INFLUENCE OF COMMUNITY BASED WILDLIFE MANAGEMENT ON GREVY'S ZEBRA CONSERVATION IN WESTGATE COMMUNITY CONSERVANCY IN SAMBURU COUNTY, KENYA

BY

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A **Research Project Report Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Master of Arts in Project Planning and Management of the University of Nairobi.**

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DECLARATION

This research project report is my original work and has not been presented for award of degree in any other university.

Signed……..…… Date……...

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DEDICATION

This work is dedicated to my parents, Godfrey Mate and Nellie Mate; and my siblings, Crispus Mwenda, Karen Muthoni and Irene Kawira. Their support, encouragement, prayers and love were invaluable in inspiring me complete this study.

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LIST OF ABBREVIATIONS AND ACRONYMS

CAMPIRE: Communal Areas Management Program for Indigenous Resources

CEC: Conservation Education and Communication

CITES: Convention on International Trade of Endangered Species of Flora and Fauna

CREMAs: Community Resource Management Programs

CWM: Community-based Wildlife Management

GZT: Grevy's Zebra Trust

IUCN: International Union for Conservation of Nature

KWS: Kenya Wildlife Service

LIFE: Living in a Finite Environment

NGO: Non Governmental Organization

NOGR: Ngutuk Ongiron Group Ranch

NRMP: Natural Resource Management Program

NRT: Northern Range Trust

PRM: Participatory Rangeland Management

SADC: South African Development Community

SPSS: Statistical Package for the Social Sciences

SSC: Species Survival Commission

USA: United States of America

USAID: United States Agency for International Development

WPT: Wildlife Policy of Tanzania

WMAs: Wildlife Management Areas

WWF: World Wildlife Fund

ABSTRACT

Community based Wildlife Management (CWM) is a conservation approach whereby stewardship of wildlife rests at the local and not state level. It asserts that it is possible to improve rural livelihoods, conserve the environment as well as promote economic growth. The Grevy's zebra is one of the world's endangered mammal species. Over the past 18 years the population has declined by more than 50% leaving less than 2800 individuals in the wild particularly to the north of the equator in Kenya and south Ethiopia. This rapid decline has been caused by competition for resources with expanding human livestock populations, habitat degradation as well as loss of migration and dispersal areas for these animals. The purpose of the study was to examine the influence of community based wildlife management on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. The study was guided by four research objectives; to examine how community rangeland practices, community by-laws, conservation benefits accrued to the community and conservation education of the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. The study employed a descriptive survey design. The population for the study was 4000 and the sample size comprised of 351 community members. Data was collected by use of questionnaires. Construct validity was ensured by carrying out a pilot study. Findings revealed that majority (90.4%) of the respondents indicated that planned grazing as a rangeland practice had the greatest influence on Grevy's zebra. conservation. The study also established that community by laws had a positive influence to Grevy's zebra conservation as indicated by 72.4% of respondents who said that that the established by laws should remain and the 74.5 % of respondents who indicated that they comply with the laws. Further findings indicated that conservation benefits accrued to community such as improved infrastructure, employment within the conservancy and tourism influence Grevy's zebra conservation to a very great extent. Asked whether they would still conserve the wildlife if these benefits were withdrawn, 72.4 % of the respondents indicated that they would. As regards to conservation education, 90.4 % and 86.5 % of the respondents indicated that personnel from the conservancy and local barazas respectively played a very big role in providing conservation education to the community. This implies that community awareness has high conservation returns of Grevy's zebra conservation. 78.7% of the respondents indicated that Grevy's zebra population has increased in the last ten years and gave conservation education, good grazing lands and high birth rates as the top reasons for the increase. The study lastly concluded that community involvement in activities/meetings had increased regarding conservation issues. Based on the findings above, the study recommends that the community should be encouraged to form more environmental clubs in the school. The community conservancy personnel should increase awareness on the existence of environmental conservation and natural resource management courses to the community members. Furthermore, effective community participation should involve more than just attending meetings and volunteering for conservation activities. It is imperative that communities be actively involved in decision making processes at every level of wildlife management in order to create a sense of ownership in Grevy's zebra conservation. Lastly, there should be promotion of equitable benefit sharing mechanisms among the different zones in the communities as members living in certain zones indicated that they felt marginalized in distribution of employment opportunities. Further research is recommended to examine the influence of other key stakeholders involved in wildlife conservation.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Wildlife plays a significant role in any place that it is found and its value cannot be overemphasized. One of the most important values is its contribution to a people's economic wellbeing through revenue and wealth creation (Chasrdonnet, Clers, Fischer, Gerhold, and Jori, 2002). There is also the nutritional value of wildlife which has been a principle source of food for human beings since pre-historic times. Today the consumption of wildlife meat (bush meat) has diminished although some hunter gather groups still rely on wild meat. One also cannot deny the ecological value of wildlife as it interacts continuously with all the components of the ecosystem. To create a healthy balance within these ecosystem natural resource managers need to actively manage wildlife. Lastly some of the endangered species found in our environment provide important medicinal value, for example the Houston toad found exclusively in southeast Texas in the United States of America (USA) secretes chemical such as serotonin and alkaloids through its skin that protects it from predators. These chemicals are used as medicine to treat heart and nerve disorders in human beings (Ndiaye, 1998).

Community based Wildlife Management (CWM) is defined as the regulated use of wildlife population and ecosystems by local stakeholders (Mayers, Grieg-gran and Hughes, 2000). The local stakeholders may be a village, group of villages, an individual, group of individuals with a shared interest in the resource. The underlying thinking to this approach is that stewardship of wildlife rests at the local and not state level and that it is possible to improve rural livelihoods, conserve the environment as well as promote economic growth (Songorwa, Buhrs and Hughey, 2000).

CWM is an active participatory approach where communities are capable of carrying out wildlife management activities. It aims at empowering the communities in the whole process of wildlife conservation, from problem identification, to planning and designing projects as well as implementing and evaluating them. The main rationale of

CWM is effectiveness. Those in favor of this participatory approach argue that the local communities are better placed for wildlife management than governments because they are more familiar with the area and the wildlife within it (Leach, Mearns and Scoones, 1999).

Nepal is home to 861 bird species, of which six are endangered pheasant species. It also has about 640 species of butterflies, 6500 species of flowering plants as well as 175 mammal species (DNPWC, 2004). This country rich in biodiversity has had conservation policies that have evolved from emphasis on research and species preservation together with strict law enforcement policies to a more conciliatory and participatory approach. A number of successes in conservation, protection and utilization of biological diversity have been recorded over the years. This is owing to participation of communities in decision making. The buffer zone model and landscape approach towards biodiversity are the major participatory wildlife conservation initiatives in Nepal (Kafle and Balla, 2005).

In Central America there have been small initiatives that have developed owing to CWM. This is mostly in Guatemala and Nicaragua. In Costa Rica most of the people involved in community based wildlife management hold no land title and live on government land. Although conservation is a popular activity in the region it is done as a secondary means of income after subsistence farming by the local families. Nongovernmental organizations (NGOs) and international organizations are the main driving force of this approach in the region with the government playing a very small role (Gutierrez, Ortiz and Imbach, 2000).

The full adoption of CWM in South East Asia has been hampered primarily by the frequent migration of the people in the recent times. Countries like Lao, Indonesia, Vietnam and Cambodia have experienced mass migration due to conflict and state sponsored resettlement schemes. This social disruption is not conducive for local communities to be fully participating in the management of their wildlife. Because of this conservation planners have tended to rely on managing protected areas. However,

stakeholder involvement in the protected areas has been increased by linking biodiversity conservation to community development (Baird, 2000).

In Germany, management of protected areas has been such a subject of political opposition over the recent years that conservation of biodiversity has stalled. This has been caused primarily by the manner in which local communities have been engaged in the management of wildlife. There have been issues of miscommunication and misunderstanding between landowners and residents. Additionally the manner in which local communities have been consulted has been often considered rushed and of too narrow a focus. A case study done on the successful integration of nature conservation and regional economic development at Uckermark Lakes Nature park about 80 Km from Berlin showed that strategic management, good leadership and sensitivity to the needs of the local communities is more successful in ensuring proper management of protected forest and wildlife areas (Stole-kleemann and Riordan, 2002) .

According to Stein (2001), the USA supports more large-scale ecosystem types than any other nation on earth. These ecosystem are however being threatened by degradation, pollution and commercial exploitation with loss of habitat being among the greatest threat. Over many years the USA has established protected areas and enacted legislation in a bid to protect these biodiversity. Community involvement has also been seen as way of bridging the gap where the federal efforts have failed since the local communities can come up with sincere efforts that can provide lasting sustainable solutions in managing wildlife. However, Steelman (2002) states that there is a need to balance out the involvement of the community as sometimes they can compromise the gains made through environmental laws that have been set up by the government.

In Botswana local communities, NGOs and development agencies plan and implement their projects in community controlled hunting areas through the Natural Resource Management Program (NRMP). This was initiated in 1990 as part of a South African Development Community (SADC) plan to promote community based resource management (Reynolds, 1997). Some communities have obtained wildlife quotas after establishing a Quota Management committee and through these started joint ventures

with private business such as safari companies (Twyman, 2011). This community involvement has lead to creation of business, employment and the conservation of the wildlife because it is a source of income. A consultative study done in the Kalahari communities shows that there is a need to examine the form of participation communities are allowed to have. Planner centered participation has been shown to give communities few choices in involvement of wildlife management and rendering most projects done in those areas unsustainable.

Zimbabwe has initiated a number of projects and programs based on participatory approaches to wildlife management such as the Communal Areas Management Program for Indigenous Resources (CAMPIRE). The program seeks to empower the local communities in the tourism sector by granting them custodianship rights of the wildlife in their regions (Tsitsi and Muchemwa, 2011). The aim of such an initiative was based on the objectives of; Having flexible programs that could have long term natural resources problem solving mechanisms, increase ownership and territorial rights to wildlife by local communities, establish legal institutions that the communities can manage and make a living out of and finally, provide technical and financial support to communities that join such programs (Songorwa and Zealand, 1999).

Central Africa is considered geographically significant to Africa as it supports more than 60% of Africa's biodiversity due to the immense forest cover (Hakizumwami, 2000). Over the long term there has been a gradual decline of Central Africa's natural resources given the large rural population that relies on logging, mining and plantation subsistence activities. Central Africa over the years supported CWM due to the positive changes in national policies on the role of wildlife in driving the economy of the local communities (Ndiaye, 1998). This has helped in managing their dwindling natural resources in a sustainable manner for the benefit of both the government and the local communities.

Wildlife resources in Ghana have contributed immensely to the economic development of the country. It has also enhanced national development. In the course of utilization, this resource has been heavily depleted. Much of the depletion has been caused by

unsustainable wildlife management systems and lack of proper incentives for the proper use of wildlife as a resource. Consequently the government adopted better policies that have enabled communities to participate more actively in the management of wildlife. One of the national programs that arose from the change of policies concerning wildlife management is the Community Resource Management Program (CREMAs). This program considers that rural people play an important role in conservation of wildlife. It uses community as the management unit and integrates wildlife management with existing community land use so that there is mutual benefit and sustainability (Forest and Ministry of Lands and Natural Resources Ghana, 2012).

In 1998 Tanzania adopted a new wildlife policy based on the view that wildlife would only survive in the long run if communities got a chance to experience its value directly. Community participation in the conservation and management of wildlife resources is enshrined in the Wildlife Policy of Tanzania (WPT). The four objectives that support community participation in the protection and utilization wildlife resource within the policy are; promoting conservation of wildlife outside core protected areas by establishing Wildlife Management Areas (WMAs), transferring management of WMAs to local communities, ensuring wildlife is appropriately valued by encouraging sustainable use by local communities and lastly to create a conducive environment to ensure that legal and wildlife schemes directly benefit local communities (Baldus, Hahn, Kaggi, Kaihula and Murphree, 2001).

Kenya has over the years evolved in her approaches to managing and conserving wildlife from the Protectionist concept where wildlife resources were predominantly managed by the state to the community based concept that emphasized that local communities have rights and responsibilities over managing wildlife (Mburu, 2004). The Kenya Wildlife policy (2011) remains supportive on the establishment of community wildlife sanctuaries and areas to ensure community participation in managing wildlife. Under the Kenya Wildlife Service (KWS), the adoption of the Community Wildlife Programs strategy that advocates for community participation in wildlife conservation outside protected areas

with tangible benefits to the local communities has led to a gradual increase in the number of wildlife conservancies and sanctuaries in Kenya.

The Westgate Community Conservancy located in Samburu County was formed in 2004 by the owners of Ngutuk Ongiron Group Ranch (NOGR). It borders Kalama Community Wildlife Conservancy to its east, Meibae Community Conservancy to the northwest, Samburu National Reserve to its south, and Namunyak Wildlife Conservation Trust to the north. Its southern and western boundary is the Ewaso Ngiro River. The community conservancy is managed by representatives who are elected among its registered members during their Annual General Meetings. It was established with the help of Northern Range Trust (NRT) which is a community based initiative in the arid and semi arid rangeland of northern Kenya. It was set up in 2004 with the aim of developing resilient community conservancies that transform lives, secure peace and conserve natural resource (Northern Range Trust, 2007).

Lalampaa (2012) states that the goal of West Gate Community Conservancy is to " improve the livelihoods of its residents by providing a platform for sustainable protection and utilization of resources within NOGR for income generation through natural resource related enterprises that shall address health, water, education, livestock, and infrastructure and wealth creation for present and future generations". The long-term goal of the conservancy is to increase the capacity of the local community to manage the group ranch with particular emphasis on their valuable population of Grevy's zebra so that the land retains its ecological importance for the species (http://www.samburupedia.info/tourism/index.php/eco-tourism/westgate-conservancy.html). Additionally the conservancy gives access to other programs that benefit the community by government agencies, the private sector and NGOs.

Other key wildlife species found in the conservancy are lions, waterbuck, elephant, lesser kudu, warthog, Grant's gazelle, Somali ostrich and impala. However, the Grevy's zebra has undergone an appalling decline in the past 30 years and now only occurs in northern Kenya and southern Ethiopia (Nelson & Williams, 2003). Among other

priorities, the conservancy was formed to help with conserving this endangered animal (see appendix 1 for picture of a herd of Grevy's zebra grazing within the Westgate Community Conservancy) According to (http://www.samburupedia.info/tourism/index.php/eco-tourism/westgate-conservancy.html) the conservancy provides important habitat the wildlife. Westgate community provides critical grazing area for approximately 400 Grevy's zebra during the wet season and approximately 150 animals during the dry season especially in the Loijuk area found between Westgate conservancy and Kalama conservancy (Low, personal communication, October 31, 2014). The conservancy helps conserve the Grevy's zebra by monitoring the species and their habitat closely to ensure the conservancy remains ecologically important to the Grevy's Zebra among other wildlife.

Many studies have been conducted on how wildlife benefits the communities around them. A study conducted by Lekalkuli (2011) on factors influencing the emergence of community wildlife conservancies indicated that socio-economic ranked high on the list. In the CAMPIRE program in Zimbabwe we see that local communities manage wildlife as a resource that if properly sustained improve their quality of life (Roe & Jack, 2001). Lalampaa (2012) did a study on the role of community based conservation on poverty reduction in Westgate Community Conservation. He concluded from his research that improved security, enterprise development and institutional governance contributed the most to poverty reduction in the area. On the other hand improved rangeland management and wildlife conservation influenced poverty reduction in the area the least.

There is sufficient research that has been carried out to examine whether and how communities involved in conservation and management of wildlife benefit from these wildlife resources (Hoyt, 2001; Lalampaa, 2012; Songorwa, 1999; USAID, 2002). However there appears to be a gap in documenting the link between community involvement in wildlife conservation and management to species conservation. In light of this, the study intends to determine the influence of Community based Wildlife

Management on Grevy's Zebra conservation by studying the Westgate Community Conservancy in Samburu County.

1.2 Statement of the problem

The Grevy's zebra is one of the world's endangered mammal species. The Grevy's zebra is currently range restricted to the north of the equator in Kenya and south Ethiopia. They historically also existed in Djibouti, Sudan and Eritrea and Somalia although they are now extinct in these regions (Bauer, McMorrow and Yalden, 1994). The Grevy's zebra is listed as Endangered A1a, 2c by the IUCN (International Union for Conservation of Nature) /SSC (Species Survival Commission) Equid Specialist Group and is also listed on Appendix I of the Convention on International Trade of Endangered Species of Flora and Fauna (CITES). It is also legally protected in Ethiopia (Moehlman, Rubenstein and Kebede, 2013).

Over the past 18 years the population has been seen to have declined by more than 50%. There are less than 2800 individuals remaining in the wild. Numbers have dropped from an estimated 15,000 in the late 1970's (Grunblatt, Said and Nutria, 1989) to a low of between 1,700 and 2,100 animals at the turn of the millennium (Nelson and Williams, 2003). According to the total aerial count of Grevy's zebra done in November 2012 in Laikipia-Samburu-Marsabit ecosystem the minimum wild population was established to be 1897 (Ngene *et al*, 2013).

This rapid decline has been caused by competition for resources with expanding human livestock populations and the resultant habitat degradation threats from human encroachment (Williams & Low, 2004). This is especially evident considering that the present day range of this species overlaps with pastoralist communities of Ethiopia and Kenya which includes the Afar, Somali, Borana, Hamar, Arbore, Dassenetch, Turkana, Samburu, Aarial, Rendille, and Gabbra in Ethiopia and Kenya (Mwazo, 2008). This overlapping has exacerbated the problem by causing reduced access to water resources as well as loss of migration and dispersal areas for these animals. The Hamar, Arbore, Dassenetch, Borana and Turkana are also known to poach these animals for food which

has led to the continual decline. Another important contributor to the population decline is that until the early 1980s when CITES listed a hunting ban on the Grevy's zebra, hunters would kill these animals for their skin for trophies and also export the skin in the markets of Europe and North America (Williams, 2002).

The situation is made worse when local communities living around these animals do not benefit from wildlife resources and are left out of wildlife related businesses that are profitable, for example the tourism industry. Barrow, Bergin, Infield, and Lembuya (1995) state that a significant condition for the success of wildlife conservation in community areas is that equitable amounts of wildlife revenues must remain in the hands of the community and that the revenues reach majority of the community members in a manner that is transparent and easily understood. Barbier (1992) asserts that if the community members realize the benefits of conservation they can create and increase interest in conserving.

The Grevy's zebra is a flagship species being used to promote the overall conservation of wildlife in the northern parts of Kenya which includes Westgate Community Conservancy in Samburu County. Communities have been tasked with the responsibility of conserving the Grevy's zebra among other wildlife even as they benefit from these animals. This is in tandem with the requirements of all the people of Kenya to achieve the national values as provided in Article 10 of the Constitution of Kenya (2010), to among others, participation of all people towards sustainable development (The Constitution of Kenya, 2010). This is particularly necessary considering that the Grevy's Zebra are dependent on resources used by pastoral people and their livestock. With this increase in human and livestock populations access to water and forage has become more difficult causing loss of habitat for the Grevy's zebra (Hack & Rubenstein, 1998)

Failing to honor this duty will result in a number of negative effects. Firstly, the eroding of unique status that Kenya has obtained as one of the two countries that have a

viable population of Grevy's zebra in the wild. Secondly, this will adversely interfere with the biodiversity of the ecosystem as 'wildlife fulfills critical ecological functions that are important to the interconnected web of life supporting systems' (Udoto, 2012). Thirdly there will be a direct ripple direct on the benefits that already accrue and or are enjoyed by the community by conserving wildlife. These include the health centers, schools and employment that come as a result from profits of wildlife resources. Exposure to other cultures and overall standards of living and quality of life would also go down. Not only will this negative effect impact the local community but will spill over to the county and national level as it will have a direct impact on development of Kenya that heavily relies on tourism to build its economy.

1.3 Purpose of the study

The purpose of this study was to examine the influence of community based wildlife management on Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County.

1.4 Objectives of the study

The study was guided by the following objectives:-

1. To assess how community rangeland practices influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County.
2. To establish how community by-laws influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County.
3. To determine the extent to which conservation benefits accrued to the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County.
4. To examine how conservation education of the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County.

1.5 Research Questions

The study sought to answer the following research questions:-

1. How do community rangeland practices influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County?
2. How do community by-laws influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County?
3. To what extent does conservation benefits accrued to the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?
4. How does conservation education of the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?

1.6 Significance of the study

The Samburu community living in Westgate community would hopefully benefit from the results of this study. The information from the study would reveal whether their efforts of conserving and managing the Grevy's zebra population have been a success. The results from the study may expose any gaps that exist in their strategy as well as provide recommendations on how to continue conserving the population in a sustainable manner. Other wildlife conservancies in the Samburu County as well as Laikipia County may benefit from the study by having relevant information they can use to base their conservation decisions on.

To the Kenyan government and the relevant policy makers this study would hopefully be useful in providing information to further improve already existing wildlife policies to ensure that wildlife are indeed conserved and managed in a sustainable manner and that the communities also benefit from this participation. Donors and other important stakeholders like the Grevy's Zebra Trust (GZT) which was established to conserve Grevy's Zebra in collaboration with local communities would also benefit from this study by having access to information on the progress of the conservation efforts in the area.

This study would add to the existing literature on the influence of community based wildlife management on the conservation of Grevy's zebra. Consequently other researches and academicians may benefit from the knowledge generated from this study. Research on the conservation of Grevy's zebra is still at its early stages and contributions to the knowledge gaps will form the basis upon which other studies will be done.

1.7 Basic assumptions of the study

The basic assumption of the study was that the officers, managers and community members from the conservancy will give honest and accurate information.

1.8 Limitations of the study

A limitation of the study was the illiteracy of the respondents from the community since a large portion of the community members is not conversant in English. To address this problem the researcher intends to work together with native speakers from the community who were trained to administer the questionnaires face to face, to translate the questions and record the respondents' answers. Another likely limitation was that some respondents may fail to cooperate in giving the required information. In such instances the researcher informed the respondents of the reasons for the research as well as the benefits accrued from the research with an aim of gaining their cooperation. The final limitation of the study was the resources allocated for this study in terms of money and time. To maximize on these resources the researcher planed well.

1.9 Delimitations of the study

The study was confined to Samburu County and particularly Westgate Community Conservancy The study was also confined to the four factors namely rangeland management, community by- laws, conservation benefits and conservation education in examining the influence CWM has on conservation of Grevy's zebra in Westgate Community Conservancy.

1.10 Definition of significant terms used in the study

Community based Wildlife Management- The regulated use of wildlife populations and ecosystems by local stakeholders with a shared interest in the resource. In this proposal the local stakeholders refers to the community members of Westgate Community Conservancy.

Grevy's zebra conservation in Westgate Community Conservancy- Activities that the community members at Westgate Community Conservation are involved in to ensure the continued survival of the Grevy's zebra species. These activities may include teaching conservation education, sustainable use of the land, making water resources available for the animals among others.

Community rangeland practices- This involves the proper use by community members of grazing land to ensure that there is consistent livestock production and, at the same time, conservation of range resources.

Community by-laws- These are rules and regulations enacted by a community to provide a framework for its operation and management. These by laws control the internal affairs of the community and govern the roles and responsibilities of the members within that community. In this study community by laws refers to regulations on issues such as land use, hunting and sharing of wildlife benefits.

Conservation benefits accrued to the community- The profits and products realized when a community is involved in conservation activities. It can also be referred to the positive outputs accruing from conservation. The community benefits referred to in this study is based on the wildlife conservation activities that the community members are involved in and include improved infrastructure, health centers, tourism, and employment among many others.

Conservation education of the community- The teaching of community members to appreciate their natural resources and how to wisely use those resources, in this case wildlife in a manner that benefits them and the future generations. It involves activities and programs such as community sensitization on the importance of wildlife, practices that are harmful towards wildlife and active community participation in conservation activities.

Westgate Community Conservancy- A wildlife conservancy established in Samburu County that is managed by members of the local community residing in Westgate area.

Grevy's zebra- It is the largest living wild animal in the equidae family known for having the thinnest stripes among the zebras. It is listed as endangered in the International Union for Conservation of Nature Red List of threatened species

1.11 Organization of the study

The study was presented in five chapters. The first chapter covers the introduction to the entire study and entails: background of study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of study, basic assumptions, limitations of the study, delimitations of the study, definition of significant terms used in the study and organization of the study.

Chapter two focuses on review of the related literature on the influence of community based wildlife management on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. It also includes the theoretical framework, conceptual framework as well as the summary of literature.

Chapter three focuses on the methodology used in the study. It gives a description of research design, target population, sample size and sampling procedure, research instruments, data collection procedures, data analysis techniques, ethical considerations as well operational definition of variables.

Chapter four focuses on the data analysis, presentation, and interpretation of the research findings.

Chapter five concludes the study with summary of findings, discussions, conclusions and a number of recommendations suggested for further research based on the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The purpose of this chapter is to present the literature relevant to the subject of this study in order to set the context for the subsequent analysis and discussions as well as to identify knowledge gaps in literature that this study tries to bridge. The chapter starts by highlighting and expounding on the meaning, history and approaches to Community based Wildlife Management (CWM). The focus then moves to more specific literature on community rangeland practices, community by-laws for wildlife management, and the benefits of community based wildlife management and community conservation education in order to identify relevant research and determine the contribution that this study makes to the body of available literature.

2.2 The concept of Community Based Wildlife Management

An important goal for CWM is to create, through an active participatory approach and cooperation between communities and the respective governments, conditions whereby a maximum number of people in wildlife areas benefit, both directly and indirectly, from the sustainable management and utilization of wildlife (Songorwa, Buhrs and Hughey, 2000). The (CWM) is a solution that led the wildlife authorities to cooperate and partner with the local communities in the control and management of wildlife. The wildlife authorities also realized that the communities are rightful beneficiaries of wildlife. The main aim of CWM is to empower and actively involve communities in the process of wildlife conservation.

The colonial government of Botswana and Zimbabwe in their establishment years always thought that the local communities lacked the will, the training and the knowledge to manage wildlife in a sustainable way. For this reason, the control of wildlife and land was placed in the hands of the state. Local communities were thus forced to relocate and were distanced from the resources they and their authorities had once owned and controlled (Hitchcock, 1995). The local communities were instead seen as the primary threat to wildlife. The wildlife authorities, the government at that

time thus focused their attention on stopping the members of these communities from 'disturbing' these protected areas and the wildlife therein. An example was the policy adopted by the Kenyan and Zimbabwean authorities to 'shoot-to-kill' or 'shoot-on-sight' as a policy against poaching. This approach was called the protectionist approach, or the fences-and-fines approach (Songorwa, Buhrs and Hughey, 2000). It caused a lot of skepticism, lack of trust and even stirred hatred between the communities and the wildlife authorities (Muth & Bowel, 1998). This approach introduced by the colonists is now agreed by conservationists and international conservation organizations to have failed to protect wildlife mainly because it failed to take into consideration economic and other interest of local communities such as the decisions they would make concerning wildlife.

Top down approaches to management of wildlife involved the establishment and expansion of protected areas. It also included the creation and enforcement of legislation and establishment of modern systems of resource possession. These approaches attempted to protect and preserve the wildlife for future generations. Applied biological research, enforcement of wildlife legislation, patrols by authorities and infrastructure maintenance are some of the activities that promoted this approach (Brandon and Wells, 1992). According to Nelson, (2009) these approaches neglected the traditional role of wildlife in African culture and displacement of local communities from their ancestral lands for example, the expulsion of Maasais from the Serengeti in Tanzania and the Okiek hunters and gatherers from the Mau forest in Kenya.

The top down approach had two main components namely wildlife management and community economic development. It is said to have originated from the shift in environmental politics from the exclusionist paradigm. This paradigm assumed an unlimited supply of natural resources but excluded human beings. On the other hand, the alternative paradigm included human beings and argued that there is a limited supply of resources. It advocated for public involvement of wildlife management, devolution, power sharing, empowerment and a shift of concern from wildlife to the

well being of humans (Porter *et al*., 2000). There are also other different approaches to managing wildlife on privately owned lands. The species richness approach involves providing support to as many wildlife populations as possible by providing a varied habitat. This approach, attempts to provide habitat for a selected species. The key here is to identify the precise habitat requirement of the selected species and provide those that are in shortest supply (Clemson Cooperative Extension, 2009).

The participatory approach to conservation was introduced as a way to address local people's concerns by emphasizing the importance of linking their economic activities with managing of protected areas. This approach includes the locals in the planning and management of wildlife. The USA African Development Foundation (2010) described local participation as a process through which all members of a community or organization are involved in and have influence on decisions related to development activities that will affect them. Therefore this implies that development projects will address those community or group needs on which members have chosen to focus, and that all phases of the development process will be characterized by active involvement of community or organization members.

The participatory approach to wildlife management includes active and passive participation; Passive participation describes a situation where there is limited input from the community into control and decision making and active participation describes where there is extensive contribution to decision making. International Institute for Environment and Development (1994) states that from an economic perspective, passive participation initiatives provide a larger range of benefits to communities than the top-down approach, by incorporating benefits for local communities. Such participatory initiatives have intended to reduce the cost of conservation particularly the protection costs. Active participation attempts to establish equitable partnerships so that everyone has an equal chance to partake in the analysis, establishment and implementation of action plans, in order to incorporate stakeholders' priorities into their management strategies. Decision making power is shared in this approach; outsiders act

as catalyst to the set projects while formation of community groups is encouraged. Several participatory approaches are a combination of both the ‘active’ and ‘passive’ approaches.

The Chon-Kemin Wildlife Management Area (WMA) located in the Northern Tien-Shan in Kyrgyzstan, Central Asia, was initiated by local people with the support of the government. The WMA is characterized by endangered species such as the deer, lynx, snow leopard, the tien-shan bear, golden eagle and vulture (Kumar, 2014). The decision to set up the community-based conservation organization came from the local communities as a result of significant depletion of wildlife beyond The State National Park ‘Chon-Kemin.’ This depletion occurred as a result of overgrazing and uncontrolled poaching that was occurring in the area. The wildlife area is of social value to the surrounding community as they depend on its natural resources such as forests, berries and fruits and pasture land. In the past, the communities benefited from trophy hunting, although presently rely more on eco-tourism and park visitors by providing services such as horse renting, hostels, selling handicrafts, among other activities (Federal Agency for Nature Conservation, 2013).

In Zimbabwe, the CAMPFIRE program was established and rolled out in1986, in order to foster community participation in wildlife management. CAMPFIRE focuses on the basic principles of re-empowerment of local communities through providing them with access to, power over and taking up responsibility over natural resources (Tsitsi and Muchemwa, 2011). This program continues to be implemented by various institutions such as the Department of National Parks and Wildlife Management, with the Center of Applied Social Sciences at the University of Zimbabwe, the Zimbabwean Trust and the CAMPFIRE Association. The program has been a success in some areas such as reawakening the value of wildlife in people of the West Hurunge communities, reducing complaints about wild animals, a reduction in poaching, an increase in household revenue, funding to schools and clinics, among others (Ngwerume and Muchemwa, 2011).

2.3 Community Rangeland practices and Grevy's zebra conservation

Community rangeland practices attempts to incorporate the goals of sustainable development, conservation and community participation. Historically, rangeland was managed according to the customary government systems, which was working well until only recently (Svejcar and Sheley, 1995). Traditional rangeland practices in Africa were led by council or tribal leaders. They controlled the overall management and utilization of the communally owned land, and granted permission to pastoralists from other ethnic groups who were interested in using the land. Getting permission was not difficult for the ethnic groups as pastoralists from the study areas had a culture of sharing resources (Oba, 1998). Land was almost all communally owned and utilized.

Other traditional rangeland practices were based on the ecological concept of the climax plant community. Climax community is the plant species that dominates a site if there is no disturbance. This concept assumes that if such disturbances as overgrazing and drought are removed and returned to their normal levels, it would allow the plant community to return to its climax level (Smith *et al*., 1995). This concept has been used on agricultural fields with the intention of reviving the native vegetation, however this concept has failed several times. Consequently the 'state-and-transition' approach whereby plant communities known as states enable changes from one community to another are listed down and managers refer to guide their decisions as an alternative. This model has however been limited in predictive capability as the models lacks in scientific mechanisms and explanations for why changes occur and a framework for combining science and management (Sverjcar and Sheley, 1995).

Currently, pastoralists in Ethiopia own small plots of rangeland and cropland for crop production and this allows private management of rangeland and forage conservation during wet seasons. Private ownership of rangeland also allows for families with less livestock to enjoy full benefits of the rangeland. The rest of the land is still owned communally and is similar to what many pastoralists have in many areas of East African countries (Abule *et al*, 2005). Grazing land was also not allocated according to

seasons. Instead, they set aside small enclosures for use by sick animals, lactating cows and calves during feed shortage periods. This practice was famous with the Borana and Benna pastoralist communities in Kenya. Despite their effectiveness, and relatively low cost of hiring herders, these traditional systems have not been adopted perhaps because they didn't fit into the fenced 'ranch' model (Oba 1998).

According to Maryam Niamir (1991) majority of pastoral groups have many types of rangeland practices for example grazing reserves and pasture deferment method that are used to reserve forage for critical Sahara periods. An example is the Zaghawa community in Chad who move their livestock north, to the desert in parallel portions to save an ungrazed portion for their return to the south. The Pokot in Kenya defer using areas with termite-resistant grass during the wet season so that they can preserve good fodder for the dry season. This approach has been shown to increase the carrying capacity by 50% in Amboseli National Park. Herders also have rules regulating the incidences of movements and camp locations. They also closely monitor their livestock and environment for indicators that they need to move and the best direction to take. In Mauritania, the Fulani evaluate the quality of range by examining soil types, the behavior of livestock, the presence of specific key forage species and presence of wildlife. The Samburu also monitor for pasture degradation by observing the grass and browse availability (FAO, 1991). The Wange Community in Zimbabwe with the help of The African Center for Holistic Management have been working to better their livelihoods by making decisions based on what they envision for the wildlife, people and domesticated animals living side-by-side with them Participation of the villagers has demonstrated that water, land and biological resources can be restored (Savory and Butterfield, 1999).

Another concept in rangeland practice is threshold which is defined as a change that is difficult to reverse (Archer, 1991). Ecological thresholds also describe abrupt changes in ecological properties in time or space. In rangeland practices, thresholds reflect changes in vegetation and soils that are expensive or impossible to reverse. Recognition of states and thresholds is useful for rangeland evaluation and management as managers

often make decisions with threshold in mind as they now consider a broader array of ecosystem attributes and behaviors when evaluating the state of rangeland (Tongway and Hindley 2004). Consequently, mangers are now better prepared to handle the changes that they may see and the solutions that are available for them. Threshold is also used to prioritize management and restoration programs in large areas since land areas that do not show degradation towards threshold or that have crossed threshold are of low priority since they are unlikely to respond to restoration efforts. Focus is more on 'intermediate' states where low cost grazing management and restoration efforts are more likely to be successful (Bestelmeyer, 2006).

2.4 Community by-laws and the Grevy's zebra conservation

Wildlife laws vary from country to country but at minimum should describe the status and the functions of the wildlife in the country and articulate variety of reasons for control of its use such as aesthetic values, historical value, food value, conservation of genetics, among others. The laws should also describe the major factors affecting wildlife and the function of the institutions and structures in place in conserving them. The available policies should also confer management and control of wildlife to the local communities, allowing them to establish local government structures in order to accomplish this (McHenry, 1994). Wildlife policies should also take into account other non-wildlife laws especially those relating to forestry, land tenure, fiscal, local government that relate to wildlife management as they may have greater impact than the wildlife specific law itself (Moore, 1985).Caldecott *et al*., (2005) also points out the role traditional knowledge systems as vital when establishing species conservation and management strategies due to the close relationship between cultural diversity and biodiversity. For example the United Nations Convention on Biological Diversity calls for stakeholders to respect and apply knowledge and practices of local and indigenous communities relevant for the conservation and sustainable use of biodiversity.

In Namibia, the earlier devolution created a dual system where white farmers had property rights and incentives to protect wildlife on their property while black Namibians had limited rights over wildlife and could not afford access fee to hunt. The

Namibians often cooperated with poachers in order to gain from the wildlife on their lands (Alpert, 1996). The white farmers also held a thicker bundle of property rights that enabled them to benefit from trading opportunities, unlike the Namibians who had thinner bundle rights and couldn't flourish in ways they found satisfying (Boudreaux, 2005). The government began to resolve these differences in the early 1990s in order to provide rural citizens with a more valuable property right bundle. They did this through a participatory approach and identified the problems that the local communities were facing, drafted Policy on the Establishment of Conservancies, partnered with the United States Agency for International Development (USAID) to develop a project by the World Wildlife Fund (WWF) called Living in a Finite Environment (LIFE). The government then devolved rights to manage and benefit from wildlife to local people through adoption of policies and legislation.

In Cameroon, Joint resource management between the local citizens and government is seen as an integral to 'good governance' (Brown, 1999). For the law to succeed, processes that involve negotiation, rights sharing and privileges such as decision making by various stakeholders, and the recognition of these by government and an array of resource users (Ingles et al., 1999). Allowing such laws and policies may increase resource flows to wildlife dependent communities, promote reforms of institutions, devolve management responsibilities and create new partnerships that involve access and changes in ownership (Brown, 1999).

The usefulness of incorporating local belief systems and modern conservation strategies among the Cross River gorilla was studied in Lebialem Division Cameroon, through a survey that assessed local perceptions of human-gorilla totemic kinship practices and taboos against hunting and eating of gorillas. The villagers interviewed agreed that gorillas were totems of the people living in the village and therefore these people did not hunt or eat gorillas. As a result, the hunting of gorillas is banned in all the 5 villages surveyed. These traditional controls could be key in the survival of a gorilla population especially where law enforcement is near nonexistent. Etiendem *et al*, (2011) states that no gorilla hunting has been reported in this area in the past 15 years largely because of

this belief. These beliefs that forbid exploitation of the species have been considered as a successful local conservation strategy. These taboos are still in place and are still respected.

Pastoralist Maasai communities of Northern Tanzania managed land according to locally agreed upon rules that are designed to manage and conserve key resources such as water sources and pastures. Pastoralist management practices such as maintaining the grazing reserves helps to conserve wildlife on their lands. Wildlife relies heavily on these managed lands. Pastoralists and wildlife continue to coexist, with pastoralists having little negative impact on both diversity and density (Nelson, 2009). The Loita Forest in Northern Kenya is an example of a forest that has successfully been conserved as a result of customary measures. Isolated forests in northern Kenya and scarce sources of water are protected by local Borana communities through rules that govern access and activities such as permanent settlement around the area or tree felling.

Maasai communities also divide their pastures into different types of areas that are governed by traditional rules (Bassi, 2006) for example wet season pasture and dry season refuge that retain vegetation that livestock and wildlife can access during the dry season. There is also pasture close to the source of water and the settlements that is allocated for weak and sick livestock. These pastures are allocated to particular households for management, rather than being managed at the village or community level.

2.5 Community conservation benefits and Grevy's zebra conservation

Community-oriented approaches to wildlife conservation are based on the premise that there will be a 'win-win' situation if local communities are involved in wildlife management and will benefit economically from this participation. Community conservation activities have a strong economic rationale; they aim to simultaneously improve the socioeconomic status of people while maintaining wildlife populations. Some expected short term benefits of CWM are socio-economical and tangible such as health clinics, hospital drugs, roads, cash, even food. These act as motivation for local

people to actively participate in the programs (Songorwa, 1999). The fact that wildlife can generate such benefits in turn forms a precondition for community-based wildlife conservation. Wildlife is now known to support an array of ecological services, intrinsic cultural aesthetic and ecosystem functions. Such benefits build up from local to national and even global level (Emerton, 1999).

Community conservation is a bottom up approach which can unite communities and support them to solve their own problems leading to improved communication among them, information sharing and problem solving skills. These approaches respond to community and environmental needs, and use resources efficiently by facilitating pooling of resources among the community members and drawing upon available community resources thus making it more effective than the top down approach. Individuals benefit from the above approach because as volunteers they enjoy the conservation process, they are satisfied the process and they grow within the process (Ringer, 1996). Such communities can also increase their understanding of how governing bodies operate, and how they balance between needs and interests. This improves the support to governments and reduces skepticism among the communities as stated by Thomas (1995). Other benefits of community based approaches include social and psychological benefits for those who volunteer for the approach, development of leadership skills, an increase in social capital as well as raised awareness and appreciation of the environment around them (Buchan, 2007).

The largest source of benefits to rural people from wildlife potentially is tourism. For example in South Africa, trophy hunting in 1996 contributed $225 million to their economy, Tanzania's, Zambia's and Zimbabwe's economy as well (Elliot and Mwangi, 1998). Mechanisms are being established to increase the participation of local people as they have been benefiting less than they should (Williamson, 2003). For example, governments such as Southern Africa have made awarding business licenses to tourist businesses on condition that they partner with local communities, through employment and purchase of good such as fruits and vegetables, handicrafts, and services such as laundry.

Other benefits of wildlife conservation include social and psychological benefits for those who volunteer development of leadership skills, an increase in social capital, and raised awareness and appreciation of the environment (Buchan, 2007). Sea turtles and whale watching based tourism usually makes a significant contribution to the local economy of Australia. Visitors come at the Bundaberg and Hervey Bay regions for the presence of turtles and whales. Many countries which until then used to use these resources for consumptive purposes are now embracing non-consumptive purposes such as nature based tourism (Hoyt, 2001).

Community members in Africa also benefit from bush meat as an important source of nutrition for many people. It was estimated that about 120 000 tonnes of game meat, of market value US$150 million was harvested by over 1 million hunters in Ivory Coast in the year 1996. In Congo Basin the amount of game meat harvested in the same year was about 4.3 million tonnes (Caspary, 1999). These numbers support the widely held view that wild meat is an important component of the dietary intake of many people (Williamson, 2003).

Community based Wildlife Conservation initiatives in South Africa focus on commercial use, where wildlife ranching is for the production of venison that yield a greater financial return than livestock does (Child, 1995). In Namibia Community-based wildlife management has contributed to development through the establishment of conservancies (USAID, 2002). The harvestable value of wildlife in these conservancies has since then increased by 30 times, reaching a value of US$10 million, and is expected to increase to US$30million, resulting in an increase in the average income of the local communities (USAID, 2002). In Botswana the distribution of benefits is a significant responsibility of local community trusts and has been influenced by the stated reconfigured social relations, power structures and the dynamics of local politics (Rechlin *et al*., 2008).

2.6 Community conservation education and Grevy's zebra conservation

Conservation education includes any education about nature, wildlife, and the environment that has as its underlying mission, the goal of encouraging the development of appreciation, knowledge or participation related to the protection of nature. It is any form of applied environmental education that has conservation as its underlying goal. Supporters of the CWM concept discovered that wildlife knowledge has always been part of a culture (Rees, 1990). Local communities have always had the traditional knowledge required for wildlife management that was gained through long-term interaction and observation of ecosystems in which they inhabit, and was passed on from generation to generation by word of mouth, observations, tales, through practice behavior, dances, songs and rituals.

States, conservationists and agencies charged with wildlife management need to respect local conservation knowledge by learning and using it alongside scientific knowledge since they both involve the same reasoning. Communities need this information to assist them in making informed decisions such as setting hunting quotas. Communities, for a long time were ordered to keep away from wildlife; they were forcibly relocated, beaten, jailed and even shot and killed in order to protect the wildlife. Consequently, these people became detached from their cultures, consequently loosing whatever traditional knowledge they had accumulated. People were brainwashed into believing that their cultures, knowledge and system of government were primitive and worthless and they were forced out of it. Therefore, there has been a great loss of the indigenous knowledge that was accumulated (Songorwa, Buhrs and Hughey, 2000).

One of the most important components of an initiative is vigorous education and outreach programs that reach school going children, adults, and other stakeholders. Public and targeted awareness also has high conservation returns, and tends to build political participation and support. Creating understanding of the issue and acceptance of the implementation of strategy requires education of all stakeholders. Wright, (2010) in his paper advocates for films to be shown as part of conservation education program and these are now a common part of broadcast schedules in developed countries such as the United Kingdom. Ironically communities that co exist with wildlife are unlikely to

ever have the opportunity to gain such an insight into the species and the threats that they face. However, if these films are produced by local conservation educators and broadcast to the communities, they are then likely to have the biggest impact.

Proper management and conservation efforts in Nepal are being developed to conserve this rich biological diversity and improve the livelihoods of the community members. The World Wildlife Fund (WWF) Nepal Program since 1993 has had Conservation Education and Communication (CEC) as an integral part of their initiatives. Conservation education is taken to students in different ways such as the formation of Eco Clubs at their schools, study tours, the dissemination of conservation education among other activities. This has brought about positive changes in the attitude and behavior of their target audience in support of conservation and sustainable development in Nepal. Through conservation education and communication, WWF Nepal and partners such as community based organizations, non-governmental organizations, have managed to reduce the conflict between the people and the park by bettering their understanding of the importance of the natural and cultural environment and wildlife conservation. These efforts have also enhanced the ability of community members to improve their lives by efficiently and sustainably managing Nepal's biological diversity (WWF Nepal Program, 2005). Madagascar too undertakes conservation education through classes, demonstrations, paintings and folklore. Students in clubs are also encouraged to create 'living laboratories' through which they carry out researches according to their expertise through collecting data on plants and ecological numbers (Dolins *et al.*, 2010).

Changing the way people view wildlife is one challenge conservation efforts are facing. The rural urban migration is changing Kenya's population. This change has brought about a growing population with little knowledge on wildlife and their importance, nature conservations and national parks. This population also does not see their role in nature's and wildlife conservation (Mbugua, 2012). Most of Kenya Wildlife Service (KWS) education efforts target the youth, majority of who are still in schools. The

KWS programs aim to strengthen what they learn especially in areas of ecology, biology, and history as well as nature conservation.

KWS also targets remote areas with special programs tailored to address conservation issues that affect them such as deforestation, poaching, banditry and the dangers of charcoal burning, with their effect on climate change, wildlife movement, and degradation of the environment, and also advocates for the wise use of resources such as water. KWS in their value statement recognize communities and other stakeholders' role in conservation and thus their rights to information and knowledge. For this reason, KWS education and information centers have been established all over Kenya to offer conservation education to schools and organized groups. To most visitors, a trip to the park is not only an enjoyable experience, but it is also a learning experience that increases their understanding of nature and wildlife, consequently creating an appreciation of the various conservation efforts made by the programs. Through these forums, the programs hope to garner support for community participation and wildlife management in conservation efforts (KWS, 2008).

2.7 Theoretical Framework

The theoretical underpinning that informed this study traces its roots from Runge's (1984) "Assurance Problem Theory". It challenges the 'Tragedy of the Commons' written by Hardin (1968). Hardin's theory has over the years come to represent the degradation of the environment that is to be expected whenever many individuals use a finite resource in common. He used the example of pastoralists to demonstrate his point by stating that by holding the land they lived in "common", individual herders had no incentive to limit the number of animals they grazed on that land. Without the herders having limits set on the use of land, the conditions were set for land degradation and desertification (Hardin, 1968; Pratt and Gwyn, 1977).

The Assurance Problem theory however proposes that natural resource management policies, should seek to support community-run institutions where they are effective and promote them where they no longer exist in their efforts to manage natural

resources. Contrary to the ‘Tragedy of the Commons’ argument which is premised on the view that local people are responsible for causing natural resource degradation (Harding, 1968) Runge formulated an ‘Assurance Problem’ theory as a means of understanding how rural communities evolve their own management systems. Further evidence (Adams and Anderson, 1988; Goodin, 1996a) also point to the fact that rural communities in the past had effective institutions to manage resources and that these institutions are in some places active and effective today.

2.8 Conceptual framework

This section describes the conceptual framework that guided the study.

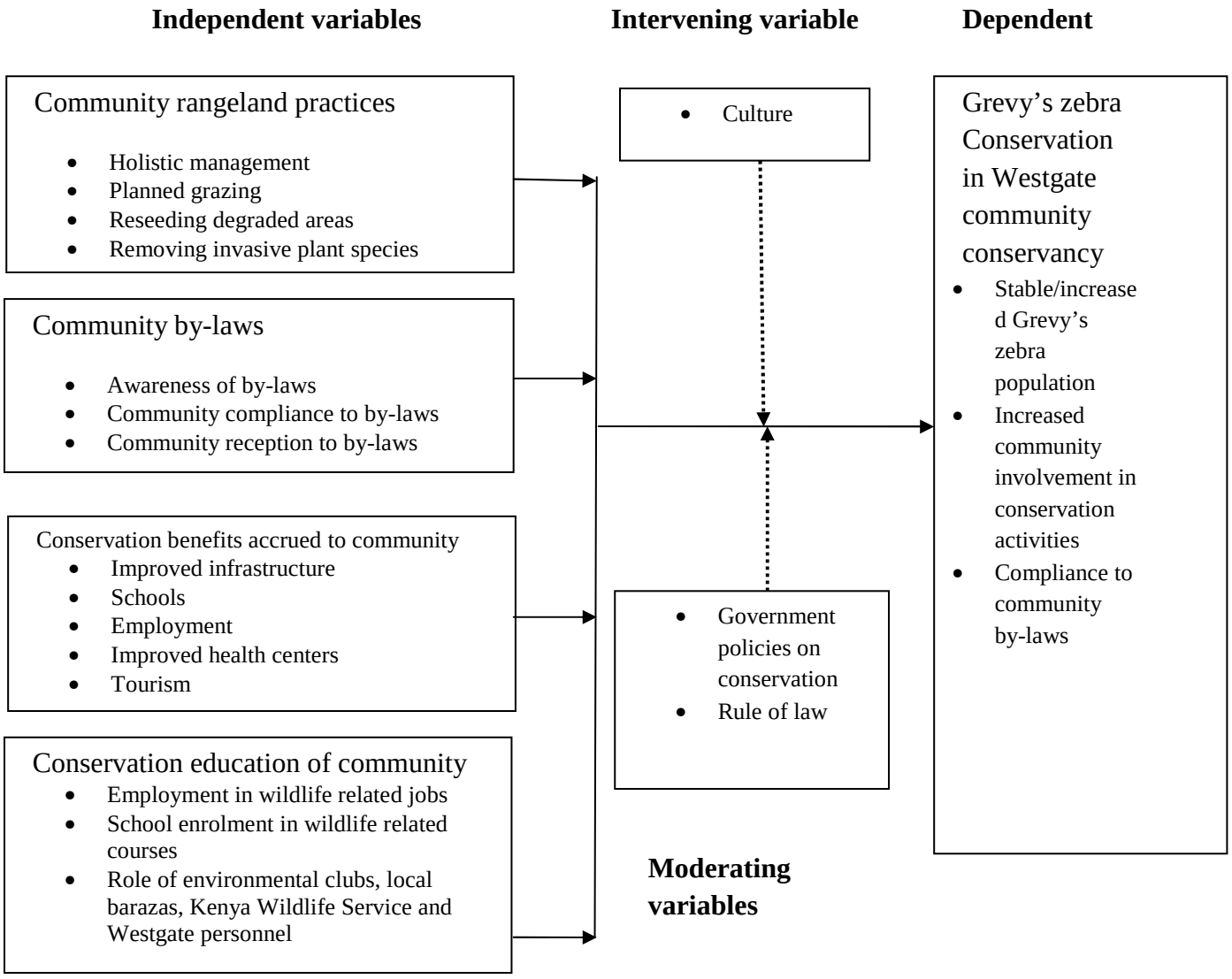

Figure 1: Conceptual Framework

The conceptual framework in figure 1 was used in this study to examine the influence of community based wildlife management on Grevy's Zebra conservation in Westgate Community. Independent variables stand alone and are not changed by other variables being measured while dependent variables depend on other factors; independent variables cause a change in the dependent variable. The independent variables in the study were community rangeland practices, community by-laws, conservation benefits accrued to the community and conservation education of the community. The study sought to examine the relationship between the independent variable and the dependent variable which is Grevy's zebra conservation in Westgate community conservancy.

The intervening variable in this study was the culture of the Westgate community. Culture as an intervening variable in this study comes between the independent and dependent variables and shows the link between them and explains the mechanisms that account for the causal relationship between them. The moderating variables in was study are government policies on conservation and the rule of law. Moderating variables affect the relationship between the independent and dependent variables by modifying the effect of the independent variables. In this study the influence of community rangeland practices, community by-laws, conservation benefits accrued to the community and conservation education of the community on Grevy's zebra conservation in Westgate community conservancy can be modulated by government policies on conservation and the rule of law.

2.9 Summary of literature

The literature established that wildlife authorities have realized that the local communities are the rightful beneficiaries of wildlife. It also shows that the responsibility of resource and wildlife management in various regions such as the fragile arid and semi-arid northern parts of Kenya has been shifted from the authorities (top down approach) to the local community members to what is known as the participatory approach. This has been found to be beneficial to the community members and some wildlife species, for instance, the species found within the Chon-Kemin Wildlife Management Area in Kyrgyzstan, Central Asia.

Various methods of community rangeland practices in Africa have also been highlighted, for example in Ethiopia and Kenya. Additionally, information on how the management of various rangelands benefits the species that the land holds has also been demonstrated. Approaches such as the Participatory Rangeland Management are in use in various communities in Kenya. These communities have a lot of natural resources in their environment and their conservation efforts recognize the importance of helping communities in increasing their knowledge to sustainably exploit their natural resources and expand their economic base through activities such as tourism.

The available policies and by-laws within communities that co-exist with wildlife have granted control and management of wildlife to the local communities. Recognition and incorporation of local belief systems and modern conservation strategies to effectively conserve wildlife, for example, among the community members in Lebialem Division, Cameron has also been demonstrated in the literature. These by-laws have contributed to a large extent to the successful conservation of wildlife in several regions in Africa and Asia.

Community conservation education has always been there and passed on from generation to generation through various means such as songs, dances and rituals. The case studies highlighted show that this knowledge contributed to the conservation of different wildlife species. The study will seek to establish the availability and function of such empowerment programmes, who delivers them and how it contributes to Grevy's Zebra conservation in Westgate Community Conservancy.

The different case studies highlighted in the literature review reveal that the combination of different efforts for wildlife conservation: the empowerment and education of local communities on matters wildlife, the enforcement of community by-laws, benefits accrued to communities and proper rangeland practices, can contribute significantly to the conservation of different wildlife species. The literature has also established that community conservation programmes are a bottom up approach that have a strong economic rationale as they contribute to conserving wildlife population and at the same time, improve the socio-economic status of the local community by

establishing partnership with other stakeholders in the private sector. The concepts discussed will aid in the understanding of how Grevy's zebra in Westgate community Conservancy can benefit from similar efforts.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the approaches which were used to obtain data, sampling design, how the data was analyzed and presented. In particular this chapter covers research design, target population, sample size and sampling technique, research instruments, data collection procedures, data analysis technique and ethical consideration.

3.2 Research Design

Singleton *et al* (1988) defines research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure. Research design emanates from qualitative, quantitative and mixed method research.

This study employed a descriptive survey design. Descriptive survey research entails acquiring information from one or more groups of people by asking them questions and tabulating their answers (Mugenda and Mugenda, 2003). It was ideal for this study as it was used to collect information regarding the current status of a phenomenon as well as to examine the relationship between and among variables.

3.3 Target Population

Burns and Grove (1997) describe target population as the total number of respondents that meet the selected criteria. The population for the study was the Westgate Community members. The target population for the study was 4000 (Westgate Community Conservancy, personal communication, 2014).

3.4 Sample size and sampling procedure

This section describes sample size and sampling procedure that was used in this study.

3.4.1 Sample size

The sample size for the study was 351 respondents derived from the target population of 4000. The sample size of 351 was drawn from the table for determining sample size for a given population provided by Krejcie and Morgan (1970).

3.4.2 Sampling procedure

The sample size for the study was 351 respondents. The respondents comprise the community members living within Westgate Community Conservancy. The sample size was determined using the table for determining sample size from a given population provided by Krejcie and Morgan (1970). Using the formula
$s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$ Krejcie and Morgan developed a table for determining sample size (see appendix II for table).

In the formula $s = X^2NP(1-P) \div d^2(N-1) + X^2P(1-P)$; s refers to the required sample size, X^2 refers to the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841), N refers to the population size, P refers to the population proportion (assumed to be 50 since this would provide the maximum sample size), d refers to the degree of accuracy expressed as a proportion which in this formula is .05 (Krejcie and Morgan, 1970).

The study employed stratified sampling to select respondents from the community. Westgate community conservancy is divided into eight zones. Stratified sampling was chosen as the preferred sampling method to ensure that individuals in each zone were represented in the sampling process (Yount, 2006). In each zone the researcher sampled 44 individuals; this number was reached by dividing the sample size of 351 with the 8 zones which is 43.8. Random sampling was then employed to sample the community members and the researcher administered the questionnaire to the adult male or female available (Fox, Hunn and Mathers, 2007).

3.5 Research instruments

The main research instrument for this study was questionnaires. A pre-coded semi structured questionnaire was used to obtain data from both the community members. This research instrument was used because it is both cost and time effective as compared to other instruments. Moreover it provides quantitative data that is easier to collect and analyze as well as providing in depth information on the perception and opinions of the sampled group (Phellas, Bloch and Seale, 2011). The questionnaire had an introduction which briefly outlined the objective of the survey and contained a statement of confidentiality of the information provided. The questionnaire was further divided into 6 sections addressing each of the research themes.

The first section was on the socio-demographic characteristics of the respondents. The second section asked questions on the contribution of rangeland practices in conservation of Grevy's zebra. The third section collected information on the awareness, reception and compliance of by- laws within the community. The fourth section asked questions on conservation benefits accrued to the community and the extent of their contribution to the conservation of Grevy's zebra in the conservancy. The fifth section asked questions on the role of conservation avenues in providing conservation education as well as its influence on selection of environmental related courses and choice of employment in the environmental sector. The sixth section was Grevy's zebra conservation where the researcher collected information on the respondent's awareness on the status of the Grevy's zebra population as well as the community's level of involvement.

3.5.1 Pilot testing

Baker (1994) describes pilot study as a pre-testing or 'trying out' of a particular research instrument. The questionnaire needs a pilot study to validate the effectiveness of this research instrument, and the value of the questions to elicit the right information to answer the research questions. The researcher conducted the pilot study by selecting 10% of the sample size which was 35 respondents (Mugenda and Mugenda, 2003). These 35 respondents were selected from another conservancy that exhibited similar characteristics like that of Westgate Community Conservancy. In this case the pilot

study took place in Kalama Conservancy in Samburu County because it also has a population of Grevy's zebra and community members living within the conservancy. Once the data was collected it was then analysed to examine whether the questions were interpreted correctly and whether there were any ambiguous questions. The researcher then made any necessary changes to the construction of the questions in the questionnaire. After two weeks re-test was conducted to ensure the changes made have solved any problems with the questionnaire.

3.5.2 Validity of instruments

Validity determines whether the research instrument truly measures that which it was intended to measure, in other words, how truthful the research result are Golafashani (2003). Content validity is an assessment of how representative the questions are and whether the questions and answering what the objectives of the study are while construct validity is an assessment of the quality of an instrument or experimental design. The researcher ensured content validity by giving a copy of the questionnaire to the supervising lecturer for expert opinion on the representativeness and suitability of questions and give suggestions of corrections to be made to the structure of the research tool. Construct validity was ensured by carrying out a pilot study and administering the questionnaire to determine that the questions were objective, clear and void of any ambiguous and awkward question. Lastly, validity was also ensured by training the research assistants and translators appropriately.

3.5.3 Reliability of instruments

Joppe (2000) writes that for an instrument to be considered reliable the results need to be consistent over time and be an correct representation of the whole population being studied when carried out with a similar methodology. The method for checking for reliability was internal consistency which measures consistency within the research instrument and questions how well a set of items measure a particular behavior or characteristics within the test was determined through Cronbach's Alpha test (Tavakol and Dennick, 2011).

The researcher used the formula alpha = Np/[1+p(N-1)] to measure reliability of the questionnaire. In this formula; N refers to the number of items being measured and p refers to the mean inter item correlation which is .5. In the questionnaire the number of items being measured was 5. Therefore, 5(.5)/ [1+.5(5-1)] gave alpha value of 0.8333. The alpha value ranges between 0 and 1 with reliability increasing with the increase in value. Coefficient of 0.7 is a commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicates good reliability. Therefore an alpha value of 0.83333 indicates that the questionnaire was reliable.

3.6 Data collection procedures

The researcher obtained a research permit from the Ministry of Higher Education, Science and Technology prior to collecting the data at the conservancy. Additionally the researcher also wrote a letter of introduction to Westgate Community Conservancy requesting permission to collect data at the conservancy. The questionnaire was administered to the community respondents face to face through the help of a trained field assistant who was conversant in English, Kiswahili and the Samburu dialect. This technique was used especially because a large proportion of the community members are not conversant in English or Kiswahili. Once the questions were asked the interviewer recorded the respondents answer in the questionnaire and handed over the questionnaires the researcher.

3.7 Data analysis techniques

The study employed descriptive statistics. Descriptive statistics are procedures used to summarize, organize, and make sense of a set of scores or observations. This assisted the researcher analyze the quantitative data collected. (Morley, 2006). Once data collection was completed the data was checked for completeness and coded according to the various themes to be prepared for analysis. Descriptive statistics produced as a result of analysis was then presented in percentages, means, frequency distributions and tables for interpretation. The qualitative data that was collected was analysed by documenting verbatim the statements made by the respondents. The data was then

analyzed using the predictive analytic tools of the Statistical Package for the Social Sciences (SPSS – version 20).

3.8 Ethical considerations

Research ethics is that domain of enquiry that identifies ethical challenges with a view to developing guidelines that safeguard against any harm and protects the rights of human subjects in research (Rogers 2008). The researcher obtained a research permit from the Ministry of Higher Education, Science and Technology prior to collecting the data at the conservancy. Additionally the researcher also wrote a letter of introduction to Westgate Community Conservancy requesting permission to collect data at the conservancy. The researcher assured the respondents of confidentiality of their identity by guaranteeing that any identifying information that they provided was not made available to anyone who is not involved in the study and it remained confidential for the purposes it is intended for. The prospective research participants was fully informed about the procedures involved in the research and was asked to give their consent thus ensuring that participation is entirely voluntary. Lastly the researcher informed the conservancy that the results would be communicated to the Westgate Community Conservancy.

Table 3.1: Operational definition of variables

Objectives	Independent Variables	Indicator	Measurement Scale	Tools of analysis	Data Analysis
To assess how community rangeland practices influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County	Rangeland practices	a)Holistic management b)Planned grazing c)Reseeding of degraded areas d)Removing of invasive plant species	Ordinal Ordinal Ordinal Ordinal	Questionnaire	Frequency distribution, percentage and mean
To establish how community by- laws influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County	Community by-laws	a)Awareness of by-laws b)Community compliance to by-laws c)Community reception to by-laws	Nominal Nominal Nominal	Questionnaire	Frequency distribution and percentage

To determine the extent to which conservation benefits accrued to the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County	Conservation benefits	a)Improved infrastructure b)Schools c)Employment d)Improved health centers e)Tourism	Ordinal and Nominal Ordinal and Nominal Ordinal and Nominal Ordinal and Nominal	Questionnaire	Frequency distribution ,percentage and mean
To examine how conservation education of the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County	Conservation education	a) Employment in wildlife related jobs b)School enrolment in wildlife related courses c) Role of environmental clubs, local barazas, Westgate Community Conservancy employees and Kenya Wildlife Services	Ratio Ratio Ordinal	Questionnaire	Frequency distribution, percentage and mean
Dependent Variable	Grevy's zebra conservation	a)Stable/increased Grevy's zebra population b)Increased community involvement in conservation activities c)Compliance to community by-laws	Nominal and Ordinal Ordinal Nominal	Questionnaire	Frequency distribution and percentage

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This study investigated the influence of community based wildlife management on Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County. The study specifically investigated how community rangeland practices influence Grevy's Zebra conservation in Westgate Community Conservancy , how community by-laws influence Grevy's Zebra conservation in Westgate Community Conservancy , the extent to which conservation benefits accrued to the community influence Grevy's zebra conservation in Westgate Community Conservancy and how conservation education of the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. This chapter presents the data analysis and interpretation of the findings.

4.2 Questionnaire return rate

Questionnaire return is the proportion of the questionnaires returned after they have been issued to the respondents. Of the 351 respondents sampled, 333 (94.9%) of community members responded and returned the questionnaire. The theory of questionnaire return rate was guided by Baruch (1999) who states that a questionnaire return rate of above 70% is adequate for data analysis for social sciences and educational surveys. The 5.1% unreturned questionnaires was due to non responses and hence were regarded as having no major effect on the overall data analysis.

4.3 Demographic information of community members

Demographic information of respondents was based on gender, age, occupation and level of education. Findings are presented in the following section:

4.3 1 Distribution of respondents by gender

The gender of the respondents was regarded as important in the study since community wildlife conservation involves both men and women and it therefore important to capture both their views.

Table 4.1 presents gender of respondents

Table 4.1 Gender of respondents

Gender	Frequency	Percentage
Male	168	50.5
Female	165	49.5
Total	**333**	**100.0**

Data in table 4.1 shows that out of 333 respondents who participated in the study 168(50.5%) of were male while 165(49.5%) of respondents were female. The data shows that both gender was equally represented in the study. This enabled women's views to be captured as they are usually sidelined in conservation matters yet they also have a wealth of knowledge and experience pertaining to natural resource management. The responses could therefore not be biased towards a particular gender.

4.3.2 Distribution of respondents by age

It was important to capture the age composition of the respondents so as to examine the varied views of the different age groups concerning conservation.

Table 4.2 presents the age of respondents

Table 4.2 Age of respondents

Age	Frequency	Percentage
Below 20 years	14	4.2
20-30 years	94	30.0
31-40 years	121	40.0
41-50 years	64	19.2
51-60 years	29	8.7
Above 60 years	11	3.3
Total	**333**	**100.0**

Table 4.2 shows that 14(4.2%) of respondents were aged below 20 years, 94(30.0%) of respondents were aged between 20 and 30 years, 121(40.0%) of respondents were aged between 31 and 40 years, 64(19.2%) of respondents were aged between 41 and 50 years. Data further shows that 29(8.7%) of respondents were aged between 51 and 60 years while 11(3.3%) of respondents were aged above 60 years. Most of the respondents were middle aged, however the older respondents had a wealth of knowledge garnered over the years from their observations and interaction with this wildlife.

4.3.3 Distribution of respondents by occupation

The type of occupation reflects the community's level of dependence on natural resources. It is on this basis that the researcher examined the different occupations within the community.

Table 4.3 presents the occupation of the respondents.

Table 4.3 Occupation of community members

Occupation	Frequency	Percentage
N/A	52	15.6
Conservancy manager and attendants	14	4.2
Herdsman	131	39.3
Accountant	1	0.3
Security manager	3	0.9
Range - land coordinator	9	2.7
Watchman	1	0.3
Business man	29	8.7
Student	8	2.4
Sport guide	1	0.
Teachers	13	3.9
Matron	2	0.6
Catechist	1	0.3
Herdswoman	20	6.0
Contract labourer	1	0.3
Housewives	34	10.2
motorcycle operator	1	0.3
Tour guide	1	0.3
Casual	6	1.8
Conservancy driver	1	0.3
Warrior watch	1	0.3
Scout	3	0.9
Total	**333**	**100.0**

Table 4.3 shows that 14(4.2%) of respondents were conservancy managers and attendants at West gate, 131(39.3%) of respondents were herdsman, 29(8.7%) of respondents were business people, 13(3.9%) of respondents were teachers, 20(6.0%) of respondents were herdswomen while 6(1.8%) of respondents were casual workers. The data further shows that the respondents were also accountant, security manager, range - land coordinator, student, sport guide, motorcycle operators, tour guide, conservancy driver, warrior watch and scouts. The data implies that some of the respondents were directly involved in wildlife related occupation hence would have a better

understanding of the importance of the conservation of the Grevy's zebra. Furthermore, the data shows that majority of the respondent highly depended on ecosystem services for their livelihoods leaving them are more vulnerable as they have no alternate source of income.

4.3.4 Distribution of the respondents by level of education

The level of education of the community has an influence of how much they can get involved in conservation. It is on this basis that the study sought to establish the level of education of the respondents.

Table 4.4 tabulates community members and conservancy managers level of education

Table 4.4 Respondents level of education

Level of education	Frequency	Percentage
Certificate	70	21.0
Diploma	18	5.4
Degree	4	1.2
No formal education	216	64.9
Upper primary	14	4.2
Lower primary	11	3.3
Total	**333**	**100.0**

Majority 216(64.9%) of respondents had no formal education, 70(21.0%) of respondents had certificate level of education, 18(5.4%) of respondents had diploma education, 4(1.2%) of respondents had degree education level 14(4.2%) of respondents had upper primary education while 11(3.3%) of respondents had lower primary education level. The data shows that majority of the respondents had not received formal education. This shows that they may not be aware of the importance of wildlife which may ultimately affect their involvement in the conservation of Grevy's zebras.

4.4 Rangeland practices and Grevy's zebra conservation

The study sought to examine the influence of community based wildlife management on Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County. The study specifically sought to assess how community rangeland practices influence Grevy's Zebra conservation in Westgate Community Conservancy. In a likert scale, the community members were asked to indicate the extent that various aspects of improved range practices contribute to Grevy's zebra conservation in Westgate Community Conservancy. Table 4.5 tabulates the findings.

Key: Very great extent (VGE)= 5; Great extent (GE)= 4; Moderate (M)= 3 Low extent (LE) = 2 No extent at all (NE)= 1

Table 4.5 Community members' responses on influence of Rangeland practices on Grevy's Zebra conservation in Westgate Community Conservancy

Statement	VGE		GE		M		LE		NE		MEAN
	F	%	F	%	F	%	F	%	F	%	
Holistic management contribution to Grevy's zebra conservation	286	85.9	29	8.7	14	4.2	0	0.0	4	1.2	1.22
Removing invasive plant species contribution to Grevy's zebra conservation	261	78.4	44	13.2	20	6.0	2	0.6	6	1.8	1.33
planned grazing contribution to Grevy's zebra conservation	301	90.4	26	7.8	4	1.2	2	0.6	0	0.0	1.12
Reseeding of degraded areas contribution to Grevy's zebra conservation	295	88.6	21	6.3	8	2.4	6	1.8	3	0.9	1.20

F= Frequency
%= Percentage

Majority 286(85.9%) of respondents indicated that holistic management contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County to a very great extent, majority 261(78.4%) of respondents indicated that removing invasive plant species contributed to a very great extent to Grevy's zebra conservation. Data further shows that majority 301(90.4%) of respondents indicated that planned grazing contributed to a very great extent on Grevy's zebra conservation while majority

295(88.6%) of respondents indicated that reseeding of degraded areas contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County to a very great extent.

There were no differences in the mean scores in the responses all ranging from 1.21 to 1.33. This showed that all the respondents were tending towards very great extent. This implies that the community practices incorporated the goals of sustainable development, conservation and community participation.

Community by-law and Grevy's zebra conservation

To establish how community by-laws influence Grevy's Zebra conservation in Westgate Community Conservancy in Samburu County, the community members and conservancy managers were posed with items that sought the same. Data is presented in the following section:

4.5.1 Local rules governing conservation of Grevy's zebra

The local rules governing the conservation are important since they make the community aware of their responsibilities in conservation. The study therefore sought to establish awareness of the existence of these rules.

Table 4.6 presents community members responses on whether there were local rules in place governing Grevy's zebra conservation in Westgate community conservation

Table 4.6 Community members responses on whether there were local rules in place governing Grevy's zebra conservation in Westgate community conservation

Response	Frequency	Percentage
Yes	250	75.1
No	83	24.9
Total	**333**	**100.0**

Majority 250(75.1%) of respondents indicated that there were local rules in place governing Grevy's zebra conservation in Westgate community conservation while

83(24.9%) of respondents indicated that there were no local rules. Asked to give a brief description of these rules, the community members and conservancy managers indicated that there was a rule of no killing of Grevy's zebra, protection of Grevy's zebra and also the local pastoralist of west gate had accepted the Grevy's zebras to live and share habitat and that the rule stated that there should be no illegal tender on land issues. It was also found out that there were restrictions of unrecognized groups on sand selling, charcoal burning within conservancy, cutting down of Accacia, and there was reduction of influx of ex- community members' migration.

The local rules also stated that Grevy's zebra conservation was a community based activities and it was also an individual role to conserve. The respondents further indicated that the rule stated that any poachers to be reported and any community members resulting to human animal conflict. Movement to park areas was restricted and there was encouragement of permanent building by the local rules. There was no human disturbance of Grevy's zebra water points and decrease number of roads on the restricted lands. The village elders to be involved in issues concerning community land by the local rules and also the rules enhanced respect to the environment. Local rules on Grevy's zebra conservation also indicated that if jobs were to be created, first priority was given to community members within the conservancy. The findings imply that the success of conservation of the Grevy's zebra was dependent of the awareness of the rules. Moreover, the by-laws described the major factors affecting wildlife and the function of the institutions and structures in place in conserving them.

4.5.2 Local rules being retained and Grevy's zebra conservation

Retaining of the local rules for the conservation of the Grevy's zebra is instrumental for effective conservation and management. The researcher therefore sought from the community members whether established by-laws and rules should remain. Table 4.7 tabulates the findings

Table 4.7 Community members responses on whether established by-laws and rules should remain

Response	Frequency	Percentage
Yes	241	72.4
No	92	27.6
Total	**333**	**100.0**

Majority 241(72.4%) of respondents indicated that established by-laws and rules should remain to protect wildlife and punish poachers, improve of habitats. They also indicated that established by-laws and rules had led to permanent settlement of community members as unrecognized members were chased away. They also led to active participation in community based activities hence decrease in tree cutting and the rules yield positive fruits to the community. The findings showed that the rules also helped the community to participate in conservation and have led to creation of reserve areas during dry seasons, preservation of some portions of land to graze during drought seasons and also created jobs for many people in the community. This implies that the by-laws are effective for successful conservation of Grevy's zebra.

4.5.3 Community compliance to by-laws and Grevy's zebra conservation

Determining whether the community members comply with the established by-laws concerning wildlife conservation within the community or not is important to Grevy's zebra conservation so as to ensure sustainable use of wildlife.

Table 4.8 tabulates community members responses on whether they usually comply with the by-law and local rules concerning wildlife conservation

Table 4.8 Community members' responses on whether they usually comply with the by-law and local rules concerning wildlife conservation

Response	Frequency	Percentage
Yes	248	74.5
No	85	25.5
Total	**333**	**100.0**

Majority 248(74.5%) of respondents indicated that they usually comply with the by-law and local rules concerning wildlife conservation because the rules improved the range land hence improving the living, helped to conserve and manage the wildlife, led to decrease illegal businesses and because trees are source of food to animals. They further indicated that the rules do not require any training for a person to comprehend, they do not press down the community, and that they are cheap and easy to follow. The rules have helped the community to accrue income through wildlife and they have enlightened the community. Findings further shows that 85(25.5%) of respondents did not comply with the by-law and local rules concerning wildlife conservation as they were reluctant on matters concerning their involvement in conservation. These findings implied that quite a number of the community members understood that complying with these by-laws led to more effective conservation of Grevy's zebra and that the community also stand to benefit when the wildlife thrive.

4.6 Extent to which conservation benefits accrued to community influence Grevy's zebra conservation in Westgate Community Conservancy

To determine the extent to which conservation benefits accrued to the community influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County, the researcher posed items to community members to examine the same.

Table 4.9 presents the perception on a scale of 1 to 5 as shown

Key

Very great extent (VGE)= 5; Great extent (GE)= 4; Moderate (M)= 3 Low extent (LE) = 2 No extent at all (NE)= 1

Table 4.9 Community members' responses on the extent that conservation benefits accrued to the local community influenced Grevy's zebra conservation

F= Frequency

Statement	VGE		GE		ME		LE		NE		MEAN
	F	%	F	%	F	%	F	%	F	%	
Improved roads within the conservancy influence Grevy's zebra conservation	216	64.9	64	19.2	31	9.3	12	3.6	10	3.0	1.60
Establishment of schools within the conservancy influence Grevy's zebra conservation	159	47.7	25	7.5	45	13.5	47	14.1	57	17.1	2.45
Employment within the conservancy influence Grevy's zebra conservation	292	87.7	15	4.5	12	3.6	3	.9	11	3.3	1.27
Establishment of health centers within the conservancy influence Grevy's zebra conservation	149	44.7	26	7.8	24	7.2	43	12.9	91	27.3	2.70
Tourism within the conservancy influence Grevy's zebra conservation	222	66.7	46	13.8	41	12.3	14	4.2	10	3.0	1.63

%= Percentage

Findings indicates that majority 216(64.9%) of respondents indicated that improved roads within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy to a very great extent, 159(47.7%) of respondents indicated that establishment of schools within the conservancy influence Grevy's zebra conservation to a very great extent. Majority 292(87.7%) of respondents indicated that employment within the conservancy influence Grevy's zebra conservation to a very great extent, 149(44.7%) of respondents indicated that establishment of health centers within the conservancy influence Grevy's zebra conservation to a very great extent while majority 222(66.7%) of respondents indicated that tourism within the

conservancy influence Grevy's zebra conservation to a very great extent. Furthermore, employment influenced Grevy's zebra conservation to the greatest extent with a mean score of 1.27 while establishment of health centers had the least influence (2.7). This shows that community conservation activities had a strong economic rationale; they aimed to simultaneously improve the socioeconomic status of human activities while maintaining wildlife populations.

4.6.1 Withdrawal of conservation benefits and Grevy's zebra conservation

The researcher sought to determine whether if the conservation benefits were to be removed, whether community members would still conserve the Grevy's zebra.

Table 4.10 tabulates the findings

Response	Frequency	Percentage
Yes	241	72.4
No	92	27.6
Total	**333**	**100.0**

Majority 241(72.4%) of respondents indicated that they would still conserve the Grevy's zebra if the conservation benefits were to be removed. This implied that wildlife had a high aesthetic value to the community. 92(27.6%) of respondents indicated that they would not conserve the Grevy's zebra if the conservation benefits were to be removed as they had no incentive to conserve the wildlife.

4.7 Conservation education of the community and Grevy's zebra conservation

To examine how conservation education of the community influences Grevy's zebra conservation in Westgate Community Conservancy in Samburu County, the researcher asked the community members to indicate the role that conservation education avenues have played in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County.

Table 4.11 tabulates the findings

Key

Very big role 5; Big role (VBR)= 4; Small role (BR)= 3 Very small role (VSR) = 2 No Role (NR)= 1

Table 4.11 Community members responses on the role that conservation education avenues have played in the conservation of Grevy's zebra Westgate Community Conservancy

Statement	VBR		BR		SR		VSR		NR		MEAN
	F	%	F	%	F	%	F	%	F	%	
Environmental classes as conservation education avenue in the conservation of Grevy's zebra	182	54.7	67	20.1	40	12.0	18	5.4	26	7.8	1.92
Local barazas as conservation education avenue in the conservation of Grevy's zebra	288	86.5	29	8.7	8	2.4	2	.6	6	1.8	1.20
The personnel from the Westgate Community Conservancy as conservation education avenue in the conservation of Grevy's zebra	301	90.4	17	5.1	5	1.5	5	1.5	5	1.5	1.18
Kenya Wildlife Services (KWS) as conservation education avenue in the conservation of Grevy's zebra	210	63.1	46	13.8	33	9.9	25	7.5	19	5.7	1.78

F= Frequency
%= Percentage

Findings shows that majority 182(54.7%) of respondents indicated that environmental classes has played a very big role in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County, majority 288(86.5%) of respondents indicated that local barazas has played a very big role in the conservation of Grevy's zebra. Majority 301(90.4%) of respondents indicated that the personnel from the

Westgate Community Conservancy have played a very great role in the conservation of Grevy's zebra while majority 210(63.1%) of respondents indicated that Kenya Wildlife Services (KWS) has played a very great role in the conservation of Grevy's zebra in the community. According to the mean score, Westgate conservancy personnel played the greatest role (1.18) in providing conservation education to the community while environmental classes had the least (1.92). This implies that community awareness has high conservation returns in Grevy's zebra Westgate Community Conservancy in Samburu County.

4.7.1 Conservation education and conservation of Grevy's zebra

Education on conservation is an important factor in increasing conservation awareness of the wildlife. The researcher was therefore interested in establishing the extent to which the respondents had been exposed to education on conservation. The respondents were therefore asked whether the exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy, the community members and conservancy managers responded as Table 4.12

Table 4.12 Community members' responses on whether exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy

Response	Frequency	Percentage
Yes	291	87.4
No	39	11.7
Not sure	3	0.9
Total	**333**	**100.0**

Majority 291(87.4%) of respondents indicated that the exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy while 39(11.7%) of respondents indicated that the exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy while 3(0.9%) of

respondents were not sure on the statement. This can be attributed to conservation education activities carried out by the conservancy and other organizations that are working with the community that offer conservation education.

4.7.2 Involvement of family members in the conservation

Involvement of family members in conservation has an influence on how the family at large will be involved in the conservancy. The researcher therefore sought to establish whether there were family members that were employed in tourism or conservation organizations within the community, the community members responded as Table 4.13

Table 4.13 Community members' responses on whether they had any person in their household employed in tourism or conservation organizations within the community

Response	Frequency	Percentage
Yes	224	67.3
No	109	32.7
Total	**333**	**100.0**

Majority 224(67.3%) of respondents indicated that they had a person in their household employed in tourism or conservation organizations within the community while 109(32.7%) of respondents lacked a person in their household employed in tourism or conservation organizations within the community. The community members and conservancy managers indicated their people were employed in Westgate community conservancy, Sentrim lodge, Saruni lodge, Samburu lodge, Interpids lodge, Ewaso Lions and Sopa Lodge. This implied that direct involvement in conservation through employment was moderately high and this influenced conservation positively.

4.8 Grevy’s zebra conservation

To establish evidence of Grevy’s zebra conservation in the community, the community members were asked whether they had ever seen a Grevy's zebra. Table 4.14 tabulates their responses

Table 4.14 Community members responses on whether they had ever seen a Grevy's zebra

Response	Frequency	Percentage
Yes	300	90.1
No	30	9.0
Not sure	3	.9
Total	**333**	**100.0**

Majority 300(90.1%) of the respondents had seen Grevy's zebra, 30(9.0%) of respondents had never seen Grevy's zebra while 3(0.9%) of respondents were not sure whether they had seen Grevy's zebra. This implied that the community members were aware of the presence of Grevy’s zebra within their community.

4.8.1 Perception on the increase or decrease of the Grevy's zebra

The researcher further sought to establish whether the number of Grevy's zebra in Westgate community conservancy increased, decreased or stayed the same, over the last ten years in Westgate community conservancy. Table 4.15 presents community members responses

Table 4.15 community members' responses on whether the number of Grevy's zebra

Response	Frequency	Percentage
Increased	262	78.7
Decreased	52	15.6
Stayed the same	9	2.7
I don't know	10	3.0
Total	**333**	**100.0**

Majority 262(78.7%) of respondents indicated that the number of Grevy's zebra in Westgate community conservancy has increased over the last ten years in Westgate community conservancy, 52(15.6%) of respondents indicated that the number has decreased while 9(2.7%) of respondents indicated that the number of Grevy's zebra in Westgate community conservancy has stayed the same over the last ten years.

Asked to indicate the reason why the number of Grevy's zebra in Westgate community conservancy increased, decreased or stayed the same, the respondents indicated that there has been loss of habitat, frequency drought, livestock encroachment, overgrazing on the livestock land, settlement of community in the area, diseases, change in environmental factors led to decrease of Grevy's zebra over the last ten years.

They further added that rangers monitored the zebra and the community had the initiative in conservation. Progressive education on conservation, community perception of the Grevy's zebra, rules governing Grevy's zebra, reduction in any illegal activity, plenty grass, low competition, predators decrease, employment of more community rangers, decrease in lion encroachment, high birthrates, provision of water at their water points, reduction in death due to plenty grazing lands., patrol activities and Practical warrior watch on conservation were the reasons why Grevy's zebra has increased over the last ten years. Other reasons included increase in outreach programmes on conservation, community involvement, creation of buffer zones in

conservancy, decrease in clearing of forests, Effort of scouts and KWS, Grevy's zebra organization, and the support from the community at large.

This implied that the community members were aware of the efforts put in place to conserve this wildlife. Furthermore, this awareness led them to participate in the conservation activities within the community and therefore their knowledge that the population of the Grevy's zebra had increased over time.

4.8.2 Opinion on the future of the Grevy's zebra

Asked whether they would still have Grevy's zebra in Westgate community conservancy ten years to come, they responded as Table 4.16

Table 4.16 Community members' responses on whether they would have Grevy's zebra in Westgate community conservancy ten years from now

Response	Frequency	Percentage
Yes, definitely	276	82.9
Maybe	40	12.0
It might not be	5	1.5
Definitely not	6	1.8
I don't know	6	1.8
Total	**333**	**100.0**

Majority 276(82.9%) of respondents indicated that they would have Grevy's zebra in Westgate community conservancy ten years from now, 40(12.0%) of respondents indicated that they might be having Grevy's zebra, 5(1.5%) of responded indicated they might not be having Grevy's zebra in Westgate community conservancy ten years from now while 6(1.8%) of respondents were not sure on whether they would be having Grevy's zebra in Westgate community conservancy ten years from now. The implication of this is that the conservation measures that have been put in place are indeed working and the threats facing the survival of this wildlife were being mitigated.

4.8.3 Community involvement in conservation activities

Asked whether the community involvement in decision making/meetings had increased, decreased or stayed the same regarding conservation issues, they responded as Table 4.17

Table 4.17 Community members involvement in conservation activities

Response	Frequency	Percentage
Increased	314	94.3
Decreased	12	3.6
Stayed the same	7	2.1
Total	**333**	**100.0**

Majority 314(94.3%) of respondents indicated that the community involvement in activities/meetings had increased regarding conservation issues, 12(3.6%) of respondents indicated that it has decreased while 7(2.1%) of respondents indicated that the community involvement in decision making/meetings had stayed the same regarding conservation issues. This implied that the conservancy personnel realized that success in wildlife conservation was heavily reliant on the good will of the community members and therefore involved them in conservation activities. Additionally the community members are aware of their individual responsibility to conserve the said wildlife.

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the findings, discusses the findings of the study and presents conclusions, recommendations and suggestions for further research.

5.2 Summary of findings

5.2.1 Rangeland practices and Grevy's zebra conservation

The study established that rangeland practices influence Grevy's zebra conservation positively. Further the respondents indicated that holistic management 286(85.9%), removing invasive plant species 261(78.4%), planned grazing 301(90.4%) and reseeding of degraded areas 295(88.6%) contribute to Grevy's zebra conservation to a very great extent. Majority of respondents 301 (90.4%) indicated that planned grazing had the greatest influence as a rangeland practice.

5.2.2 Community by-law and Grevy's zebra conservation

The study also established that community by-laws regarding conservation existed as indicated by majority 250(75.1%) of respondents. Furthermore the established by-laws and rules should remain to protect wildlife and punish poachers as indicated by majority of respondents 241 (72.4%). Lastly, majority248 (74.5%) of respondents indicated that they usually comply with the by-law and local rules concerning wildlife conservation because the rules improved the range land hence helped to conserve and manage the wildlife, led to a decrease in illegal businesses and because trees are a source of food to animals.

5.2.3 Conservation benefits accrued to community and Grevy's zebra conservation

Findings revealed that conservation benefits accrued to the community influenced Grevy's zebra conservation positively. The respondents indicated that improved roads

216 (64.9%), establishment of health centers 149 (44.7%), establishment of schools 159 (47.7%) and tourism 222 (66.7%) all influenced Grevy's zebra conservation to a very great extent. Additionally, majority of the respondents 241 (72.4%) would still conserve the Grevy's zebra if the conservation benefits were to be removed.

5.2.4 Conservation education of the community and Grevy's zebra conservation

The study established that personnel from the conservancy (M=1.18) played the biggest role in providing conservation education followed by local barazas (M=1.20), Kenya Wildlife Services (M=1.78) and lastly environmental classes (M=1.92). Majority (87.4%) of respondents indicated that the exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy. Moreover, the community members had people in their household employed in tourism or conservation organizations within the community as indicated by majority 224 (67.3%) of respondents.

5.2.5 Grevy's zebra conservation

Findings indicate that majority of respondents 300 (90.1%) had seen Grevy's zebra. Majority of respondents 262(78.7%) also indicated that the number of Grevy's zebra in Westgate community conservancy has increased over the last ten years. Community members also felt they would have Grevy's zebra ten years from now as shown by majority (82.9%) of respondents. It was further established that community involvement in conservation activities/meetings had increased as indicated by majority 314(94.3%) of respondents.

5.3 Discussion

5.3.1 Rangeland practices and Grevy's zebra conservation

Findings on the influence of rangeland practices on Grevy's zebra conservation in Westgate Community Conservancy revealed that holistic management contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County to a very great extent as indicated by majority (85.9%) of respondents. This agrees with

(Oba, 1998) who indicated that community rangeland practices attempts to incorporate the goals of conservation and community participation. The removing of invasive plant species contributed to a very great extent to Grevy's zebra conservation. This agreed with (Smith *et al*., 1995) who revealed that if the invasive plant species that dominates a site is eliminated, it would allow the plant community to return to its climax level.

Findings further shows that majority (90.4%) of respondents indicated that planned grazing contributed to a very great extent on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. It was further found out that reseeding of degraded areas contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County to a very great extent as indicated by majority (88.6%) of respondents. These findings correlate with Neely & Butterfield (2004) argument that planned grazing has saved wildlife, increased the herd size and through proper management benefitted the land resource among the Wange community in Zimbabwe.

5.3.2 Community by-law and Grevy's zebra conservation

Findings on the influence of community by-laws to Grevy's zebra conservation in Westgate Community Conservancy revealed that there were local rules in place governing Grevy's zebra conservation in the community as indicated by majority (75.1%) of respondents. These rules included: - rules of no killing of Grevy's zebra, protection of Grevy's zebra and also the local pastoralist of Westgate had accepted the Grevy's zebras to live and share habitat and that the rule stated that there should be no illegal tender on land. It was also found out that there were restrictions of unrecognized groups on sand selling, charcoal burning within conservancy, cutting down of Accacia, and there was reduction of influx of ex- community members' migration. The local rules also stated that Grevy's zebra conservation was a community based activities and it was also an individual role to conserve. These findings agree with Bassi, (2006) that scarce natural resources within communities are protected through customary rules.

The study further indicated that any poachers and community members engaging in activities resulting to human animal conflict had to be reported. Movement to park areas was restricted as well as rules on no human disturbance of Grevy's zebra water points and decreasing the number of roads on the restricted lands. Furthermore the village elders were to be involved in issues concerning community land. Local rules on Grevy's zebra conservation also indicated that if jobs were to be created, first priority should be given to community members within the conservancy. Water was protected by local communities through rules that govern access and activities such as permanent settlement around the area or tree felling. This implied that laws on Grevy's zebra conservation described the major factors affecting wildlife and the function of the institutions and structures in place in conserving them. This is in line with McHenry (1994) who stated that wildlife laws and policies should confer management and control of wildlife to the local communities, allowing them to establish local government structures in order to conserve wildlife effectively.

5.3.3 Conservation benefits accrued to community and Grevy's zebra conservation

Findings revealed improved roads within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy to a very great extent as indicated by majority (64.9%) of respondents. It was also found out that establishment of health centers within the conservancy influenced Grevy's zebra conservation as indicated by majority (44.7%). This implies that community conservation was a 'win-win' situation as majority (87.7%) of respondents indicated that employment and tourism (66.7%) within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy to a very great extent. This resonates with Elliot & Mwangi (1998) study that the largest source of benefits to rural people from wildlife potentially is tourism. Majority (72.4%) of respondents indicated that they would still conserve the Grevy's zebra if the conservation benefits were to be removed. This implied that wildlife had a high aesthetic value as indicated by (Emerton, 1999) and needs to be conserved for the benefit of the future generations.

5.3.4 Conservation education of the community and Grevy's zebra conservation

Findings revealed that environmental classes have played a very big role in the conservation of Grevy's zebra Westgate as indicated by majority (54.7%) of respondents. This agrees with (Rees, 1990) who indicated that communities need environmental information to assist them in making informed decisions such as setting hunting quotas. The study also found out that majority (90.4%) of respondents indicated that the personnel from the Westgate Community Conservancy have played a very great role in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County. The study also found out that Kenya Wildlife Services (KWS) has played a very great role in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County as indicated by majority (63.1%) of respondents.

Majority (86.5%) of respondents indicated that local barazas. has played a very big role in the conservation of Grevy's zebra Westgate Community Conservancy. This agrees with (Musgrave & Stein, 1993) who indicated that village councils are involved in every aspect of management, development of recommendations and enforcement of regulations.

Majority (87.4%) of respondents indicated that the exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy. This implied that public and targeted awareness also has high conservation returns. It also denotes that creating understanding of the issue and acceptance of the implementation of strategy requires education of all stakeholders. Data further shows that the community had people in their household employed in tourism or conservation organizations within the community as indicated by majority (67.3%) of respondents hence improving the livelihoods of the community members. This can be attributed to conservation and tourism related employment opportunities created by the existence of this wildlife in their community.

5.3.5 Grevy's zebra conservation

The study found out that majority (90.1%) of the respondents had seen Grevy's zebra. The study indicated that the number of Grevy's zebra in Westgate community conservancy has increased over the last ten years in Westgate community conservancy as indicated by majority (78.7%) of respondents due to progressive education on conservation, community perception of the Grevy's zebra, rules governing Grevy's zebra, reduction in any illegal activity, plenty grass, low competition, predators decrease, employment of more community rangers, decrease in lion encroachment, high birthrates, provision of water at their water points, reduction in death due to plenty grazing lands., patrol activities and practical warrior watch on conservation. This is however contrary to information from Grevy's zebra scout data and aerial surveys that indicates that there has been a slight decrease in the last few years due to less forage caused by overgrazing of livestock on the plains (Low, personal communication, October 31, 2014).

Community involvement in activities/meetings had increased regarding conservation issues as indicated by majority (94.3%) of respondents. The CAMPIRE conservation program in Zimbabwe is a largely success story whereby community participation was highly encouraged in its conservation activities as is the case with Westgate Community Conservancy (Ngwerume & Muchemwa, 2011).

5.4 Conclusions

The study concludes that rangeland practices do influence Grevy's zebra conservation. Furthermore the four facets of rangeland practices that were studied which were holistic management, removing invasive plant species, planned grazing and reseeding of degraded areas all contributed to Grevy's zebra conservation to a very great extent. These rangeland practices improved the health of this wildlife and increased their chances of survival.

The study also concludes that there were community by-laws in place governing Grevy's zebra conservation in Westgate community conservation. The study revealed that majority of the community members complied with these by-laws. Furthermore majority of the community members indicated that the established by-laws should remain as they improved the habitat, protected the wildlife hence helped to conserve and manage the wildlife, led to a decrease in illegal businesses and because trees are a source of food to animals.

The study also concludes that the benefits accrued to the local community influence Grevy's zebra conservation. Improved roads within the conservancy, employment, tourism and establishment of health centers all influenced Grevy's zebra conservation to a very great extent. Moreover, majority of the community members indicated that they would still conserve this wildlife if the above mentioned benefit were removed. This indicates that the value they place on this wildlife goes beyond the tangible benefit they get from them.

The study further concludes that conservation education does influence Grevy's zebra conservation in Westgate Community Conservancy. The study established that environmental classes, local barazas, the personnel from the Westgate Community Conservancy and Kenya Wildlife Services (KWS) had played a very big role in facilitating conservation education. It was also established that exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy.

Finally the study concludes that the number of Grevy's zebra in Westgate community conservancy has been increasing within the last ten years. There has however been a slight decrease over the last few years due to less forage caused by overgrazing of livestock on the plains (Low, personal communication, October 31, 2014), however the population remains stable. On a positive note, community member's opinion is that they would have Grevy's zebra in Westgate community conservancy ten years from now.

Community involvement in activities/meetings had also increased regarding conservation issues.

5.5 Recommendations

Based on the findings and conclusion made above, the study makes the following recommendations. The study recommends that:

1. The community should be encouraged to form more environmental clubs in the school. The research found that while conservation education took place in the schools environmental clubs were missing. As a result the young people are losing out from important learning experiences carried out and shared in clubs. The Kenya Wildlife Services and other conservation entities around the community would be helpful in setting this up.
2. The Westgate Community conservancy personnel through the help of the education ministry in Kenya should increase awareness on the existence of environmental conservation and natural resource management courses to the community members. This can be done by holding regular seminars where the community members are informed of the availability of these courses and how to apply for them. These will create an interest for such courses and may increase the man power needed in wildlife conservation.
3. Effective community participation should involve more than just attending meetings and volunteering for conservation activities. It is imperative that communities should be actively involved in decision making processes at every level of wildlife management in order to create a sense of ownership in Grevy's zebra conservation. The studies show that decisions were mostly reached by the personnel working at the conservancy and other organization around the community and disseminated to the locals.
4. There should be promotion of equitable benefit sharing mechanisms among the different zones in the communities. Members living in certain zones indicated that they felt marginalized in distribution of employment opportunities. The reflection of this sentiment was evident in their unwillingness to participate in the conservation of Grevy's zebra conservation.

5.6 Suggestions for Further Research

This study focused on investigating the influence of community-based wildlife management on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County. Further research is recommended to examine the influence of other key stakeholders involved in wildlife conservation. This researcher takes exception to the fact that the study was conducted in Samburu County, it is recommended that the study be conducted in other regions in Kenya where the Grevy's zebra exist in order to inform Grevy's zebra conservation efforts.

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APPENDICES

Appendix I

Grevy's zebra grazing in Westgate Community Conservancy

Source: Andrew Letura

Appendix II

Table for Determining Sample Size for a Given Population

Table for Determining Sample Size for a Given Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

Appendix III

Letter of Transmittal

LIZBETH NJERI MATE

University of Nairobi,

Department of Extra Mural studies,

October 2014

Dear respondent,

I am a student at the University of Nairobi, pursuing a Master of Arts Degree in Project Planning and Management. I am conducting a study on the influence of Community-based Wildlife Management on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County, Kenya. Please find attached a questionnaire for gathering information for the aforementioned study and kindly fill the questionnaire to the best of your knowledge. The responses will be handled with utmost confidence and used only for the purpose of this study.

Yours Faithfully,

Lizbeth Njeri Mate

Registration Number: L50/77551/2012

Appendix IV

Questionnaire for community members

Introduction

I am Lizbeth Mate from the University of Nairobi. I am undertaking a study on the influence of Community based Wildlife Management on Grevy's zebra conservation in Westgate Community Conservancy in Samburu County, Kenya. Please allow me to ask you a few questions. The answers you give are for information only. Your names will not be used in any report and no reward or punishment will be given based on your answers

A. Socio-demographic characteristics

Name of the Interviewer ---------- Zone----------
Sub location---------- Village ----------
--
Date of interview ----------

i. Gender: Male ☐ Female…… ☐ (House hold size)……..
ii. Age…….
iii. Occupation: ……
iv. Level of education……

B. Rangeland practices

To what extent do the following aspects of improved range practices contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?(***Tick***)

Statements	Very great extent 5	Great extent 4	Moderate extent 3	Low extent 2	No extent at all 1
1.To what extent does holistic management contribute to Grevy's zebra conservation in Westgate Community					

Conservancy in Samburu County?					
2.To what extent does removing invasive plant species contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					
3.To what extent does planned grazing contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					
4.To what extent does reseeding of degraded areas contribute to Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					

C. Community by-law

1. Are there local rules in place governing Grevy's zebra conservation in Westgate community conservation, Samburu County? Yes ☐ No ☐

2. If your answer is yes to question 1, give a brief description of these rules

3. Should the established by-laws and rules remain? Yes ☐ No ☐

4. Kindly give reasons for your answer

5.Do you usually comply with the by-law and local rules concerning wildlife conservation?

Yes ☐ No ☐

6.Kindly give reasons for your answer

D. Conservation benefits accrued to community

To what extent have the following conservation benefits accrued to the local community influenced Grevy's zebra conservation in Westgate Community Conservancy in Samburu County? (*Tick*)

Statements	Very great extent 5	Great extent 4	Moderate extent 3	Low extent 2	No extent at all 1
1.To what extent do improved roads within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					
2.To what extent do establishment of schools within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy in					

Samburu County?					
3.To what extent does employment within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					
4.To what extent does establishment of health centers within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					
5.To what extent does tourism within the conservancy influence Grevy's zebra conservation in Westgate Community Conservancy in Samburu County?					

6. If the above mentioned conservation benefits were to be removed, would you still conserve the Grevy's zebra? Yes ☐ No ☐

E. Conservation education

What role do you think the following conservation education avenues have played in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County? (*tick*)

Statements	A very big role 5	A big role 4	Small role 3	Very small role 2	No role 1
1.What role do you think environmental clubs has played in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County?					
2.What role do you think local barazas has played in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County?					
3.What role do you think the personnel from the Westgate Community Conservancy have played in the conservation of Grevy's zebra Westgate Community Conservancy in					

Samburu County?					
4.What role do you think Kenya Wildlife Services (KWS) local barazas has played in the conservation of Grevy's zebra Westgate Community Conservancy in Samburu County?					

5.In your opinion, do you think exposure to conservation education has increased enrollment in wildlife /conservation/environmental related courses within the conservancy?

Yes ☐ No ☐

6.How many people from the community do you know who are employed in wildlife/conservation/environmental related fields? Please tick the answer that applies below.

a. 0 = 1

b. 1 to 4 = 2

c. 4 to 9 = 3

d. Above 10 = 4

7. Is any person in your household employed in tourism or conservation organizations within the community?

Yes ☐ No ☐

8. If yes please state which organization

F. Grevy's zebra conservation

1.Have you ever seen a Grevy's zebra? Yes ☐ No ☐ Not Sure ☐

2.In your opinion, has the number of Grevy's zebra in Westgate community conservancy increased, decreased or stayed the same, over the last ten years in Westgate community conservancy?

a. Increased = 3

b. Decreased = 2

c. Stayed the same = 1

d. I don't know = 4

3.Why do you think the number has increased, decreased or stayed the same? Rank your reasons in order of importance

Answer: I think this has happened because…
1.
2
3
4

4.In your opinion, will you still have Grevy's zebra in Westgate community conservancy ten years from now?

a. Yes, definitely = 5

b. Maybe = 4

c. It might not be = 3

d. Definitely not = 2

e. I don't know = 1

5.In your opinion, has community involvement in activities/meetings increased, decreased or stayed the same regarding conservation issues?

a. Increased = 3

b. Decreased = 2

c. Stayed the same = 1

Appendix V

Letter from School

UNIVERSITY OF NAIROBI
COLLEGE OF EDUCATION AND EXTERNAL STUDIES
SCHOOL OF CONTINUING AND DISTANCE EDUCATION
DEPARTMENT OF EXTRA-MURAL STUDIES
NAIROBI EXTRA-MURAL CENTRE

Your Ref:

Our Ref:

Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
N A I R O B I

29th October 2014

REF: UON/CEES//NEMC/19/285

TO WHOM IT MAY CONCERN

RE: LIZBETH MATE - REG NO L50/77551/2012

This is to confirm that the above named is a student at the University of Nairobi College of Education and External Studies, School of Continuing and Distance Education, Department of Extra- Mural Studies pursuing Master of Arts in Project Planning and Management.

She is proceeding for research entitled **"influence of community based wildlife management on grevy's zebra conservation in Westgate community conservancy in Samburu County, Kenya**

Any assistance given to her will be highly appreciated.

UNIVERSITY OF NAIROBI
P. O. Box 30197
NAIROBI
NAIROBI EXTRA-MURAL CENTRE

CAREN AWILLY
CENTRE ORGANIZER
NAIROBI EXTRA MURAL CENTRE

APPENDIX VI

RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MISS. LIZBETH NJERI MATE
of UNIVERSITY OF NAIROBI, 0-100
Nairobi,has been permitted to conduct
research in *Samburu County*

on the topic: *INFLUENCE OF COMMUNITY BASED WILDLIFE MANAGEMENT ON GREVY'S ZEBRA CONSERVATION IN WESTGATE COMMUNITY CONSERVANCY IN SAMBURU COUNTY, KENYA*

for the period ending:
17th December,2014

.....
Applicant's Signature

Permit No : NACOSTI/P/14/4989/3979
Date Of Issue : 12th November,2014
Fee Recieved :Ksh 1,000

.....
for Secretary
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 3603

CONDITIONS: see back page