THE IMPACT OF MIGRANT LIVESTOCK KEEPERS ON THE NATIVES AND NATURAL RESOURCES OF KILOMBERO VALLEY, IN TANZANIA: A CASE OF KILOMBERO DISTRICT

By

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Dissertation Submitted in Partial/fulfillment of the Requirements for the Award of the Masters of Science in Development Policy (MSc. DP) of Mzumbe University

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CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by Mzumbe University, a dissertation entitled ***"The Impact of Migrant Livestock keepers on the natives and Natural Resources of the Kilombero Valley in Tanzania: The Case of Kilombero District"*** in partial fulfillment of the requirements for the award of the degree of Masters of Science in Development Policy (MSc. DP) offered by Mzumbe University.

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DECLARATION AND COPYRIGHT

I, ***Alto Mbikiye Kabuye*** declare that, this dissertation is my original work and that; it has not been presented and will not be presented to any other University for a similar or any other degree award.

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DEDICATION

This dissertation is dedicated to my deceased mother Suzan Lazaro Kikeyuke. She laid a strong foundation of my entire life, created a good understanding and interaction with the entire society in terms of good morals and hence moulded me to be who I am at the moment.

LIST OF ACRONYMS

DALDO	-	District Agricultural and Livestock Development Officer
DC	-	District Commissioner
DEO (P)	-	District Education Officer (Primary)
DEO (S)	-	District Education Officer (Secondary)
DEO	-	District Environment Officer
DMO	-	District Medical Officer
DNRO	-	District Natural Resources Officer
DPLO	-	District Planning Officer
FTER	-	Frontier Tanzania Environmental Research
ICRC	-	International Committee of Red Cross.
IFAD	-	International Fund for Agricultural Development
IPCC	-	Intergovernmental Panel on Climate Change
ILRI	-	International Livestock Research Institute
LID	-	Livestock in Development
MIS	-	Management Information System
NGO	-	Non Governmental Organization
SSA	-	Sub Sahara Africa
SPSS	-	Statistical Package for Social Science
TAWIRI	-	Tanzania Wildlife Research Institute
URT	-	United Republic of Tanzania
VEOs	-	Village Executive Officers
WEOs	-	Ward Executive Officers
WWF	-	Wildlife World Fund for Nature

ABSTRACT

This study investigated the impact of migrant livestock keepers on the natives and natural resources of Kilombero valley. Both descriptive and exploratory designs involving the use of various data collection methods such as questionnaires and interviews were used to collect data. The study also used documentary review to collect secondary data from various report concerning migrant livestock keepers. Data were analysed by Microsoft excel and Statistical Package for Social Science (SPSS) version 16.

The study revealed that migration of livestock keepers to the study area had both positive and negative impacts. As the results of migrant livestock keepers, agricultural activities, trade and animal keeping have increased in the area. On the other hand, activities such as fishing and hunting activities have decreased. The study revealed that migrant livestock keepers have caused small changes in cultural elements of the natives. It was established that migrants have brought a great changes in natives' ways of perfuming works, marriage matters as well as food and eating behaviour. Other cultural elements were found not to be affected much. The study further showed that migrant livestock keepers used natural resources of the study area to large extent. Resources such as water, wetland, natural vegetation and land/space for carrying out human development activities were reported to decrease. The findings showed that natives have used land use plans, eviction, use of village security guards *"sungu sungu"*, and use of by - laws among other strategies to protect natives culture and natural resources from being engulfed by the migrant livestock keepers. But strategies used were reported to have done little work compared to the expectations.

The study concluded that natural resources were mostly affected by migrant livestock keepers activities compared to the native activities and culture. It was recommended that co - existence approach between agriculturalist and pastoralist and cooperation between different government departments, local authorities and the general local community need be adopted for the sustainable management of the natural resources in Kilombero valley.

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CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter provides the overviews of the problems that was examined and highlight the gap of the proposed study. It comprises the following section as background to the problem, statement of the problem, research question, and objectives of the study, Scope of the Study, significance of the study and justification of the study area.

1.1 Background to the Problem

It is estimated that one billion of the world's poorest people depend on animals for food, fibre, income, social status, security, and companionship (IPCC, 2007). Intergovernmental Panel on Climate Change (IPCC) has evidenced that climate change is a cumbersome phenomena that leads to a worse, and that the poorest and most vulnerable people will be the worst affected. The effects of climate change and variability such as rising temperature and changes in rainfall are undeniably clear with impacts already being manifested in ecosystems, biodiversity and human activities. Africa is among the most vulnerable regions to the impacts of climate variability and change. Also the International Fund for Agricultural Development (IFAD, 2009) acknowledges climate change as one of the factors affecting rural poverty and as one of the challenges it needs to be addressed.

Globally, negative impacts of climate change are more brutally felt by poor people in developing countries who rely heavily on the natural resource base for their livelihoods. But rural poor communities depend more than urban for their survival on agriculture and livestock keeping which are amongst the most climate-sensitive economic sectors (http://www.ifad.org/lrkm/factsheet/cc.pdf). Climate change and variability factors are among which have created hardship to pastoralists everywhere in Africa with respect to both water and grazing lands availability. As a coping strategy, pastoralists have opted to migrate to unfamiliar territory mainly in search of pasture and water for their livestock, which are mainly occupied by agricultural communities (Antezza, 2008).

Livestock production is increasing throughout Africa (source?), this is driven by human population growth and improving living standards. In Africa, about 70% of the rural poor own livestock and over 200 million people rely on livestock for income (Thornton, 2006). Also according to Livestock in Development (LID, 1999) roughly 70 per cent or 150

million of the rural poor in SSA are at least partially dependent on livestock to sustain their livelihoods. Though Sub Sahara Africa has the largest area of permanent pasture of any continent, and the largest number of livestock keepers compared to the other parts of the world still contribute small amount to the GDPs (Ogle, 1996). And thus, livestock production currently contributes about 35 per cent of agricultural GDP in SSA (Ehui et al, 2002). Livestock is socially and culturally important in Africa for payment of dowry, celebrations and gifts to family members, and also as a source of savings that is often safer, despite diseases and drought, than banking systems and easier to manage for remote livestock keepers (Thornton, 2006).

Climate change in Africa has been characterized by increasing climate uncertainty, including an increase in the frequency and intensity of extreme weather events such as warm spells, droughts and floods. Africa's livestock sector is currently affected by climate changes through more frequent catastrophic events, reduced water availability, changes in the pattern and quantity of rainfall, an increase in temperature, changes in seasonality, a decrease in feed and fodder production, changing patterns and distribution of disease (Thornton, 2006).

Climatic change in Africa has accelerated to movement of livestock keepers from one area to another. Migrant livestock keepers have migrated to West Africa and in Sub Sahara Africa searching for pastures of their livestock. That movement have spread throughout East Africa including Tanzania.

It is estimated that Tanzania had about 15.7 million cattle which are distributed in regions and districts unequally but contributing almost 15 – 18% of the total GDP which is low compared to their population. For many years now the livestock keepers have been keeping their traditionally, with low productivity and hence also low contribution to the livestock keepers and nation at large (Mbwambo, 2003).

The livestock keepers had been moving from one point to another searching for green pastures of their cattle, a thing which had accelerated many livestock keepers to move into Kilombero valley a place which was full of green grasses savannas and wood lands. These migrants escaped from their original regions and districts due to environmental destruction

contributed to climatic change which then resulted into uneven rainfall distribution in the region as well in the district.

The Kilombero Valley is a floodplain of global, national, regional and local importance in terms of its ecology and biodiversity. The valley is an important source of nutrients and sediment for downstream areas and the globally important Mafia-Rufiji mangrove, sea grass and coral reef complex.

The valley contains almost 75% of the world's population of the wetland dependent Puku antelope *Kobusvardonii*. Kilombero recognised as having one of the most significant populations of *Crocodylusniloticus* and Colobus monkey *Procolobusgordonorum*. The valley also provides an important dry season habitat for large mammals, particularly *Loxodontaafricana*, *Hippopotamus amphibius* and *Synceruscaffer*. Three endemic birds known the weaverbird *Ploceusburnieri*. The site regularly supports over 1% of the eastern (&southern) African population of the waterbirds*Vanellusalbiceps* and *Rhynchopsflavirostris*. A short-term study in the Kilombero Valley identified 23 types of fish, of which 19 species were identified belonging to 17 genera and 11 families. The most widely caught commercial fish are tilapia *Oreochromis*, catfish *Clarius* and *Bagrus*, tiger fish*Fydrocynus*, *Distichodus*, *Mormyrus*, *Schilbe*, *Citharinus* and *Alestes*, but they are depleting every year (Charlwood & Utzinger , 1997).

The majority of people in the valley are subsistence farmers, who rely on the production of rice for a wide range of livelihood outcomes (over 98% of the population) and fisheries are over 30% of population (Mwaseba, 2007). But, since the early of 2000s Kilombero Valley woke up to an influx of pastoralists who were looking for the pastures of their cattle after environmental degradation in western and northern Tanzania where pastoralists resided.

Typically, Kilombero valley had received alot of migrant livestock keepers from Mwanza, Shinyanga, Arusha, and Manyara who entered Kilombero looking for pasture of their livestock following environmental destruction in their areas of origin. Most of the mentioned regions are environmentally degraded due to over clouding of livestock as well as in Kilombero valley has faced the same as that of Mwanza, Manyara, Arusha and Shinyanga who has experienced drought for many years now.

Pastoralists and peasant communities depend each other in terms of goods, skills and services which arise from growth of rural economies. In Africa, exchange between pastoralists and agriculture communities have been influential not only in satisfying the growing need of food but also income for both populations (Antezza, 2008). It has been noted that pastoralists want cereal grains from peasants, while peasants need milk, meat and manure from pastoralists. This relationship had been existing between groups in Africa since many years ago (Antezza, 2008).

According to the URT (2008) the Kilombero Valley is characterised by very high concentrations of the endangered Kobusvardonii which in to stamated to have 75% of the world's population. Other large mammals are like Buffalo, Elephant, Hippopotamus and Lion are also found. Fishing has traditionally been the primary resource use of people in the area.

However, in the late 1980s agriculture (especially paddy farming) was rapidly expanding at the same increasing population of cattle brought by migrant pastoralists from Mwanza, Shinyanga, Tabora, Arusha, Manyara, Mbeya, Rukwa and Iringa regions started causing conflictual relationship with the natives who blame that the current socio-economic situation in the valley is due to pastoralist invaders (Mfugale, 2012). Many villagers who are mainly peasants complained that cattle damaged their crops without any compensation and relationships between pastoralists and villagers often appeared to be poor (Rainey, 1997). Environmental degradation caused by livestock has led to the drying up about 82% of swamps and 70% of rivers, while other areas which were suitable for agriculture are no longer viable because the soil has lost moisture and fertility (Mfugale, 2010).

It is envisaged that the incoming of livestock to native territories have brought with it socio-economic diversification among natives. Originally, the Kilombero natives depended on agriculture and fishing as their main activities that provided daily bread of their households. But coming of livestock keepers in Kilombero valley has changed the way of life of the natives due the fact that livestock have contributed to the destruction of fish nurseries and river banks which were used as pastures during the dry season. Not only lowering fish productivity but also number of hackers for farming had reduced to allow pasture for the cattle.

1.2 Problem Statement

Originally, the Kilombero Valley residents were agriculturalists and fewer fishers, however, the situation started changing in the mid 2000s whereby the valley had witnessed influx of cattle ever seen before (Mfugale, 2012). According to the survey conducted by the Tanzania Wildlife Research Institute (TAWIRI) (2008) estimated cattle at 76,621 and sheep and goats 13,710. In coming of livestock keepers in Kilombero valley has caused environmental destruction including clearance of wood land in Kilombero game reserve area, fire out breaks, and use of deeps for washing cattle which in turn dissolve in the river by the time they are drinking also poising fish.

According to the baseline survey by the University of Dar es Salaam (2009), the total population of different types of livestock in the Kilombero Valley was 97,506 cattle, 11,130 goats, 5190 sheep, and 170 donkeys; and the average carrying capacity of grazing areas in the Valley is about 2 Ha per livestock unit per annum. While the estimated suitable grazing land is about 120,000 Ha which cannot carry about 100,000 livestock units needing 250,000 Ha of grazing land per annum. Aerial and ecological surveys carried out by Frontier Tanzania Environmental Research (FTER) in collaboration with the University of Dar es Salaam (UDSM) (2009) focused on the ecosystems that were changing rapidly in the face of increasing human populations and demands for natural resources. Also Sokoine University of Agriculture (SUA) in collaboration with the Wildlife World Fund for nature (WWF) carried out situation analysis of the endemic Weavers *Ploceusburnieri* in Kilombero Valley project (1997), the study was much concentrated on how to conserve endemic weavers who were seen to be disappeared in Kilombero valley due to human activities carried out in the area.

Regardless of all studies conducted, there was no study which has looked at the impact of the immigrant livestock keepers on the activities of the natives of Kilombero valley. Therefore it is the work of this study to look on the extent to which the immigrant livestock keepers have impacted native activities and natural resources of the area and adaptation strategies developed by the natives to the problem.

1.3 Objectives of the Study

Objectives of this study have been divided into general and specific objectives

1.3.1 General Objective

The general objective of this study was to examine the impact of migrant livestock keepers on natives and natural resources of Kilombero valley.

1.3.2 Specific Objectives

In order to meet the primary aim of this study put forward, the study has to incorporate the following specific objectives.

i. To assess impact of migrant livestock keepers on activities of the natives of Kilombero valley.
ii. To investigate the impact of the migrant livestock keepers on the natural resources in the study area.
iii. To assess the impact of migrant livestock keepers on the culture of the natives.
iv. To assess the adaptation strategies used by the natives to the livestock influx in the area.

1.3.3 Research Questions

The study has answered the following questions

i. How does the migrant livestock keepers affected the activities of natives of Kilombero valley?
ii. What are the consequences of the migrant livestock keepers on the natural resources in the study area?
iii. What are the impacts of migrant livestock keepers to the cultural aspects of the natives?
iv. What are the copying strategies taken by natives due to the influx of livestock in their area?

1.4 Significance of the Study

In spite of the importance of livestock keepers towards bringing socio-economic development in Tanzania in terms of increasing productivity through raising shields, milk, cheese and meat; the study wants to go beyond looking more on effects for keeping cattle in Kilombero valley. The study explored livestock keepers against natives towards social activities, natural resource as well as knowing coping strategies used by natives towards cattle influx in the area.

Information generated from the study help partly fills the gap for research on impacts of migrant livestock keepers on the natives and natural resources of the Kilombero valley. The findings are useful to academics, researchers, policy makers and the general leadership of interested company, institution and/or district council use as one among the sources of project and program development for the betterment of her people.

1.5 Scope of the Study

The study aimed at examining the positives and negatives effect of the migrant livestock into the Kilombero Valley on natives and natural resources as well. The study employed questionnaires in order to explore information which brought about the answers. In addition, the study used observation and interviews so that to fulfil the gap left by questionnaire.

All these methods of data collection were selected in relation to descriptive research design which was in line for the study. Therefore, the area of study included Mofu and Utengule wards in Kilombero district.

1.6 Limitation of the study

The researcher faced a number of limitations during the study as noted here; First, it was difficult for a researcher to continue with data collection due heavy rain occurred in study area causing floods, leaving road infrastructure damaged. Roads towards field were passable only by using tractors and some other places were out of reach.

Secondly, the study faced a challenge of limited financial resources due to inadequate financial support. Thus the researcher had to use family resources not allocated for the study.

Third, it was difficult to continue with the research because one of the family members was admitted at Mhimbili National Hospital (MNH) for major operation of gallstone.

All these reasons led

a researcher to postpone data collection which caused also a Postponance of the study from academic year 2012/2014 to 2012/2015.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the review of related literatures on the study conducted. It covers definitions of the major concepts and ideas of the study. This section focuses on theoretical perspectives, under which major concepts are discussed and defined; and lastly are summarized in a conceptual and analytical framework.

2.1 Definitions

Livestock farmer means any person who engages in livestock farming for the production purposes (URT, 2006).

2.1.1 Livestock keepers

The term livestock keepers represent those communities who have a long-standing cultural association with their livestock and have developed their breeds in interaction with a specific territory or landscape (Kabir, 2010). According to Simpkin (2005) livestock keepers are people who derive most of their income or sustenance from keeping livestock in conditions where most of the feed that their livestock eats is natural forage rather than cultivated fodders and pastures.

2.1.2 Migrant Livestock Keepers

Migrant livestock keepers who may be constantly on the move literally in search of green pastures (Mwamfupe and Mng'ong'o, 2003).

2.1.3 Natural resource

A natural resource is any asset that can be obtained from our environment including water, soil, plants, wind, animals, minerals, the energy of the sun and many others. These are often seen in terms of economic value, because many of them are crucial for people's livelihoods. Without water, air, soil, and minerals we would not be alive. Natural resources are of two types namely renewable and non-renewable natural resources. (http://static1.1.sqspcdn.com/static)

Worthington, E.B. (1964) defines that natural resources in a broad sense include everything that is derivable for the use of man from any part of the universe; in the physical sphere they include energy from sunshine and gravity as well as mineral deposits and the rain. And in the biological field they include domesticated a well as wild plants and animals.

2.1.3.1 Renewable natural resources

Renewable natural resources are those can regrow, or whose supplies can be replenished through natural processes. Some examples of renewable resource include plants, animals, insects, or wind. But being renewable does not mean that these resources automatically last forever. If the renewable resources in a particular area are overexploited for a long time, it is possible that they may become endangered or even disappears overall (http://static1.1.sqspcdn.com/static)

2.1.3.2 Non-renewable natural resources

Non-renewable natural resources are those can be used but will not replenish them self. Typical examples include oil, coal, minerals, or rocks. The use of these resources should be carefully monitored and managed according to their availability. The effects that their exploitation has on all the other resources and the environment as a whole should be carefully followed (http://static1.1.sqspcdn.com/static)

This fact shows how man depends on natural resources for her existence and should not compromise for the future generation to use. If natural resources are use roughly can cause the depletion of non renewable resources causing to future generation not to meet their needs effectively. Resources are commonly classified with respect to their exhaustibility. The differentiation between exhaustible and inexhaustible resources only focuses on their quantitative availability and not on their potential for natural growth and recycling.

Therefore, maintaining healthy ecosystems all living and non-living things interact with each other and co-exist in a balance. Disturbing this balance by overexploiting natural resources usually has broad effects on everything in the entire ecosystem (http://static1.1.sqspcdn.com/static)

2.2 Genesis of Livestock Migration

A biblical model of animal migration obviously must start with the Bible. From Genesis we can gather the following important facts: “And of every living thing of all flesh you shall bring two of every sort into the ark, to keep them alive with you; they shall be male and female. Of the birds after their kind, of animals after their kind, and of every creeping thing of the earth after its kind, two of every kind will come to you to keep them alive” (Genesis 6:19–20).

Pastoralism develops from surplus, as individuals simply accumulate too many animals to graze them around a settlement throughout the year. In addition, as herders learnt more about the relations between particular types of ecology and the spread of debilitating diseases they gradually developed the practice of seasonally removing their animals from danger-zones (Genesis 6:19–20).

The earliest literary references to a people who would appear to be pastoralists are the Amorites, who herded cattle, sheep, goats and donkeys in the Near East in the first half of the second millennium BC (Cribb, 1991). Chronicles of the Hsia dynasty in China (2205-1766 BC) note the Ch’iang nomads, probably the ancestors of modern Tibetans, as weavers of fine wool (Miller & Craig, 1997). Herodotus mentions a number of peoples assumed to be pastoral across Central Asia: Russian archaeology has made remarkable and still little-known contributions to our knowledge of the Scythians, the Sauromations, the Saka, the Siberian Schythisna and the Mongols (Davis-Kimball, Bashilov & Yablonsky, 1995).

Descriptions of a recognisably pastoral culture in Sub-Saharan Africa date back to Pliny (who described blood and milk drinking in the Horn of Africa). The exact origins of pastoralism can only be gauged from archaeology and in particular from careful osteometric work which demonstrated wild forms of livestock and their domesticated relatives (MacDonald and MacDonald, 2000). However, the interpretation of osteometric evidence already depends on the assumption that early herders were controlling breeding; but it seems likely that the earliest stages of pastoralism involved the management of wild animals, as reindeer pastoralism does still today in some parts of the subarctic (MacDonald and MacDonald, 2000).

Some authors have said that Pastoral culture spread out from the Nile Valley and North Africa, probably through the agency of the ancestors of present-day Berber populations (Blench, 1993). Pastoral production appears clearly in the archaeological record in both East and West Africa 4500-4000 bp (Marshall, 2000). The exact routes and dates whereby pastoralism reached southern Africa are disputed (Bousman, 1998), but there seems to have been pre-Iron Age transmission nearly 2000 bp, probably initially with sheep and shortly after with cattle. The elaborate cattle culture described by early travellers to the Cape (Boonzaier, 1996) was probably established only some five hundred years before the first navigators encountered the Khoikhoi - South Africa.

2.3 Conceptualization of Risk and Uncertainty Theory

This study is based on the theory of risk and uncertainty. It utilizes the possibilities offered by the Dempster-Shafer theory of evidence as one way of representing inaccurate probabilities and partial information in an involuntary decision-making context (Ducey, 2001). Pastoral risk management involves making choices/decisions in the face of uncertainties. Most of such choices/decisions, including migratory decisions, involve everyday directly perceptible risks. Such risks are managed instinctively and intuitively (Adams, 1999). Risk is restricted to situations where probabilities are allocated to the occurrence of an event. On the other hand, uncertainty arises when the chances governing stochastic factors are imperfectly known. In this case, livestock farmers contemplating a decision at the height of cattle rustling would be likely to face both risk and uncertainty. Just like in many other forms of risks, there is no formal probabilistic assessment done before making a decision to migrate by a pastoralist herder. However, there are two things that are obvious under such circumstances. First, herders prefer higher social economic status in the community to lower status. Secondly, under uncertainty all herders face the possibility that they would suffer heavy losses, and each must compare what he has to gain against what he has to lose in what would be essentially a random draw. Therefore, decisions made due to risk and uncertainties like the fear of cattle rustling or loss of livestock through drought should be able to contend with chances and degree of belief (Ducey, 2001). Shafer (1976) in his theory of risk and uncertainty points out that, if the chance associated with an event is known, it would be advantageous to adopt those chances as degree of belief and act accordingly. Furthermore, Caselton and Luo (1992)

recommended that the utility of Dempster-Shafer theory in decision analysis under risk and uncertainty, particularly where data are sparse and absent.

Beyond reasonable doubt the case of under study reveals the Dempster Shafer's theory where the pastoralists made an abrupt decision to shift from Western as well as Northern Tanzania to Kilombero valley looking pastures for their herd cattle. Livestock plays multiple roles in the lifestyle of pastoralists in of African context, notably as livelihood sources, socio-cultural and religious functions, and asset and security against risks (Guliye, 2007). For example in pastoralist societies, livestock is the main source of food by providing milk and meat, the basis of traditional social relations, and also as payment of dowry (from the groom's family to the bride's family) during marriage or compensation of injured parties in tribal feuds, symbol of prosperity and prestige, store of wealth, and security against drought, disease and other calamities.

2.4 Migrant Livestock Keepers and Peasants Social Economic System

The overall approach of this study is to examine interaction between the two groups as a single system. This is due to one; their activities overlap substantially and two; this aspect of overlapping create some degree of contact and mutual effect (Painter, 1994). The social systems may be more divergent but socio-economic linkage which is the bottleneck of this study is substantial. This justifies description of the two groups as part of a one rural social economic system.

In economic terms, financial capital is crucial. As peasants are native of the area, they are likely going to act as businessmen of their agricultural products and migrants, customers; ceteris paribus.

2.5 Wise use Approach

The theory illustrates that the wise use of wetlands is their sustainable utilization for the benefit of humankind in a way compatible with the maintenance of the natural properties of the ecosystem (Ramsar, 1987).

Sustainable utilization is defined as human use of a wetland so that it may yield the greatest continuous benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations (Ramsar, 1987). Natural properties of the ecosystem are defined as those physical, biological or chemical components, such as soil,

water, plants, animals and nutrients, and the interactions between them (Ramsar, 1987). According to Ramsar (2010) Wise use of wetlands has been defined under the Convention as "the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development". The phrase "in the context of sustainable development" is intended to recognize that as some wetland development is inevitable and that many developments bring important benefits to society, developments can be facilitated in sustainable ways by approaches elaborated under the Convention, and it is not appropriate to imply that 'development' is an objective for every wetland.

Wise use, management and restoration of wetlands should help to build opportunities for improving people's livelihoods, particularly for wetland-dependent, marginalised and vulnerable people. Wetland degradation affects livelihoods and exacerbates poverty, particularly in marginalised and vulnerable sections of society (Ramsar, 2010).

The wise use approach assumes that if people use wetlands in a good manner that allows the present generation to meet their needs without compromising the future generation to survive. My study views the impact (effects) of migrant livestock keepers in the wetlands of Kilombero valley whereby the livestock keepers want to increase their herds unlimitedly.

Each man is locked into a system that compels him to increase his herd without limit - in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own interest in a society that believes in the freedom of the commons (Hardin, 1968).

2.6 Empirical Review

The study by Mung'ong'o and Mwamfupe (2003) on the poverty and changing livelihoods of migrant Maasai pastoralists in Morogoro and Kilosa Districts analyzed how the Maasai migrants have adapted themselves to the new ecological conditions and the impact of such adaptations on their livelihoods.

The study applied the Department for International Development's (DFID) Sustainable Livelihoods Approach (SLA) (Department for International Development, 1997)

livelihood methodological framework to understand the changes of livelihoods among the Maasai pastoralists in Kilosa and Morogoro districts. The
SLA was used in three different ways: as a set of principles, as an analytical framework or as an overall developmental objective (Farrington, 2001).

In that study, data collection methods employed in the first phase of the study included library research, questionnaire interviews and Participatory Rural Appraisal (PRA). Most of the available literature on the Maasai and their economy was surveyed. Reports of various studies until now done on pastoralists' impoverishment and subsequent migration were collated (Mung'ong'o and Mwamfupe, 2003). Mwamfupe continues by saying that one day was spent in each sample village administering a structured questionnaire to selected households in the sample villages to gauge socioeconomic trends at that level.

The concept of the household in this study however, posed some methodological problems. The simple husband-wifechildren- relative household structure usually found among crop cultivators was not relevant to the pastoralist situation. A Maasai family (olmarei) is normally polygamous. The number of wives and children varies with the age of the husband/father. Each wife has a separate house (engaji) within a homestead/boma (enkang). It was difficult to decide which of the units engaji, olmarei or enkang could be treated as a household unit of analysis.

But finally, the enkang was chosen as a useful unit of analysis for the study whereby a household was understood as comprising a person, or a group of persons, generally bound by ties of kinship, who may or may not live together under a single roof or within a single compound, but who share a community of life, in that they are answerable to the same head and share a common source of income and livelihood (Mung'ong'o and Mwamfupe, 2003).

The study used various ways for data analysis. Quantitative data was analysed into frequency and cross-tabulations using the SSPS statistical programme. On the other hand, qualitative data was analysed manually and used with the quantitative data to triangulate and enrich our understanding of the socio-economic trends analysed in this study.

The findings from the study show that pastoralists have been in deep crisis, particularly with regard to the management of their pastures and livestock. Generally, their centuries-old occupation is coming under threat of existence. Although the causes for the crisis are several, those related to loss of grazing lands and prolonged drought are most significant. Nearly half (47.8%) of the Maasai in Kilosa na Mvomero areas identified the loss of grazing land as the main cause for their outmigration (Mung'ong'o and Mwamfupe, 2003).

The reduction of their grazing land has had an effect not only in terms of shortage of pastures but also has contributed to the spread of cattle diseases. It is no wonder that loss of livestock due to cattle diseases was identified as another reason for outmigration by 23.7 per cent of the respondents (Mung'ong'o and Mwamfupe, 2003).

Mung'ong'o and Mwamfupe (2003) concluded that development of agriculture and livestock keeping as viable economic pursuits will continue to be the mainstay of the migrant Maasai in the study area and thus policy interventions should follow through three logical steps:

(i) Recuperating the agriculture and livestock development sector so as to provide a base for the development of non-farm economic activities;

(ii) Improving the human capital in the rural areas so as to enable excess labour in rural communities to right to use other profitable economic sectors in the country; and

(iii)Improving the existing and other prospective non-farm economic activities so as to expand the income earning portfolios in the rural areas.

This entails that some appropriate form of subsidy programme on farm and livestock production inputs be formulated and implemented for the agriculture and livestock development sectors.

Secondly, infrastructure such as rural roads, rural water supply, schools, research institutions, and extension services are important in reducing production costs and increasing productivity in agriculture and livestock keeping. Good roads facilitate efficient spatial distribution of factors of production and the commodities produced. On the other hand, education, research and extension services improve production techniques and

enhance farm productivity. Improvements in infrastructure are, however, for the most part costly investments whose effectiveness is too marginal to be attractive to private sector capital investment. The state has the duty to provide for such investments, both for enhancing not only the development of agriculture and livestock keeping, but also of non-farm economic activities.

Thirdly, a system of micro credit financing to smallholder farmers and livestock keepers has to be developed. The hopes of neo-liberal economists that the structural adjustment programmes would create an enabling environment for private investment in rural banking, crop insurance, micro credit financing, etc., have been completely dashed (World Bank, 1994). Thus, more effective credit financing institutions need to be developed and supported. These institutions should be conjoined to the development of democratic farmers' cooperatives through which farmers would organise the sale of their crops and animal products and generally get their agricultural and livestock keeping requirements in time and at a reasonable cost. The existing cooperatives in Tanzania are still suffering from the hangover of one-party socio-political centralisation.

2.7 A Conceptual Framework

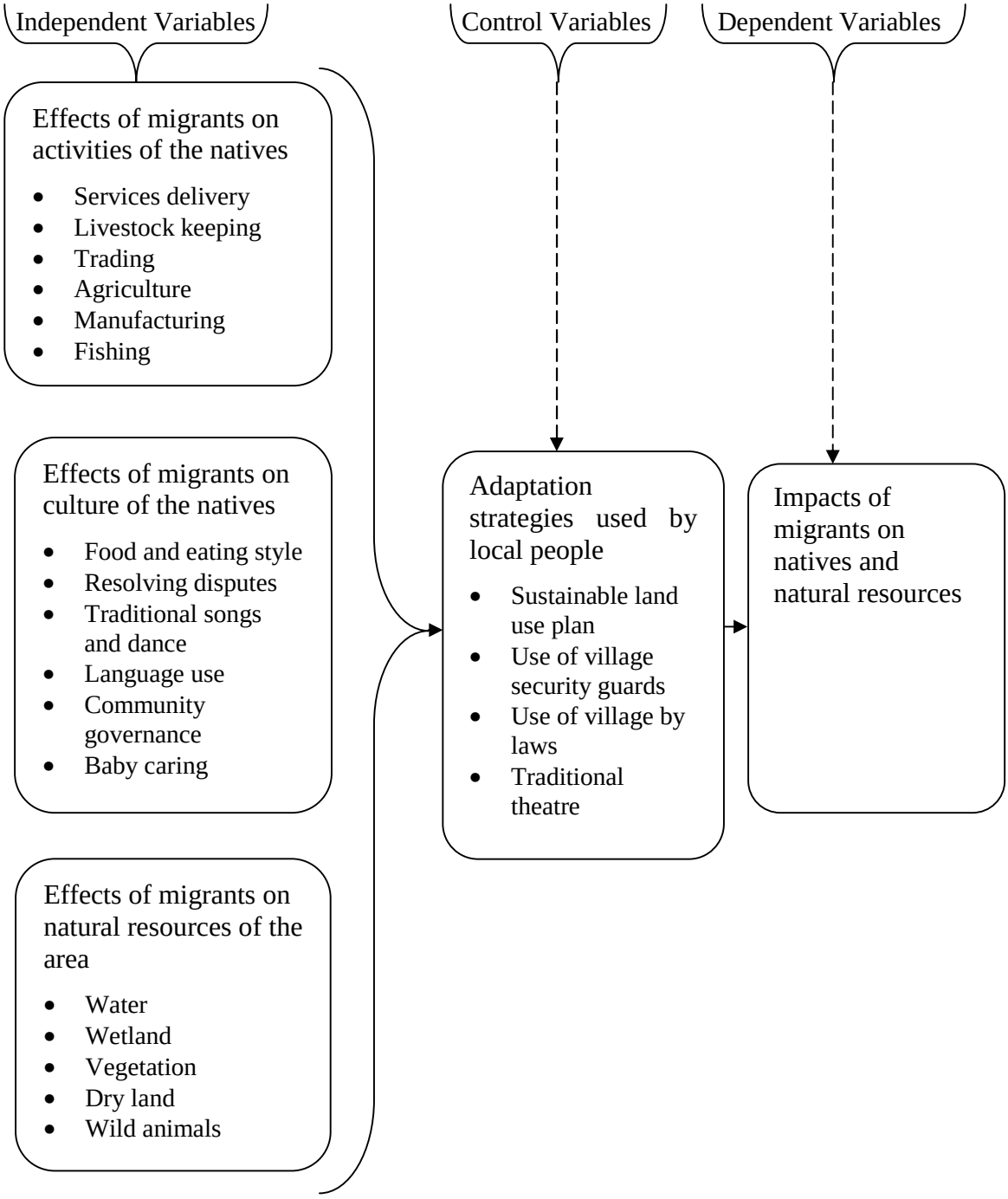
The conceptual model is known as the approach that shows the important points to be studied in the research either in graphical or narrative form as it was narrated by Fellows and Liu (2003). According to Kenneth (2005), conceptual framework is structured from a set of broad ideas and theories that help a researcher to properly identify the problem that he/she is looking at, frame his/her questions and find the suitable literature. Most academic research uses a conceptual framework because it helps the researcher to clarify his research question and aims. In this view then the conceptual framework on the impact of the migrant livestock keepers in Kilombero valley depended on the research questions as recalled below from chapter one.

i. How does the migrant livestock keepers affected the activities of Kilombero natives?
ii. What are the consequences of the migrant livestock keepers on the natural resources in the study area?
iii. What are the shortcomings of migrant livestock keepers to the cultural aspects of the natives?

iv. What are the copying strategies taken by natives due to the influx of livestock in their area?

From the literature and empirical review the following framework was developed.

Figure 2.1: The Conceptual Framework



Source: Researcher's construct 2015

2.8 Variables

A variable is a characteristic that can assume two or more properties. If a property can change either in quantity or quality, then it can be regarded as a variable. In the study there will be three types of variables; independent variables, dependent variables and control variables (Kenneth, 2005).

2.8.1 Independent Variables

An independent variable is the variable researcher has control over, that is, what the researcher can choose and manipulate. It is usually what researcher thinks will affect the dependent variable (Patton, 1990). In this study researcher had identified three categories of independent variables which were related to the dependent variable. The first category was effects of migrants on activities of the natives of Kilombero in which researcher was concerning with currently condition of the services delivery in the said area, level of the livestock keeping, status of trade activities, level of agriculture and manufacturing as well as fishing within the area. The second category of the independent variable was effects of migrants on culture of the natives whereby the issues involve were food and eating style, resolving disputes, traditional songs and dance, language use, community governance and baby caring. Lastly, it was effects of migrants on natural resources of the area such as water, wetland and dry land, vegetation and wild animals.

2.8.2 Dependent Variables

A dependent variable is what researcher measures in the study and what is affected during the study. The dependent variable responds to the independent variable. It is called dependent because it depends on the independent variable (Patton, 1990). In this study researcher had to relate what has been know as the independent/exploratory variables with impacts of migrants on natives and natural resources of Kilombero valley. Therefore, dependent variable in the study was impacts of migrants on natives and natural resources.

2.8.3 Control Variables

An intervening/ control variable is a hypothetical internal state that is used to explain relationships between observed variables, such as independent and dependent variables in empirical research (Edward, 1938). They facilitate a better understanding of the relationship between the independent and dependent variables when the variables appear to not have a definite connection. In this study control variables were adaptation strategies used by local people of Kilombero against impacts of the migrant livestock in the area.

These included variables like formation of sustainable land use plan, use of village security guards, use of village by laws and traditional theatre.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter was presenting a systematic description of the research techniques that was used in the study. It was dealing with the choice of the study area, research design, data collection methods, population, sample and sampling techniques, and lastly data processing, analysis and presentation.

3.1 The Study Area

Kilombero District is one among six districts of Morogoro region covering a total area of 73,325 km^2. Others are Kilosa, Ulanga, Morogoro Rural, Mvomero, and Morogoro. Kilombero District covers 14,918 km^2 in total. In terms of boundaries, there is Kilosa District in northern part of Kilombero and Ulanga District in the southern part.

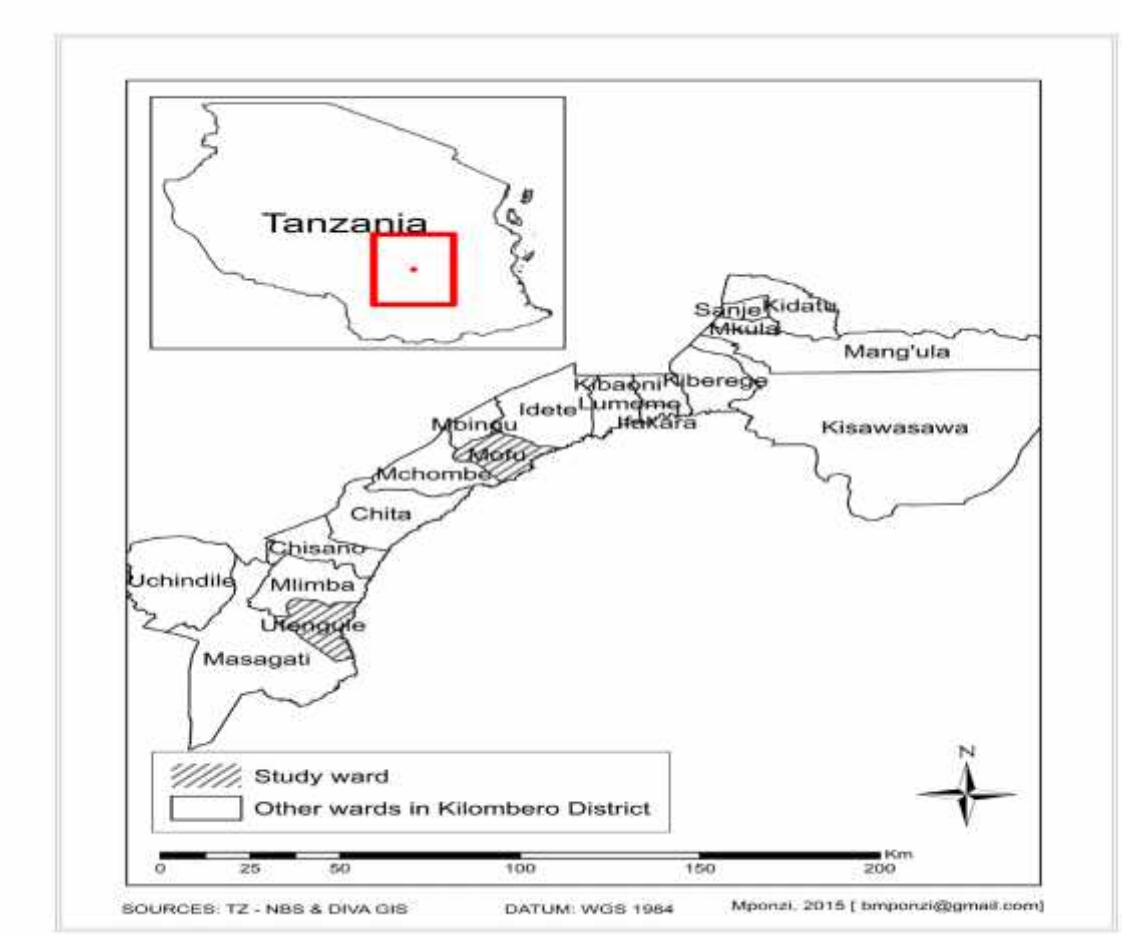
Kilombero District is located on the western side of Morogoro Region. The district lies between latitudes $70^0$40' and $9^0$21' South of the Equator and between longitudes $35^0$20' and $37^0$48'East of Greenwich. It borders with Kilosa, Morogoro Rural District to the North East, Mufindi and Njombe to the Southwest and Kilolo District to the North, all of Iringa region, Ulanga District to the South East (along Kilombero River) and Songea Rural District of Ruvuma Region to the South.

Kilombero Valley is located in Kilombero district Morogoro region, south western Tanzania. The name Kilombero originated from the river. The district is situated in a vast floodplain, between Kilombero River in the South-East and the Udzungwa Mountains in the North-west. On the other side of the Kilombero River in the south-east the floodplains is part of Ulanga district. The distance from Ifakara which is district headquarters of Kilombero district to Dar es Salaam is 450 Kms, and to the regional headquarters is 235 Kms.

Kilombero District has 98 villages and 23 Wards namely: Mlimba, Utengule, Masagati, Uchindile, Chisano, Chita, Mngeta, Mofu, Mbingu, Idete, Ifakara, Kibaoni, Kiberege, Kisawasawa, Mang'ula, Mkula, Sanje, Kidatu, Lumemo, Kamwene, Mwaya, Mchombe,

and Michenga. The indigenous people of Kilombero District are Ndamba, Mbunga, Pogoro, Bena, and Ndwewe. But in 1980's

Figure 3.1: Map of Kilombero District showing the study Wards



Source: Mponzi, 2015

Kilombero district experienced migration of Maasai, Sukuma, Nyakyusa and Mang'ati who were searching for pastures of their livestock and land for agriculture.

Wards of Utengule (Utengule village), Chisano (Chisano village), Chita (Merera village), Mchombe (Lukolongo village), Mofu (Mofu and Ikwambi villages), Idete (Namwawala, Idete and Miwangani villages), Michenga (Ihanga village), Lumemo (Mahutangu village), Kibaoni (Lungongole village), Kiberege (Signal, Sagamanga and Kiberege villages) Mlimba (MsolwaMakirika village) and Kidatu (Msolwa station) are ones who received livestock from came migrants. Thus migrant livestock keepers are found in 17 villages (16.6%) out of 98 villages and 12 wards out of 23 wards.

The study was conducted in Kilombero district specifically in two wards of Mofu and Utengule. The selection of the study area was based on the reality that Mofu (in Ikwambi and Mofu villages) and Utengule (in Utengule and Ngalimila villages) wards received alot of cattle compared to Mlimba, Chisano, Kamwene, Chita, Kibaoni, Mlimba, Kiberege, Kidatu and Mchombe wards. Ikwambi, Mofu, Utengule and Ngalimila villages were purposely selected due reality they received livestock of cattle causing effects on the native activities. Ikwambi and Mofu villages were natural villages and mostly found indigenous tribe of Kilombero while Utengule and Ngalimila were villages with the mixture of tribe but mostly the people from Iringa region.

Table 3.1: Cattle distribution and grazing area in Kilombero District

No	DIVISION	WARD	VILLAGE	No. PASTRO LIST	COWS	GOATS	SHEEP	GRAZING LAND (HA)
1	Kidatu	Kidatu	Msolwa St.	18	985	71	32	289.7
2	Mang'ula	Kiberege	Kiberege	25	3400	522	663	4623
			Signal	51	3342	398	429	1683
			Sagamaganga	19	1186	316	140	1989
3	Ifakara	Ifakara	Lipangalala	10	293	63	61	729
			Katindiuka	4	1100			2640
		Kibaoni	Lungongole	37	8763	632	512	4302
			Kikwawila	4	130			312
		Lumemo	Mahutanga	6	1223	41	13	2961
			Ihanga	5	35			645.1
		Idete	Namawala	11	2378	214	100	5263.75
4	Mngeta	Mofu	Mofu	16	3505	331	344	5216.25
		Mbingu	Igima	9	1353			3246
		Mngeta	Mkangawalo	30	3204	876		5024.03
			Lukolongo	16	6700			4650.4
			Mngeta	17	1350			3240
			Njagi	13	56			135
			Ikule	27	67			162
		Chita	Merera	44	11916	3334	6007	6,825
5	Mlimba	Mlimba	Kalengakelo	29	2045	34	21	4932
			Msolwa	8	113	14	9	279
			Mwembeni	75	1683	36	22	4056
		Utengule	Utengule	6	7000	300		1164.19
			Mpanga	21	1805	704	1950	559.97
			Ngalimila	20	2147			1901.9
		Uchindile	Uchindile	12	507			1218
			Kitete	5	60			144
			Lugala	7	80			192
		TOTAL		545	66246	7886	10303	68383.29

Source: Kilombero District Livestock Officer.

In addition, accessibility of transportation facilities for the researcher and the availability of the target population in line with possibility to get reliable information related to the study was another reason of choosing the area. Kilombero valley was selected because it is

believed to be among the valleys which received livestock that cause environmental destruction, whereby an arable land suitable for agriculture especially paddy has been disturbed.

3.1.1 Land area and Administrative Units

The district covers an area of 14,918 km2 (1,491,800 ha) and it is categorized as follows:

(i) Arable land is about 4,458.96 km^2 (445,896 ha).

(ii) Grazing area is about 1,200 km^2 (120,000 ha).

(iii) Area covered by water bodies and wetland is about 1,076.26 km2 (107,626 ha).

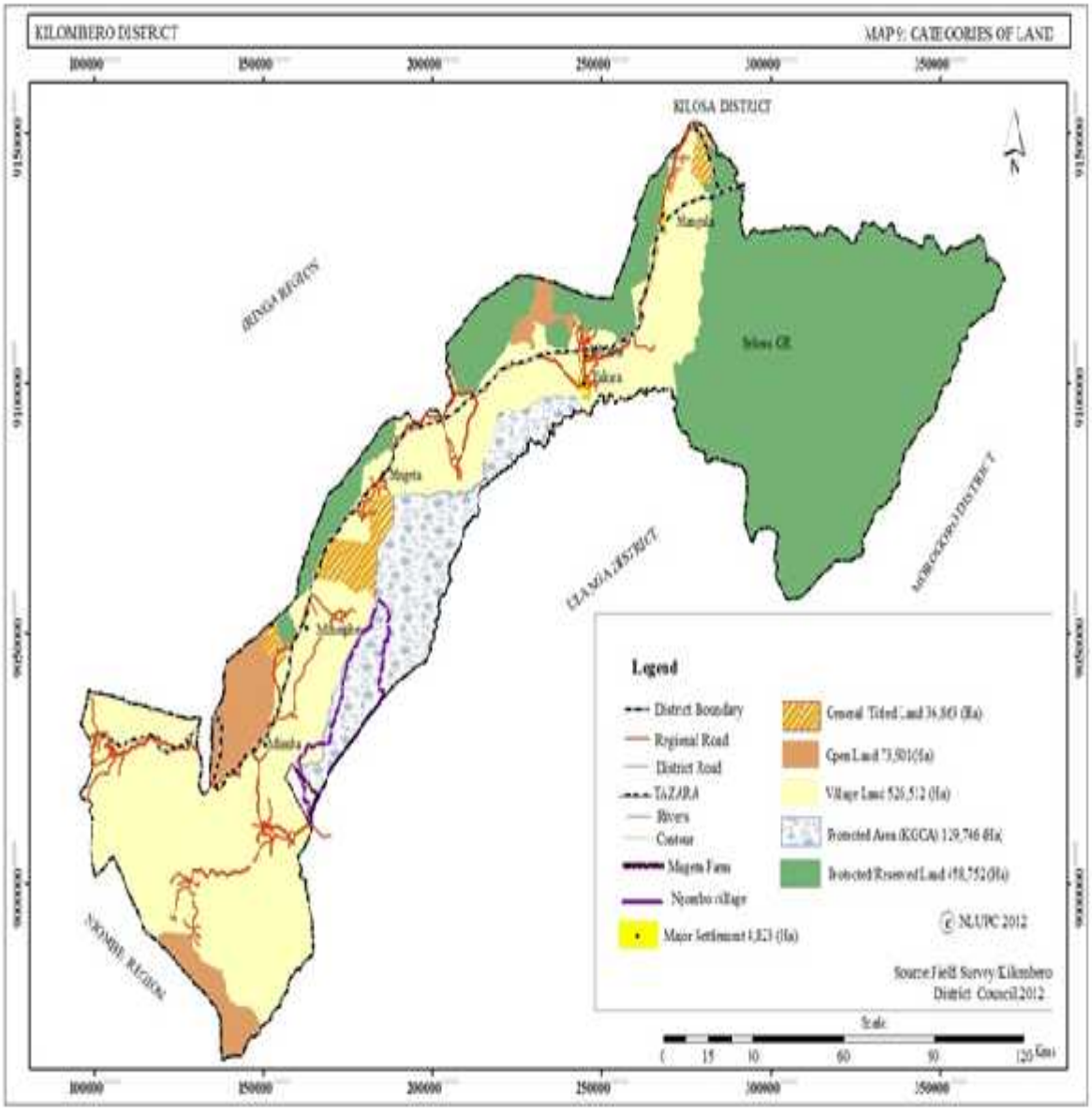
(iv) Area covered by natural forest is about 1,250 km^2 (125,000 ha).

(v) Area covered by reserved forest is about 1,079.15 km^2 (107,915 ha).

(vi) Area covered by planted forest is about 66.98 km^2 (6,698 ha).

(vii) Residential area is about 5,786.65 km^2 (578,665 ha).

Figure 3.2: Land Use categorises in the Kilombero District



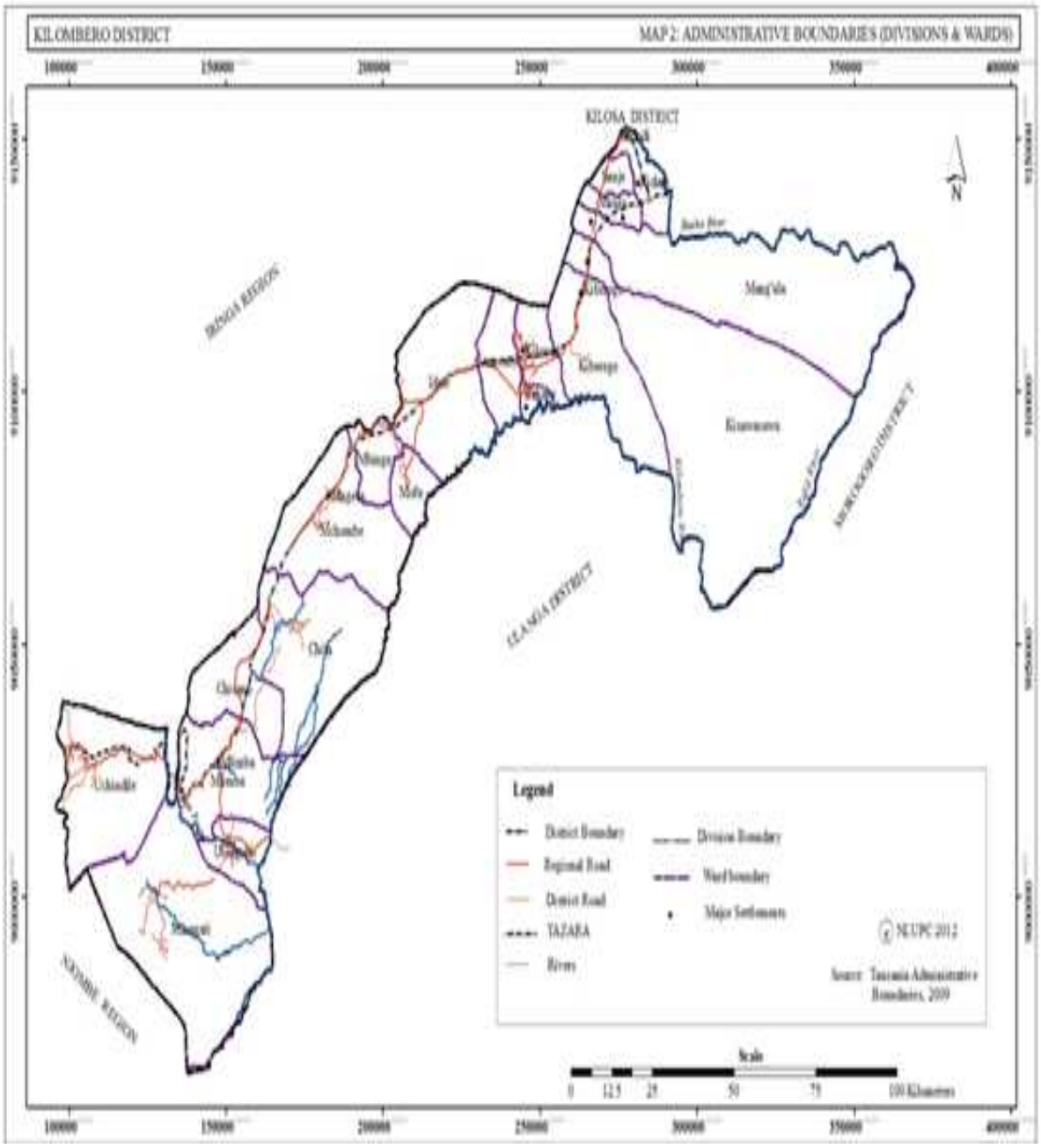
Source: Kilombero District Land Officer

3.1.2 Administration

The district is divided into 5 administrative divisions, 23 wards, 98 villages and 360 hamlets. Most of the district area lies along the Kilombero Valley and part of it in the Rufiji Basin and Selous Game Reserve which extends to the Udzungwa Mountains National Park, covered by Miombo woodlands that rise to about 1700 metres above sea

level. The district has 38 permanent rivers which provide high potential for hydroelectric power (Kidatu and Kihansi Hydro power) and large irrigation schemes.

Figure 3.3: Kilombero district administrative area



Source: Kilombero District Land Officer

3.1.3 Demographic features/ Population Size and Population Growth

According to the 2012 National Population and Housing census, the district had a total population of 407,880 (202,789 males and 205,091 female) with a total of 94,604 households with average size 4.3 people per household; the average population growth rate stood at 2.3 % per annum (URT, 2013). Administratively, Kilombero district has 23 wards, 97 villages and 360 hamlets. Therefore, Mofu (6,025 males and 5,697 females) and Utengule (5,470 males and 5,092 females) wards will be the area of study.

3.1.4 Economic Activities

The main occupation of the people in Kilombero District is agriculture. About 90% of the population are engaged in agricultural production, which is predominantly for subsistence. However in recent years it is transformed to commercial. Rice, Maize, peas and Bananas are the main food crops while sugarcane, simsim, sunflowers and cocoa are grown for commercial purposes. Currently, livestock keeping is coming up as an economic activity. Fishing is also regarded as an economic activity even though not yet utilized to its full potential. The average income of rural households is estimated at Tsh. 163,000 – 175,000 per year (DPLO, 2010).

3.1.5 Climate and soil

Generally, the District has high temperatures (hot weather conditions) and has bimodal rainfall patterns. Short rains begin towards the end of November and ends in January or February. Long rains usually start in March and ends in May or June. The average temperature in the District ranges from 26º to 32ºC. The average rainfall ranges from 1200 to 1600mm. Kilombero experiences seasonal flooding which causes some parts of the district to be inaccessible during the long rain season (DALDO, 2010).

3.1.6 Agro - ecological zones

Kilombero district was divided into three agro –ecological zones which are; North eastern zone, central zone and western zone.

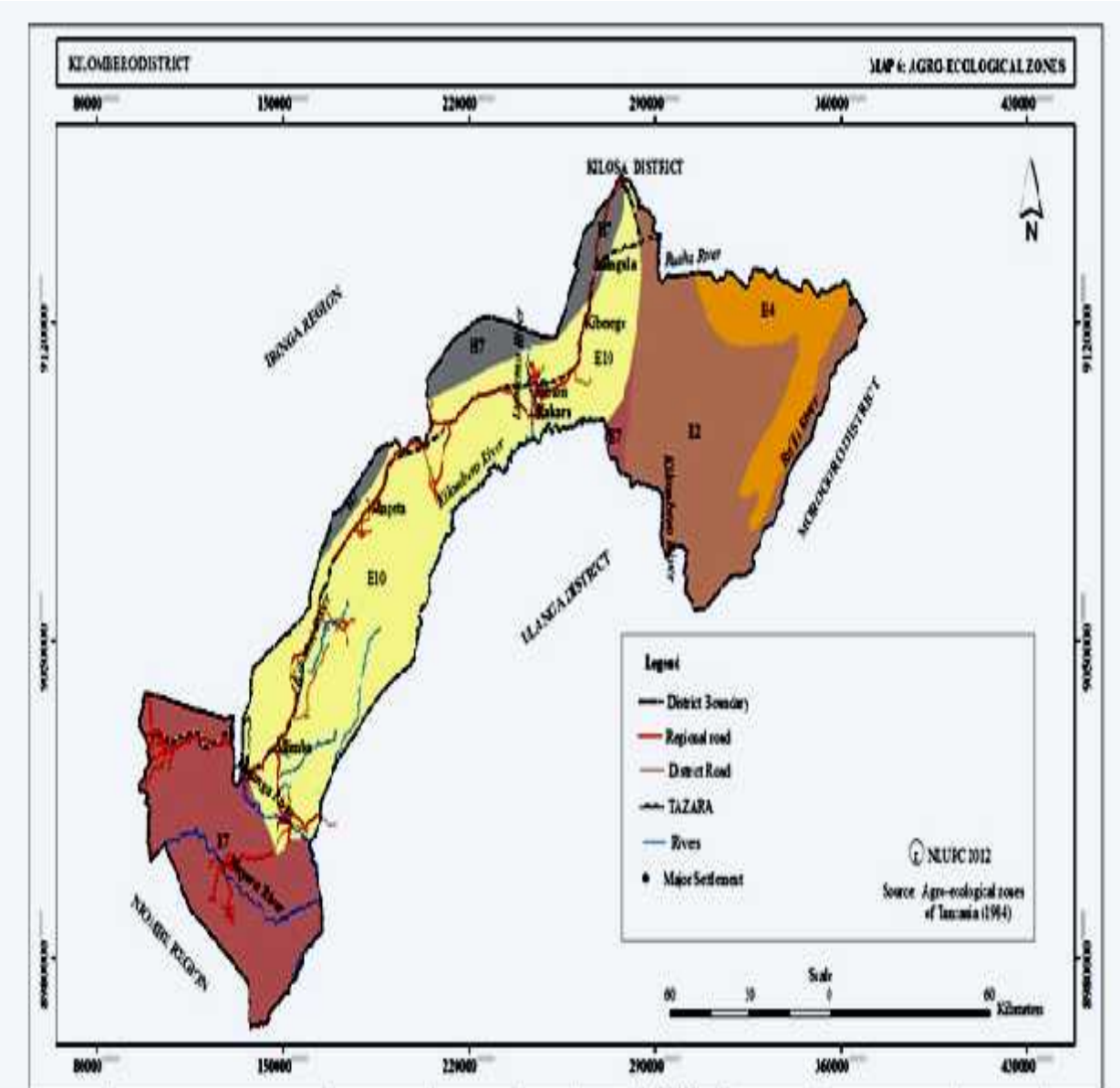
The north eastern zone includes divisions of Kidatu and Mang'ula. Crops grown in this zone are, Paddy, maize, Sugar cane, various types of vegetables: - (okra, amaranths, tomatoes, Chinese cabbage) and fruits (like oranges, mangoes, pawpaw, and pineapples),

Bananas, sweet potatoes and cassava. Soil type of this part includes loamy, clay, and sandy soils.

Central zone includes the Ifakara division. Crops grown are Paddy, maize, cassava, vegetable and fruits (oranges, mangoes and pawpaw). Soil types are loamy, clay, sandy, and sandy - loamy.

Western zone includes divisions of Mngeta and Mlimba. Crops grown are maize, paddy, bananas, Cocoa, sunflower, simsim, cassava, vegetable and fruits. Sugar cane and rubber can also be grown. The type soils are Clay, sandy, clay loamy (DALDO, 2010).

Figure 3.4: Agro-ecological zone of Kilombero district



ZONE	PHYSIOGRAPHY	LITHOLOGY	ALTITUDE (M)	MIN	MAX	RAINFALL (mm)	DGP	AWC mm/m	pH Water
E4	Level to rolling plains associated with strongly dissected uplands and low hills	Intermediate metamorphic rocks	300-1000	18-21	29-31	800-1000	One 4.5-6 months, unreliable onset	80-120	4.7
E10	Flat Alluvial plains with complex sedimentation pattern	Complex Alluvium	400-600	18-23	28-31	1400-1600	One 3(6)-7.5-8 months, influenced by flooding regimes	80-150	5.5-7.5
H7	Undulating to hilly Plateau with strongly dissected crests	Intermediate metamorphic rocks	1500-2300	10-15	22-25	800-1000	One 4-7 months reliable onset	80-120	4.5-7.0
E2	Undulating to rolling plains & Plateau	Granitic rocks	900-1200	15-18	27-30	800-1000	Main 3-4.5 months second 1-2 months unreliable onset	50-100	4.7
E7	Flat to rolling plains locally hilly with strongly dissected uplands and low hills	Intermediate metamorphic rocks	750-1000	15-18	27-28	800-1000	One 4-7 months reliable onset	80-120	5.0-6.5

Source: Kilombero District Land Officer

3.1.7 Irrigation

Kilombero district has a total of 35,238 hectors potential for irrigation, but out of 35,238 hectors only 665 hectors are currently cultivated by irrigation. That means the area is underutilized.

3.1.8 Education Services

3.1.8.1 Pre - primary education

Kilombero District has 137 Pre- Primary schools with a total number of 6,537 pupils (3,289 are Boys and 3,237 Girls).

Primary education

Kilombero district has 149 Primary Schools of which 145 are Government owned and 4 under private ownership. Enrolment of pupils in 2012 was 82,021 of which 46,664 are boys and 45,644 girls (District Education office – primary [DEO (P)], 2012)

3.1.8.2 Special Education

Kilombero District has five (5) centres providing special education, four of which are Owned by the government and one is under Roman Catholic diocese of Ifakara.

3.1.8.3 Secondary education

From 2005 to 2009 there was a drastic increase in the number of secondary schools. Notably, the district had 2 secondary schools in 1995 but through community initiatives and government programme to establish secondary schools at ward level, by the year 2009 Secondary schools increased to 40 (31 are Government schools and 7 are private schools) which is equal 95% increase, among 40 only one is a high school (DEO [P], 2012)

3.1.9 Health Sector

Kilombero District has a total number of 44 health facilities, whereas two (2) hospitals – Saint Francis hospital owned by Roman Catholic Church Diocese of Ifakara and ILLOVO hospital- Owned by ILLOVO Sugar Company; 4 government health centres, 38 Dispensaries, 15 being governmental while 23 privately owned (District medical office [DMO], 2010).

3.2 Research Design

According to Kothari (2006) research design is the arrangement of conditions for collection and analysis of data in manner that aims to combine relevance to the research purpose with economy in procedure; the research design is the conceptual structure within which research was conducted. It is an assemblage of conditions for specifying relationships among variables in a study, operationalizing them and controlling effects of extraneous variables; and a plan for selecting the sources and types of information used in answering the research questions.

Descriptive research design was employed due to the nature of study which needs descriptions and more clarification. The study was based on finding out impact of migrant livestock keepers on natives and natural resources. Thus descriptive design helped narration of facts especially in this case needs to describe the impacts related to migrant livestock keepers on natives and natural resources

3.3 Study Population

A population is the total of all the individuals who have certain characteristics and are of interest to a researcher. It can also be defined as a group which the researcher is interested in gathering the information from, as well as drawing conclusions on (Crowl, 1993). In this study, the target population was the natives who are mainly peasants and the migrant livestock keepers who are pastoralists of both sexes, together with government officials who were filling up information gaps. This mixture of group was used to examine pattern of issues concerning impact of migrant livestock keeper on the activities of the natives of Kilombero valley.

3.4 Sample and Sampling Procedures

3.4.1 Sampling Techniques

It was difficult for the researcher to cover the whole population; therefore sampling techniques was used in conducting the study. Thus, simple random sampling and purposive sampling was employed in getting the sample population. Simple random sampling was applied only to allow equal opportunities for every member of the population to have equal chance of being chosen as representative of the population, whereby natives were respondents as well livestock keeper was selected. While non

probability (purposive) sampling was used to select some government officials to supplement simple random sampling technique. This was applied so as to explore true and valid information from the population in the study area. This study employing purposive sampling techniques for 16 key informants due to their positions and responsibilities. They included Government Officers such as 7 VEOs, 2 WEOs, DC, DNRO, DALDO, DAICO, DEO as well as project coordinator of Kilombero Ramsar site management area who is usually dealing with conserving the Ramsar site. In purposive sampling, subjects were selected under established criteria from which one can learn the most (Wilson, 2002).

3.4.2 Sample Size

A sample is a part of the population which is studied in order to make inferences about the whole population (Manhein, 1977). Therefore, study population in this case refers to a target population which represents all units (person) for which the information is required (Rwegoshora, 2006). According to Cohen (2000), a sample is a small group or a subset of the total population under study and it represents characteristics of the population. The use of sample was useful in a research as it reduced from 24,064 residents (URT 2012) to 96 people unnecessary number studied with minimal costs in terms of time and money and achieving greater cooperation from respondents because the number was manageable. Rwegoshora (2006) witnesses that the study of a very large population would require a long time, a large number of interviews, large amount of money, and uncertainty of data collected by numerous investigators.

Kilombero district has a total of 23 wards, 97 villages, 360 hamlets comprise of 94,604 households with the average of 4.3 people per household, whereas wards understudy were Mofu and Utengule which have total population of 24,064 residents. Since it is difficult for the study to be conducted in the wholly area of the Kilombero valley due to inadequate resources of money, time, research assistants and the like, the researcher has come up with reasonable number of 96 respondents.

Notably, the sample size for the study was 96 whereby 40 (equally divided by sex) respondents who were natives and 40 migrant livestock keepers was interviewed to provide relevant information for the study. The respondents were randomly selected from the lists of households in the study area of 40 respondents. Also 16 key informants

including DC, DED, DNRO, DALDO, DEO, DAICO, Ramsar site project coordinator, 2 WEOs and 8 VEOs was interviewed so as to supplement some useful information for the study.

3.5 Data Collection Methods

Data collection process involved preparation of instruments/ tools for collecting the data, then getting into the field to collect the data. It was done after properly defining the research and careful selection of equivalent research design. Data was collected from both, primary sources as well as secondary ones by using observation, interviews and questionnaires.

3.5.1 Primary Data

According to Kothari (2006) “primary data are those which are collected afresh and for the first time, and thus happen to be original in character”. These were collected from the key informants by using interviews, questionnaires as well as observation method.

3.5.1.1 Interview Method

Interview means getting into direct contact with respondents that is a conversation between interviewer and interviewee. Structured and unstructured interview guide was administered to household of natives and livestock keepers.

3.5.1.2 Questionnaire Method

This is the most popular method of data collection. A questionnaire consist of a number of questions printed or typed in a definite order on a form or set of forms. Questionnaires was administered to gather data from respondents who was not interviewed especially key while informants.

3.5.2 Secondary Data

Documentary sources from relevant institutions such as District reports, plans, livestock register and other relevant materials, journals, articles and the like available from Management Information System (MIS) of Kilombero district was used. Resources from Ramsar site report, NGOs dealing with environmental conservation records, libraries, websites and other sources was accomplishing the study.

3.6 Data Processing

Both primary and secondary data were processed manually. Data processing stage involve editing, classification, coding, transcription and tabulation of data from different sources. Data coding was done by formulating a template in the SPSS software and enter the data from the questionnaires which made user friend and distributed respondents.

3.7 Data analysis and Presentation

Both qualitative and quantitative data were analysed through descriptive statistical analysis. Computer was used Microsoft Excel (Spread sheet) for quantitative data and Statistical Package for Social Science (SPSS) for qualitative data. Quantities use the following ways of data presentation including percentages and ratios in collaboration with mean, mode, median and the like in quantitative data analysis. Data was presented in text, tabular, graphs and figure forms.

CHAPTER FOUR

PRESENTETION AND DISCUSSION OF THE FINDINGS

4.0 Introduction

This chapter presents the results of the study based on the completed questionnaires and interviews with natives of two ward of Kilombero district area namely Mofe and Utengule wards. The chapter has two sections, in which section one presents demographic characteristics of the respondents and section two presents result of the study objectives.

4.1 Demographic characteristics of the respondents

The following results show the background of the respondents. Cross tabulations were used for presentation of background information of respondents which includes gender, age, level of education, period of residing in the area and occupation. The results from the cross tabulation was presented as follows:-

4.1.1 Sex of Respondents

The findings presented in the Table 4.1 below were generated using cross tabulation analysis in order to explore the distribution of gender of respondents. The reason of analyzing gender of respondents was to show that the results of the study were from both male and female.

Table 4.1: Sex of Respondents

Variables			**Ward**		**Total**
			Mofu	**Utengule**	
Sex of Respondents	Male	Count	23	33	56
		% within Ward	57.5%	55.0%	56.0%
		% of Total	23.0%	33.0%	56.0%
	Female	Count	17	27	44
		% within Ward	42.5%	45.0%	44.0%
		% of Total	17.0%	27.0%	44.0%
Total		Count	40	60	100
		% within Ward	100.0%	100.0%	100.0%
		% of Total	40.0%	60.0%	100.0%
X^2= 0.061 df= 1 p=0.805					

Source: Field Data, 2015

The findings presented in the Table 4.1, shows that in Mofu ward male and female respondents were 57.5% and 42.5% respectively while in Utengule ward male were 55%

and female were 45%. This implies that the results of the study came from both male and female. That means there was no respondent's selection bias in this study although number of male were slightly high than that of female in both ward. The overall sex of respondents was 56% for male and 44% for female. The results of likelihood test (Chi-Squire test) indicate that there is no significant different between respondents from Mofu and Utengule in term of their sex (p=0.805 >0.05).

4.1.2 Age of Respondents

The results in the Table 4.2 below shows that different age group (generation) perceived one thing in different ways.

Table 4.2: Age of Respondents

Variables			**Ward**		**Total**
			Mofu	**Utengule**	
Age groups of respondents	21-30 yrs	Count	9	8	17
		% within Ward	22.5%	13.3%	17.0%
		% of Total	9.0%	8.0%	17.0%
	31-40 yrs	Count	15	12	27
		% within Ward	37.5%	20.0%	27.0%
		% of Total	15.0%	12.0%	27.0%
	41-50 yrs	Count	6	24	30
		% within Ward	15.0%	40.0%	30.0%
		% of Total	6.0%	24.0%	30.0%
	51-60 yrs	Count	6	15	21
		% within Ward	15.0%	25.0%	21.0%
		% of Total	6.0%	15.0%	21.0%
	61yrs and above	Count	4	1	5
		% within Ward	10.0%	1.7%	5.0%
		% of Total	4.0%	1.0%	5.0%
Total		Count	40	60	100
		% within Ward	100.0%	100.0%	100.0%
		% of Total	40.0%	60.0%	100.0%
X^2= 13.385 df= 4 p=0.010					

Source: Field data, 2015

Table 4.2 shows that there is significant difference between respondent from Mofu and Utengule in term of their age groups (p=0.010 <0.05). This age difference can be realized on the suggestion that majority (22.5% + 37.5%) of respondents from Mofu are youth compared to the majority (40% +25%) of respondents from Utengule who are comparatively elders. The general results show that 30% of the respondents were in the age of between 41-50 years old. Followed by 27% which was taken by age between 31-40 years old, 21% for those of age between 51-60 years old, 17% for those of age between 21-30 years and 5% for those at age of 61 and above. These results show that information

contained in this study was from adult people who were able to think and give clear image of the socio-cultural changes in their areas following influx of migrant livestock keepers.

4.1.3 Level of Education of Respondents

The results in the Table 4.3 below were generated using cross tabulation analysis in order to explore the education qualification of respondents. The reason why education qualification was recorded was to show that respondents were from people of different level of understanding which relate to their education level.

Table 4.3: Respondents Levels of Education

Variable			**Ward**		**Total**
			Mofu	**Utengule**	
Respondents level of education	Primary	Count	29	48	77
		% within Ward	74.4%	81.4%	78.6%
		% of Total	29.6%	49.0%	78.6%
	Secondary	Count	8	11	19
		% within Ward	20.5%	18.6%	19.4%
		% of Total	8.2%	11.2%	19.4%
	Diploma	Count	1	0	1
		% within Ward	2.6%	.0%	1.0%
		% of Total	1.0%	.0%	1.0%
	Advance diploma	Count	1	0	1
		% within Ward	2.6%	.0%	1.0%
		% of Total	1.0%	.0%	1.0%
Total		Count	39	59	98
		% within Ward	100.0%	100.0%	100.0%
		% of Total	39.8%	60.2%	100.0%
X^2= 3.214 df=3 p=0.360					

Source: Field data, 2015

Table 4.3 shows that there is no significant difference between respondents from Mofu and Utengule in term of academic qualifications (p=0.360 >0.05). Generally, 78.6% of respondent had a primary level of education, 19.4% had secondary level of education, while those with diploma and advance diploma had equal percentage of 1%. The results indicate that most of respondent had a primary education, this implies that majority of the native of Kilombero valley have low level of education. This may be due to the activities performed by them-most of these people are peasants and therefore spent a lot of time in the farm hence they had little time to go to school. On the other hand, they are possibly illiterate people on the issues regard sustainable utilization of natural resources

4.1.4 Period of Staying in the Area

The results in the Table 4.4 below were generated using cross tabulation analysis in order to explore the period to which respondents have stayed in the area understudy.

Table 4.4: The Period Residing in Kilombero Valley

Variable			Ward		Total
			Mofu	Utengule	
Period of Residing in Kilombero Valley	1-5yrs	Count	1	0	1
		% within Ward	2.5%	.0%	1.0%
		% of Total	1.0%	.0%	1.0%
	6-10yrs	Count	3	1	4
		% within Ward	7.5%	1.7%	4.0%
		% of Total	3.0%	1.0%	4.0%
	11-15yrs	Count	8	5	13
		% within Ward	20.0%	8.3%	13.0%
		% of Total	8.0%	5.0%	13.0%
	16-20yrs	Count	15	25	40
		% within Ward	37.5%	41.7%	40.0%
		% of Total	15.0%	25.0%	40.0%
	21yrs and above	Count	13	29	42
		% within Ward	32.5%	48.3%	42.0%
		% of Total	13.0%	29.0%	42.0%
Total		Count	40	60	100
		% within Ward	100.0%	100.0%	100.0%
		% of Total	40.0%	60.0%	100.0%
X^2=7.591 df=4 p=0.108					

Source: Field data, 2015

From Table 4 above it shows that of the period of staying in the area under question the is no significant difference between respondents from the different ward (p=0.108 >0.05) wherein more than half of the respondents in both Mofu and Utengule have staying in Kilombero Valley for more than 16 years. However, the general results indicate that 1% of respondent had stayed in the area for the period ranging between 1-5years, 4% had stayed for a period of 6-10 yrs, 13% for the period of 11-15 years, 40% for the period of 16-20 years and 42% for the period of 21 year and above. Since large percentage of respondent had stayed for many years (21 years and above) in the area it can be said that the respondent were permanent residents of the study area hence they could give reliable information concerning the impact of livestock keepers on their culture and natural resource of Kilombero valley since they know well the area how it looked before the influx of migrants livestock keepers and changes that have occured after the coming of migrant livestock keepers.

4.1.5 Occupations of Respondent

The same cross tabulation analysis was used to explore the primary occupations of respondents in the study area. Table 4.5 below presented the results of this analysis.

Table 4.5: Occupation of Respondents

Variables			Ward		Total
			Mofu	Utengule	
Primary occupations	Agriculture	Count	21	36	57
		% within Ward	52.5%	60.0%	57.0%
		% of Total	21.0%	36.0%	57.0%
	Livestock keeping	Count	1	0	1
		% within Ward	2.5%	.0%	1.0%
		% of Total	1.0%	.0%	1.0%
	Service	Count	2	0	2
		% within Ward	5.0%	.0%	2.0%
		% of Total	2.0%	.0%	2.0%
	Trading	Count	6	10	16
		% within Ward	15.0%	16.7%	16.0%
		% of Total	6.0%	10.0%	16.0%
	Employed	Count	3	1	4
		% within Ward	7.5%	1.7%	4.0%
		% of Total	3.0%	1.0%	4.0%
	Fishing	Count	7	13	20
		% within Ward	17.5%	21.7%	20.0%
		% of Total	7.0%	13.0%	20.0%
Total		Count	40	60	100
		% within Ward	100.0%	100.0%	100.0%
		% of Total	40.0%	60.0%	100.0%
X^2= 7.029 df=5 p=0.219					

Source: Field data, 2015

Table 4.5 above shows that 57% of respondents were agriculturalist, 2% were offering services, 16 % were traders (i.e. business man and women), 4% were employed either in government or private organizations and 20% were fishers. This implies that the researcher collect data from respondents performing different activities in the study area. Hence it can be believed that respondents gave information regarding how migrant livestock keepers affected their activities in their area. Moreover the result revealed that agriculturists were more than other performers (more than half of respondents 57%) in the area. This indicates that agricultural activity is highly performed in the study area. On the same line the results of Chi square test indicate that there is similarity between respondents from Mofu and Utengule in term of their primary occupations ($p=0.219 >0.05$).

4.2 The Impact of migrant livestock keepers on activities of the natives of Kilombero valley

The findings show that migrant livestock keepers had an impact on the activities of the natives due to the big influx of the livestock keepers and their heads. The results presented in the Table 4.6 below shows that 58.6% of respondents indicated that there was a big influx of migrant livestock keepers in Kilombero valley. The 34.3% of those responded said the influx was very large extent, 5.1% shows that its small extent and 2.0 % showed it was very small extent. For that reason large percentage of respondents (58%+34.3%) agrees that invasion of migrant livestock keeper in Kilombero valley was high. This result implied a significant impact on the activities of the natives and natural resources of the area. The findings are supported with similar studies conducted by Mwafupe and Mungo'ngo', (2003) who reported that there was migration of livestock keeper in many areas of Tanzania such as Kilombero, Kiteto, Rufiji and Kilosa districts which create scarcity of natural resource such as land and water hence lead to conflict between farmers and livestock keepers.

Table 4.6: Influx of Migrant Livestock Keepers in Kilombero Valley

Variable	Measurement	Frequency	Percent (%)
Extent to which migrant livestock keeper have invaded Kilombero valley	Very small extent	2	2.0
	Small extent	5	5.1
	Large extent	58	58.6
	Very large extent	34	34.3
	Total	99	100.0
Cultural difference between the natives and migrant livestock keeper	Negligible	3	3
	Very small	7	7
	Small	15	15
	Big	36	36
	Very big	39	39
	Total	100	100

Source: Field data, 2015

The findings revealed that more than two third (36+39) of the respondents accepted that the cultural difference between this two groups was either big or very big. Few of them 15% rated small difference, 7% rated very small difference and 3% rated no difference. This study showed that there was a significance cultural difference between natives of the Kilombero valley and migrant livestock keepers. The differences were based on the fact that the two groups performed different activities with different ways of handling each issue.

The findings show that most of the activities affected included among others: agriculture, livestock keeping, fishing, trading, service delivery, manufacturing, employment opportunities and hunting. The native respondents were given questionnaires with 5 Likert points ranging from (1) has decreased little (5) has increased very high, and told to rate their views concerning the provision of the variables given. However, frequency, mean scores and standard deviation were employed to compute how the migrant livestock keepers have impacted the variables mentioned. The results are presented in the Table 4.7 according to the order of their priority.

Table 4.7: Impact of Migrant Livestock Keeper on the Activities of the Natives-Descriptive Analysis

Variables	N	Scale					Mean	STD	Rank
		1	2	3	4	5			
Livestock keeping	100	2	2	4	27	65	4.51	0.83	1
Agriculture	99	6	2	2	32	57	4.33	1.059	2
Trading	100	5	50	34	10	1	3.52	0.789	3
Services delivery	100	2	4	82	9	3	3.07	0.573	4
Employments opportunities	100	6	24	33	35	2	3.03	0.958	5
Manufacturing	99	29	22	43	4	1	2.25	0.962	6
Fishing	100	53	30	14	2	1	1.68	0.863	7
Hunting	99	69	19	6	3	2	1.48	0.896	8
Average Mean	2.98								
Interpretation of the Mean 4.21-5.0 =Has increase very highly 3.41-4.20= Has increase little 2.61-3.40= Remain constant 1.81-2.60= Has decrease little 1.00-1.80= Has decrease very little									

Source: Field data, 2015

From Table 4.7 above, it can be said that migrant livestock keeper had different impacts on the different activities of the natives. The findings showed that the activities which were rated “has increased highly” were; livestock keeping (mean=4.51) and agriculture (mean= 4.33). Followed by activities which were rated “has increased little” which were; trading (mean=3.52). However activities that was rated “remain constant” was service delivery (mean= 3.07) and employment opportunities with mean of 3.03. Moreover, manufacturing (mean=2.25) was rated to have “decreased little” and activities such as hunting (mean=1.48) and fishing (mean= 1.68) was rated to have “decreased very highly”. Additionally, the average mean was 2.98 which imply that in general activities remained

constant. This is because while some activities were decreasing others were increasing and the impact of those decreased and those increased outweigh each other.

The results were subjected to one sample t-test in order to determine which factors/variable significantly determines the impact of migrant livestock keeper on the activities of the natives. This test was chosen since it is used when investigator wants to know whether the mean of the score/variable from which the sample is drawn is the same as the hypothesized mean (or average mean of the scores). Hence, mean of each identified individual variable was tested against the average mean. But since this is non parametric test and the results based on the people/respondents' perceptions, therefore, in interpreting the results of t-test let us neglect the observed negative signs of t-values and of Confidence Intervals (CIs) and concentrate on the meaning of p-values. These negative values are the results of the effects of the mean difference which was obtained after subtracting the value of average mean from the actual mean of the given variable.

Now, the results of such t-test have been shown in the Table 4.8. The results of the t-test (Table 4.8) indicate that the impact of the migrant livestock on the activities of natives of Kilombero can be significantly observed on the agricultural activities ($p<0.0001$), livestock keeping ($p<0.0001$), fishing activities ($p<0.0001$), business/trading ($p<0.0001$), manufacturing ($p<0.0001$) and hunting activities ($p<0.0001$). On the other hands Service delivery ($p=0.119 >0.05$) and employment opportunities ($p=0.603 >0.05$) do not significantly determine impacts of native migrants in Kilombero Valley.

Table 4.8: Impact of Migrant Livestock Keeper on the Activities of the Natives-T Test

	Test Value = 2.98					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Agriculture	12.710	98	.000	1.353	1.14	1.56
Livestock keeping	18.328	99	.000	1.530	1.36	1.70
Fishing	-15.061	99	.000	-1.300	-1.47	-1.13
Business or trading	6.882	99	.000	.540	.38	.70
Service delivery	1.571	99	.119	.090	-.02	.20
Manufacturing	-7.524	98	.000	-.727	-.92	-.54
Employment opportunities	.522	99	.603	.050	-.14	.24
Hunting	-16.598	98	.000	-1.495	-1.67	-1.32

Source: Field Data (2015).

Next was the discussion of these findings. The discussion material are the results of the findings obtained from the analysis of the study findings, ideas contributed by respondents during interviews, ideas of researcher and other peoples who shows interest in this study and contribute their views in one way or another. Also, findings of other researchers in this area were included in the discussion to justify the results of present study.

4.2.1 Livestock Keeping

This study established that livestock keeping activity has increased following the influx of migrant livestock keepers. The livestock keepers have made animal keeping activity to rose due to increased number of cattle, sheep and goats. The study argued that the increase of livestock in area have also led for the diversification of the economy of the natives. Some natives have also started to keep these animals which were not their privilege in the past. The study by Mwambene et al., (2014) showed that migration of livestock keepers to Rukwa region has diversified the economy of the natives in the area where the local farmers started keeping different domestic animals which they were either rarely or completely not keeping. Mwambene et al., (*1bid*) also revealed that a large number of animal keepers moved to Kilombero and Lindi regions following the Government eviction order from Ihefu wetlands in 2006 and increased livestock keeping activity in the area. Walsh (2012) showed that immigrant pastoralist mainly Sukuma and Maasai in Usangu area have contributed to the increased number of livestock in the area hence led to environmental degradation which ultimately decreased the volume of water in Ruaha river.

On other hand, Shem (2010) noted that the growth of the livestock population has led to increased movement of large herds of livestock to areas which traditionally had few livestock, such as Mbeya, Rukwa, Iringa, Coast Regions and Morogoro creating pressure over the existing natural resource base and lead to serious land use conflicts

4.2.2 Agriculture

The finding show those invasions of pastoralist in the area have lead to increased agricultural activities. The findings on the ways migrant livestock keepers or pastoralists have increased agricultural activities in the area showed that the main reason was that

pastoralist have been selling ox-driven ploughs to agriculturalist which they used for the cultivation of more big area as well as facilitation of theharvests. Apart from oxen also donkeys have been used by agriculturalist for the purpose of simplifying their farming activities. Similarly, Mwambene et al., (2014) reported that the arrival of pastoralists in Lindi, Rukwa and Kilombero regions had positive effects on food security and growth of social interactions among pastoralists and farmers.

The findings showed that increased food and cash crops in Kilombero valley particularly rice. The researcher tried to make an investigation of amount of rice sold from Kilombero to other parts of the county; this investigation was carried out only at Ifakara market (a prominent rice market in Kilombero) leaving behind the rice sold at other markets as well as at peoples' homes. The statistics showed that there was a persistence increase of rice production in Kilombero. In the study one of the native respondents whose primary occupation was agriculture said that he bought four oxen from immigrant keeper that he always used for cultivating his farms. The same person forecasted that since he started using oxen he was able to plants many acres of land compared to the previous time when he was using hand hoe. Therefore, he gets produce enough for feeding his family of twelve individuals and for sale. Farm sizes varied from 0.5-11 hectare among the respondents in the household interview.

Mbwile (2012) reported that migration of pastoralists had both negatives and positives; revealed that arrival of pastoralist to Handeni-Tanga transformed the subsistence farming practiced to large scale commercial farming because of establishment of ox-driven ploughs. Masanja (2013) revealed that there was increase in agricultural activities in Misungwi district following the influx of agro-pastoralist to the area. Crop identified grown in the area included maize, paddy, banana, vegetables tomatoes, spinach, egg plants, peppers, green peppers, cabbages, ocra, onions, and carrots, sunflower and cotton. Chuwa (2012) reported that the excessive influx of agro pastoralist in Kilombero valley has lead to encroachment of the wetlands in order to obtain area for agriculture and grazing.

4.2.3 Trading

The findings revealed that trading activity has increased in Kilombero valley; this is due to the fact that the migration of the livestock keepers in this area increased the population

and as population increase selling and buying of goods increases. Also the increase human population in this area attracted business people from different area to come and either buy or sell their products in the area-who initially were no trading in this area hence lead to increase in business activity. In the similar study by Guendel (2002) argued that migration of Turukana (pastoralist group) from North Kenya to West and Central zones have brought positive impact such as increased availability of meat and milk trading and the natives were no longer facing meat and milk shortages as they used to be.

On other hand, a study by Mbwile (2012) showed that arrival of agro pastoralist to Lindi and Rukwa regions have increased meat business in the area which is indicated by increased number of butcheries , “nyama-choma” (roasted meat) business was also reported to have increased. Therefore, this study showed that migrant livestock keepers in Kilombero valley has promoted mutual benefit between natives and livestock keepers. The Ndamba (native group) who were agriculturalist in nature have got large market for their crops meanwhile the Sukuma (agro-pastoralists) and Masai (pastoralist) who have moved into the area have also got large market for their products such as milk and meat hence led to the expansion of trading products in the area.

4.2.4 Services Delivery

The results presented in the table 4.7 shows that services delivery in the area were found to remain almost constant in spite of the fact that there was the high influx of migrant livestock keepers in the area. This means that the presence of livestock keepers in the area does not alter services provision by either government or private institutions and individual such as health services; education and communication services. The study argued that number of the schools and hospitals in the area have increased with the increase of the population. It has to be noted that migrations of pastoralists in this area have not decreased availability and/or accessibility of these fundamental services.

The study also noted that before the year 2000 each village had one primary school, except Mpanga one. The villages of Utengule which had no primary school, now there are two to three primary schools in each village. However, in Utengule ward there are two government secondary schools and one private secondary school operating while in Mofe ward there was one government secondary school. Moreover, existing primary health care centres have been expanded in term of both number of health officers and health facilities.

. For that case researcher has put it out that as the population increases the government (i.e. both local and central governments) also increased the provision of social services according to the increased number of people hence no shortage or surplus of the services in the area.

4.2.5 Employments opportunities

The findings like service delivery, the employment opportunities in the study area were found to have remained constant regardless of increased population following migration of livestock keepers in the area. Therefore, the study shows that migrations of livestock keepers in the area had no any impact to employment sector. In many cases movement in population of a certain area to another area created deficiency in the availability of employment opportunities to the host area. It was reported that the movement of livestock keepers were looking for the grazing land together with cultivation other than formal employment opportunities in either government or private organizations. They also did not create jobs for the natives who were performing quite different activities.

4.2.6 Manufacturing

The findings show that manufacturing in the area has decreased little. This means that the migration of livestock keepers to the area has negative effect on the manufacturing activity in the area. The people interviewed highlighted that in the past, the natives were consuming products which had been locally or traditionally made. Such products were furnitures, belts, drums and other music instruments, caps and baby's clothes, traditional medicines and honey. But following the increase of the population in their area which expanded across the area traded new products brought in the area from China. The researcher achieved to interview one herbalist in the area and noted that herbal products manufactured by a Ndamba man (a native person of Kilombero valley) have lost the market in Kilombero since the natives are now loyal to herbal products manufactured by a Maasai men (a migrant livestock keeper).

In terms of some of the manufacturing activities such as honey productions and their traditional medicinal products have decreased according to Chairman of Ikwambi village of Mofu since the coming of livestock keepers. This has led to the clearance of vegetation in the area hence decrease honey and traditional medicinal productions. Also migrants

especially Maasai are good in manufacturing sandals using animal skin and tyres hence they have weaken shoes manufactured by the native in the area.

4.2.7 Fishing

In this study it is identified that fishing activity in the study area has decreased very little and this may be attributed by the factor of excessive water use by migrant livestock keepers to feed their animals. It was argued that migrant pastoralist communities tended to invade wetlands which in turn reduce the volume of water and habitat areas for breeding and fishing. This findings are supported with a study by Shem (2010) who indicated that extensive degradation by migrant livestock keepers in Usangu area have reduced the volume of water including fish niches.

One fisherman explained that “fish depend on water for their survival increase in water use by livestock has decreased the volume of water in the valley hand in hand with destroying breeding site by trampling of livestock hence the number of fish production decreases.....” a phenomenon which undermine the fishing activity in the Kilombero valley. It was also argued that the increase of agricultural production has been associated with the encroachment of wetlands by farmers to obtain farm land an act which led to the low water level of Kilombero River and its tributaries affecting fisheries in the area.

4.2.8 Hunting

The findings show that hunting activities have decreased very little in the area. This can be explained in two ways, first the migrations of livestock keepers in the area has led to clearance of vegetation and grass as food for their animals and destroy the environment used by wildlife. This may have caused the wild animal to migrate to other areas to find new habitats hence decreased hunting activities in areas dominated by migrant livestock keepers. Second the decrease of hunting activities is caused by alternatives meat brought by migrant livestock keepers in who brought enough supply of meat through their cattle which discouraged natives who initially obtained meat through hunting hence undercut dependence of the wild animal meat.

4.3 The impact of migrant livestock keepers on the natural resources

The study investigated the extent to which livestock keeping activities of the pastoralist have affected water resource, dry land, wetlands, natural plants, wild animals and fish. The respondents were given questionnaires with 5 Likert points ranging from (1) negligible to (5) very large extent and told to rate their views concern with provision of the variables given. Frequency, mean scores and standard deviation were employed to compute extent to which migrant livestock keepers have use mentioned natural resources. The results are presented in the table 4.9 and have been arranged according to the order of their priority/ranking.

The result of Table 4.9 above shows that the extent to which livestock keepers have used natural resources in the area wherein water (mean=4.98), wetland (mean=4.81), and vegetation (mean=4.51) were rated at the means which were interpreted to be used at "very large extent". Followed by dry land (mean=3.57) which was interpreted to be used at "large extent" while wild animals (mean=3.00) was interpreted to be used at "small extent" and fish (mean= 1.96) was interpreted to be used at "very small extent". The general results gave the average mean of 3.77 which implies that natural resources have been generally used at "large extent".

Table 4.9: The extent to which Livestock Keepers used Natural Resource in the Kilombero Valley-Descriptive Analysis

Variables	N	Scale					Mean	STD	Rank
		1	2	3	4	5			
Water	100	0	0	0	2	98	4.98	0.141	1
Wetlands	98	0	0	0	19	78	4.81	0.397	2
Vegetation	100	0	0	4	41	55	4.51	0.577	3
Dry land	100	27	1	6	40	26	3.57	1.555	4
Wild animals	99	19	23	18	17	22	3.00	1.443	5
Fish	98	46	33	6	3	10	1.96	1.259	6
Average mean	3.77								
Interpretation of the Mean 4.21-5.0 =very large extent 3.41-4.20= large extent 2.61-3.40= small extent 1.81-2.60= very small extent 1.00-1.80= negligible									

Source: field data, 2015

In similar manner t-test was also applied in order to determine factors which significantly determine the extent to which livestock keepers used natural resource in Kilombero valley.

The results of such t-test have been presented in Table 4.10. Since this is non parametric test and the results based on the respondents' perceptions, therefore, in interpreting the results of t-test the negative signs of t-values and that of Confidence Intervals (CIs) can be ignored and concentrate on the meaning of p-values. These negative values are the results of the effects of the mean difference which was obtained after subtracting the value of average mean from the actual mean of the given variable.

Now, the results reveal that all variables/factors considered in this matter can significantly determining the extent to which livestock keepers use natural resource in the Kilombero valley. This is because after conducting one sample t-test the p-values of each of the variable used has been found to be low that a critical upper limit of 0.05. This implies that they have significant power to present utilization of natural resource of Kilombero valley by migrant livestock.

Table 4.10: The extent to which Livestock Keepers used Natural Resource in the Kilombero Valley-T test

	Test Value = 3.77					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Water	85.995	99	.000	1.210	1.18	1.24
dry land	-2.573	99	.012	-.400	-.71	-.09
wetland	25.813	97	.000	1.036	.96	1.12
natural plants	12.819	99	.000	.740	.63	.85
wild animals	-5.310	98	.000	-.770	-1.06	-.48
Fish	-14.235	97	.000	-1.811	-2.06	-1.56

Source: Field Data (2015)

After presenting the results of the analyses rendered to this the extent to which livestock keepers used natural resource in the Kilombero valley, discussions of the study findings pertain to this objective followed.

4.3.1 Water resources

The findings show that the use of water resources by migrant livestock keepers was at very large extent. It was highlighted that vegetation had major role in the protection of water source of many rivers and streams, encroachment by both farmers and livestock keepers has led to destruction of forest in the catchment areas hence lead to shortage of water in some rivers while other dred up. It's further reported that in Mofu ward Mkele

River and Maujiji swamp had completely dried due to extensive utilization of water by immigrant pastoralists.

The study noted that in the past, before the coming of livestock keepers in Kilombero valley, the valley had about 79 rivers and until 2009 the valley had about 38 rivers but today there are only 28 rivers and this was due to farming and grazing activities. These findings were reported by Walsh (2012), who highlighted that migrant pastoral communities have invaded the wetlands in the Usangu and reduced the volume of water and thus affecting the volume of water supply in the hydroelectric dams. In the same context of migrant pastoralist Walsh (*ibid*) continued to report that water levels in major rivers like Ruhuji, Mnyera, Furua, Mpanga, Kihanzi, Luipa, Ruaha and Kilomero have drastically gone down, indicated bad future for peasants and fishers living in the area. A study by Guendel (2002) showed that migration of Turukana (pastoralist group) from North Kenya to central Kenya have consequences on water resources whereby some of seasonal and permanent water bodies have dried up while others have been reduced and the situation has reached alarming levels where about entire central area have been turned to semi desert.

4.3.2 Wetlands

The surveyed respondents highlighted that the utilization of wetland resources by migrant livestock keepers were at very large extent. This was due to the increasing in livestock keepers in the area which caused shortage of grass on the dry land to feed their animals hence they were forced to utilize wetlands vegetationsas feed stock. A chairman of Mofu village acknowledged that due to the limited availability of alternative grazing pastures following increase of animals, the communities used the wetlands as their grazing fields.

Chuwa **(**2012) identified that the Kilombero wetlands was highly threatened because of overgrazing by livestock, deforestation and agriculture activities. Deforestation was reported to be done through collections of poles for construction of cattle enclosures. Furthermore Hongo and Masikini (2002) found that the increased influx of pastoralists from neighbouring areas to Magu District has led to severe destruction of wetlands across lake victoria, wetlands was reported to be used for feeding animal especially during the drought season. Similarly, a study by Masanja (2013) showed continued expansion of human and livestock populations in the Mbalika wetlands corridor of lake Victoria in

Misungwi district of Mwanza. The study found out that trapid and excessive increased number of people and livestock had a more adverse effect on the carrying capacity and sustainability of the wetland as compared to the previous time. At this point, it became clear that increased use of the wetlands resources was due to the increased demand of land for settlements, agriculture and grazing lands.

4.3.3 Vegetation

Increased agricultural activities and animal keeping in the study areas, led to the clearance of the natural vegetation along the wetlands to get more land for cultivation as well as grazing within the wetlands. The findings from table 4.9 also revealed that vegetation in the study area was used to large extent by migrant livestock keepers. It was established that natural plants were used as pasture for animal and roofing of pastoral houses.

A study by Mlopola (2006) showed decrease in the vegetation density in the Kilombero valley due to over utilization of the area by pastoralists who were continuously grazing on the Kilombero valley. Herbaceous vegetation and basal cover were the plants reported to have been highly utilized by pastoralists for feeding animals. Luwanda (2008) also noted that there was increase in livestock in Kilombero valley and it was associated with more consumption of plant cover. Even so, not much was offered in the current body of knowledge concerning impact of migrant livestock keepers on the natural plants but it is clear that heavy stocking rates destroy grass cover and erosion sets in. It was argued that overgrazing has adversely resulted into decreased plant species composition and loss of forage yield, leaving a lot of bare ground and bush encroachment.

4.3.4 Land resources

The findings revealed that the extent to which dry land has been used by migrant livestock keepers was large. The findings reported extensive use of the dry lands by livestock keepers who normally use land as grazing area. During one of the interview sessions it was reported by one of the interviewees that the influx of livestock keepers in Kilombero valley has led to the increase of demand of land resource due to population increase and changing land use patterns. However, apart from grazing the pastoralists use Kilombero land for different activities including areas for their settlement and farms for cultivation. It was further revealed that the migrant livestock keepers have taken the large piece of land hence creates scarcity of land in the area for the native agriculturalist and this was the root

causes of conflicts between pastoralist (migrant livestock keepers) and agriculturalist (natives) in the Kilombero valley.

Other effect of migrant livestock keepers in the area has been noted to be soil erosion. This was also reported by Masanja (2013) who proclaimed that land erosion in Misungwi district was attributed to the excessive land use by migrant pastoralist following the increased density of livestock. Masanja further showed that the available animal exceeded the carying capacity of the land. Range land available could support only half of the animal identified during his survey.

4.3.5 Wildlife

The findings show that there was small extent usage of wild animals by migrant livestock keepers. It was discussed that livestock keepers affect the wild animals directly through killing of wild animals when they invade their cattle or their farms, also indirectly by destruction of their habitat through cutting of trees in order to obtain area for grazing. In the interview, one of the native mentioned that although Masai traditions are well known for not eating bush meat but some of the Masai people in the Kilombero valley have changed and they consumed bush meat. He added that Masai have been using feathers and eggs of wild bird and hunted small animals. The study went further to investigate some on the wild animals inhabiting Kilombero flood plain and it was discovered that Impalas, hartebeest reedbuck hyenas, Zebra, bushbuck, civet and warthogs are the wild animal that were regularly seen in the area but currently their population have been some how low compared to the near past. Major reasons reported for their disappearance was encroachment of their areas mainly through grazing activity of the livestock keepers. Furthermore Luwanda (2008) reported that increased agro pastoralists in kilombero valley affected the wildlife population. Haule (2002) showed that potential threats to the future of wildlife in Kilombero include agricultural expansion, unsustainable cutting of trees and poaching.

4.3.6 Fish and fishery resources

This study established that migrant livestock keepers used fish to in a very small extent. Traditionally, livestock keepers rely mostly on meat, milk and blood from cattle for protein and caloric needs that is why the use of fish to them was very small. And even small amount which was reported to have been used was due to social interaction which

transformed them and enabled them to eat the foods which are eaten by their hosts (the native people). They only affected fish by reducing amount of water in the rivers and ponds as well as destruction of fish breeding sites through animal tramping.

On other hand, it was reported that natives were the major source of decline in fish population in the area more than pastoralists. It was discovered that natives engaged in some illegal fishing activities using illegal fishing instrument such as damming of river tributaries, the use of small meshed nets, poisonous chemicals both industrial and local and drift nets hence contributed largely to decrease in fish and fishery resources in the area.

4.4 The impact of migrant livestock keepers on the culture of the natives

The following variables were used to identify the change in the culture of the natives: ways of performing works, marriage matters, food and eating style, ways of resolving disputes, community governance, tradition songs and dances, language use, baby caring, worshiping, dressing and greeting. Five Likert scale ranging from (1) “very large changes” to (5) “very small changes” was used in which the respondent were asked to rate their opinions on the condition of the given variable. Frequency, Mean and standard deviation were also used in analysis of the findings.

The findings presented in the Table 4.11 show that the cultural element which changed very largely was ways of performing works (mean= 4.44). Followed by the cultural elements which were rated to have changed largely, that were: marriage matters (mean= 4.18) together with food and eating style (mean= 3.67). Resolving disputes (mean= 3.27) and community governance (mean= 3.17) were voted to have changes small. Moreover, traditional songs and dace (mean= 2.07) and language use (mean=1.81) were voted to have changes very small. Other remaining cultural elements baby caring (mean= 1.73), worshiping (mean=1.59), dressing (mean=1.63) and greetings (mean= 1.49) was rated as to have negligible changes. Additionally, the average mean was 2.64 which imply that, generally, presence of migrant livestock in the area has led to small changing in cultural elements.

Table 4.11: The Impact of Migrant Livestock Keepers on the Culture of Natives- Descriptive Analysis

Variable	N	Scale					Mean	Std.	Rank
		1	2	3	4	5			
Ways of performing works	98	1	11	14	12	60	4.44	.985	1
marriage matters	100	8	2	9	26	55	4.18	1.192	2
Food and eating style	98	3	6	33	34	22	3.67	.993	3
Resolving disputes	99	12	4	32	47	4	3.27	1.048	4
Community governance	100	11	7	43	33	6	3.16	1.032	5
Traditional songs and dance	100	35	33	24	6	2	2.07	1.008	6
language use	98	60	11	17	9	1	1.81	1.146	7
Baby caring	98	55	24	16	2	1	1.73	1.256	8
Worshiping	99	61	20	16	2	0	1.59	.833	9
dressing/clothing	98	67	11	12	5	3	1.63	1.078	10
Greetings	100	78	7	6	6	3	1.49	1.049	11
Average mean	2.64								
Interpretation of the Mean 4.21-5.0 =Very large changes 3.41-4.20= Large changes 2.61-3.40= small changes 1.81-2.60= very small changes 1.00-1.80= Negligible changes									

Source: Field Data, 2015

One sample t test was also used to find out factors which determine significantly the impact of migrant livestock keepers on the culture of natives. The results of the Table 4.12 show that all variables considered in this objective are the significant predictors of impact of migrant livestock keepers on the culture of natives. This is because all variables analysed have produced very small probability values ($p<0.0001$ to all variables). On the other hand it can be believed that natives of Kilombero valley have experiences significant change of ways of performing works ($p<0.0001$), marriage matters ($p<0.0001$), food and eating style ($p< 0.0001$), resolving disputes ($p<0.0001$), community governance ($p<0.0001$), traditional songs and dance ($p<0.0001$), language use ($p<0.0001$), baby caring ($p<0.0001$), worshiping ($p<0.0001$), dressing/clothing ($p<0.0001$) and greetings ($p< 0.0001$).

Table 4.12: The Impact of Migrant Livestock Keepers on the Culture of Natives-T test

	Test Value = 2.64					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Greetings	-10.960	99	.000	-1.150	-1.36	-.94
Food and eating style	10.308	97	.000	1.033	.83	1.23
Baby caring	-7.134	97	.000	-.905	-1.16	-.65
Traditional songs and dance	-5.657	99	.000	-.570	-.77	-.37
Resolving disputes	6.007	98	.000	.633	.42	.84
Ways of performing works	18.076	97	.000	1.799	1.60	2.00
Language use	-7.205	97	.000	-.834	-1.06	-.60
Marriage matters	12.915	99	.000	1.540	1.30	1.78
worshiping	-12.590	98	.000	-1.054	-1.22	-.89
Community governance	5.039	99	.000	.520	.32	.72
dressing/clothing	-9.248	97	.000	-1.007	-1.22	-.79

Source: Field Data (2015)

4.4.1 Work performance

The findings show that there was a big change in cultural ways of performing work in the area following the influx of migrant livestock keepers. It was argued that in the past the natives of the Kilombero valley practised communal work system like building, weeding, and pounding of cereals which does not exist today. Furthermore, this can be evidently with the shifting from the use of the hand hoe to ox-driven ploughs. The past method of cultivation (hand hoe) claimed low little productivity but shifting to the new method which is more advanced leading to great advantage to native farmers. It should be noted that the oxen have been introduced by migrant livestock keepers who have invaded the area. Also before their coming natives were not much engaged in keeping livestock but after interacting with keepers they started keeping animals. Msinde (2010) illustrated that social and economic networks between pastoralists and peasants have been increasingly,

their economic interests are so interlinked despite conflicts and each may have a reason to be interested with the well-being and functioning of the other

4.4.2 Marriage

From the study it shows that marriage matter change to very big extent following the influx of migrant livestock keepers in the area. This is because of social interaction between communities of different behaviours. It was reported that some of the traditional procedures of getting married have been removed following intermarriage between native and new comers. It was also highlighted that on past years both native and pastoralist parents could resist their youths from intermarriages and push them to marry within their own communities but now day's things have changed and intermarriage has become common in the area. One of the interviewed native women said that she had got fifty cows when her daughter got married to the Sukuma man (a pastoralist man). She was real happy of the wealth she obtained from such intermarriage-things which is not easy for the native men, who are agriculturalist, to offer as the dowry.

4.4.3 Food and Eating behaviour

The study revealed that the impact of influx of migrant livestock keepers has changed food and eating style to large extent. Originally the native (Wandamba) of the area are known for eating rice yams and fish only; its known that they can eat rice all year without changing. But after the influx of the migrant livestock keepers their eating style start to change and native found themselves eating food such as meat and milk which are the products produced by the migrants. However, migrants have introduced maize plantation together with banana in the area therefore the native are also eating maize and banana foods. Also, it was reported that migrants have introduced some primary crops like millet and sorghum.

However, it was reported that the native have taboos on eating specific species of both domestic and wild animals and this varied from one tribe to another. One of the interviews said that Wandamba were not allowed to eat donkey, zebra, warthogs and python. Wangindo tabooed eating Zebra, and Wapogoro were not allowed to eat bushbuck and civet. Marekano tribe could not eat warthog. In recent time, such taboos are not strictly observed any more.

4.4.4 Resolving disputes

Study result found that migrant livestock keeper has small changing the native cultural ways of solving disputes. This is due to the day to day conflict between livestock keepers and native the farmers. It is well known that now days Kilombero valley have turned to the battle field between pastoralist and agriculturalist. Farmers complain for livestock keepers feed their animal in their farms. This conflict is closer to the civil war since many people have been reported to lose their lives following the fight between the two groups. Both traditional weapons and fire arms have been reported to be used in the fight. This being the fact the natives have now become accustomed to the aggressive ways of solving conflicts among themselves; through fighting each other and in a many incidences through the use of the courts of law.

In the past natives could resolve conflicts peaceful with the help of elders through the intervention of the Ward Tribunal Councils where a stubborn individual could be given a punishment such as cleaning the roads, ponds and performing other unpaid community works. Surprisingly, today natives are solving their disputes in confusion ways some of them fail total to resolve their disputes and keep prolonged disagreement. Mofu's village chairman put it that his people have altered their traditional ways of solving dispute following the mixture of different tribes in their area. Therefore, the study concluded that migrant pastoralists have brought a new custom of solving disputes to the natives of the Kilombero valley.

4.4.5 Community Governance

Study revealed that migration of livestock keepers in the study area had small impact on community governance. It was argued that migrant livestock keepers are not engaging in the traditional politics of their hosts. The village administrations have been still governed by the natives. However, natives have been remaining using their traditional ways of obtaining their leaders. Nevertheless, the presence of the new cultural groups in the area can in one way or the other, directly or indirectly, affects administrations behaviour of the area. And this is why it was found that migrant pastoralists have at least brought some small changes in the community governance. The discussion continued to explain that the conflict between natives and migrant livestock keepers in the study area stems from the fact that these livestock keepers are ignorant of the village governance and regulation.

Respondents in this study revealed that in the past, all the residents of Kilombero valley had norms and customs. They used to keep their environment from degradation, but with the coming of livestock keepers and other external tribes into their lands, they crushed the tradition ways of life, thus causing massive degradation. Strong norms and customs existing in the area before their coming, nobody was allowed to trespass or dirty the rivers. If women were in their periods, they were also not allowed to go and do any activity in the rivers, but today things have fallen apart most of these traditional rules which are mainly for the environment and the entire community protection have been bleached. This indicates that the coming of migrant livestock keepers have in certain degree altered their traditional community governance on how they use to conserve the environment and the identity of the people in the area.

4.4.6 Traditional Songs and Dancing

The natives of the Kilombero valley traditionally own their tradition songs and dances which were widely practiced in their communities. Songs was used for ceremonial, religious and political. They were performed during funerals, to praise the departed, to console the bereaved, to keep people awake at night, to express pain and agony, and were also used during cleansing and chasing away of spirits. They were also played during ceremonies like beer parties, welcoming back the warriors from a war, during a wrestling match and during courtship.

Cultural evolutions according to the respondents have occurred and increase much when pastoralist groups migrated to and incorporated components of a new culture into their culture of origin. This is, in turn, lead to the traditional songs and dances to be performed in incidental purposes. The researcher also witnessed some children of the natives (Pogoro children) playing Masai dancing with Masai children. With these results the study accepted that migration of livestock keepers might have brought some changes in the traditional songs and dancing of the natives in the study area. In the cultural change case study by Kitabu (2012) also demonstrates that cultural interaction leading to diffusion of some element of culture such as traditional songs from one culture to another.

4.4.7 Language Use

According to findings, migrant livestock keepers had very small impact on language use of the natives. This may be due to the fact that when two or more languages interact lead

to language contact hence when migrant talks their tribal language the natives can hear them and try to cram. Also it was argued that the pronunciations of the natives have changes due to long contact with migrant livestock keepers. On other hand, for the case of the Migrant like Masai it beneficial to them since most of them they did not know how to speak Swahili but due to interaction with the natives now they are able to communicate well using Kiswahili which is a national language.

4.4.8 Worshiping

Religion provides the best insight into a society's behaviour and helps answer the question why people behave rather than how they behave. Most of natives of the Kilombero valley they are Roman Catholic. For migrants such as Masai, they believe in their own God, called "Engai", though it has two natures; kind and vengeful. They have a "Laibon", who is their spiritual leader. However, he doesn't have any higher position in their community, just prophetic or healing power. Study finding shows that the impact of migrant livestock keeper on the worshiping was negligible, it means that their presence do not affect the believes of natives. The native were resistant and insist they community to up hold their normal worshiping system hence no alteration of their believes encountered.

4.5 Adaptation strategies used by the natives to the livestock influx in the area

The findings shows that respondents gave different descriptionon the way in which communities have been protecting the natural resources in the area from migrant livestock keepers. Respondents also mentioned to have been protecting their culture from being engulfed by that of migrant livestock keepers. The findings show that some of the strategies used among others the following:

- Sustainable land use plan
- To reduce number of cattle by force removal of livestock keepers
- Use of village security guards
- Use of village by laws
- Educating children through traditional dances
- Traditional theatre

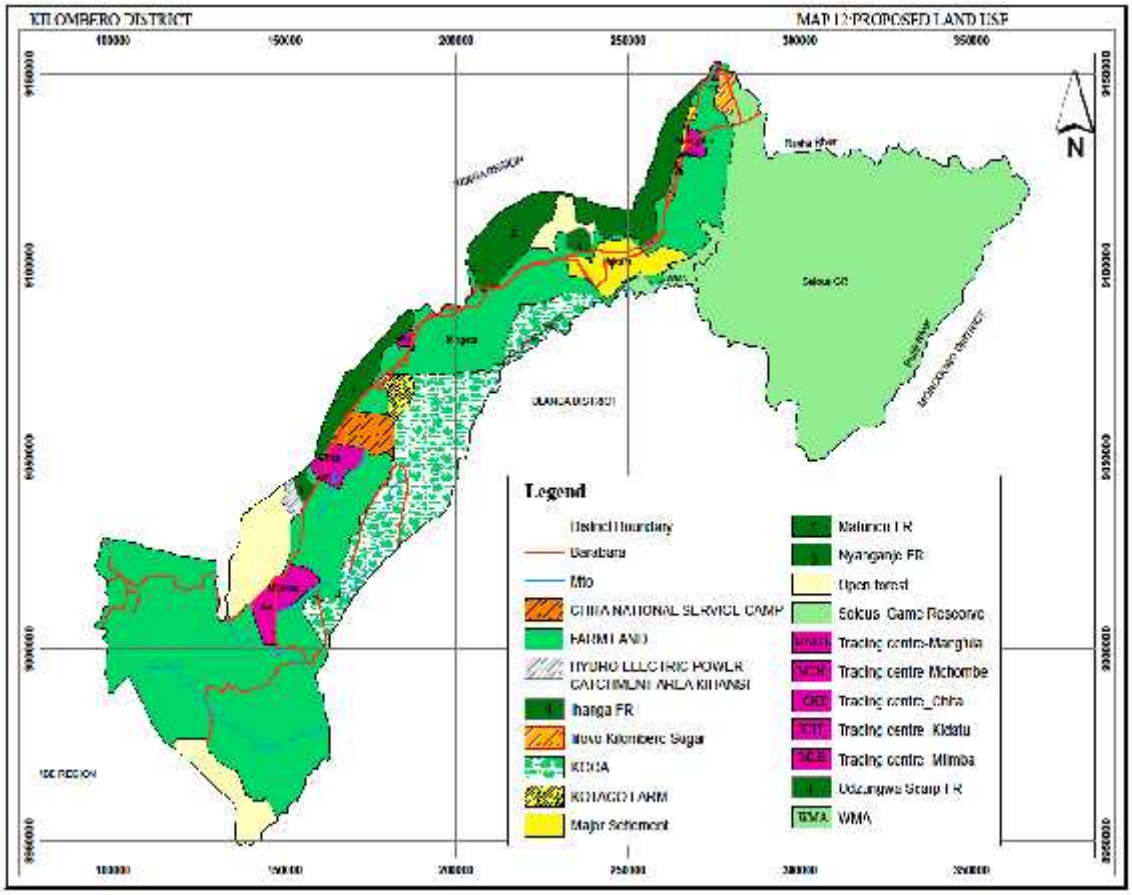
4.5.1 Sustainable Land use Plan

Most of respondents interviewed mentioned that sustainable land use plan was introduced in the area to protect natural resources from being swept away by livestock keepers. Under

this policy the pastoralists were given areas for grazing their cattle, and the penalty of Tsh 10,000 per animal found grazed outside the grazing zone was established as a way of keeping pastoralist in their areas agreed upon. The introduction of land use plans included also provision of all necessary livestock infrastructures such as water, dip tanks, stock routes and livestock markets. But it was reported that the policy did not work. Its implementation was reported to be challenged as pastoralist did not follow it, instead they grazed their cattle everywhere even in other people's farms. Ward executive officer of Utengule mentioned that village government allocated land for pastoralist in Kilombero valley but it was not enough because they invited their relatives and the number of livestock increases day to day hence the destruction of natural resources continued to exist.

A study by Mwambene et al., (2014) reported that migration of livestock keepers from Ihefu valley to Lindi and Rukwa regions, where the government established village land use plans in the selected villages received the pastoralists with an overall objective of demarcating village land area into different land use units such as cropping, grazing, settlement, forestry and reserved land before the arrival of pastoralists to conserve natural resource in the area and mitigate conflicts expected between farmers and the pastoralists. This study shows that establishment of land use plan in the Kilombero valley could be significant tool of protecting degradation of the Kilombero natural resources and a a solution for the on going conflict between natives and migrant livestock keepers.

Figure 4.5: Kilombero District land use plan



Source: Kilombero District Land Officer

4.5.2 Eviction

Most of respondent also mentioned that the action of government to evict pastoralist in Kilombero valley flood plain in 2012/2013 was one of the measure taken to conserve the natural resources in the area from being swept away by migrant livestock keepers. The process of eviction was carried out because cattle were degrading the Kilombero valley flood plain which is rich in ecology and biodiversity. This has been done in the ground that the Kilombero valley flood plain contains one of the world's key populations of the wetland dependent antelope known as Puku *Kobus vardoni*. It was also argued that one of the reasons for pastoralist eviction from Kilombero valley was because the area is among the wildlife migratory corridors. Moreover the area contain other rare species, and a number of rivers, which make up the largest seasonal freshwater in low-land floodplain in East Africa.

Although it is very rich in ecology and biodiversity, Kilombero valley has witnessed high level of degradation which has lead to reduction in the number of both animals and bird species. Due to that government decided to evict livestock keepers in the area in order to rescue the natural resource (Kitabu, 2012). It is estimated that 286,736 out of an estimated total of 500,000 numbers of livestock were seized and removed by a team of 400 people including police, officers from Regional and District.

4.5.3 By-Laws

The respondents revealed that village by-laws had been created to protect the natural resources in the study area. But the study noted that the by-laws were violated not only by migrant pastoralists by also by natives themselves. This being the fact the study suggested that there should be proper observation of the bylaws by both district and village councils. The enforcement can be facilitated by village local militias after being passed by district council. It was further noted that the village by-laws to protect natural resource in the visited village did not work because they were not powered by district council. It was recommended that the village land use plans should and bylaws be participatory.

4.5.4 Village Security Guards

In this study it was reported that increased number of livestock in Kilombero was not compatible with the natural resources of the area including the farms of the natives. Farms and crops were destroyed by the livestock of migrant livestock keepers. And when natives reported to respective authorities like police, noor little action was taken. The farmers and other natives of the area decided to form a traditional militia group (the Sungusungu) for self-defence. The role of this group was to catch livestock invading farms and to bring these animals to the Ward Executive Offices. Then the livestock owners should then report to the police and pay compensation for damage caused by livestock to get their animals back. But as the way of protecting themselves, migrant livestock keepers have also formulate their local militias group with the aim of solicit pastures while fighting the guard groups of natives. Therefore, the study has concluded that formulated militia groups by the native of Kilombero has not worked out well to protect village natural resources.

4.5.5 Traditional Theatre

The findings show that traditional theatres (in Swahili knows as Jando and Unyago) was used by the natives of Kilombero valley to protect their culture from being engulfed by that of migrant livestock keepers. In these traditional practices youth were taught different things about how they can behave in their societies. One of the respondents said that they Pogoro and Digo (some of the native groups) normally conducted traditional theatres after the harvest purposively to teach youth how to comply with their norms and values of their tradition. This saved as basic element to protect their culture because children grew up with the culture.

4.5.6 Elder's Taught Parents

One of the respondent said that *"….in our society elders are believed to have wisdom and they know many thing concerning lives as they are our fore learners"*. Contrary to that it was argued that elders were used to protect the culture of the native of the Kilombero valley from being consumed by that of migrant livestock keepers. Elders were said to be used in providing education to young parents through their traditional meetings. The matters taught include but not limited to how they can raise their children with good behavior according to their traditional customs. It was added that it is the shame for parent if the children deviate to their norms so the parent tries hard to educate their generation contrary to their ethics.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.0 Introduction

This chapter reviews the study background and objectives, and summarizes the researcher findings. Recommendations are provided to suggest possible solution to the impacts caused by migrant livestock keepers to the native and natural resource.

5.1 Summary

The intention of the study was to examining the impact of migrant livestock keepers on the natives and the natural resource of Kilombero valley in Tanzania. The study posed four investigative questions in order to attain its objectives. The questions were: how the migrant livestock keepers affected the activities of Kilombero natives? What are the consequences of the migrant livestock keepers on the natural resources in the study area? What are the shortcomings of migrant livestock keepers to the cultural aspects of the natives? What are the copying strategies taken by natives due to livestock influx in their area? The results obtain in the study to answer the above question can be summarized as follow:

5.2 Conclusions

The findings revealed that influx of migrant livestock keepers in Kilombero valley has both positive and negative impact on the activities of the natives. The influx of this livestock keeper was found to have increased trading, livestock keeping and agriculture activities of the natives. Trade was said to have increased due to the increase of the products manufactured both within the area and outside the area following the increase of the population. Migrants have also helped natives who are agriculturalist to get use of the ox-driven plough in digging-the technology which is highly productive compare to the hand hoes which were used by almost all natives before coming of migrant livestock keepers. Other activities such as service delivery and employment opportunity were found to have remained constant. On other hand activities such as fishing and hunting activities were found to have decrease. Statistically, the migrant livestock keepers in the Kilombero valley had constant effect since there was balance in both pros and cons of their coming in the area.

Through analysis of respondent opinion it's revealed that migrant livestock keeper has use natural resource of the area to the large extent. Resource such as water was reported to decrease while some stream in the area drying. Deterioration of resource such as land was founded due to overgrazing and expanding demand of land for agriculture. Also wetland resource was revealed that it was destroyed since livestock keepers use it as fodder for their animals during drought and they were cleared in order to get area for cultivation. Furthermore it was founded that there is decrease in vegetation cover and natural plants of the area due to overstocking of the area. Lastly study reveal wild animal in the area also was used by migrant livestock keepers.

Generally the findings showed that migrant livestock keeper cause small change in cultural element of the natives. Through analysis of findings of the study, the natives' ways of perfuming works was reported as the cultural element which has undergone very large changes. Marriage matters and as well as food and eating style was found to have changed large but not compare to the first mentioned element. Traditional songs and dance was also reported to have changed small. On the other hand the following cultural elements were reported to have not changed language of the natives, baby caring, worshiping, dressing/clothing and greetings.

It was revealed that natives of Kilombero valley have used some several methods to protect their culture and natural resource of the area, especially land, from being engulfed by the migrant livestock keepers. Nevertheless, the methods and/or strategies did not work properly due to the lack of proper supervision necessary for their implementation. However, those strategies were strongly challenged by migrants who were daily developing their strategies and techniques to defeat the natives. The study showed that the natives have used strategies such as formulation of sustainable land use plan, eviction of cattle by force removal of livestock keepers, use of village security guards (sungu sungu), and use of village by laws. Also, it's found that parents taught their children how to behave through traditional dances and traditional theatre (Jando and Unyago), and elders education to young parents were practised to protect culture from being swept away by migrant livestock keepers.

5.3 Recommendations

This study has ranged across a wide spectrum of impact of migrant livestock keepers on the natives and natural resource of Kilombero valley in Tanzania. Based on the findings of this study, the following recommendations were made:

In order to protect the natural resource of the area such as wetlands, land, water, natural vegetation and wild animals; the human activities such as agriculture and livestock keeping within the Kilombero valley must be managed well by both local and central governments through policy and legal frameworks which govern human development activities in a way that ensures sustainability and minimizes adverse impacts of these human activities in the area.

In order to attain the spirit of friendliness and peaceful living between agriculturalist and pastoralist in the area there is the need of developing and well implementing the village land use plans. This should go hand in hand with legal agreement between agriculturalist and pastoralist on how to use available natural resources in their area.

Creating awareness among communities through conservation education is important. When local communities are provided educations on different activities they can do without causing unnecessary threat to wildlife and other natural resource then conservation of resource will be attained. Education should be provided to children at primary schools, nursery level and even at college level but most important is that children they can educate their parents back home about conservation

Lastly successful co-existing approach between agriculturalist and pastoralist together with management of the natural resource in Kilombero valley will depend more on the cooperation between government departments, local authorities and the general local community around.

Further research should be carried out to investigate the implementation of the village land use plans in the study area and see how it has to resolved conflicts caused by immigrant pastoralists in the area.

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LIST OF APPENDICES

Appendix I: Questionnaire to the heads of the households (natives) of Kilombero Valley

Dear Sir/Madam,

Dear respondent, I am **Alto K. Mbikiye** a Mzumbe University student pursuing Master's degree in Development Policy.

As part of the programme, I am supposed to collect information which will help solving the problem. I am requesting you to set aside your precious time to respond to my questions. Your name will not appear in any data that is made publicly available. The information you provide will be used purely for the research purposes.

This questionnaire survey aims to better understand the impact of migrant livestock keepers on activities of the natives, their culture and the natural resources of Kilombero valley, and adaptation strategies used by the natives to the livestock influx in the area. In addition, demographic characteristics of the respondents' gender, age, educational level, occupation, will also be collected.

Dear respondent feel free to answer by writing in either Kiswahili or English language.

SECTION A: Demographic characteristics of the Respondent

1. Name of the Ward_____
2. Name of the Village_____
3. Gender of respondent:

M	F
1	2

4. Age of group of respondent:

21-30 years	31-40 years	41-50 years	51-60 years	Above 61years
1	2	3	4	5

5. Your level of education

Primary	Secondary	Diploma	Advance Diploma	Degree	Master
1	2	3	4	5	6

6. For how long have you been living in this area/village?

1-5 years	6-10 years	11-15 years	16-20 years	21< years
1	2	3	4	5

7. Your occupation?

Agriculture	Livestock keeping	Service	Business	Employed	Fishing
1	2	3	4	5	6

STECTION B: Objectives of the Study

8. Show how you would rate the extent to which migrant livestock keepers have invaded Kilombero Valley.

Negligible	Very small extent	Small Extent	Large Extent	Very Large Extent
1	2	3	4	5

9. Mention all activities performed by the native people in the valley

_____

_____

10. By referring to the impacts of migrants livestock keepers in this area, how would you rate status of the following activities in the area?

S/N		Has decreased little (1)	Has decreased little (2)	Remaining constant (3)	Has increased little (4)	Has increased very highly (5)
i	Agriculture					
ii	Livestock keeping					
iii	Fishing					
iv	Business or trading					
v	Service delivering					
vii	Manufacturing					
viii	Employment opportunities					
	Hunting					
	Mention other activities and rate accordingly					
ix						
x						

11. How would you rate cultural difference between your culture and that of migrant livestock keepers who have come in your area?

Negligible	Very small	Small	Big	Very big
1	2	3	4	5

12. Mention some of the cultural difference practiced between your community members and that practiced by migrant livestock keepers

S/N	Practice by your society	Practice by migrant livestock keepers
I		
Ii		
Iii		
Iv		
V		
Vi		

13. The study wants to know how the following cultural elements have been changing day by day in your area as you are regarding to the influx of migrant livestock keeper.

S/N		Negligible (1)	Very small (2)	Small (3)	Big (4)	Very big (5)
i	Greeting					
ii	Food and eating style					
iii	Baby caring					
iv	Traditional dance and songs					
v	Resolving disputes					
vii	Ways of performing works					
viii	Language use (words and accent)					
ix	Marriage matters					
xi	Worshiping					
xi	Community governance or leadership					
xi	Dressing/clothing					

14. In your opinions explain how influx migrant livestock keepers in your area have affected your culture.

_____

_____

15. Mention all natural resources in your area?

_____

_____

16. Mention the extent to which migrant livestock keepers have used the following natural resources in this area.

S/N		Negligible (1)	Very small extent (2)	Small Extent (3)	Large Extent (4)	Very Large Extent (5)
i	Water					
ii	Dry land					
iii	Wet land					
iv	Natural plants					
v	Wild animals					
vi	Fish					
	Mention other resources and rate accordingly					
vii						
viii						
ix						
x						

17. Mention all ways your community has been used to protect her culture from being engulfed by that of migrant livestock keepers.

    _____

    _____

18. Mention all ways your community has been used to protect natural resources in your area from being swept off by migrant livestock keepers.

    _____

Thank your Time

Appendix II: Interview Guide for Ward and Village Officials

Dear respondent, I am **Alto K. Mbikiye** a Mzumbe University student pursuing Master's degree in Development Policy. I am conducting a study on *"the impact of migrant livestock keepers on natives of Kilombero valley"*.

As part of the programme, I am supposed to collect information which will help in the problem. I am requesting you to set aside your precious time to respond to my questions. Your name will not appear in any data that is made publicly available. The information you provide will be used purely for research purposes.

1. What are the economic activities of the natives of Kilombero valley since independence of Tanganyika?
2. Is there any difference in economic activities of the natives 1980s compared 2000s? State clearly?
3. When do migrant livestock keepers started coming into Kilombero valley?
4. What do you think was the motive behind the coming of livestock keepers in the valley?
5. What has happened so far on natural resources (water source and forests) of Kilombero valley due to invasion of migrant livestock keepers?
6. What are remarkable changes in agriculture produce since the coming of migrant livestock keepers in the valley?
7. Are there any notable challenges on the natives' culture caused by migrant livestock keepers in the valley? Mention them.
8. What have natives done to cope with these challenges brought by migrant livestock keepers in their culture?
9. Is there any rescuing measures have been taken towards the demerits of migrant livestock keepers in the valley?

Thanks for your cooperation!