Protected Area can be of equivalent damage to the livelihoods of farmers as they incur a lot of costs purchasing drugs to treat cattle of the diseases acquired from wildlife. That same amount of cash might have been used to start some income generating projects or supplement the livelihoods; instead, it is diverted for livestock management on diseases that can be avoided. The other disadvantage is that of crop destruction by wildlife thus jeopardizing poor farmer's hope of getting food in a hard hit Zimbabwean economy. However, cattle serve as financial aids, the poor do not have access to credit and banking facilities in general. Thus, cattle offer an alternative to their savings or accumulated capital and as a hedge against critical times.

Farmers can sell their livestock for urgent cash or use them as a form of insurance that can be sold to provide for the family. Most cattle are sold within communities where market prices constantly vary and are arrived at through negotiations where farmers have limited bargaining power. Depending on the circumstances and pressure to get ready cash in a depressed economy, most smallholder or communal farmers get low returns from their sales. As much as cultural norms in many poor rural societies place considerable value on livestock as an indicator of social importance in the community, cattle are no longer kept for social prestige and for cultural or traditional ceremonies. The socio cultural practises are no longer common because of Christianity that does not allow the performance of these rituals to appease ancestors.

All farmers faced constraints or challenges in getting forage and clean water for their livestock. There is also lack of functional marketing and veterinary networks, lower prices of selling cattle, contracting of diseases from wildlife and predation of livestock among other things. Despite all these constraints, farmers in Magoli, Chezhou and Kamativi still make conscious decisions to keep cattle, as they still believe that it is the core of their livelihood and will always bring good returns in the end. Nevertheless, they ignore all challenges and continue sending their cattle into the Park and Forest in search of greener pastures as they assume it is good for livestock hence economic gain.

5.3 Recommendations

In light of the conclusions above, the following are some of the recommendations arrived at:

- Authorities like National Parks and Forestry Commision should make more commonage land available to the rural farmers in order to cope with degrading forage land and population growth.
- There is need for improved communication between stakeholders (decision makers) for both cattle and wildlife populations to negotiate and come up with feasible policies that will promote co-existence.
- Loans should be provided to rural farmers to be able purchase atleast one or two cows for reproduction purposes. There is need for viable institutions like Agribank in attending to such matters.
- Research and specialist services/extension should disseminate information to farmers through organized shows and field days in all available dip tanks to enhance farmers' expertise on livestock management and existing challenges marketing linkages through government's department of Agricultural Marketing Authority.
- The Park authorities should help the community in the provision of veterinary services and drugs to counter for the negative impacts of wildlife on people and livestock (providing veterinary doctors at a cost that every farmer can manage, if possible free).
- Rural farmers need to be trained to view farming as a viable businesses and to demand access to better selling opportunities guided by standardized livestock grading systems.

- Livestock producers must form groups for marketing and lobbying purposes. These groups may also help producers to join national farmer associations or unions like Zimbabwe Farmers Union.
- There is need for emancipation and development programmes that promote women's access, ownership and decision making on cattle.

6.0 References

Anderson et al. (2013).Transfrontier Conservation Areas. People living on the edge. Routledge. London and New York

Assan, B. (2013). Future priorities on improved livestock production in Zimbabwe. International Journal of Environmental Sciences, Routledge.

Babbie, L. (2001) Research Methodology In Social Sciences, University of Cambridge. Cambridge.

Barret J. (1992). The Economic role of cattle in Communal area farming systems of Zimbabwe.ODI Pastoral Development Network Paper.ODI. London.

Basurto et al. (2013). The Socio-ecological system framework as a classificatory system for benthic small scale fisheries. ELSEVIER.

Bayer et al. (2004). Status of dairy cow management and fertility in small holder farms in Malawi. Tropical Animal Health Production.Routledge. London.

Beck, J.E. (1994).Towards a permanent solution for controlling cattle in communal areas.McMillian. Milan.

Bergis et al. (2002). Livestock production economics on communal land in Botswana. Effects of tenure, scale and subsidies. Development Southern Africa.

Berkes et al. (2003). Common Property resources; Ecology and Community based Sustainable development. Belhaven Press, London. UK.

Bettercount, T. (2013).The economic and socio-cultural role in the well-being of rural communities of the Time Leste.CEFAGE.

Bong, W and Gall, D. (2007). Educational research: An introduction. Los Angeles. Pearson Education Limited.

Bourn, G. and Blench, R. (1999). Can livestock and wildlife co-exist? An interdisciplinary review. Environmental Research Group. Oxford Ltd. Oxford.UK.

Carey, J. (1995). Understanding land manager's capacities to change to sustainable practices. Oxford University Press. Melbourne.

Carr, M. (1994).A handbook of Social Science students. McGraw Hill International Publishers. London.

Chimonyo et al. (1999). A survey on land use and usage of cattle in small holder farming in Zimbabwe. Journal of Applied Sciences in Southern Africa.

Cleaveland et al. (2006).Impacts of Wildlife infections on human and livestock health with reference to Tanzania. Implications for Protected Area Management.

Cousins, B. (1988). Evaluation of Pilot Cattle grazing schemes (Report by EEC and Agritex, Harare.

Cumming, D.H.M. (2008). Large Scale Conservation Planning and Priorities for the Kavango Zambezi Transfrontier Conservation Area, Conservation International. Harare.

Dey, I. (2005). Qualitative Data analysis: A user friendly guide for social scientists.

Dzingirai, V. (2001) Consultation, Planning and Community interest in Transfrontier Conservation, IUCN-ROSA, Harare.

Dzingirai, V. (2004) Disenfranchisement at Large: Transfrontier Zones, Conservation and Local Livelihoods, IUCN-ROSA, Harare.

Egon.B. (2002).Transformations of Social and Ecological Issues into Trans-disciplinary research.UNESCO Publishers. Paris.

Enock K. (2005). Factors influencing Livestock production. Department of Animal and Poultry Sciences. University of Guelph.

FAO. (2008). Marker assisted selection- Current status and future perspectives in crops, livestock, forestry and fish in Africa. Rome. Italy.

Ferner, S. (1982).Transmission cycles and broad patterns of observed epidemiological behaviour in human and other animals. Benin, Germany.

Gambiza, J. and Nyama, C. (2000). Country Pasture/ Foreign resource profile, Zimbabwe.

Gapare R.L. (1988). Communal farmers Constraints and objectives in livestock production. Henderson research station. Department of research and Specialist Services. Harare, Zimbabwe.

Gapare.R.L. (1988).Communal farmers Constraints and Objectives in Livestock production systems. Department of research and Specialist services. Harare. Zimbabwe.

Gerber, P. (2010). Climate change and the growth of the livestock sector in developing countries. Mitigation, Adaptation strategies and Global change.

Giller et al. (2013).Population and livelihoods on the edge. CPI Group, UK, Croydon.

Grahn, C. and Leyland, P. (2005).Livestock and Wealth creation. Improving the husbandry of animals kept by resource poor people in developing countries. Nottingham University Press. UK.

Gwaze et al. (2009).Communal livestock production in Southern Africa. A review of tropical Animal health production.

Hamadikuwanda, G. and Smith, F. (1988). Livestock on farm research in Zimbabwe and some aspects of it related to crop production. Paper presented at a Workshop. Mendel training Center. Harare.

IFAD. (1995). Mara Region Agricultural Development Project: Socio- Economic and Production systems study. Ministry of Agriculture, IFAD, Dar es Salam.

Keeley, J. and Scoones, I. (2003).Understanding Environmental Policy Processes. Cases from Africa.Eathscan. London.

Khombe, C.T. (2002). A genetic improvement of indigenous cattle breeds in Zimbabwe. A case study of Mashona Group breeding Scheme, Department of Agriculture Economies and Extension. University of Zimbabwe.

Kirakowski (2002) Managing people and their livestock at the periphery of Protected Areas. Tuscan. AZ

Kitalyi et al. (2008).Industrial livestock production and its impact on communal farmers. Germany.

Leady, P.D. 91997) Practical Research planning in Social Research Methods, Qualitative and Quantitative Approaches. Butterworth. Durban.

Maburutse et al. (2012). Communal livestock production in Simbe Gokwe South district of Zimbabwe. Online J. Anim Feed Pre, 2:351-360. http://www.science-line.com/index/, http://ojafr.ir

Maphosa, N. (2013). Livestock production systems in Africa. Zimbabwe Open University. Harare, Zimbabwe.

Maphosa. P. (2010) Environmental Degradation and anthropogenic activities in communal lands, University of Pretoria, Pretoria.

Mapiye et al. (2006). A review of Improved forage grasses in Zimbabwe. Tropical and sub-tropical ecosystems.

Mashoko et al. (2007).Beef cattle production in Zimbabwe Journal of Sustainable Development in Africa.

Mashoko et al. (2007). Beef cattle production in a peri-urban area of Zimbabwe. Journal of Sustainable Development in Africa.

Masikati, P. (2010). Improving the water productively of integrated crop –livestock systems in the semiarid tropics of Zimbabwe. An exe-ante analysis using simulation modeling.http://wwww.zcf.de

Mavedzenge et al. (2006). Changes in the livestock sector in Zimbabwe following land reform. The case of Masvingo.www.lalr.org.za.

McDermott et al. (1999) The economies of optimal health and productivity in small holder livestock systems in developing countries. Scientific and Technical Review of the Office International des Epizooties.

McLeod et al. (2001). The delivery of livestock services to the poor. A review in livestock and the poor. School of Agriculture, Policy and Development. University of Reading.

Mombeshora et al. (1985).Livestock ownership and management in Chibi and Mangwende Communal Areas in Zimbabwe. International Livestock Center for Africa. Addis Ababa.

Morgan, F. and Wall, O. (2009).Drivers of change in crop livestock systems and their potential impacts on agro-ecosystems services and human wellbeing, ILRI. Nairobi, Kenya.

Moyo, S. and Magwenzi D. (2014). Comparative study of the performance of Tuli, Braham, Herford, Simmental and their resultant crosses. Animal report, Division of Livestock and Pastures, Department of research and specialist services. Harare. Zimbabwe.

Mude. A. (2009). Index based livestock insurance for northern Kenya's arid and semi-arid lands. Nairobi, Kenya.

Mukamuri, B.B (1997) People and Big animals: An evaluation of the CAMPFIRE project in Guruve District, CIRAD, Harare.

Mukamuri, B.B et al. (2000) Local organisations and natural resource management in the face of economic hardships: A case study from Zimbabwe. CIFOR

Mupawenda, V. (2009).discussion on incidences for livestock growing inside Protected Areas. University of Pretoria.

Murwira, A. et al. (2013) Resource gradients and movements across the edge of transfrontier parks, Routledge, London and New York.

Musatyl, N. (2008). Evaluation of indigenous crossbreeds cattle in semi-arid environments. University of Botswana, Gaborone, Botswana.

Ncube et al. (1992). Reproductive systems of cattle production in Zimbabwe, Longman Press. Harare. Zimbabwe.

Ndebele et al. (2007).Livestock production research in Zimbabwe in relation to crop production, Sage Publications, McMillian.

Ndebele. (2007).Cattle breeding management practices in the Gwayi smallholder farming area of South Western Zimbabwe. Livestock research for rural development. http://www.irrd.org

Nyathi, N. (2008). Enhancing income and livestock through improved farmers' practices on production and marketing. ICRISAT.

Otte, J. and Upton, M. (2005).Poverty and livestock agriculture.WAAP.Book of the year. Wageningen Academic Publishers. The Netherlands.

Ouma et al. (2003). Cattle as assets: Assessment of non-market benefits from cattle in smallholder Kenya crop livestock systems, Durban, South Africa.

Pearson .R. (1993).Strategic Research on Nutrition and Management of Drought animals. Proceeding of a workshop on Human and Drought animal power in crop production. Harare, Zimbabwe.

Ramutsindela, M. (2007) Transfrontier Conservation in Africa. At the Confluence of Capital, Politics and Nature, CABI Publishing. Wallingford.

Richards, E. (2010). Sustainable smart investments in sustainable food and livestock production. Revisiting mixed cop-livestock systems. Routledge.

Rukuni, M and Escher, C. K. (1994).Zimbabwe's Agricultural revolution. University of Zimbabwe Publications, Harare, Zimbabwe.

Rwelamira et al. (1999). Meat production in developing countries. Nutrition Society, University of Cambridge.

Sarantakos, P. (1998). Social research. Palgrave. McMillian. Boston.

Shackleton, C.M ., Cousins, B. and Shackleton, S.E. (2001) The role of land based strategies in rural livelihood: The contribution of arable production, animal husbandry and natural resource harvesting in communal areas in South Africa, Development southern Africa, vol. 18, pp. 582-604

Swanepoel and Setshaelo. (1997) The role of indigenous cattle breeds. Adaptative and production trends. Department of Animal Science. University of Zimbabwe.

Tavirimwa et al. Nyangoni et al. (2007).The evaluation of dry season nutritive value and improved grasses in Zimbabwe. Journal of Sustainable Development in Africa.

Tesemma et al. (2011). Changes in Vegetation structure, herbaceous biomass and soil nutrients in response to grazing in semi-arid Savannas in Ethiopia. J. Arid Environment.

Thornton P.K. (2010).Livestock production, recent trends, future prospects. Philosophical transaction; Biological Sciences. Parasitol.

UNFCCC. (2008). Challenges and Opportunities for mitigation in the agricultural sector: Technical paper. http://unfcc.international/docs/2008/tp/08.pdf

Van Dach et al. (2007). Livestock revolutions -Opportunities for farmers.

Van Rooyen. (2007). Unexpected Agricultural Growth. The case of crop livestock production in Zimbabwe. AAAE Conference.

World Bank (2000).Interim strategy Note, FY 2008-2009 for the Republic of Zimbabwe. Washington D.C.

Wreford, M. and Adger, D. (2010). Impact of Agricultural knowledge science and technology on development and sustainability in Africa. Island Press. Washington D.C.

Yin, R. (1994). Case Study Research: Design and Methods. Sage Publications. London.