THE ROLE OF WILDLIFE CONSERVATION ACTIVITIES ON LIVELIHOOD DEVELOPMENT IN THE MAASAI MARA NATIONAL RESERVE, NAROK COUNTY, KENYA

BY

KIPKOSGEI MESHACK LAGAT

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DECLARATION AND APPROVAL

Declaration

This thesis is my original work and has not been presented for award of a degree in this or any other any University. No part of this thesis will be reproduced without the author's prior permission.

Kipkosgei Meshack Lagat

TP02/JP/MN/8634/2019

Signature ……. Date…….

Approval

This thesis has been submitted for examination with our approval as University supervisor.

1. Professor James Nampushi

   Department of Tourism and Hospitality Management.

   Maasai Mara University

   Signature ……. Date……

2. Dr. Maurice Omollo

   Department of Environmental Studies, Geography and Agriculture.

   Maasai Mara University

   Signature ……. Date……

DEDICATION

I wish to dedicate this thesis to all my family members; Naum, mum Salina and Dad Joseph Ruto. You are special.

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ABSTRACT

Maasai Mara National Reserve (MMNR) is a tourist attraction site and brings revenue to the Kenyan economy. This study, therefore, assessed wildlife conservation and livelihood development in the Maasai Mara Ecosystem (Siana, Naikarra and Mara Wards), Narok County in order to understand the benefits distribution, success and failures of socio-economic projects, community conservation efforts, livelihood activities and wildlife livestock depredation. The study used Mixed Method's concurrent design. From a population of 135130, a sample size of 115 respondents for Siana Ward, 114 respondents for Mara Ward and 114 respondents for Naikarra Ward were selected. Stratified sampling was used to identify the sublocations while systematic random sampling was used to select subjects within the different geographically formed strata or sublocations. Purposive sampling was used to select conservation key informants within the region. The main data collection tools were questionnaires, structured interviews and Focused Group Discussions (FGDs). Pilot test was conducted in Oldonyo Rasha Sublocation to ascertain the validity and reliability of the research instruments. Descriptive analysis was done where frequencies, chi-squares, measure of central tendencies, linear correlation and Ordinal Logistic Regression were computed and presented in tables, pie-charts and bar-graphs. To test the hypothesis Spearman's rank coefficient and ordinal logistic regression (x^2 tests) were done. Among the key findings were that there were socio-economic benefits derived from the MMNR ($r = -.180$, $df = 284$, $p = 0.002$) and since $p < 0.01$, revealed that socio-economic benefits vary significantly with distance from MMNR boundary, ($x^2 = 6.36$, $df = 1$, $p = 0.012$) while $p < 0.05$ at 95 % CL, indicated that socio-economic factors influence the success of wildlife conservation projects in Siana, Mara and Naikarra wards. Additionally, the local community in their effort to support conservation has developed local strategies and activities that demonstrate the value of wildlife conservation in form of community projects that support and exist in the forms of school bursary, construction of class rooms and community water projects. However, there were community projects that could not be established whether they were initiated to support conservation or they were political projects. Livestock depredation and other economic costs were conspicuous, especially closer to MMNR and the intensity of disturbance reduced with advancing distance from MMNR. The local community were participating in livelihood activities that were in support of wildlife conservation and at the same time earning them alternative income, like land leasing, pastoralism, among others. It is concluded that, socio-economic benefits vary with distance from MMNR boundary; livestock depredation vary significantly from MMNR boundary and there are livelihood activities in Siana, Mara and Naikarra ward related to wildlife conservation. The study then recommends that; the County Government of Narok should enhance the 19 % policy on compensation to equitably cover most of the deserving cases; the establishments within the MMNR (hotels and camps) should consider partnering with the local community especially in trade; and the National Government and the private sector should invest in the financial sector, that is, establishment of banks and micro-finance institutions in major trading centres within the Maasai Mara Ecosystem (MME) to enhance credit access.

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ABREVIATIONS AND ACRONYMS

BPO Business Process Outsourcing

CAMPFIRE Communal Areas Management Program For Indigenous Resources

CBC Community Based Conservation

CBNRM Community Based natural Resource Management

CBO Community Based Organization

CL Confidence Level

CS Cabinet Secretary

CWCCC County Wildlife Conservation and Compensation Committee

ECDE Early Childhood Development

FGD Focused Group Discussion

GBV Gender Based Violence

GSU General Service Unit

HWC Human Wildlife Conflict

ICDP Integrated conservation Development Plan

KWS Kenya Wildlife Service

MME Maasai Mara Ecosystem

MMNR Maasai Mara National Reserve

MTP Medium Term Plan

NACOSTI National Research Council for Science and Technology and Innovation

NCG Narok County Government

NGO Non-Governmental Organization

PA Protected Area

SDGs Sustainable Development Goals

SPSS Statistical Packages for Social Sciences

STI Science, Technology and Innovation

UNDP United Nation Development Programme

UNEP United Nation Environment Programme

US United States

VTC Vocational Training Centre

WCTF Wildlife Conservation Trust Fund

WMA Wildlife Management Areas

WWF World Wildlife Fund

OPERATIONAL DEFINITIONS OF TERMS

Benefit-sharing model it means a formula or technique that is used by the County Government to share both monetary and non-monetary advantages derived from the exploitation of wildlife resources.

Household head is a male member (father or husband) of the household who is the primary provider or any other member assuming the roles of household head in his absence**.**

Livelihood development are programs designed to improve the quality of life for the local people by providing them with access to health, education, opportunities and security so that they can contribute to the community's economy.

Sustainable wildlife conservation means the application of management practices that allow the use and exploitation of wildlife resources for posterity.

Wildlife economic costs are economic losses associated with hosting wildlife which include wildlife predation on livestock, destruction of crops, the transmission of diseases to livestock and humans, deaths and opportunity costs.

Livelihood network is the means through which people access food and earn income to meet their basic needs.

Compensation Scheme is a scheme that is to be used to finance compensation claims for human death or injury or crops and property damage caused by wildlife.

Conservation projects are programs undertaken by conservation institutions including Narok County Government and environmental organizations to protect biodiversity, wildlife, wild places or endangered species.

CHAPTER ONE

1.0 Introduction

1.1 Background to the Study

For sustainable conservation of wildlife resources, a sense of belonging must be brought to the local community through their involvement (Akyol, Türkoğlu, Bekiroğlu, and Tolunay, 2018). In Central America, which is home to some world's richest concentration of biodiversity, wildlife species face threats due to the conversion of protected areas into agricultural lands, illegal cattle ranching, human-wildlife conflicts, poaching and wildlife trafficking (US Fish, 2016). Some 80% of protected areas of South America have indigenous people living inside them and the presence of parks and protected areas are considered to pose a threat to livelihood development (Obong, Aniah, Okaba, and Effiom, 2013).

Elsewhere in Africa, the causes of wildlife decline include deforestation, poaching, human-wildlife conflicts, water pollution, uncontrolled fires and wildlife-borne diseases (Jemitias, 2017). In Zimbabwe, it precipitated into the introduction of a bio-economic model in the 1990s, known as the Communal Areas Management Program For Indigenous Resources (CAMPFIRE) as a scheme to address the locals' needs and wildlife conservation (Jemitias, 2017; Herbert , 2015). In Namibia, the development of the Community Based Natural Resource Management (CBNRM) program enabled an environment of connection between conservation and the socio-economic well-being of the local communities (Riehl and Naidoo 2015). In South Africa, Integrated Conservation Development Projects (ICDPs) have been seen as a sound idea that is considered to encourage the conservation of wildlife resources (Herbert, 2015).

Most Kenya's protected areas are found in Arid and semi-Arid areas and are mainly inhabited by the pastoralists (Shah, 2019). They are often the most economically marginalized and therefore making their livelihood insecure (Emerton, 1999; Price, 2017). The economic benefits of wildlife and biodiversity are diverse and accrue to the individuals in society, the financial component of the benefits are mostly realized by governments and outsiders who are business people, especially in the wildlife tourism sector (Walpole and Thouless, 2009a). This further complicates issues, especially in an area where the locals rely on natural resources, making the relationship between conservation and livelihoods unfavorable (Riehl et al., 2015).

Trust land within the Maasai Mara National Reserve (MMNR) of Kenya is occupied by community conservancies (Government of Narok County, 2018). These generally consist of communal and private landowners leasing their land for conservation in exchange for monetary, non-monetary and land management benefits (Maasai Mara Wildlife Conservancies, 2017). However, the benefit-sharing model does not seem to include communities in the decision-making, there is unclear allocation of property rights, lack of proper management structures, lack of involvement of Community-Based Organizations (CBOs), inadequate access to social services and biodiversity awareness creation programs (Shah, 2019).

To address the challenges of conservation and livelihood development, a conservation wave called the poverty alleviation wave was developed to try and resolve livelihood insecurity, bearing the thinking that any economically empowered community would protect its resources (Jon, 2013; Sarmiento, 2011). For an effective balance, the benefit-sharing model should have a complete understanding of the economics of community

wildlife conservation and the nature of wildlife benefits (Akyol et al., 2018; Emerton, 1999). For local communities to be willing and economically be able to conserve wildlife, then, it requires that conservation generate broad benefits that exceed wildlife costs (Emerton, 1999; Crystal and Courtney, 2015). This will be achieved when integrated development are enhanced and are participatory so that both poverty alleviation priorities and conservation strategies are realized (Blackburn et al., 2016; Sitati et al., 2007).

In Narok County, 50% of the proceeds of conservation as per law is supposed to go to the wards adjacent to the Maasai Mara National Reserve, courtesy of a by-law formed by the County to create a community fund where 19% of MMNR income is shared with the community around the reserve (Kenya Wildlife Conservancies Association, 2016). This study intends to determine if the MMNR proceeds contributes to sustainable wildlife conservation and livelihood development using the context of the Maasai Mara Ecosystem.

1.2 Statement of the Problem

Maasai Mara National Reserve is predominantly found within the area surrounded by the Maasai community who are pastoralists. The reserve is located within their ancestral land and the adjacent areas where they live, therefore, also act as dispersal areas for wildlife from the MMNR. This brings about stiff competition for resources between the locals and wildlife. Despite Maasai Mara National Reserve raising about 5.8 billion in the period 2012/13 to 2016/17 (Government of Narok County, 2018), there has been little to show the locals have benefited. The surrounding community still have dilapidated infrastructure in terms of road network, water supply, telecommunication network and access to credit facilities. This happens when the expected sharing of the revenue generated from conservation efforts should be visible and thereby enhance a cordial relationship between

the local people and the wildlife authorities in accessing sustainable livelihoods for the locals and ensuring appropriate and self-driven wildlife conservation efforts by the adjacent community in case, they experience the benefits. In this state, it is important that an assessment of the role of wildlife conservation on livelihood development in the Maasai Mara Ecosystem is undertaken in order to solve the conflicting interests of community's livelihood endeavors and wildlife conservation efforts.

1.3 Research Objectives

1.3.1 Purpose of the study

To assess the role of wildlife conservation on livelihood development in the Maasai Mara Ecosystem, Kenya.

1.3.2 Specific Objectives

i. To determine variation of accrued socio-economic benefits of wildlife conservation with distance from Maasai Mara National Reserve boundary.
ii. To evaluate socio-economic factors that influence wildlife conservation projects in Siana, Mara and Naikarra Wards.
iii. To evaluate wildlife conservation efforts undertaken by the local communities of Siana, Mara and Naikarra Wards.
iv. To determine livelihood activities in Siana, Mara and Naikarra Wards that are related to wildlife conservation efforts.
v. To assess the livestock depredation with distance from Maasai Mara National Reserve boundary.

1.4 Research Hypotheses

The study had the following hypotheses;

i. H_0 Socio-economic benefits does not vary significantly with distance from Maasai Mara National Reserve.

ii. H_0 Socio-economic factors does not influence the success of wildlife conservation projects in Siana, Mara and Naikarra Wards.

iii. H_0 There are no wildlife conservation efforts undertaken by the local community of Siana, Mara and Naikarra Wards.

iv. H_0 There are no livelihood activities in Siana, Mara and Naikarra Wards related to conservation efforts.

v. H_0 Livestock depredation does not vary significantly with distance from Maasai Mara National Reserve.

1.5 Justification of the Study

The study is in line with the following goals of Sustainable Development Goals (SDGs); goal one of getting rid of extreme poverty, goal two of ending hunger and achieving food security, goal four stresses on inclusive and equitable quality education, goal six is availability and sustainable management of water and sanitation, goal eight of promotion of sustained economic growth, inclusive and productive employment and goal fifteen of emphasizing on protection, restoration and promotion of terrestrial ecosystems, sustainably managed forests, combating desertification and halting reserve land degradation and biodiversity loss.

Kenya is also implementing the Vision 2030, under its third Medium Term Plans, geared towards achieving 10% economic growth per anum and making Kenya an upper middle-

income economy. Key among the elements of the Vision 2030, is the creation of employment and spurring of investment opportunities, through tourism activities. The government of Kenya is enforcing the 'Big Four Agenda' of Manufacturing, Food Security, Universal Health Coverage and Affordable Housing. Through effective conservation and efficient benefit-sharing model, the local community can be empowered to contribute to the government plans and agenda.

Narok County being the host of the Maasai Mara National Reserve (MMNR), has the County Integrated Development Plan (CIDP), 2018-2022, that is keen to empower the economic, social and environmental well-being of all the people of Narok County. Through sustainable conservation and an equitable benefit distribution scheme, the county will be able to achieve its vision. Siana, Mara and Naikarra Wards within the environs of MMNR, was chosen for the study based on reported livelihood issues around the area.

1.7 Significance of the Study

This study was expected to reveal the variance of socio-economic benefits from MMNR boundary. The study was to evaluate the social factors influencing wildlife conservation projects. It was to identify wildlife conservation efforts and assess livestock depredation variance with distance from the boundary of MMNR. This study may contribute to the Narok County Government (NCG), a point of reference in distributing the benefits that accrue from MMNR. This study should also be viewed as contributing to the discourse of wildlife economic costs with immense focus on providing possible solutions to livestock depredation that is constantly affecting pastoralist. Additionally, this study may contribute to the existing knowledge on variance of socio-economic benefits with distance from the

protected areas boundaries and the wildlife conservation efforts that the local community can engage in.

This study may contribute to livelihood development in providing the activities the local community should focus in so that they can reduce vulnerability, diffuse wildlife economic shocks and improve their economic standards, with a focus on poverty alleviation. This may make a contribution to the SDGs goal one on alleviation of extreme poverty and goal two on ending hunger and achieving food security.

1.8 Scope and Limitations of the Study

The scope of this study is limited to Siana, Mara and Naikarra Wards of Narok County. Most emphasis was laid on the role of wildlife conservation on livelihood development and was guided by mixed use- concurrent design. This study involved data that was collected between July, 2021 and January, 2022.

MME is a vast savannah and most households are sparsely distributed. Travelling to access the homesteads and respondents was quite tedious and costly and therefore, motorcycles had to be involved in areas not accessible by vehicles.

Communication barrier between the researcher and elderly respondents who could only understand local dialect. Research assistants came in handy, because the all understood the local dialect, they interpreted the questions during the interview where necessary to help collecting the required data.

Collected data was also limited by inability to access wildlife dispersal areas. A number of wildlife in the area are known to attack human beings, however, with the guidance of the

area chiefs and security personnel, relevant data was collected despite the fear of wildlife attack.

1.9 Organization of the Thesis

This thesis has been structured into five chapters, such that chapter one presents the background of the study, the problem statement, research objectives, research hypothesis, justification of the study, significance, scope and limitations and terms underlying the study. Chapter two discusses literature review on benefits of wildlife conservation, factors influencing wildlife conservation projects, wildlife conservation efforts, wildlife economic costs and livelihood activities related to conservation. It also provides the gaps that the study intends to bridge and the study's conceptual framework. Chapter three provides research design and methodology. It includes the administrative description of the study area, study population, sample size and sampling techniques, data collection instruments and procedures. data collection instrument includes, questionnaires, interview schedules and focused Group discussions. This chapter presents methods of data analysis and presentation. Chapter four presents the results and discussions of the demographics and the socio-economic benefits from MMNR boundary, factors influencing wildlife conservation projects, wildlife conservation efforts undertaken by the local community, livelihood activities and livestock depredation. Chapter five provides the summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature on wildlife conservation and livelihood development and shows the gaps that this study intends to fill. It also provides the theoretical framework that guided the research and its modified conceptual framework that is derived to fit with the specific variables of interest to this study.

2.2 Wildlife Resources Conservation Benefit Sharing

2.2.1 Wildlife resource conservation

Over the years, biodiversity conservation has continuously gained great connections to the socio-economic well-being of the local communities (Riehl et al., 2015). This notwithstanding, in 2014, WWF published a piece of alarming information on the dwindling wildlife population due to habitat destruction, poaching, pollution and climate change (WWF, 2014). In Central America, for instance, which is home to some world's richest concentration of biodiversity, wildlife species face threats due to the conversion of protected areas into agricultural lands, illegal cattle ranching, human-wildlife conflicts, poaching and wildlife trafficking (US Fish, 2016). Some 80% of protected areas of South America have indigenous people living within them and the presence of parks and protected areas are considered to threaten livelihood development (Obong et al., 2013).

In the US, on drier ground, a study conducted by the United States Fish and Wildlife Service found that birdwatchers contribute $32 billion annually to the US economy, and safaris in Kenya generate close to $1 billion in annual revenue (UNDP, 2014). The most

thorough study conducted into the financial impact of nature-based tourism has found Africa's 8,400 protected areas are generating $ 48 billion in direct in-country expenditure and that tourism drives 8.5% of Africa's economy and supports 24 million jobs (UNEP, 2014). By 2030, visitors could more than double to 134 million people (UNEP, 2014).

For sustainable management and protection of biodiversity, a sense of belonging needs to be instilled in the local community, which in turn will increase the level of participation and create the right perception of the whole concept of conservation (Akyol et al., 2018). In Namibia, the development of the CBNRM program makes an ideal connection between conservation and socio-economic development (Riehl et al., 2015). This program was taken in the form of jobs that could improve households as well as other benefits-sharing programs, such as community projects (Riehl et al., 2015). Conceptually CBRNM is a sound idea and seems to encourage the livelihoods of poor rural livelihoods through the proceeds of wildlife activities (Ntuli et al., 2018).

2.2.2 Socio-economic benefits

The socio-economic benefits to the community are a key component of conservation and wildlife development (Mosimane and Silva, 2015; Nkhata et al., 2012). GeAnge Imanishimwe and Nsabimana, (2018) views ICDPs as one of the major solutions to human-wildlife conflicts which creates a win-win situation. In Zimbabwe, CAMPFIRE was implemented to give the locals in the communal areas a strong impact on the management and protection of wildlife resources (Jemitias, 2017). From the CAMPFIRE program, the community would get part of the proceeds for wildlife conservation which are distributed to them as cash transfers (Ntuli et al., 2018). This was in support of the fifth wave of conservation which emphasized the innate tendency of growth and development both

economically and socio-culturally alive to the fact that economically empowered communities protect their resources (Fausto, 2011). Herbert (2015) further contends that a community that derives benefits from wildlife conservation has adequate incentives to conserve wildlife.

The majority of Kenya's Protected Areas (PAs) are found in arid and semi-arid lands where pastoralists and agropastoral live and productivity is often low due to weather challenges (Shah, 2019; Reid et al., 2016). Like most sub-Saharan African countries, poverty and lack of alternative livelihood and subsistence hamper effective conservation of wildlife in most of these areas. The majority of the local people around Maasai Mara benefit from the proceeds of MMNR but lack equitable sharing of the benefits by the Narok County Government, which is the custodian of the wildlife resources to the surrounding communities, which could compromise sustainable conservation of wildlife (Shah, 2019; Walpole and Thouless, 2009b). The concept of an egalitarian approach (Mosimane & Silva, 2015) would be helpful in the community around MMNR, where all people are viewed to deserve equal rights and opportunities to the benefits as opposed to a few elite individuals benefiting at the expense of those who bear the brunt of conserving wildlife (Ntuli et al., 2018).

2.2.3 Importance of socio-economic benefits

Livelihood is the greatest of all challenges to communities, households, and individuals and is about food, money, labor, employment and asset (Obong et al., 2013). Riehl et al., (2015) contends that household could benefit from the investment made at the community level, like improved schools leading to improved educational opportunities and improved health infrastructure resulting in enhanced health treatment. Protected areas directly or

indirectly contribute to the creation of job opportunities, improvement of income, access to education and health services, as well as providing environmental services such as clean air, water, aesthetic beauty and relaxation opportunities (Shah, 2019).

However, these benefits or revenues channeled to the community may not create an impact on the livelihoods of the community's people as long as participation remains a questionable issue (Sakala and Moyo, 2017; Pienaar et al., 2013; Sitati et al., 2007). Further, successful project outputs do not necessarily result in successful outcomes (Crystal and Courtney, 2015). Crystal & Courtney (2015) argues that without steps to ensure these outcomes are realized, community projects may be more beneficial for tourism marketing than for the neighboring residents.

It is worth noting that conservation areas have been generating incomes than in many regions, with the objective to support conservation programs that enhance local community's livelihood systems. Most local communities depend on activities related to wildlife conservation, which during low seasons have not been enough to sustain livelihoods. Protected areas, generate revenues that come as either direct or indirect benefits to the local community. However, sharing of these revenues (revenue) resources has been reported to be unjust and inequitable. It is expected that, the people living closer to PAs owing to high disruption of livelihoods, should be compensated the most. This clarity has not been achieved and this study intended to show clarity in the way benefit-sharing varied with distance from the PAs.

2.3 Factors Influencing Wildlife Conservation Projects

The strict form of conservation of natural resources has negatively affected many residents who depend on them (Akyol et al., 2018; Obong et al., 2013). Given that conservation can

only be sustainable if local people enjoy tangible benefits, then it is paramount to involve them in decision making, design of projects, precise allocation of property rights, equitable benefit sharing through management structures, formation of Community-Based Organizations (CBOs), proper access to social services and enhancing biodiversity awareness (Shah, 2019).

An improvement in the community institutions might have a significant impact on the growth of wildlife stock through the local peoples' role in constraining behavior (Herbert, 2015). Conservation initiatives may be very effective if participation which includes the creation of partnerships between local communities, government, and the private industry (Camino et al., 2016). As such, Akyol et al., (2018) found that differences in perception and expectations between local groups have a bearing on the success of the participatory practice of community projects.

To a greater extent, the success of ICDPs in many third-world countries depends on the perceptions and attitudes of the local people living adjacent to protected areas (Ntuli et al., 2018). However, in Wildlife Management Areas (WMA) in Tanzania, a paradigm shift has seen things done differently where the legislation aspects allow villagers themselves to choose to enter into WMA agreements with investors, investors collecting the revenue and delivering it to the federal government for distribution (Maria, 2017) and has provided for more participatory structures and likely to determine the success of community conservation-based projects. In Botswana, CBNRM, which has largely been focusing on photography (Mbaiwa, 2015) and safari hunting, has had some successful conservation projects and others totally collapsing. Mbaiwa (2015) contends that CBRNM projects should be judged on political, social and economic factors of individual projects. Herbert

(2015) explains the factors that affect the outcome of biodiversity projects in Zimbabwe as cooperation, training of community members, benefits sharing, social capital, and information sharing and continue to indicate that government projects should target capacity building in terms of institutional capacity and skills development in order to have a positive impact on biodiversity.

Local peoples' perception dramatically determines the success of conservation, as a result, these perceptions affect attitude and behavior with respect to conservation (Ntuli et al., 2018). While Community-Based Conservation (CBC) success requires engaging with and providing benefits to the local community (Mariki, 2018; Brooks et al., 2012), CBC projects are not always successful or free of controversy (Brooks et al., 2012). Mariki (2018) argues that though Community-Based Organizations were successfully established as institutions to provide leadership development, some key actors still lack the necessary entrepreneurship and managerial skills, transparency, and sustainable good relationships to ensure its success and sustainability.

GeAnge Imanishimwe and Nsabimana (2018) suggests the establishment of a methodology to guide the implementation of ecodevelopment projects and further note that the problem bedeviling programs lies with the countries which do not follow up to make sure that Integrated Development Projects (ICDPs) are well implemented. As such, it is important that the positive output of a project leads to a positive outcome because if they do not, communities will get frustrated, and attempts to make them conserve will backfire, making them more negative about conservation (Crystal & Courtney, 2015; Nkhata et al., 2012).

While the Kenya wildlife policy of 2011 seeks to promote partnerships, incentives and benefit sharing at the same time promote positive attitudes towards conservation and

management (Kenya Wildlife Service, 2011), there are other suggestions that National government institutions, corruption, and standard of living can influence projects outcomes (Brooks et al., 2012). Low access to education and health care may also limit conservation efforts (Crystal & Courtney, 2015). There is also a feeling that communities who bear the brunt of conservation still lag behind in terms of development on issues like; clean water, education facilities, credit facilities, energy provision, health facilities, access to information and telecommunication services and good roads (Shah, 2019).

Gren et al., (2018) contend that the asymmetric allocation of costs and benefits among stakeholders constitutes a threat to wildlife. Gren et al., (2018) further note that this challenge is a policy issue that could affect community projects and programs, especially if the local people are not compensated adequately for wildlife costs. Studies show that mixed factors have been put forth to affect the performance of community-based projects, which include the types of communities involved, resource governance, the effectiveness of the institutional framework in charge of the project, availability of skilled personnel, stakeholder capacity, reinvestment of conservation projects, revenue sharing and community cohesion (Mbaiwa, 2015). Brooks et al., (2012) evaluated the project's success based on four outcomes domains; attitude, behaviors, ecology and economics. Brooks et al., (2012) observed that as conservation practitioners seek viable alternatives to strict protectionism, they increasingly recognize that projects achieve many ecological, economic and social goals to be successful.

Past studies have noted that in many conservation areas, matters of conservation projects have been synonymous with CBOs, NGOs and other conservation institutions. It has, therefore, been noted that the strength of these institutions has a bearing and a significant

impact on the growth and development of wildlife conservation programs. Perceptions that have been noted to emanate from incentivizing the local community, have had an influence in the resident's behaviors towards wildlife conservation initiatives. What have been noted in this study and is of concern is other factors that contribute to the success or failures of community's conservation projects that when collectively considered and addressed, it will sustain the objectives of ICDPs, in this regard, this study intended to do that.

2.4 Wildlife Conservation Associated Costs

The presence of wildlife anywhere gives rise to costs by interfering with other components of community livelihood systems (Emerton, 1999). Costs occur from wildlife predation on livestock, destruction of crops, traffic collisions, the transmission of diseases from wildlife to animals and humans, property damage, among many others (Gren et al., 2018). In Kozildag National park in Turkey, residents noted that they incurred an income loss due to the existence of a National Park (Akyol et al., 2018). In Nigeria, around Cross National Park, it is noted that the poses a threat to the local livelihood system (Obong et al., 2013). It is, therefore, clear that many of the costs of wildlife conservation are acute and borne locally (Sitati et al., 2007). Emerton (1999) contends that the opportunity costs of people's time in wildlife areas are high because of the constant disruption of their livelihood activities.

2.4.1 Human-wildlife conflicts

This is a well-known issue throughout sub-Saharan Africa, and stepping down the challenges and problems mounted by wildlife has become an urgent conservation priority and vital to the coexistence between humans and animals (Mekonen, 2020). In Ethiopia, for instance, human-wildlife conflicts have no such empirical data to deal with this concern

and foster an amicable solution to it (Mekonen, 2020). It is, therefore, reported that the local communities do not get enough benefit from wildlife resources and are alienated from wildlife-related economic activities. The case of Bale National Park indicates that human activities have a significant bearing within and around it, which has resulted in adverse effects on the park and wildlife conservation initiatives (Mekonen, 2020).

From this point of view, it is vital to assess the human-wildlife conflict that occurs with local communities living adjacent to conservation areas (Sanjeeva, 2011). Most studies done on this subject are aimed at identifying the potential ways to mitigate or prevent conflicts for the better well-being of both people and wildlife (Gren et al., 2018). One best way to find effective solutions is initially understanding the whole phenomenon of conflict (Length, 2017).

Additionally, the present study aims at finding out how the challenges such as livestock depredation, vary with distance away from conservation areas and especially how the scenario looks like where co-existence between humans and wildlife has high interactions (Doly et al., 2020). Indeed, from past studies, local communities and conservation organizations have had the benefit of understanding how to conserve or manage wildlife in addition to ensuring they foster a positive coexistence between people and wild animals in the interest of human and environmental well-being (Robinson et al., 2018).

2.5 Estimating Livestock Depredation

Human-Wildlife conflict is one of the greatest threats to the carnivore population, especially lions (Baral and Bijay, 2010). The rate at which livestock depredation is tolerated varies from region and culture. In Ethiopia, research has shown that locals do not benefit enough from wildlife because the nature and extent of Human-Wildlife Conflicts

(HWC) around the Bale Mountains have greatly affected livelihood (Mekonen, 2020). In such a scenario, wildlife becomes a source of costs which occur in the form of wildlife depredation on livestock, destruction of crops, traffic collisions, the transmission of diseases and browsing (Gren et al., 2018; Munyao, et al., 2020). FAO (2015) reports that the issue of HWC, mainly emanating from crop damage and livestock depredation, is the leading cause of livelihood destruction, especially in developing countries. Therefore, communities bordering PAs often suffer losses of economic opportunities when coupled with the rapid human population growth (Emerton, 1999).

Studies have shown in Tarangire-Manyara ecosystem that conservation challenges have arisen mainly due to crop raiding and livestock depredation (Pittiglio, 2008). The cost of wildlife depredation in South Africa, for instance, has been estimated to be $ 58.5 million in losses per year, accompanied by complex social, economic, and ecological drivers involved (Kerley et al., 2017). In South Mexico, most people in rural areas keep livestock and poultry as a way of additional income (2013), but they still face attacks from carnivores such as *Puma puma concolar and jaquar panthera***,** whereas, in the US, livestock are threatened by coyotes (United States, Department of Agriculture, 2002).

Livestock predation can easily destroy livelihood, but there are other factors that contribute to the mortality of livestock, including zoonotic diseases (FAO, 2015). As reported by (FAO, 2015) of the emerging infectious diseases 70 % are zoonotic originating from wildlife, for example, ebola virus (EBOV), Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome Corona Virus (MERS-CoV), brucellosis among others.

At the same time, carnivores also suffer retaliatory deaths as the human-lion conflict in most PAs escalates (Gebresenbet et al., 2018). However, most instances of retaliatory

behavior are witnessed closer to the PAs more than in further areas, for instance, in Serengeti National Park, the livestock mortality rate is the highest closer to the park thus, distance significantly affects attack rate and mortality rate (Larkin, 2014). At the same time, research has indicated that living alongside predators entails a substantial amount of costs to property and personal safety, especially in Maasai Mara National Reserve (Femke et al., 2021). Additionally, most depredation occurred during the day when livestock is grazing and during the dry season (Mbise et al., 2018).

2.5.1 Livestock depredation

Past studies have shown that the most common problematic wild animals are leopards, common jackals, spotted hyenas, and lions, among others. This challenge of livestock depredation also differs from village to village because in other places, they have a mechanism for containing this menace, thus reducing the effect on livestock (Length, 2017; Widman and Elofsson, 2018). The leopard, for instance, preys on almost all types of livestock and other domestic animals, while Common jackals attack sheep and goats (B. T. and N. Baral, 2010). The spotted hyena is known to attack almost all livestock and more so responsible for the loss of oxen, cows, donkeys, mules, domestic dogs and horses. In most conservation areas, including MMNR, carnivores are attacking domestic livestock due to the declining number of herbivores in the wild due to prolonged droughts and habitat degradation (Ogada et al., 2003).

2.5.2 Killings of wildlife

Studies have shown that in the event compensation is not affected for crop losses or any other damage accruing to the local communities, the communities suffer most, where in return for the damages caused, they attack the wildlife animals (Wittemyer et al., 2013). It

is, however, worth observing that damage to crops negates the progress towards food security and, by extension, injures the strides gained on the goals of SDGs. Past studies have also indicated that the lack of ways to protect and prevent crop-raiding has occasioned a great loss to the efforts to conserve wildlife at the same time, maintain the livelihoods of the people living nearby conservation areas (Convention on Biological Diversity, 2016). From the study by Stanley et al., (2014) the root causes of human-wildlife conflicts were observed to be; agricultural expansion, human settlement, overgrazing by livestock, deforestation, illegal grass collection and poaching.

Previous studies have indicated that deforestation is a major cause of human-wildlife conflict which is mainly caused by the felling down of trees in the move to expand farmlands, collect firewood and livestock grazing (Blackburn et al., 2016). There are instances where overgrazing has been reported in many protected areas and has been a source of concern, especially during periods of drought when there is a scarcity of pasture and water (Kevin et al., 2015).

2.5.3 Methods of preventing depredation

According to Kenya Wildlife Management and Conservation Act 2013 (The Republic of Kenya, 2013), no compensation shall be paid where the owners of the livestock, crops or other property failed to protect them from damage by wildlife or their land use practices are incompatible with the ecosystem's management plan. In South Africa, for instance, attempts have been shifted from eradicating predators to non-lethal methods to reduce livestock predation (Kerley et al., 2017). In Maasai Mara National Reserve, conservation strategies that involve human-wildlife co-existence approaches are being adopted and aimed at minimizing costs associated with predators against the option of killing them.

Studies show that this has been the case in Maasai group ranches between Tsavo National Parks and Amboseli, where retaliatory attacks have been remarkably high (Femke et al., 2021).

Preventing livestock depredation may involve a combination of techniques and tools (United States Department of Agriculture, 2002), such as fencing, guard animals, shed lambing, and scarecrows, among others (FAO, 2015). However, there is a raging use of artificial eyespot as a technique that may function as diversion targets, predator mimics, conspicuous startling signals, deceptive detectors, or a combination and become cost-effective when applied on high-value livestock (Cameron et al., 2020)

It has been reported that, conservation areas face numerous economic costs which in the long run influences livelihood networks negatively. They have been noted to create great livelihood disruption to socio-economic progress and sometimes death of human beings caused by wildlife attacks are reported. Much of these economic costs and the impact they create to the society have been delved with a lot in many studies but hardly is there enough information regarding how these economic costs and their influences vary with distance from the conservation areas. This study intended to do exactly that, especially considering how depredation varied with distance away from MMNR.

2.6 Wildlife Conservation Efforts

2.6.1 Wildlife conservation and human-wildlife conflicts

Previous studies have found out that HWC is associated with conflicts between groups of people and how each group has different interests in the management of wildlife (FAO, 2015). Most conservation areas have been observed to resist urbanization over the years, and this kind of resistance has been observed in agricultural activities (Lagat, 2019).

However, some studies have observed that it has not been easy to resist agricultural activities, especially where the alternative forms of livelihood were limited (Nsonsi et al., 2017).

Thus, in many conservation areas, the enforcement of protectionist conservation policies has created feelings of leaving others behind and escalating a sort of injustice and thereby demotivating the conservation crusaders (Walpole and Thouless, 2009a; Teel et al., 2022). Further, studies have observed that severe friction and differences are witnessed where the local community has a completely different agenda from those of the proponents of conservation (Doly et al., 2020).

In such cases, it is imperative to have local solutions to such local problems, which must consider the previous interventions and their outcomes and may include monitoring towards adjustments because perceptions, as well as the populations and activities of both humans and wildlife, change over time (Length, 2017; Ochieng et al., 2020).

In Central India, for instance, the economic loss occasioned by wildlife is a considerable threat to animal conservation due to increasing resentment among the residents that may result in retaliation, and therefore, an appropriate compensation action is also considered to reduce conflict, making conservation efforts more fruitful (Bayani et al., 2016).

In Gera District of South Western Ethiopia, the pressures exerted on land resources and reduction of core habitat for wild animals and elimination of corridors for migration increase the probability of contact and possibly create conflict between farmers and wild animals (Florida et al., 2017). Human population growth and anthropogenic effects such as deforestation, inappropriate site selection for investment (coffee production) in forested

areas and expansion of subsistence agricultural activities lead to increased HWC (Amaja et al., 2016).

2.6.2 Cooperation and support within the traditional conservation institutions

Studies have indicated that the overall results of social and economic factors are drivers of cooperation in institutional formation (Nkhata et al., 2012). Past studies have indicated that community wildlife institutions significantly relate to cooperation (Kelman, 2013). In this regard, it seems to point out that improving the quality of institutions improves cooperation with respect to communities and, more so, institutions in conservation areas (Norton-griffiths and Economics, 2020). Most communities in most conservation areas have managed to develop some form of institutions, but now these institutions differ in terms of their characteristics from one community to another. Previous studies results have pointed out that the level of cooperation in a community declines as the size of a resource system increases. However, communities bordering conservation areas have a role to participate, get involved and build institutions that are charged with the conservation and management of wildlife (Stephenson and Ntiamoa-Baidu, 2010). These institutions could be a creation of the law and most of them are tasked with resolving conflicts surrounding land resources or natural resources amongst the inhabitants. Therefore, most communities which have small resource systems sometimes do not generate tangible benefits (Riehl et al., 2015). This may be considered a source of conflict and in areas where wildlife roams freely, it becomes a big concern in the form of human-wildlife conflicts. In such situations, community institutions come in handy to help mitigate the conflicts and assist in the equitable distribution of resources (Mutanga and Vengesayi, 2015). However, in some other regions, studies have observed that communities that have reduced protected areas

and have big population are better off in terms of reflecting cooperation than communities with an extended conservation area and a small number of people (Shah, 2019). Thus, in managing and conserving wildlife resources, cooperation is one of the vital characteristics of a population bordering protected areas (Patricia et al., 2020).

2.6.3 Public dissemination of conservation information

Studies conducted on the residents of Amaramudnur village in India, indicated that though they may not be entirely aware of wildlife conservation, they had seen or heard public service advertisements on this issue at least once; further, previous studies have indicated that most members of the local community bordering a conservation area had studied about conservation of forest, wildlife and biodiversity while others were admitted in an institute and majority can be able to mention various threats faced by wildlife over the years (Shruthi 2020; Wen et al., 2020). Further, a great portion of the population living locally is partially aware of wildlife conservation (Obong et al., 2013).

Studies have indicated that about 20% of the local people can present a better perspective on wildlife conservation (Farrington et al., 1999 ; Nsonsi et al., 2017). Most of them have expressed concern over the decreasing number of some animals like rhinos, elephants and other endangered species (Milliken, 2014). It has also been observed that most local inhabitants firmly believe that strict laws and punishments can prevent poaching and other activities that are harmful to wild animals (Chwalibo et al., 2018).

2.6.4 Social media (Youtube) awareness

Studies have revealed that conservation awareness has moved to emerging technologies, for instance, Brave Wilderness is a YouTube channel that was created in 2014 with the main focus of showing interesting wildlife in its natural habitat (Vins et al., 2022). In this

platform, special focus has been given to engaging the extremes of nature and finding interesting and misunderstood wildlife, many of which are forgotten or neglected in conservation efforts (Vins et al., 2022). Many other local communities, including the residents around MMNR, are using Facebook and Twitter to create awareness across the world about the flora and fauna that the MME host. Most of the Brave Wilderness videos, the content created tells a compelling story and highlights fascinating wildlife, bringing awareness of science, nature and conservation subjects to a large audience (Vins et al., 2022). The stories giving attention to biodiversity end up reaching many people and hence creating enormous efforts for them to conserve or contribute to the conservation and management of biodiversity (Marina et al., 2019). Currently, social media has become a strong tool upon which the academia and conservation practitioners can benefit from examining successful outreach efforts and directly participating in web-based outreach activities. Studies indicate that social media video content that gives details of diverse species, which can be available to the public, academia and conservationist, can provide great insightful information vital to biodiversity conservation but also can expose wildlife to risks (Bergman et al., 2022). Social media platforms like YouTube, Twitter, Facebook and WhatsApp can bring inspiring and educational content to an increasingly global audience where even academia can learn from, and participate in these efforts (Vins et al., 2022).

2.6.5 Community perceptions on conservation

Previous studies in Transmara, Kenya, indicate that individuals with diverse sources of income tend to have more favorable attitudes towards conservation than those whose sources of income are lean (Nyumba et al., 2021). Further, good conservation can be

attributed to direct and indirect income-generating opportunities (Florida et al., 2017). Involvement of communities in decision-making, benefit-sharing and participation in the creation of social institutions, involvement in awareness creation and enabling access to social services have a great impact on the perception of wildlife conservation (Shah, 2019). Community views on conservation can be either negative, neutral or positive perceptions towards the protection of plants and wild animals depending on whether there is a sustained benefit scheme accruing to the local communities (Shah, 2019).

Similarly, local communities that portrayed negative attitudes toward wildlife have been linked to severe losses they incur in terms of livestock depredations and crop damage (Catherine, 2018). It has further been indicated that the communities meted with the most loss are more negative towards wildlife. Other studies have observed that most communities whose livestock are killed by predators become retaliatory against predators and therefore dislike the predators (Muriuki et al., 2017). Communities that reside furthest away from the protected areas behaved relatively more positive towards wildlife and indicated that distance was the factor in how communities viewed wildlife (Blackburn et al., 2016).

Friction between livelihood activities and wildlife conservation have been negating conservation endeavors. This has been more pronounced in cases where wildlife disruption of livelihood has been immensely reported but compensation for the same also revealed to be unjust or unexpectedly delayed. Cordial and working relationship between conservation authorities could be achieved where the local community played an active role in the conservation efforts. Community traditional institutions have been observed to play a key role in ensuring sustainable conservation of wildlife resources. Further, emerging

technology in terms of communicating conservation issues, programs and wildlife incidences has been embraced by the locals. This study intended to establish other ways in which the local community could engage in, with an objective to create a livelihood for themselves and at the same time actively engage in conservation matters.

2.7 Livelihood Activities in Conservation Areas

2.7.1 Livelihood activities and conservation

There are indications from past studies that farm crops and livestock are the leading sources of income (Noe and Kangalawe, 2015). Within these conservation areas, past studies have shown that when there are other alternative means of livelihood, the total sum income increases, for instance, in areas where crop farming is done or livestock keeping a higher income on livelihood activities has been recorded (Tembo et al., 2014). This is associated with livestock keeping or poultry farming, where animal products that are in demand like eggs, milk, skins and manure, and when they are taken into account, the contribution of livestock is high (Rico García-Amado et al., 2013).

Pastoralism is a livelihood and income strategy for dry lands (Doly et al., 2020). The underlying reality is that pastoralism is a conservation strategy to make the best use of dry lands both spatially and temporally to help pastoralists mitigate against climate change effects, especially the escalation of droughts and desertification (Nkembi kengafac and Forghab, 2022).

Additionally, pastoralism as a livelihood strategy relies on natural resource management that respects the limitations imposed on such dry lands, the necessity for mobility, and puts into consideration the indigenous knowledge and pastoral institutional systems (Alberti et al., 2011; Su et al., 2020). Tremendous influence of any pastoralist activity is the nature,

security and complexity of people's livelihood strategies (Noe and Kangalawe, 2015; Riehl et al., 2015).

It is thus, important to note from previous studies that when the population of the inhabitants is swelling, initiatives to improve on diversifying the economy into activities not dependent on natural resources have to be given weighty considerations (Alberti et al., 2011; UN, 2018). This approach will help reduce overreliance or overdependence on natural resources and save on biodiversity (Mmbaga et al., 2017).

2.7.2 Livelihood improvements and wildlife costs

Past studies indicate that a lot of intervention have been done in forested areas, which may include facilitating the involvement of communities in forest resources management decisions, allowing communities to have varying degrees of power to manage the forest sustainably (Edson et al., 2013; Herbert , 2015). A study in Save Valley Conservancy in Zimbabwe indicated that prevention and mitigation of HWC in local communities adjacent to the western part of the Conservancy were limited to a small set of traditional deterrent methods (Edson et al., 2013). Pro-active guarding was the most commonly adopted method for reducing severity of damage by those experiencing crop raiding induced by wildlife (Amaja et al., 2016).

2.7.3 The connection between wildlife and people

A multispecies assessment of wildlife impacts on local community livelihoods (Carter et al., 2014; Koundouri et al., 2013; Schleyer, 2018) has indicated that conflicts arising from the conservation of wildlife are often because of antagonistic interactions between human activities and wildlife. These human-wildlife conflicts have been found to affect the well-being of the people, which are manifested in the loss of income and food and even death

or injury to human beings (Hans Bauer, 2015; Mwakatobe et al., 2013; Nsonsi et al., 2017). Human-Wildlife Conflicts disrupts normal activities like the movement of human beings within and around conservation areas and especially school-going children (Abukari and Benedict, 2020).

In the Maasai Mara Ecosystem, HWC has been observed to threaten the very existence of wildlife in the Serengeti-Mara ecosystem (Blackburn et al., 2016). The loss of wildlife resources is directly proportional to the loss of the revenues accruing from tourism activities (Catherine et al., 2018; Ochieng et al., 2020). Frictions accruing in this ecosystem can also compromise the world heritage of immense importance both to the present and future generations (B. T. and N. Baral, 2010). It was incumbent upon those tasked with the responsibility to manage and conserve wildlife resources to acquaint themselves with the critical information on patterns, trends and explanatory factors in order to properly execute their mandate (Koundouri et al., 2013).

The challenges of HWC in a region like MME, by far, can be remedied through the promotion of integrated wildlife and livestock management to make sure that pastoralists do not suffer from the inadequacy of pasture and water, and at the same time, they do not contract transmissible diseases (Widman and Elofsson, 2018; Kwaslema Malle Hariohay, 2015). The focus in livestock production has been found to be on veterinary control, bridging the knowledge gap on livestock production processes, and improving local breeds and thus produce (Suneetha et al., 2018; Bongaarts, 2006).

2.7.4 Human-wildlife conflicts and livelihood networks

Human-wildlife conflicts are prevalent in Africa, where large numbers of big mammals, such as elephants and lions, still roam freely in marginal rangelands and protected areas

(Schiess-meier et al., 2007; Mmbaga et al., 2017). The increase in human population has resulted to encroachment into more marginal lands inhabited by wildlife, leading to fragmentation and conversion of land, for instance, to settled agriculture and other uses incompatible with wildlife (Obong et al., 2013; Amaja et al., 2016). These, activities, do not only escalate conflicts between the people, wildlife, and the authorities responsible for the conservation of wildlife, but also pose a real challenge to sustainable wildlife conservation practice (Matseketsa et al., 2019). In Kenya, for instance, where much of the wildlife lives outside designated protected areas, it is observed that the people who live in these areas depend more on natural resources and find it difficult to tolerate wild animals in their lands when they consider them a threat to their lives and livelihoods (Crystal & Courtney, 2015).

Past studies indicate that the understanding of how land use change happens, variations in climate, and both human and livestock population numbers influence HWC (Kideghesho et al., 2013; Tallis et al., 2009). This can be a crucial precursor for creating effective HWC mitigation and biodiversity conservation strategies (GeAnge Imanishimwe and Nsabimana, 2018; Mwakatobe et al., 2013). Despite all these initiatives, it is difficult to establish the extent, severity and consequences of HWC for both wildlife and human communities, which also makes it more challenging to access data on long-term patterns in HWC for many wild animals due to scarcity of data (Stanley et al., 2014). Human-wildlife conflict studies do not provide accurate information due to overreliance on questionnaires mostly and that livestock owners tend to exaggerate livestock losses to large carnivore depredation, than actually is the case (Blackburn et al., 2016; Hans Bauer, 2015).

Previous studies have tried to link wildlife conservation and tourism with the intention to alleviate poverty from the adjacent communities, which in most cases has been observed to be pastoralist (Katherine M Homewood, 2012; Kathleen Krafte Holland, et al., 2021). Past studies saw the establishment of a conservation wave that promotes the empowerment of the local community in order to support conservation initiatives (Noe and Kangalawe, 2015). The extent to which wildlife revenues contribute to pastoralist livelihoods is a matter that is between conservation and empowerment of the local communities in a way that will change their perspective towards conservation and, by extension, to coexist with wildlife (Femke et al., 2021; Walpole and Thouless, 2009b). Past studies have looked into the role of livestock and other activities in the context of rural pastoral communities and what it can do with their rural-local economies and livelihoods at large (Katherine M Homewood, 2012; Schleyer, 2018).

Security concerns, which range from periodic raiding to prohibition of access to natural resources within protected area boundaries, have been reported to have numerous negative social and economic impacts on local people, especially when they have no alternative form of livelihood and they have traditionally relied upon those resources for their livelihoods (Bayani et al., 2016; Galanti, et al., 2006). Local people, in many studies, have been reported to incur additional costs such as crop losses, livestock depredation, and human injury and death caused by wildlife from protected areas which often leave their livelihood exposed and socio-economically vulnerable (Gren et al., 2018; Nyirenda et al., 2013; Obiero et al., 2019).

Climate change has, in the recent past, posed great risks to pastoralists (Blackburn et al., 2016). While pastoralism is thought to be a land use that is already adapted to variability

in rainfall and thus offers better adaptation potential than other competing land uses, it has in the recent past received great challenges, more so due to the level of escalating droughts in many of the savannahs (Katherine, 2012; Reid et al., 2016). This notwithstanding, contrary to the emerging trends related to climate change, studies have revealed that pastoralists have longstanding traditional strategies and strong social institutions for using resources and responding to climate variability (Claire Bedelian and Ogutu ., 2017; Kideghesho et al., 2013). Studies have also established that the use of mobility to track variable and unpredictable resources has gone a long way to assist in coming up with better and able ways to respond to and cope with droughts (Claire Bedelian, 2014; Katherine ., 2012; Nyumba et al., 2021). Pastoralists that move from place to place has been thought to be doing better than sedentary ones during drought and therefore are less likely to lose stock, but in the recent past, livestock husbandry and change of livestock from indigenous to exotic breeds may be an intervention on the way to resolve competition on scarce resources but better production (Blackburn et al., 2016; Mbise et al., 2018; Tembo et al., 2014). It is, however, worth observing that studies have discovered that pastoral communities' resilient livelihoods will be those best able to cope with the increased climatic shocks in these systems (Mutanga and Vengesayi, 2015).

Previous studies have revealed that the survival ways in the face of the changing climate for pastoral communities living adjacent to PAs are actually diversification of livelihoods into viable alternative livelihoods forms, which in itself act as way to spread the risk (Baird et al., 2009; Sarmiento, 2011; Wittemyer et al., 2013). Moreover, in the wake of land fragmentation enabled by the sub-division of community lands, there results in an impediment to movement of livestock and access to key resources, thus it has necessitated

pastoral communities to opt for non-livestock sources of income for their livelihoods (Shah, 2019; Mekonen, 2020). Diversification of pastoral livelihoods is widely observed across pastoralists in East Africa (Katherine, 2012; Reid et al., 2016). At a place like MMNR, studies have indicated that diversification into tourism is a viable option, especially when the local community considers land consolidation to create more conservancies to host wildlife (Kelman, 2013; Reyers, 2013). Kenya, for instance, in its semi-arid and arid lands, is inhabited by the pastoral communities who majorly coexist together with wildlife and so these pastoral lands are vital habitats for wildlife and tourism (Mutanga and Vengesayi, 2015).

Additionally, within pastoral savannas of East Africa, wildlife and livestock have coexisted over time, and past studies have found that traditional pastoralism has been considered to be compatible with wildlife conservation (David and Danda, 2014). Within the Maasai community of Narok, they have diversified into dealing in the trade of livestock products like milk, meat and other related entrepreneurship activities that provide alternative income to households (Mbise et al., 2018; Ochieng et al., 2020). This kind of action has enabled most households in the local community to withstand the severity of droughts and unpredictable economic times that affect livestock and tourism (Katherine, 2012; Muriuki et al., 2017).

Past studies have found pastoralism and wildlife conservation compatible activities and thus while pastoralism aid in making rangelands open, it also decelerates the fragmentation of land and creates synergies for wildlife (Obong et al., 2013). From this perspective, it is indicative that pastoralists play an important role in maintaining these landscapes and naturally regulating wildlife populations (Krishnan et al., 2012; Munyao et al., 2020;

Sarmiento, 2011). Most importantly, studies have shown that the synergies between pastoralism and wildlife elevate their likelihood of working adaptive land uses as an intervention in the face of unpredictable climate change especially in the erratic and variable savannas (Crystal et al., 2015; Kideghesho et al., 2013; Reyers, 2013).

2.7.5 Community programmes and improved livelihood

The concept of Community Based Natural Resource Management (CBNRM) programmes was conceived in the 1970s to reduce HWC (Pienaar et al., 2013). It worked by giving incentives to members of the local community with a foresight of conservation, which helped to mitigate the chances of the destruction of wildlife and their habitats (Abukari and Benedict, 2020; Pienaar et al., 2013). Studies have indicated that CBNRM provided socio-economic benefits to the community, which became an important component in the design and implementation of the initiatives in most rural areas (Child, 2011). CBNRM is considered to provide a two-prong approach that entails community participation and economic benefits while reciprocating in appreciating conservation initiatives in their community (Riehl et al., 2015). For instance, studies have observed that in Botswana in the 1990s, selected rural communities were allowed to sell the rights to view and/or hunt wildlife on community land and enter into joint venture partnerships with tourism operators (Mbaiwa, 2015; Pienaar et al., 2013; Schiess-meier et al., 2007).

Further, studies indicate that the country created a community to receive and manage the resulting tourism-related revenues in the hope that additional income and employment would result in the communities conserving wildlife and investing in the much-needed community development projects (Seixas and Davy, 2015). Contrary to the intention of this concept, most local communities where CBNRM is practiced have not so much

improved conservation activities (Mosimane and Silva, 2015; Riehl et al., 2015). Pienaar et al., (2013) argued that CBNRM villages in Botswana had not proven their capability to negotiate agreements with private tourism companies, which may give them control over the wildlife resources they host.

In instances where there is an exploitation of natural resources by the local community leading to the scarcity of resources, it has an impact on the coexistence between wildlife and livestock because the predators will be attacking livestock (Nkhata et al., 2012; Convention on Biological Diversity, 2016). For instance, in the Amboseli region, studies have shown a decrease in the number of prey for the predator, which puts the livestock at high risk (Godfrey, 2016; Muriuki et al., 2017).

It has also been established elsewhere that may be an effect of seasonality in that during the dry season, livestock may not be easily attacked as compared to the rainy season, where the prey, having dispersed to livestock grazing areas, exposes the livestock to predatory attacks (Blackburn et al., 2016; Claire Bedelian and Ogutu J, 2017; Crystal & Courtney, 2015; Sarmiento, 2011).

On the other hand, community patrols by the security agencies like the scouts, KWS, and other security operators who are enforcing security measures on the wildlife resources and other natural resources in many parts of the conservation areas are also assisting the locals in the protection of their property, especially the livestock who are always an easy target to predation (Child, 2011; Blackburn et al., 2016; Okello, 2014). Challenges to this strategy occur when members of the local community, during the dry period, drive their livestock inside protected areas to access pasture (Galanti et al., 2006; Jon, 2013; Ogutu et al., 2016). Research has shown that most pastoralists around MMNR battle with security officers as

they graze their livestock inside MMNR during prolonged drought periods (Bartzke et al., 2018). As a result, livestock is reported to be attacked by predators giving rise to conflicts between herders and the management (Blackburn et al., 2016; Claire Bedelian and Ogutu J, 2017).

Research has indicated that for community members to support effectively or actively engage in conservation matters, they need to see believable incentives (Baral et al., 2007; Reyers, 2013; Seixas & Davy, 2015; Valdez et al., 2006). The manner in which accrued benefits are shared has been reported from previous studies that it has a bearing on the trust and support likely to emanate from the local community members (Edson et al., 2013; Femke et al., 2021). The community's elite, who dominate in the management of the resources and subsequently in the sharing of resources, create friction amongst the vulnerable members of the community who may be poor and powerless (Femke et al., 2021; Gren et al., 2018; Riehl et al., 2015). Research has indicated that members of the community require empowerment and capacity building to participate in the management of their natural resources actively (Baral et al., 2007; Rico García-Amado et al., 2013; Seixas & Davy, 2015). However, previous studies have noted that whenever there are costs to the conservation of wildlife resources, it is imperative to sustain a situation where the benefits outweigh the costs (Gren et al., 2018; Schuhmann and Schwabe, 2000; Fausto, 2011).

The elite capture reported in most conservation areas is responsible for inequitable distribution of resources and benefits, causing injustices and leading to discontent amongst members of the community (Crystal et al., 2015; Naliaka et al., 2018). On the contrary, it is important to empower and work with all categories of people living none behind when

it comes to conservation matters (Noe and Kangalawe, 2015). More of these interventions should go to the less privileged and vulnerable members of the society who are heavily dependent on natural resources in order to ameliorate them from poverty and expand their livelihood networks (Mojo et al., 2020; Nsonsi et al., 2017; UN, 2018).

For instance, in the Kwando region in Namibia, CBNRM has given rise to feasible changes to the rural way of life (Bollig and Vehrs, 2021; Thomson, 2020). This is associated with a finding that incentives given to the local community empower them (Doly Roe et al., 2020; Reyers, 2013). In terms of management of wildlife, it has been postulated that when the members of the community are in charge of the management of wildlife resources, this level of participation contributes to appropriate control of resources which in turn generates less costs and produces a considerable amount of perceived benefits which outweighs the costs (Edson et al., 2013; Gren et al., 2018; Ochieng et al., 2020). Studies have observed that in this way, wildlife conservation comparatively may be viewed to be sustainable as long as other controlling factors are also managed (Shah, 2019). It is imperative to note that the main aim of CBNRM is to ameliorate people from poverty and uplift livelihoods toward a better society (Riehl et al., 2015).

In many parts where communities host wildlife and conservation activities are intense, apart from National parks and National reserves, community conservation has been considered an accommodative initiative that insures both wildlife and human livelihood against the adversities of weather and climate change, which result in drought and desertification in the long run (Downie, 2015; Jon , 2013; Ogutu et al., 2016).

Research has also indicated the importance of indigenous knowledge, including its institution, cultural and social perspectives, that understanding this background is crucial

for sustainable conservation of natural resources (Affiliation, 2018). It is considered imperative more than even other tangible benefits like financial incentives and research has indicated that associating with dear community values unlocks the local participation dilemma socially where the community relies mostly on natural resources for most of their livelihood networks (Catherine and Doyle-Capitman, 2018; Rico and García-Amado et al., 2013; Sakala and Moyo, 2017). Studies have thus indicated that communities like the Maasai consider wildlife while identifying with totems and their regard for wildlife and attachment, in this case, is far from direct monetary benefits since it's a cultural value (Green et al., 2018).

The realization to empower the communities by building their capacities through training and dissemination of important knowledge, especially on their rights and the right of wildlife, has been considered a sustainable strategy for management of wildlife, especially on community-owned lands (Kambaga, 2016; Obong et al., 2013). Walking on the right trajectory entails the creation of awareness, full involvement of the community, bringing to their attention the benefits they deserve from wildlife conservation, equitable distribution of the benefits and a clear explanation of the existence of wildlife economic costs and their adaptation and mitigation strategies (Ariya George and Momanyi , 2015; Marina et al., 2019; Rico & García-Amado et al., 2013). Previous studies revealed that empowered communities are well enlightened on matters to do with conservation and it also involves strengthening these communities to establish what they rightfully own, their rights and what they can possibly do in the whole arrangement of conservation is vital towards engaging them to be active participants in innovations and management (Kemboi, 2020; Mukeka et al., 2019).

2.7.6 Implications of livelihood activities on wildlife conservation

Studies have revealed that one problem protected areas face is the relationship between them and the residents (Baird et al., 2009; Chhatre and Saberwal, 2005; Seixas & Davy, 2015). Elsewhere studies have observed that it will be beneficial for PAs to provide incentives to communities that encourage the conservation and sustainable use of natural resources as well as develop alternative means of livelihood for local populations, especially from tourism (Ntuli et al., 2018). Further, the observation by Seixas & Davy (2015) indicated that conservation agencies should nurture positive perceptions and address the possible determinants of negative perceptions in order to improve community appreciation of conservation, conservation agencies need to enhance community involvement and benefits from tourism by establishing links between community support and conservation for more successful planning and conservation agencies need to consider community heterogeneity in their conservation planning and community relationship management initiatives (Akyol et al., 2018; Rico & García-Amado et al., 2013). Additionally, Herbert (2015) noted that communities that lack incentives for conservation are unable to exercise antipoaching efforts or enforcement of wildlife security measures.

It has been revealed that communities living closer to PAs depend on tourism and related activities to earn a livelihood. Most of these communities as have been indicated in past studies, engaged in activities that may not be compatible with wildlife conservation. Additionally, owing to the vastness of the savannahs, climate, droughts and other effects of climate change, their livelihood networks have faced high disruption and hence noted to be unsustainable. Engaging in activities that attract government support, for instance, participating in MSMEs activities, could introduce a sustainable intervention far from

overreliance on tourism activities. This study notes the gap that existed in overreliance on traditional livelihood alternative forms. It is, therefore, important that this undertaking was conducted to provide possible suggestions on the sustainable alternative livelihood activities in conservations areas.

2.8 Legal and Policy Framework

2.8.1 The Constitution of Kenya 2010

Chapter five of the Constitution of Kenya is about land and the environment (The Republic of Kenya, 2010). Particularly Article 60, which states the principles of the land policy, which among others are; access to land, sustainable and productive malmanagement of land resources, and sound conservation and protection of ecologically sensitive areas. Article 61, 62, 63 and 64 gives the classification of land as; public (where government game reserves are part of), community land and private land. Article 67 establishes the National Land Commission, whose mandate, among others, is to manage public land on behalf of the National and County governments.

Part 2 of chapter five, article 69, provides for the obligation of the National Land Commission (NLC) with respect to the environment, which include; ensuring sustainable exploitation and utilization, management and conservation of the environment and natural resources and ensuring that there is equitable sharing of the accruing benefits, encouraging public participation, protection and conservation of the environment, utilization of the environment and natural resources for the benefit of the people of Kenya among others.

Further, article 43 on the economic and social rights ensures that every person benefit from the rights such as the highest attainable standards of health, access to affordable housing

and reasonable standard of sanitation, free from hunger, clean and safe water, social security and a right to education.

2.8.2 Wildlife Conservation and Management Act 2019

According to The Republic of Kenya (2019), article 18 of the act provides for the Community Wildlife conservation committee which shall exist in every county and shall consist of; the chairperson appointed by the cabinet secretary, KWS officer, agricultural officer, medical officer, livestock officer and other four persons, not public officers.

This committee is to review and recommend payment of compensation on claims resulting from loss or damage caused by wildlife, develop and implement in collaboration with the service community wildlife association mechanisms for mitigation of HWC, and bring together relevant stakeholders to harness participation in conservation and management programmes of wildlife and perform other functions as the Service may require or delegate to it.

Part V of the act involves the establishment of the Wildlife Endowment Fund. Article 23 provides for the Wildlife Conservation Trust Fund (WCTF), and subsection 3 provides that the WCTF shall derive its funding from parliament appropriation, productive and service sectors, payment of environmental services and biodiversity offset schemes, debt-for-nature transactions, income from investments done by the board of governance, available grants and donations, bequests, or other gifts.

As stipulated in the Act, the purpose of this provision is to provide funds for conservation initiatives, manage and restore protected areas and conservancies, protect endangered species, habitats and ecosystems, support wildlife security operations, support community-based wildlife initiatives, and award conservation grants-based criteria, among others.

Article 24 establishes a wildlife compensation scheme. Subsection 1 a-c provides for how the government shall establish a Wildlife Compensation Scheme, and it is specified that it shall consist of the following;

i. amounts allocated explicitly for this purpose through the budget process;
ii. an insurance scheme to be established by the Cabinet Secretary responsible for matters relating to finance.
iii. monies from any other source approved by the Cabinet Secretary for the time being responsible for matters relating to finance.

Further, the Act provides that the Wildlife Compensation Scheme shall be used for financing compensation claims for human death or injury or crop and property damage caused by wildlife.

The Act provides in article 25 specificities of compensation for personal injury or death or damage to property detailing that;

1. Where any person suffers any bodily injury or is killed by any wildlife listed under the Third Schedule, the person injured, or in the case of a deceased person, the personal representative or successor or assign may launch a claim to the County Wildlife Conservation and Compensation Committee within the jurisdiction established under this Act.
2. The County Wildlife Conservation and Compensation Committee established under section 18 shall verify a claim made under subsection (1) and, upon verification, submit the claim to the Cabinet Secretary together with its recommendations thereon.

This Act of Parliament also allows the Cabinet Secretary to consider recommendations made after verification and submission of a claim, and where appropriate, to pay compensation to the claimant as follows;

a. where in the case of death, award five million shillings;
b. in the case of injury occasioning permanent disability, the claimant shall be awarded three million shillings;
c. in the case of any other injury, the claimant shall receive a maximum of two million shillings and this is going to depend on the extent of the injury.

The wildlife Conservation and Management Act, 2013 (The Republic of Kenya, 2019) also stipulates that if there is any person who suffers loss or damage to crops, livestock, or other property from wildlife and such claim appears as it has been specified in the Seventh Schedule which is also bound by the rules set by the CS, the claimant to make their submission to the CWCCC. From there, the CWCCC will have to verify the claim made and make recommendations as appropriate and submit it to the Service for due consideration.

The law further provides that the CWCCC shall review the claim and award and pay compensation valued at the ruling market rates and this has a caveat that provided that no compensation shall be paid where the owner of the livestock, crops or other property failed to take reasonable measures to protect such crops, livestock or property from damage by wildlife or his land use practices are incompatible with the ecosystem-based management plan for the area.

In cases where the victims are not satisfied with the decision taken by the committee or KWS, especially on the award, then it is allowed by this act for the claimant within thirty

days to file an appeal to the National Environment Tribunal and on a second appeal to the Environment and Land Court following their notification of the decision and award.

2.8.3 Kenya's Vision 2030

The Kenya Vision 2030 is the new long-term development blueprint for the country (Government of Kenya, 2012). It is motivated by a collective aspiration for a better society by 2030. The aim of Kenya Vision 2030 is to create "a globally competitive and prosperous country with a high quality of life by 2030". It aims to transform Kenya into "a newly-industrializing, middle-income country providing a high quality of life to all its citizens in a clean and secure environment" (Government of Kenya, 2007).

The Vision is anchored on three key pillars: economic, social, and political governance. The economic pillar aims to achieve an average economic growth rate of 10 percent per annum and sustain the same till 2030 in order to generate more resources to meet the SDGs and vision goals. The Vision has identified a number of flagship projects in every sector to be implemented over the Vision period and to facilitate the desired growth rate. The identified flagship projects directly address priorities in key sectors such as agriculture, education, health, water and the environment. The social pillar seeks to create a just, cohesive and equitable social development in a clean and secure environment. The political pillar aims to realize an issue-based, people-centered, result-oriented and accountable democratic system.

The economic, social and political pillars of Kenya Vision 2030 will be anchored on the following foundations: macroeconomic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor; infrastructure; energy;

science, technology and innovation (STI); land reform; human resources development; security; and public sector reforms.

After a comprehensive analysis of Kenya's global competitiveness, six key sectors have been identified to deliver the 10 percent economic growth rate per annum envisaged under the economic pillar: tourism; agriculture; manufacturing; wholesale and retail trade; Business Process Outsourcing (BPO); and financial services Kenya's journey towards prosperity also involves the building of a just and cohesive society that enjoys equitable social development in a clean and secure environment. This quest is the basis of transformation in eight key social sectors, namely: Education and Training; Health; Water and Sanitation; the Environment; Housing and Urbanization; as well as Gender, Youth, Sports and Culture. It also makes special provisions for Kenyans with various disabilities and previously marginalized communities.

The transformation of the country's political governance system under Vision 2030 will take place across six strategic areas: rule of law; electoral and political processes; democracy and public service delivery; transparency and accountability; and security, peace building and conflict management.

2.8.4 Narok County Integrated Development Plan (CIDP) 2018-2022

The Narok County Integrated Development Plan (CIDP) 2018-2022 is hinged on the constitution of Kenya 2010 and Kenya's Vision 2030 Third Medium Terms Plan (MTP) 2018-2022 (Government of Kenya, 2012; Narok County Government, 2018). The Bill of Rights in the Constitution of Kenya 2010 provides that there should be accessibility to adequate food for everyone, which aims at achieving SDG number two on ending hunger, achieving food security and improved nutrition and promotion of agriculture. The CIDP

(Narok County Government, 2018) also bears some county-specific objectives on food security which include, among others;

i. Increasing agricultural production by scaling up farm input subsidy of fertilizers and seeds programme.
ii. Increasing commercialization of the sector by acquiring more agricultural farm machinery and equipment.
iii. Increasing productivity of agricultural output through value addition and improving market access.
iv. Improved animal genetics and vaccine administration.
v. Enhancing County food security through increasing and expanding strategic food reserves, establishing Agriculture and Livestock drought mitigation measures, Livestock and crop farming research.
vi. Investing in mechanization of Agricultural processing and adoption of technologies.

On health, the CIDP contains sector development priorities and programmes whose coverage period is 2018-2022. On the matter of health, this plan has borrowed a lot from the Constitution of Kenya 2010 and again from the Vision 2030, including the country's health policy 2014-2030. The county has thus planned to follow through with the county's sector Strategic Plan and together with its investment plan 2018-2023, which is expected to form part of the planning and budgeting which is also expected to inform the creation of the annual planning and performance contracting on matters to do with health in the County.

Narok County hosts a number of conservation areas and is rich in natural resources. The areas where it is well endowed with natural resources include the Mau forest, MMNR, and the water basins, among other resources. The CIDP has envisioned the protection, conservation, management and increased access to clean and safe water, which the plan expects to spur socio-economic development. The plan also has in its priorities under this sector strategies and development plans close to conservation initiatives, protection and management of the environment, and all other natural resources within the county's space. Within this plan, there is also a strategy to safeguard the environment, water catchment areas and sustainable utilization of basin-based resources. There also exists in the plan the program to promote the creation of renewable energy and its use, among other development priorities within Narok County.

Concerning the aspect of education, sports, culture and social services, the CIDP has stipulated the strategies that will focus on mitigating the challenges bedeviling this sector during the implementation period of 2018-2022. The plans that are prioritized for this period include; the provision of quality Early Childhood Development and Education (ECDE), which is through training and construction of more ECDE centres, expansion of Vocational Training Centres (VTCs) and promotion of training through them, improvement of primary and secondary education through access which its intention is to foster retention and completion rates. The plan also envisions the building of sporting and talent centres in a bid to promote sporting activities and encourage talent empowerment, among others. Additionally, the renovation and rehabilitation of Narok VTC are considered key in the plan and target the youth. Within this breadth, the plan also prioritizes the sporting infrastructure, and thus its focus is on the maintenance and construction of stadia.

The CIDP also provides for gender programmes which are to be implemented with partners within the sector to prevent Gender Based Violence (GBV).

The priorities for the tourism and wildlife sector, as stipulated in the CIDP, is to develop and promote unique and diverse tourism products, which is to be done within a sustainable framework. Further, investment was to be facilitated by focusing on the enabling legal and policy framework for both domestic and export businesses to do well. The County also acknowledged that the tourism sub-sector has been facing numerous challenges such as; poaching of wildlife, high and low tourism seasons, HWC and lack of tourism product diversification. Additionally, lack of adequate community awareness is still an impediment to wildlife conservation, and thus it has been noted to require urgent intervention.

The tourism sub-sector also, has human resources challenges, and this, coupled with delays in funding from the National government to pump into the subsector, has worsened the matter. These challenges, as acknowledged by the CIDP, have slowed down the growth of the tourism sub-sector and to address this, the CIDP, through the lead department, resolved to focus on Nature-Based Tourism, cultural tourism, community-based conservancies and conference tourism (Narok County Government, 2018).

2.8.5 Sustainable Development Goals (SDGs)

The world has 17 Sustainable Development Goals (SDGs) with 169 associated targets which are integrated and indivisible (United Nations, 2018). They are setting out a direction towards sustainable development, intended to achieve global development and a “win-win” cooperation, which can result in enormous achievements for all the countries across the world. The agenda 2030 will be implemented for the benefit of all, for the current generation and for posterity.

The goals and target of the vision came into effect in 2016 and have been customized to fit every country's needs and priorities and by 2030, all the countries are expected to have fully implemented them. The world's vision 2030 is also expected to respect national policy space for sustained, inclusive and sustainable economic growth and at the same time, be consistent with relevant international rules and commitments (United Nations, 2016).

In this regard, it is a reality that each country faces specific challenges in its pursuit of sustainable development and more so, the most vulnerable countries found in Africa, the least developed countries, locked developing countries and small island developing countries, deserve special attention, as do countries in situations of conflict and post-conflict countries. There are also serious challenges within many middle-income countries (United Nations, 2015).

According to the United Nations (2018), there are 17 Sustainable Development Goals that the world is focusing on, which include;

i. Goal 1: End poverty in all its forms everywhere.
ii. Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
iii. Goal 3: Ensure healthy lives and promote well-being for all at all ages.
iv. Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
v. Goal 5: Achieve gender equality and empower all women and girls.
vi. Goal 6: Ensure availability and sustainable management of water and sanitation for all.
vii. Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all.

viii. Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

ix. Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

x. Goal 10: reduce inequality within and among countries.

xi. Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable.

xii. Goal 12: Ensure sustainable consumption and production patterns.

xiii. Goal 13: Take urgent action to combat climate change and its impacts.

xiv. Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

xv. Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

xvi. Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

xvii. Goal 17: Strengthen the means of implementation and revitalization of the Global Partnership for Sustainable Development.

2.9 Conceptual Framework

Both livelihoods and conservation of wildlife could be sustainable if a broader understanding of social networks is brought into perspective. This study used a two-prong

approach; that of the social exchange theory and the Sustainable Livelihood Conceptual Framework, to describe the current study's conceptual framework.

2.9.1 Social Exchange Theory

This theory is based on the elements of reward and its value, cost, profit and equity and distributive justice. The current study relied on the postulation of (Homans, 1961). Homans (1961) observed that exchange is social in nature. He further noted that social exchange is the exchange of activity, tangible or intangible, or more or less rewarding or costly, between at least two groups (actors). The more valuable to a man a unit of the activity another gives him, the more often he will emit activity rewarded by the activity of the other. Cost conceived as the activity forgone and behavior change is also greatest when perceived profit is least (Homans, 1961).

Reward and the value of the reward, costs, profit (reward minus costs), equity and distributive justice are the main elements of the Social exchange theory (Homans, 1961). According to Redmond (2015), the social behavior of actors often involves social exchanges when people are motivated to attain some valued reward for which they must forfeit something of value (cost).

This study is informed by this theory that conservation and livelihood development at least must strike an equilibrium by actors in order to for both to be sustainable. The socio-economic benefits like employment, access to food, shelter, and health services are the benefits the pastoralist get as a reward from the conservation of wildlife in Maasai Mara National Reserve. The reward obtained is as a result of foregoing their grazing land for the conservation of wild animals. Consequently, the pastoralist bears the brunt of conservation which in this study are the economic costs which include livestock depredation, human and

livestock diseases (zoonotic), crop damage, accidents, fear of wildlife roaming in homesteads and their grazing land. In this case, pastoralists may be willing to continue bearing the cost of conservation as long as the rewards emanating from conservation are greater than the costs they meet.

Studies have also shown that the costs are greater to a protected area than the contrary. In which case, the local people closer to the MMNR, according to the principle of equity and distributive justice, would be the ones receiving the greatest reward owing to the greatest costs they receive from wildlife conservation. Their livelihood networks are highly disrupted than the people living a distant far from the MMNR. Homans (1961) postulated that if the cost of members of one group is higher than those of another, distributive justice requires that their rewards should also be higher, for if the rewards are higher, the costs are higher too. The quest for pastoralists to continue supporting conservation initiatives is pegged on the great profit they derive from MMNR when they receive a great reward, and in reciprocation, they participate and support initiatives towards sustainable conservation and management of wildlife.

2.9.2 Sustainable Livelihood Approach

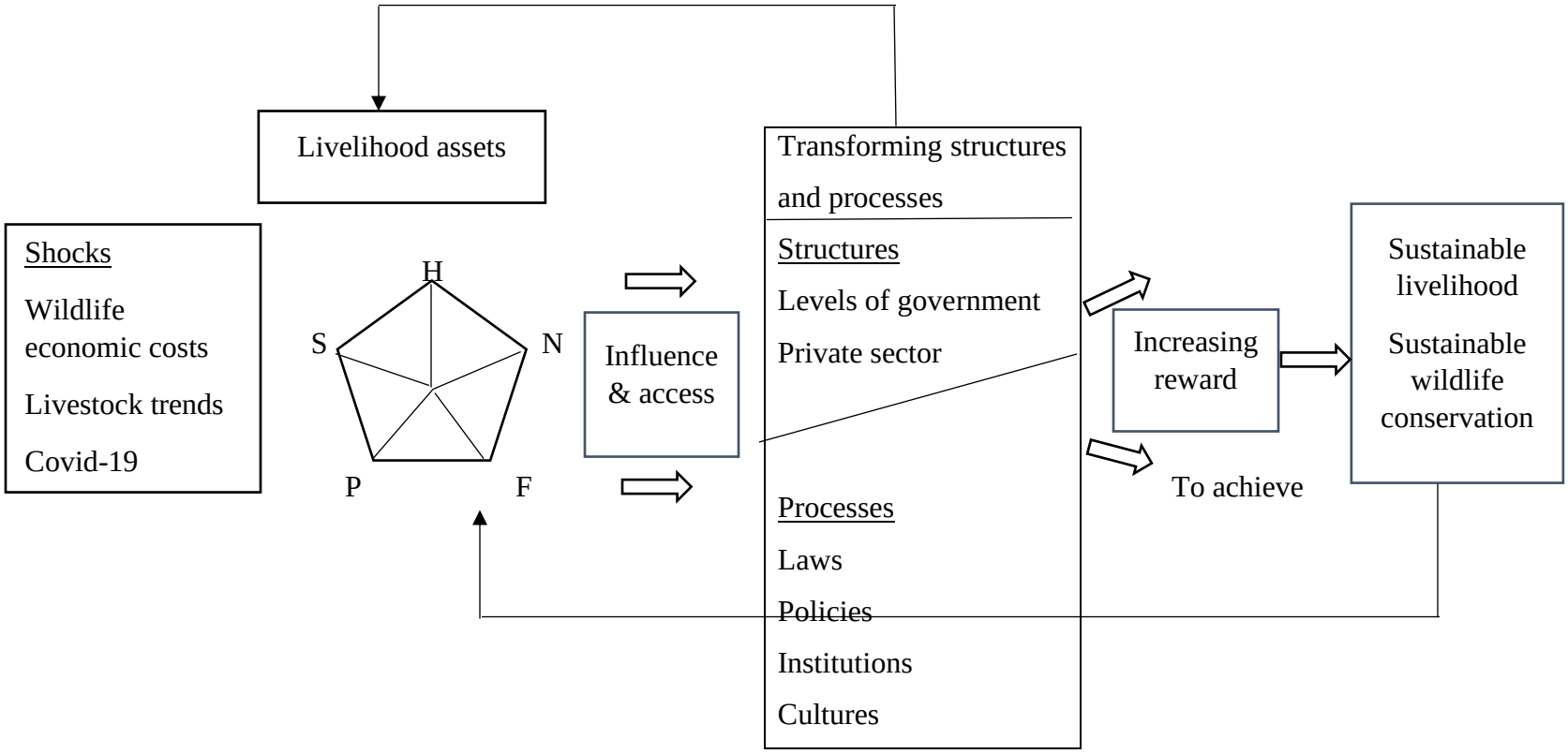
According to Kollmair and Gamper (2002), livelihood thinking dates back to the Robert Chambers in the themed-1980s, when he developed the idea of sustainable livelihood with the intention to enhance the efficiency of development cooperation. (Valdés-rodríguez and Pérez-vázquez, 2014) noted that the concept of sustainable livelihood is people-centered, holistic, dynamic, building strengths, linking macro-micro levels and sustainable.

Kollmair & Gamper (2002) further observe that the sustainable livelihood Framework (SLF) forms the core of sustainable livelihood approach. Livelihood, as defined by

(Chambers, 1992 p 6), "comprise the capabilities, assets (stores, resources, claims and access) and activities required for means of living; a livelihood is sustainable when it can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets and provide sustainable livelihood opportunities for the next generation; and contribute net benefit to other livelihoods at the local and global levels and in the short and long term."

The framework depicts stakeholders as operating in a context of vulnerability within which they have access to certain assets (Kollmair et al., 2002; Valdés-rodríguez and Pérez-vázquez, 2014; Morse et al., 2009). The vulnerability may include trends in population, resources and governance. Shocks include human, livestock or crop health shocks, natural hazards like floods or earthquakes, economic shocks and conflicts -civil or external wars (Muthoni and Wangui, 2015).

There is also seasonality regarding prices of commodities/goods or employment opportunities. The pastoralist of the Maasai Mara Ecosystem may be vulnerable because of the disruptions to their livelihood systems occasioned by the presence of wildlife in their land and manifest in the form of economic costs like zoonotic diseases, livestock depredation, deaths of people and livestock, among others. Employment, livestock prices and governance (creation of policies) opportunities may also be seasonal.



KEY

S- Social capital, P- Physical capital, H- Human capital, N- Natural capital, F- Financial capital

Figure 2.1: Sustainable Livelihood Conceptual Framework

Source: Adopted and modified from (Farrington et al., 1999, p. 3)

These are likely to influence livelihood assets like- Human capital representing the skills, knowledge (local knowledge in the case of conservation), ability to work and good health. Social capital includes networks and connections to formalized groups. Natural capital is like wildlife resources, land, water, forest, air quality and other forms in which resources (goods) and services flow. Physical capital includes basic infrastructure and producers of goods needed to support livelihoods like affordable transport, secure shelter and buildings, adequate water supply, sanitation, clean, affordable energy and access to information. Financial capital includes cash and its equivalents like available stocks of cash, bank deposits or liquid assets like livestock. It also entails regular flows of money in the form of labor income, pensions or better transfers from the state and remittances (cash transfers to the elderly and the needy in society/group).

In this case, the strategy leading to a sustainable livelihood outcome entails one that there are in place favourable policies, good governance and strong institutional arrangements that facilitate rewards to the local community (pastoralist) to enhance capacity to deal with wildlife economic costs. It requires a robust adaptive mechanism so as to enable pastoralists facing losses to recover from the shocks. Figure 2.2 connect with these studies showing the interaction of variables toward sustainable wildlife conservation and livelihood development.

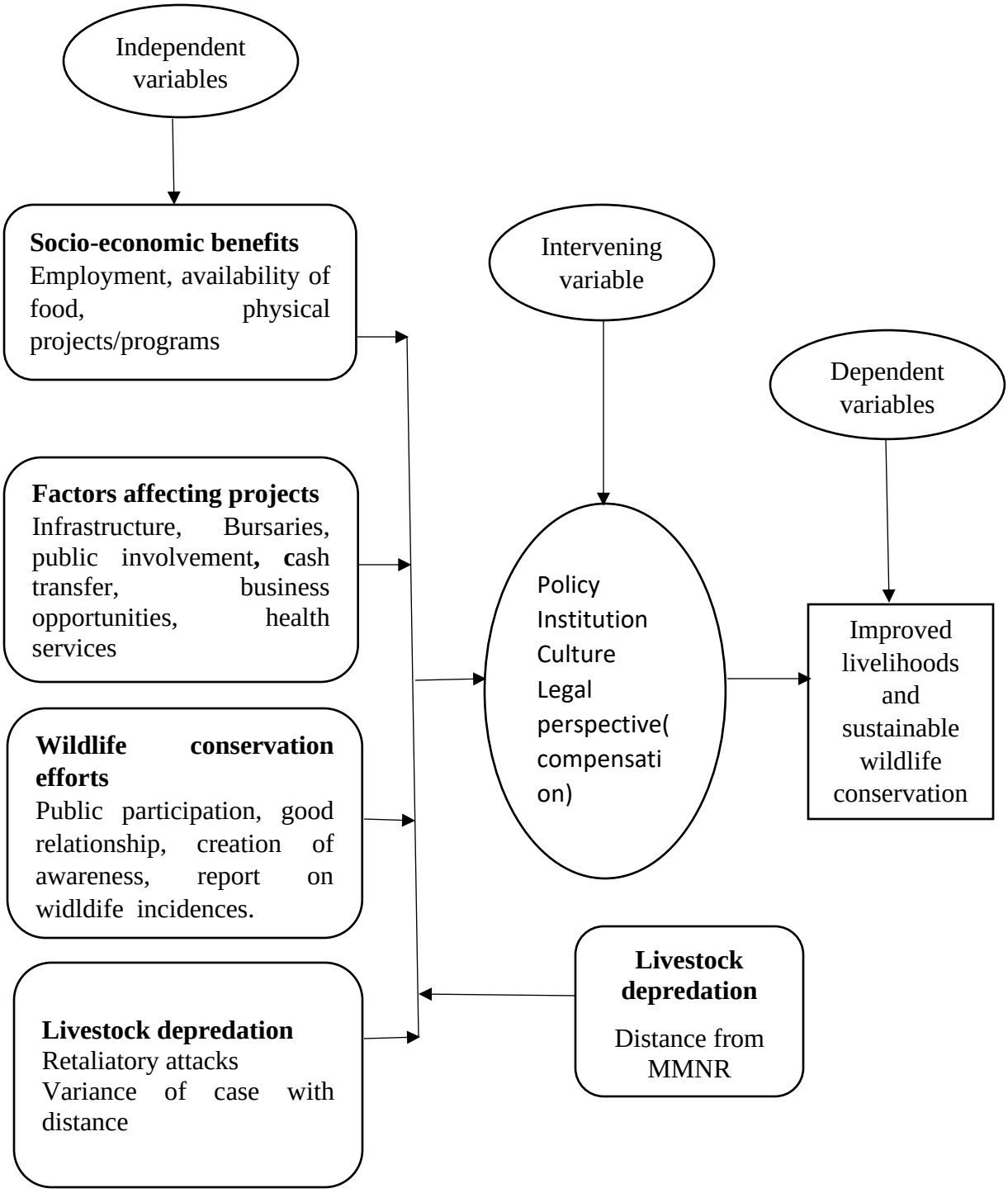


Figure 2.2: Conceptual framework

Source: Author, 2022

In Figure 2.2 above, the dependent variable in this study is improved livelihoods and sustainable wildlife conservation, which were measured both quantitatively and qualitatively. This variable will depend on four independent variables. The socio-economic benefits accruing from wildlife conservation such as (Social and human capital) employment, availability of food, physical projects/programs and networks of getting employment opportunities. Availability of food, physical projects, or development programs like roads, telecommunication networks, internet services, schools and water supply associated with wildlife conservation, when well supplied to the local community, may have a direct positive impact on the conservation of wildlife.

Factors that may influence the success or failure of programs are incentives that appear in the form of educational infrastructure (physical and financial capital) (with equipment, stationary and human resources), education bursaries to school children, support to local investors through the provision of credit facilities, cash transfers to the elderly and the needy in society among others. These incentives will empower the local community and transform their confidence positively, resulting in improved livelihoods and sustainable conservation of wildlife.

Proper funding of conservation projects, programs and training, if given priority by the County or National government policy, will help in that the community may change its attitude and then pride in conservation efforts and give conservation an affirmative action. Public involvement will allow tapping into local knowledge in conservation while simultaneously providing opportunities to all conservation stakeholders to partake in sustainable conservation of wildlife and building of livelihoods.

Wildlife economic costs such as livestock and human diseases, livestock predation, disruption of livelihoods, crop destruction, property damage and deaths of both livestock and humans are factors which, if not put to decline, may jeopardize livelihood development and risk sustainable wildlife conservation. These variables are contributory factors to negative perceptions from the local community because of the destruction they cause to their livelihood support systems. In such instances, the county government and national government will have to ensure livelihoods are protected and the economic costs adapted to or mitigated in order to sustain lives and guarantee sustainable conservation of wildlife.

The mainstay of pastoral communities is livestock rearing. When there is immense livestock depredation, it is highly likely the pastoralists will suffer greatly and tend to retaliate back and kill the problem animals. The attacks are more likely to be even more extreme closer to the PAs than it is further away. Such occurrence does not support wildlife conservation, nor do they improve the livelihood of the inhabitants. Apart from the dependent variables, the intervening variables may moderate the outcome of conservation initiatives and livelihood development efforts. These in this study may include; policy and legal frameworks, institutional framework, perception and culture.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the study area in terms of its geographical location, vegetation cover and extent. It further describes the population of the study area, research methodology, data collection tools and data analysis as well as methods of testing the hypotheses.

3.2 Study Area

This study was conducted in Siana, Naikarra and Mara Wards that border MMNR (Figure 3.1) of Narok County. It is located in the South Western part of Kenya and lies between latitudes $0^0 50^{'}$ and $1^0\ 50^{'}$ S and Longitude $35^0\ 28^{'}$ and $36^0\ 25^{'}$ E. Administrative description of the study area is shown in table 3.1.

Table 3.1 Administrative description of study area

Wards	**Sublocations**	**Size (km^2)**	**Total Human Population (No.)**	**Households**
Siana	Sekenani, Koyiaki, Nkoilale, Siana, Olkinyei, Eldonya Narasha Megwara	2800	55388	10385
Mara	Aitong, Lemek, Mararianda, Rongena Enelerai	1318	46661	9400
Naikarra	Leshuta, Naikarra, Esoit, Olderkesi Osarara/ Entarado	1053	33081	6819
Total		**5171**	**135130**	**26604**

The study area lies at a mean altitude of 1600m above sea level, mean annual rainfall of 1015 mm and daily maximum temperatures range of between 26^0 C and 30^0 C, while minimum temperature range between 12^0 C and 14^0 C (Bartzke et al., 2018). It borders Maasai Mara National Reserve (MMNR), which is considered "Kenya's Jewel" regarding wildlife resources. Maasai Mara Ecosystem covers approximately 6,500 Km^2 out of which 25% is MMNR and 75% is unprotected (Narok County Government, 2018). The reserve hosts 25% of Kenya's big cats and has one of the highest wildlife densities in Africa and over 300,000 tourist visits it every year. The main vegetation comprises of *Themeda triandra, Setavia sphacilata, Acacia drepanolabium, Penisetum mezianum, Sporobolous pyramidalis, Acacia brevispica, Dichrostachys urerea, Croton dichogamous, Indigofera spinosa* among others. It's also characterized by savannah plains and woody shrubs. The dominant community living within the Maasai Mara National Reserve is the Maasai, whose main economic activity is pastoralism. The western part of MMNR is the Mara Triangle Conservancy and it was not considered as part of this study.

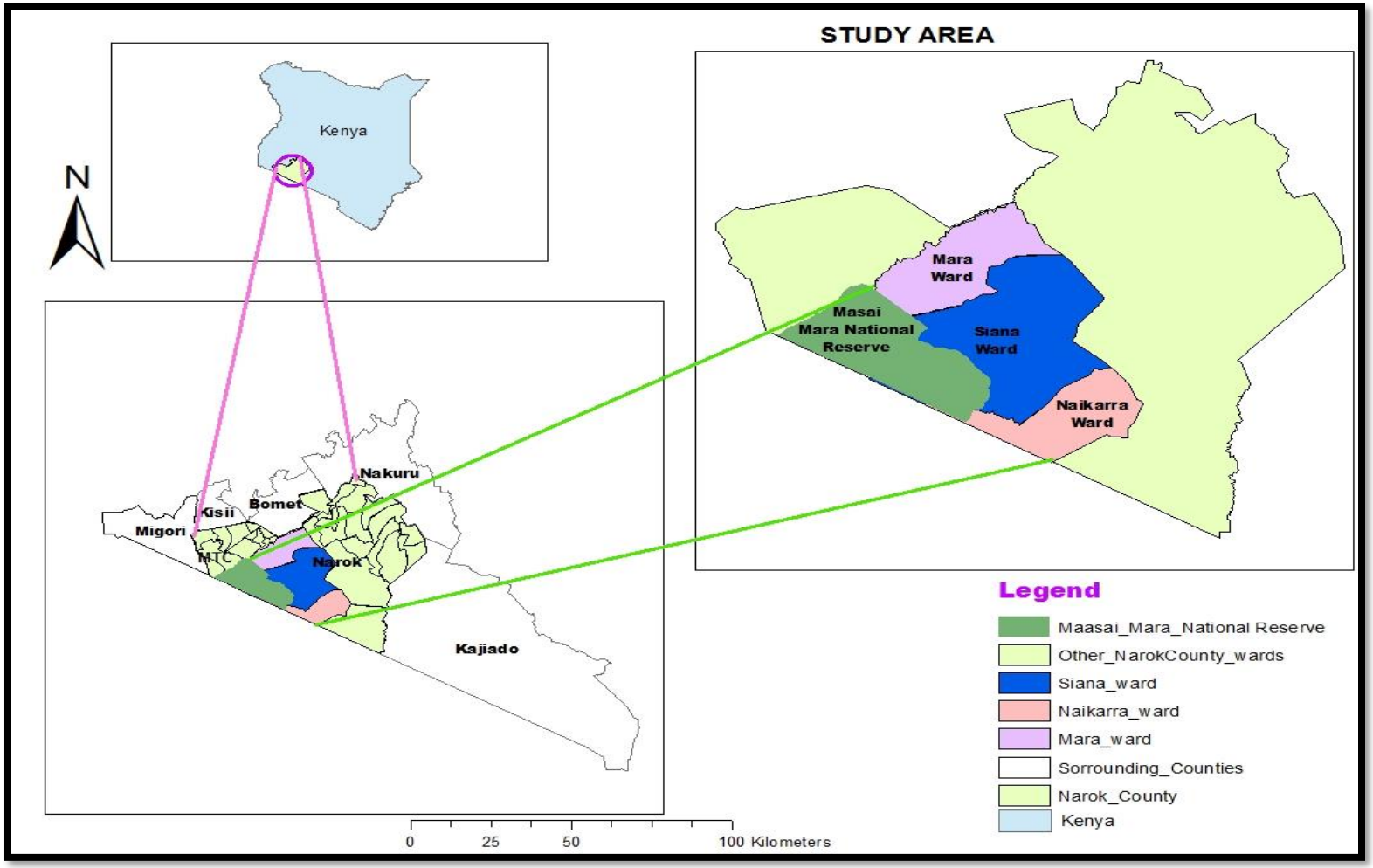


Figure 3.1: Map of the study area

Source: Extracted and modified from ArcGis online

3.3 Population of the Study Area

According to the Kenya National Bureau of Statistics (2019), Siana Ward, which comprises of seven sub-locations has 55388 persons, of whom 27928 are males and 27460 are females, while Mara Ward comprising of 5 sublocations, has a population of 46661 individuals (23431 are males and 22930 are females) and Naikarra Ward has a population of 33081 (16003 are males and 17078 are females). Located in Narok County, it has a growth rate of 4.7 % and a population density of 44 people per km^2. Narok County has a child-rich population of which 0-14 years old, contributing 51 % (Narok County Government, 2018), with an average household size of 4-6 members at 43 % (Kenya National Bureau of Statistics, 2013). In Narok County, 81 % of the population have no formal education, 10 % of those with education have primary education and 26 % have secondary education and above and a majority are working for pay (Kenya National Bureau of Statistics, 2013).

3.4 Economic Activities of Narok County

3.4.1 Wildlife species composition

According to Narok County CIDP (Narok County Government, 2018), the MMNR has close to 100 species of mammals, amphibians and reptiles and over 420 species of birds. Further, past studies have indicated that the reserve is known for the big five animals, which are the leopard, elephant, rhino, buffalo and lion (Blackburn et al., 2016; Naliaka et al., 2018). In the reserve, the bird varieties include the vulture, marabou stork, secretary bird, hornbill, crowned crane, ostrich, long-crested eagle, and pygmy falcon, among others (The Holiday Dealers, 2018; WWF-Kenya, 2019).

3.4.2 Tourism

Wildlife tourism has been known to be the main tourist attraction in Maasai Mara National Reserve (Claire Bedelian, 2014; Kathleen et al., 2021). MMNR is also one of the leading tourism areas within the County (Narok County Government, 2018). Apart from MMNR, there is the Mara Triangle and also other numerous conservancies that host wildlife and practice tourism activities (Narok County Government, 2018). The wildebeest migration across the Mara river from the Serengeti National Park, while complementing its richness in wildlife diversity, has enabled tourism to perform well over the years and is expected to be earning the country a considerable amount of foreign exchange (Shah, 2019). As the reserve prides itself on an annual wildebeest migration, these activities have enabled the MMNR to become a preferred tourist destination in the region (Narok County Government, 2018).

3.4.3 Mining activities

In Narok County, gold mining and processing are done in Lolgorian. Kilimapesa Gold Limited is currently doing gold mining and has an estimated capacity of 25 tonnes per day carbon leaching gold processing plant (Narok County Government, 2018). Studies have further shown that with the existing capacity, the facility will remain active for the next 10 years. Within the county, it has been established that there are other activities like quarrying for sand, ballast and building stones as emerging socio-economic activities.

3.4.4 Livestock production

According to the Narok CIDP (Narok County Government, 2018), pastoralism is among the main economic activities that provide income to the local community, employment and contributes significantly to the food security aspect. It is also observed that livestock

species reared comprise of cattle, sheep and goats, poultry, bees, rabbits and donkeys (Narok County Government, 2018).

The County has estimated the number of cattle to be over 1.3 million, 1.1 million sheep and 700,000 goats (Narok County Government, 2018). It is documented that because of the increasing human population and other competing factors the local people have preferred the diversification of livestock by keeping high-quality breeds. In this regard, the Sahiwal, Boran and other dairy breeds and their crosses have been on the increase in the County (Anyango, 2022; Kenya Livestock Breeds Catalogue, 2019). Of essence is the growth of the dairy value chain, which is achieving rapid growth through intensive and semi-intensive livestock production systems (Narok County Government, 2018).

The County has, over the years, engaged mainly in indigenous breeds of livestock, but this has changed in the recent past towards exotic breeds (Narok County Government, 2018). All these changes in the breed of livestock are endeavoured to improve production. In the highlands, there is a high concentration of dairy cattle and merino sheep; while in the low lands, there are the indigenous breeds of cattle and red Maasai sheep, among others (Kenya Livestock Breeds Catalogue, 2019; Narok County Government, 2018). Friesian, Ayrshire and Guernsey are the dairy breeds doing well in the highlands, while for sheep and goats, it's wool sheep and miniature East African goats. The Borana and the Zebu breeds excel well in the lowlands (Anyango, 2022; Kenya Livestock Breeds Catalogue, 2019; Narok County Government, 2018). Artificial Insemination has been adopted widely in order to make attempts to upgrade the livestock breeds, while farmers have been organized into dairy and beef cooperatives which will enable them to access cheap and affordable credit and also make insurance services available to them (Narok County Government, 2018).

3.4.5 Drainage patterns and systems

In Narok County, the main drainage systems are the Lake Victoria South catchment basin and the Ewaso Nyiro South drainage area (Masai Mara, 2019a). Rivers in these basins include Mara and Mogor that traverse the county from the Mau region through to Kenya-border and into Tanzania, emptying into Lake Victoria and River Ewaso Ng'iro rising from the Mau Escarpment, draining into Lake Natron, respectively (Narok County Government, 2018; Masai Mara, 2019b). Narok County has created access to water for both livestock and human consumption is through dams, pans, shallow wells, water reservoirs, and boreholes, among several others (Narok County Government, 2018).

3.4.6 Types of the main vegetation

There are two main vegetation types in the county include forest land in the Mau area and grasslands and shrubs in the lowland areas, which are located in Suswa, Osupuko and Loita divisions and the Mara sections in Transmara (WWF-Kenya, 2019; Masai Mara, 2019a; The Holiday Dealers, 2018). The county is also experiencing some threats to the vegetation cover owing to the destruction caused by human activities, which include grazing, charcoal burning, extraction of wood fuel and cutting down of trees without replacement resulting in adverse ecological effects (Narok County Government, 2018; Masai Mara, 2019a).

3.4.7 Culture of the Maasai community

The Maasai culture being rich and unique, has become by itself a tourism product (WWF-Kenya, 2019). This culture has continued to be outstanding despite the influences of education, civilization and western perspectives and this could be attributed to the fact that the Maasai people have embraced and stuck to their cultural livelihood (Rachel-Ross, 2019). The Maasai community is among the plain Nilotes of Kenya and Tanzania (Narok

County Government, 2018). Initially, the community was semi-nomadic, moving with their animal from one place to another in search of pasture and water. However, the Maasai community is among the only ones in Kenya who still have their cultural practices not highly influenced by Western culture or what has been known to be culture erosion due to intensive and extensive urbanization (Rachel-Ross, 2019; WWF-Kenya, 2019). They are not entirely immune from external forces and influence, for they are no longer nomadic and are now settled in a single location, where they depend on local agriculture and tourism to sustain their lifestyle and traditions. The Maasai community has also kept and packaged their cultural practices, especially songs and dances, into tourism products that could be consumed by both domestic and international tourists (Njoya and Seetaram, 2018). Their rich culture, especially in clothing, has been attractive even to other communities and most of them put on Maasai shukas in appreciation of this dominant culture within the region (Claire Bedelian, 2014; Rachel-Ross, 2019). The Maasai culture, given their lifestyle of pastoralism and living in the savannahs where they highly interact with wildlife, HWC, droughts and competition with wildlife, has over the years become a major concern threatening their livelihood system (Claire Bedelian and Ogutu , 2017; Reid et al., 2016; M. Walpole et al., 2003).

3.5 Research Design and Methodology

This study used mixed methods of concurrent design where both quantitative and qualitative components of the study were executed at the same time (Halcomb and Hickman, 2015; Judith and Johnson, 2017; Almalki et al., 2016). Use of quantitative and qualitative research approaches aimed at creating a deep understanding of the subject matter and corroboration while expanding and strengthening the study's conclusion (Judith

and Johnson, 2017). In this study, to understand the variation of socio-economic benefits with distance from the boundaries of MMNR, factors influencing conservation projects, conservation efforts, livelihood activities and livestock depredation, quantitative and qualitative data were collected, analyzed and inferences done simultaneously.

3.6 Sampling Techniques and Sample Size

3.6.1 Sample size

The study area (Siana, Mara and Naikarra) Wards has a total of 26, 604 households and a population of 135130. Households were sampled in each of ward according to the formula;

$$n = \frac{z^2.p.q.N}{e^2 \ (N-1)+ z^2.p.q}$$

where N = the population of the study area

z = 1.96 (using 95% confidence level)

p = 0.5

q = (1-.5) = 0.5

e = 0.05 (confident that the percentage has been estimated to be within ± 5% of the true value)

then;

$$n = \frac{1.96^2*0.5*0.5*55388}{.05^2\ (55388-1) +1.96^2*0.5*0.5}$$

$$n = \frac{53194.64}{139.4279}$$

n = 382

The sample size for Siana Ward was 382

The sample size for Mara Ward was derived as follows;

$$n = \frac{z^2.p.q.N}{e^2 \quad (N-1)+ z^2.p.q}$$

where N = the population of the study area

z = 1.96 (using 95% confidence level)

p = 0.5

q = (1-.5) = 0.5

e = 0.05 (confident that the percentage has been estimated to be within ± 5% of the true value)

then;

$$n = \frac{1.96^2*0.5*0.5*46660}{.05^2\ (46660-1) +1.96^2*0.5*0.5}$$

$$n = \frac{44812.264}{117.6104}$$

n = 381

The sample size for Mara Ward was 381

Table 3.2 Allocation of samples

Ward	(N)Population	Sample size (n)	30 % (n)
Siana	55388	382	115
Mara	46661	381	114
Naikarra	33081	380	114
Total	135, 130	1,143	343

The sample size for Naikarra Ward was derived as follows;

$$n = \frac{z^2.p.q.N}{e^2 \ (N-1)+ z^2.p.q}$$

where N = the population of the study area

z = 1.96 (using 95% confidence level)

p = 0.5

q = (1-.5) = 0.5

e = 0.05 (confident that the percentage has been estimated to be within ± 5% of the true value)

then;

$$n = \frac{1.96^2*0.5*0.5*33081}{.05^2 \ (33081-1) +1.96^2*0.5*0.5}$$

$$n = \frac{31770.9924}{83.6604}$$

n = 380

The sample size for Naikarra Ward was 380

3.6.2 Proportional allocation of samples

This study further adopted proportional sampling technique as proposed by Mugenda, G.A and Mugenda (1999) that 30 % of the sample size can be used in such a study;

Siana Ward; 30 % of 382 gave 115 as sample size;

Mara Ward: 30 % 0f 381 gave 114 as sample size;

Naikarra Ward: 30 % of 380 gave 114 as sample size.

The 343 samples were further allocated proportionally (n_1) to each of the wards and sublocations in the study area using the formula Kothari (2004);

Formula;

$$\mathbf{n_1 = n*n_0 /N}$$

where n_1 = proportional sample size

n = Ward sample size

n_0 = Total sublocation population

N = Total population of the Ward

hence the tables below summarize the sample size proportions for each sublocation in Siana Ward, Mara Ward and Naikarra Ward, respectively.

Table 3.3: Sampling frame for Siana Ward

Sub-location	Total sublocation population (n_0)	$n_1 = n*n_0 /N$	Proportional sample sizes (n_1)
ENDOINYO NARASHA	9586	115*9586/55388	20
OLKINYEI	4975	115*4975/55388	10
NKOILALE	6820	115*6820/55388	14
SIANA	9555	115*9555/55388	20
SEKENANI	6098	115*6098/55388	13
MEGWARA	8265	115*8265/55388	17
TALEK	10089	115*10089/55388	21
TOTAL	**55388**		**115**

Source: Author, 2022

Table 3.4: Sampling frame for Mara Ward

Sublocation	Total sublocation population (n_0)	$n_1 = n*n_0 /N$	Proportional sample sizes (n_1)
AITONG	9608	114*9608/46661	24
LEMEK	15515	114*15515/46661	38
MARARIANDA	3795	114*3795/46661	9
RONGENA	10336	114*10336/46661	25
ENELERAI	7407	114*7407/46661	18
TOTAL	**46661**		**114**

Source: Author, 2022

Table 3.5: Sampling frame for Naikarra Ward

Sublocation	**Total sublocation population (n_0)**	**$n_1 = n*n_0 /N$**	**Proportional sample sizes (n_1)**
LESHUTA	5359	114*5359/33081	19
NAIKARRA	8829	114*8829/33081	30
ESOIT	10169	114*10169/33081	35
OLDERKESI	6344	114*6344/33081	22
OSARARA/ENTARADO	2380	114*2380/33081	8
TOTAL	**33081**		**114**

Source: Author, 2022

3.6.3 Sampling techniques/procedures

This study used stratified sampling techniques to identify study subjects and households. This study stratified the population in the wards (Siana, Mara and Naikarra Wards) using the existing sublocations. In Siana Ward, there are seven (7) sublocations that became seven strata in this study; in Mara ward, there are five (5) sublocations which in this study became five strata; and in Naikarra, there are five (5) sublocations became five strata. Within the strata, the respondents were selected using systematic random sampling that entailed generating a systematic interval number (n^{th} term) that was used to select households whose heads were given the questionnaires relating to wildlife conservation and livelihood development. Every 27^{th}, 25^{th} and 18^{th} household were selected for (Siana, Mara and Naikarra Wards) respectively for the questionnaire interviews. Questionnaires

were administered to the selected respondents who have resided in Siana Ward, Mara Ward and Naikarra Ward for not less than three years and were household heads.

Purposive sampling was employed to interview key informants, which included; Narok County Conservation warden, Kenya Wildlife Service (KWS) officer, local administration (chief), Director Narok County veterinary and Narok County Livestock director. The purposive sampling technique was also used to identify members to take part in FGDs.

3.7 Data Collection Tools and Procedures

3.7.1 Questionnaires

In this study, both open and closed-ended questions were administered to the household heads (see Appendix I). The questionnaires were designed to capture information on variation of socio-economic benefits with distance from MMNR boundary, factors influencing conservation projects, conservation efforts, livelihood activities and livestock depredation.

3.6.2 Interviews

This study utilized structured interviews and it conducted interviews with the Narok County Conservation officer (Chief officer for Tourism and Wildlife), Kenya Wildlife Service (KWS) officer, local administration (chief), Director of Narok County veterinary and Narok County Livestock director. The issues considered for the interviews were; benefit-sharing criteria, zoonotic diseases and livestock depredation (see Appendix II).

3.6.3 Focused Group Discussions (FGDs)

This study conducted 2 FGDs of 6 individuals in each at Nkoilale trading centre, where every ward was represented. All the members of the FGDs were identified on the basis of

their knowledge of the matters within their villages and were considered as reliable sources of information. The first 6 members of an FGD were considered for being community wildlife scout's leaders and the members of the second FGD were also considered for being women household heads and owning a beadwork enterprise in their villages. During the FDGs, the study used a voice recorder to capture the discussion.

3.7 Validity and Reliability of Data Collection Tools

The validity and reliability of the research instruments (questionnaire) in this study were achieved by conducting pilot tests which helped to align the instruments towards adequate coverage of the topics while improving its accuracy and precision. The pilot test of 30 questionnaires was done in the Oldonyo Rasha sub-location which was a neighboring sub-location to the study area and it had more or less the same characteristics as the study area.

3.8 Data Analysis and Presentation

The questionnaires were coded and entered into Statistical Packages for Social Sciences (SPSS) version 21. By use of SPSS, descriptive analysis was done where frequencies, chi-squares, measure of central tendencies, linear correlation and ordinal regression were computed (table 3.4). Spearman's rank correlation coefficient and ordinal logistic regression were done to test the hypotheses of the study. The data was then presented using pie charts, bar graphs and tables.

Table 3.6: Methods of Data Analysis

Objectives	Method of data analysis
To determine variation of accrued socio-economic benefits of wildlife conservation with distance from Maasai Mara National Reserve boundary.	Frequencies, measure of central tendency (median) and Spearman's rank Correlation coefficient.
To evaluate socio-economic factors that influence wildlife conservation projects in Siana, Mara and Naikarra Wards.	Frequencies, measure of central tendency (median), ordinal regression, chi-square.
To evaluate wildlife conservation efforts undertaken by the local communities of Siana, Mara and Naikarra Wards.	Frequencies, measure of central tendency (median), ordinal regression, chi-square.
To determine livelihood activities in Siana, Mara and Naikarra wards that are related to wildlife conservation efforts.	Frequencies, measure of central tendency (median), ordinal regression, chi-square.
To assess the livestock depredation with distance from Maasai Mara National Reserve boundary.	Frequencies, measure of central tendency (median) and Spearman's rank Correlation coefficient.

Source: Author, 2022

3.8.1 Methods of testing hypotheses

Table 3.7: Methods of testing hypotheses

Hypothesis	Method used
H_0 Socio-economic benefits does not vary significantly with distance from Maasai Mara National Reserve boundary.	Spearman's rank correlation coefficient $rs = 1 - 6 \sum d2$ $n (n2 - 1)$
H_0 Socio-economic factors does not influence the success of wildlife conservation projects in Siana, Mara and Naikarra Wards.	Ordinal Logistic Regression (Chi-square test) Model equation (y = a - bx)
H_0 There are no wildlife conservation efforts undertaken by the local community of Siana, Mara and Naikarra Wards.	Ordinal Logistic Regression (Chi-square test) Model equation (y = a – bx)
H_0 There are no livelihood activities in Siana, Mara and Naikarra Wards related to conservation efforts.	Ordinal Logistic Regression (Chi-square test) Model equation (y = a – bx)
H_0 Livestock depredation does not vary significantly with distance from Maasai Mara National Reserve boundary.	Spearman's rank correlation coefficient $rs = 1 - 6 \sum d2$ $n (n2 - 1)$

Source: Author, 2022

3.9 Ethical Considerations

This study was conducted after assuring the respondents of the confidentiality of the collected information and that data was only to be used for academic purposes. Where it involved voice recording, the interviewees were informed of the voice recording and upon their consent, recording was done with assurance that these recordings were to be shared or disseminated anywhere else.

Research permission from the National Research Council for Science and Technology and Innovation (NACOSTI), Narok County ministry of Education and ministry of Interior and National Coordination to conduct the study in MMNR was sought and received. The chiefs and sub-chiefs were informed of the same and permission granted.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter gives results on of household socio-economic characteristics of the Maasai Mara National Reserve. Demographic characteristics are crucial information towards understanding the subject area of wildlife conservation and livelihood development. Data include information of gender, age, marital status, education level, occupation, size of the family, the time they have lived in the study area and the distance from Maasai Mara National Reserve boundary. Distance as a study variable was instrumental in understanding the variance in the wildlife benefits and costs with distance from MMNR boundary.

This chapter assesses and discusses the efforts put in place by the local community to support wildlife conservation. These efforts, most of which have ended up creating livelihoods for the majority of the residents and also promoted the initiatives from other partners like NCG through the MMNR management. The local community also indicated that there were engagements in numerous activities geared towards diversifying livelihood systems and such practices are compatible with wildlife conservation. It is noted that due to close proximity to the reserve majority of the local community members have experienced wildlife economic costs/HWC.

4.2 Demographic Characteristics

This section, deals with the following household characteristics; gender, age, marital status, education level, occupation, size of the family, the longer they have lived in the study area and the distance they live from Maasai Mara National Reserve boundary.

4.2.1 Gender of household heads

From the study, 62 % of the household heads were males while 38 % were females. These results differed slightly from the observation by (Kathleen, 2018), where the male household heads were 59 %. Research findings elsewhere (Stanley et al., 2014) were in line with this study with exception (Mojo et al., 2020) who observed the males were extremely high at 99 %.

Despite the males being the majority (62 %), the number of homes headed by women was on the rise. From the FGDs, most (38 %) households appeared to have women as household heads largely because of the polygamy attribute embraced mainly by the elderly on a significant component of their cultural practices. In addition, this was attributed to the pastoralism aspect of Maasai culture, where most of the men were out in the grazing field or looking for pasture and water for their livestock and women were left at home to do their household chores.

The findings through interviews noted that women do not access the benefits accruing from the conservation of wildlife as much as men do (table 4.1). However, they face the same share of costs from the presence of wildlife in the MMNR, and especially attacks from wildlife, as they move about looking for firewood, water, and escorting children to school and going to the market to buy food for their families. The perception that the majority of the men benefit a lot compared to the women creates a negative attitude towards wildlife conservation which is far much detrimental to the initiatives towards wildlife conservation.

Despite the majority of the household heads being men, studies show that, some women are land owners and are active participants in issues of conservation, especially in conservancies where they host wildlife dispersing from MMNR. Land owners contribute

to wildlife conservation through leasing out their land for conservation of wildlife in conservancies which was vital, being an important area hosting wildlife dispersing from MMNR.

4.2.2 Age of the household heads in MMNR

The study indicated that the majority of household heads were between the age of 38 - 47 years (40.8%), followed by those between the age of 28 -37 years (26.2%), while the minority were of the age 68 and above years (0.9 %). The study also recorded that the household heads of ages between 18-27 years were 12.2 %, 48 -57 years were 16 % and of ages between 58-67 years were 3.8 % (table 4.1).

This indicated that the majority of the household heads were youthful and probably had basic education, which was crucial in engaging in off-farm enterprises to earn their families a livelihood. The fact that few household heads were of age 58 years and above registered a concern, especially where conservation knowledge depended on the indigenous knowledge tapped from the elderly. Research elsewhere indicated that knowledge on how to evade wildlife costs was inversely proportional with age so that as age advances, they tend to face fewer attacks from wildlife. From the FGDs, it was reported that with modernization and motorization of transport through the extensive use of motorbikes in the study area more so used by the young people, encounters with wildlife were said to have reduced comparatively as compared to when trekking was used as the main means of transport across the MMNR.

However, studies carried out elsewhere indicated that as the head of the household grows older and participates in more on-farm activities, the more their livelihoods are affected by wildlife intrusion (Kemboi, 2020). These findings differ from what is observed in MMNR

because there are less on-farm activities due to the Maasai community's overreliance on livestock as the main economic activity. This implies that as the elderly grows older, the young generation takes over from them to protect and progress the family wealth invested in livestock by ensuring their livestock have sufficient pasture and water. Further, the youthful generation will be exposed to wildlife economic costs as well as the networks that offer them opportunities for employment and other direct and indirect benefits from wildlife conservation.

Table 4.1: Age of The Respondents

Age	Frequency	Percent
18-27	42	12.2
28-37	90	26.2
38-47	140	40.8
48-57	55	16
58-67	13	3.8
68 and above	3	0.9
Total	343	100

Source: Author, 2022

4.2.3 Marital status of household heads

From the findings of the study, 84 % of the household heads were married, those not married composed of 7.9 %, widows and widowers consisted of 4.1 % and 2.3 %, respectively, while households who were divorced consisted of the minority at 1.7 % (figure 4.1).

Further, from the study it was observed that married women were 81.7 % and widows 9.2 % (table 4.3). From these findings, it can be demonstrated that, while women seem to be fending for livelihoods for their families, the Maasai polygamous culture is conspicuously dominant in this region. Whereas, it can be argued that the culture of the Maasai allows a man to dominate, the reality is that most household needs are equally provided by women. It was gathered from the interviews that every household woman in a polygamous arrangement is given their livestock that would be used to educate their children, buy food, clothing and any other needs required by the children of the said woman.

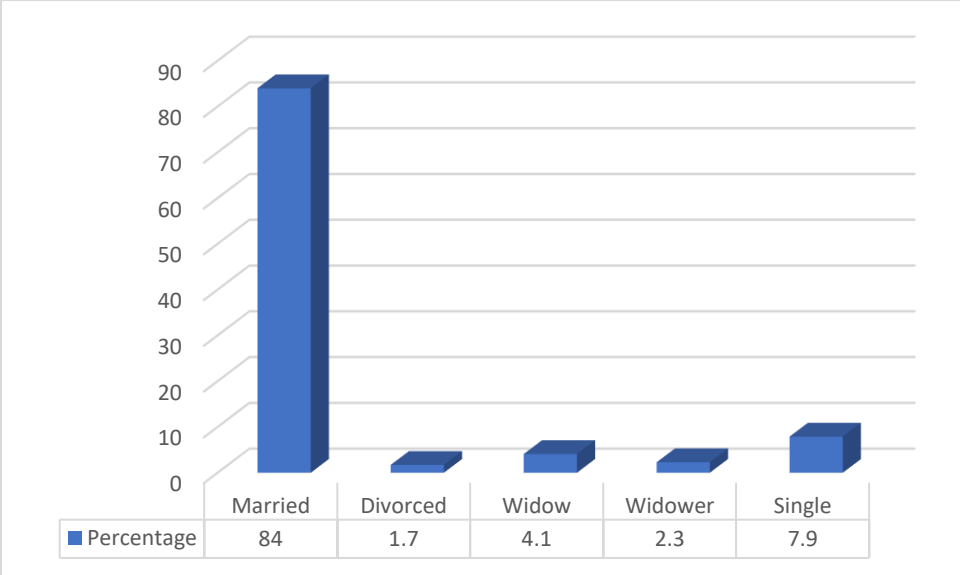


Figure 4.1: Marital Status of the Respondents

Source: Author, 2022

Table 4.2: Marital Status of Female Respondents

Marital status	Female (n)	Percentage
Married	107	81.7
Divorced	4	3.1
Widow	12	9.2
Single	8	6.1
Total	**131**	**100**

Source: Author, 2022

4.2.4 Education level

The majority (47.2 %) of household heads had no formal education, household heads with primary education were 14 %, secondary education at 23.9 %, tertiary education at 8.5 % and only 6.4 % of the household heads were university graduates or were still in the university (table 4.3). This study compares with the Narok County CIDP (Government of Narok County, 2018) and the KNBS (Kenya National Bureau of Statistics, 2013) study, which indicated that 38 % of the residents of Narok had no formal education. It was expected that owing to the high percentage of young people in the study area, that there would be a correspondingly high number of educated people. This indicated that there is more to be done in the form of educational facilities and personnel, including the stepping up of bursaries, scholarships and other necessary support, especially for post-primary, tertiary colleges and university students, in order to improve the uptake and completion rate.

Table 4.3: Education Level of the Respondents

Education level	Frequency	Percent
None	162	47.2
Primary	48	14
Secondary	82	23.9
Tertiary college	29	8.5
University	22	6.4
Total	**343**	**100**

Source: Author, 2022

4.2.5 Occupation of the respondent

Within the study area majority of the household heads were pastoralists (n = 223) at 65 %, farmers were (n = 48) at 14 % , traders (n = 47) consisting of 13.7 %, drivers ware (n=8) translating to 2.3 % while county officials and teachers (n = 6) both consisted of 1.7%, doctors were (n = 4) making up of 1.2 % of the sample size. 0.3 % (n =1) were tour guides which were the minority occupation in this study (table 4.4).

This indicated that pastoralism is the main economic stay of the people within the study area. The findings concurred with other studies (Katherine, 2012) that what the Maasai households earns from other economic activities does not compare with the main income streams from their livestock. Previous studies suggest that individuals with diverse sources of income spread out the risks associated with costs of conservation, such as damage to crops and property, loss of livestock and competition for resources. FGD findings, with the locals indicated that pastoralists were not allowed to graze their livestock within the MMNR and if found, it attracted fines and even confiscation of livestock until the fines

were cleared. Studies also indicated that the conservancies found within the entire Maasai Mara Ecosystem also had restrictive measures and some did not allow livestock to graze around the lodges found within these conservancies (Claire Bedelian and Ogutu 2017). The following is an extract from the FGD that was held during the study:

"*…. grazing is not allowed in the reserve, in fact, going beyond the boundary, your livestock will be impounded by the MMNR management and then you will be charged Ksh 10,000 per herd…*''

Previous studies observed that while there is a link between conservation and livestock rearing as a livelihood earner (Pienaar et al., 2013), there was a lot of encounter on HWC, especially from the carnivores who found livestock as an easy target. Further studies (Mukeka et al., 2019) indicated that carnivore attacks in Narok County were a serious threat that resulted in retaliatory killings, thus threatening carnivore conservation. Mukeka et al., (2019) further noted that land subdivision into smaller parcels and fencing as possible causes of HWC since it was impeding the traditional movement of livestock and also obstructing wildlife movement and suggested that this can be reduced through promoting other profitable enterprises that would increase benefits to the locals rather than over-reliance on livestock. (Claire et al., 2017) reported that restriction of grazing rights and reduction of grazing space for livestock, especially on conservancies outside MMNR, has been a contentious issue within the community that many viewed these kinds of restrictions negatively and as resulting in a significantly high cost on their livelihoods. This finding concurs with what this study found from FGDs that they viewed conservation as being detrimental to their main livelihood, especially where fines were imposed on them.

Mojo et al., (2020), in their finding, indicated that though the residents gain employment and other benefits from these PAs, 79 % of the locals still experience crop damage and livestock depredation from wildlife. These findings suggest that there is need of a relative balance of proportions between the benefits gained and losses incurred because failure to have critical considerations resulted in severe ramifications to livelihood and wildlife conservation.

Table 4.4: Occupation of the Respondent

Occupation	Frequency	Percent
Pastoralist	223	65
Farmer	48	14
Trader	47	13.7
Driver	8	2.3
Doctor	4	1.2
County official	6	1.7
Teacher	6	1.7
Tour guide	1	0.3
Total	**343**	**100**

Source: Author, 2022

4.2.6 Family size and structure

Table 4.5 reports the family size and structure with Siana, Mara and naikarra Wards. majority of the households had members of between 4-6 at 38.8 %, 25.7 % composed of members of 7-9, 13.4 % indicated members of 1-3, 11.1 % consisting of 10-12 members and those of 13 and above. These findings varied from other studies (Kemboi, 2020;

Kathleen et al., 2021; Claire et al., 2017), which recorded an average of between 8 and 9 individuals. In table 4.5, the findings indicated that it is only in Mara ward that the majority of household members were between 7-9 individuals (41.3 %). In Siana and Naikarra wards, the majority of the membership of the households were between 4-6 at 52.1% and 37.2 %, respectively (table 4.5).

Table 4.5: Family Size and Structure per Ward

Family size	**1-3**	**4-6**	**7-9**	**10-12**	**13 and above**
Siana Ward	17	60	19	10	9
% response	14.8	52.1	16.5	8.7	7.8
Mara Ward	8	31	48	17	11
% response	7	27	41.3	14.8	9.6
Naikarra Ward	21	42	21	11	18
% response	18.6	37.2	18.6	9.7	15.9
Total	46	133	88	38	38
% response	13.4	38.8	77.9	33.6	33.6

Source: Author, 2022

4.2.7 Duration (years) household heads have lived in the MMNR

From table 4.6, the study noted that the majority of household heads 82.5 %, had lived in the study area for more than 16 years. Further, other household heads had lived in the study area for 12-15 years at 8.5 %, 8-11 years at 4.4 %, 4-7 years at 3.2 % and 0-3 years were 1.5 %.

Most (82.5 %) of the household heads were the local people from the study area. Implying that they understand the dynamics of wildlife conservation and livelihood networks

compatible with wildlife conservation; most whom were land owners who leased out their land for conservation under the arrangement of conservancies. Most of these local residents too, majority being the Maasai community are pastoralists, and thus, by experience, they are facing HWC on a daily basis due to their way of life. The length of time one has lived in a place may influence conservation perception because a majority of the household heads indicated that they believed in the totem arrangement and this has enabled them to coexist with wildlife for the longest time (Nyumba et al., 2021). Kemboi (2020) reported that the more the household heads grow older and participate in certain activities closer to a protected area, the more the chances that their livelihoods will be affected by wildlife.

Table 4.6: Duration (Years) Respondents have Lived in MMNR and Distance from MMNR

No. of years	Frequency	Percent
0-3 years	5	1.5
4-7 years	11	3.2
8-11 years	15	4.4
12-15years	29	8.5
16 and above years	283	82.5
Total	**343**	**100**
Distance	**Frequency**	**Percent**
0-5 km	28	8.2
6-11 km	42	12.2
12-17 km	42	12.2
18-23 km	41	12
24-29 km	29	8.5
30-35 km	69	20.1
36-41 km	43	12.5
42 and above km	49	14.3
Total	343	100

Source: Author, 2022

4.2.8 Effects of distance from MMNR boundary on wildlife economic costs

Distance from the protected area is an important aspect, especially when considering the benefits and the economic costs of wildlife conservation. The study revealed that the majority of the household heads (20.1 %) lived at a distance of 30-35 km at from MMNR

(table 4.6). Other household heads lived at 42 km and above at 14.3 %, 36-41 km at 12.5 %, 18-23 km at 12 %, 6-11 km and 12-17 km at 12.2 %, 24-29 km at 8.5 km and 0-5 km at 8.2 %. These finding corroborates that of (Shah, 2019), who indicated that most of the locals did not live closer to the MMNR because of the density of wildlife in the area. Distance from the park affect wildlife conservation benefits positively. Most of the areas closer to the MMNR are occupied by conservancies, making it difficult for the locals to settle as compared to a distance far away from the reserve. It is worth noting that communities who live closer to the park bear the most brunt of wildlife conservation and therefore ought to be commensurate with the kind of benefits they receive from the activities of conservation in the MMNR (Shah, 2019). From other findings, Godfrey (2016) showed that distance between the household head and the proximity to a PA with relatively high elephant intensity may influence the preference of the locals for the conservation of wildlife. This was no different from MMNR because, during an FGD, the participants expressed their fear of the increasing friction between the livestock and the carnivores (Mukeka et al., 2019) and especially where they were not permitted access to the MMNR to graze their livestock during the dry periods (Kathleen Krafte Holland et al., 2021). The information gathered from the FDG conducted during the study stated as;

"……predation is there since we are within conservancies considered to be dispersal areas from MMNR…and as children sometimes herd livestock, the cheetah and, mostly hyena takes away the sheep…again there are diseases that attack livestock and come from wildlife, like foot and mouth, malignant catarrhal fever...brucellosis and Rift Valley Fever are less prevalent as compared to the ones I have mentioned earlier…"

It can be argued further that despite the occurrences of HWC in most protected areas, the local community understands very well the importance of these areas in terms of benefits and revenue income generation (Kemboi, 2020). However, studies carried out in Kwakuchinja wildlife corridor in Tanzania (Kwaslema et al., 2015) indicated that communities bordering protected areas might suffer great economic opportunities, including exclusion from potential resources as well as damage and depredation to crops and livestock (Emerton, 1999). The present study, however, concurs with the observations at Bale Mountains National Park, SE Ethiopia (Mekonen, 2020) that local people do not benefit enough from the resources and may be alienated from related economic enterprises. Shah (2019) suggested that in these proximate areas to PAs, equitable sharing of benefits and other resources from biodiversity is a way of improving the wellbeing of the population bearing the brunt of conservation and encouraging these communities to provide space for conservation.

4.3 Socio-Economic Benefits and Distance from MMNR Boundary

4.3.1 Access to socio-economic benefits from MMNR

Respondents were asked if they had ever accessed any benefit from MMNR, and from the findings, 81.9 % revealed that they had received it. However, 18.1 % of the respondents had not received any benefits from MMNR. These findings concur with that of Shah (2019), where the majority of the local community members were beneficiaries of the proceeds from MMNR. Shah (2019) further noted that the majority of those who benefited were from a distance of 1-2 km from the MMNR, and on this, it did not concur with the findings of this study which revealed that only 7.6 % of the respondents who acknowledged perceiving benefits from MMNR were living in a distance of between 0-5

km from the protected area (Stanley et al., 2014). It was noted that quite a number of people (18.4 %) who benefitted from the MMNR lived at a distance of between 30-35 km. This may be attributed to the observation made by Shah (2019), who suggested that members of the local community did not settle in most of the areas closer to the reserve, which is attributed to either having numerous wildlife or the land had been leased out to form conservancies which hosted wildlife for tourism associated activities and also acted as dispersal areas for the wildlife from the MMNR. The distances closer to the park, therefore, were not only ideal for the local community in terms of perceiving the most benefits but also it was observed to pose the greatest economic costs to the inhabitants of the study area. Notably (Downie, 2015; Kathleen, 2018; Mojo et al., 2020), in their study observed that the perceived benefits were in terms of increased access to education through bursaries and expansion of learning facilities, improvement of medical care, transportation and enhanced security, safe and secure water supply, support for the community enterprises like trade in livestock and livestock products with different lodges, camps, and hotels within the study area and employment. 19 % compensation model (Nyumba et al., 2021) by the Narok County government is a scheme of compensating those who live closer to the MMNR, however, the most noted challenge is the equitable distribution of these benefits to the local community.

This indicates that equitable distribution of resources needs to be actualized in order to have the majority of those who bear the brunt of wildlife conservation adequately compensated. It was also observed that livelihood networks were highly disturbed and, in other cases, destroyed within the distance of 0-5 km due to the high presence of wildlife, more so the carnivores, which posed a great threat to livestock and especially in areas where

human settlements have paved the way for the creation of conservancies. Maasai community is largely pastoralists whose main economic activity is livestock breeding for food and the sale of their products for income. It is a considered view that members of the community living within a distance of 0-5 km and 6-11 km get a bigger portion of the 19 % compensation plan from the Narok County Government (Mukeka et al., 2019; Kathleen et al., 2021).

Majority of males (69.7 %) have benefited from MMNR (table 4.8) and agrees with Kemboi (2020) who found that communities living around protected areas were male-dominated and that most women perform many household tasks and other historical subordinate roles. From non-participatory observation, most women in the study area, especially those close to the MMNR at a distance of 0-5 km and 6-11 km, benefitted from the sale of tourism artifacts, wildlife carvings, beadwork materials, and other tourism wares where they sold to either domestic or international tourists. The young people, on the other hand, tapped into their cultures by performing songs and dances to the tourist visiting the MMNR or the nearby conservancies. However, (Nyumba et al., 2021) indicated that the gender perspective had a significant contribution to the unfavorable conservation attitudes, especially amongst females. This observation was no different from the findings in this study because the males dominated almost every community institution responsible for making key decisions pertaining to the socio-economic, environmental and cultural welfare of the community members. It is observed further, that from an evolutionary perspective, the Maasai men were more outgoing hunters and more eager to take risks while women stayed at home taking care of the family and children. This observation may explain the

likelihood of finding the dominance of men in every sphere of the decision-making process, hence interact more with the opportunities and access these benefits more than women.

Table 4.8: Distance and benefits from MMNR

Distance	Yes	No	Total
		Frequency (%)	
0-5 km	26 (7.6)	2 (0.6)	28 (8.2)
6-11 km	38 (11)	4 (1.2)	42 (12.2)
12-17 km	36 (10.5)	6 (1.7)	42 (12.2)
18-23 km	29 (8.5)	12 (3.4)	41 (11.9)
24-29 km	21 (6.1)	8 (2.3)	29 (8.4)
30-35 km	63 (18.4)	6 (1.7)	69 (20.1)
36-41 km	33 (9.6)	10 (2.9)	43 (12.5)
42 and above km	35 (10.2)	14 (4.1)	49 (14.3)
	281 (81.9)	62 (18.1)	343(100)

Source: Author, 2022

On the age perspective and benefits, the study found out that the majority of the middle-aged people aged between 38-47 years, at 34.7 %, responded that they had benefitted from MMNR, followed by the young people of age 28-37 years (table 4.9). This finding supported what (Nyumba et al., 2021) observed in their study that due to ancestral and totemic respect for certain wildlife species, the Maasai have devised ways to coexist with wildlife and this tradition has been descended over the years to the young generations. Further, his findings pointed out to age that as age advances, there is a positive correlation with favorable attitudes to conservation which explains the importance of their rich indigenous knowledge about the environment.

Ntuli et al.,(2018) from their findings indicated that the wildlife income alone accounted for a 5.5 % reduction in the proportion of people living below the poverty line and that this income had an equalizing effect. Ntuli et al., (2018) further reported that it was a good outcome that the poor people in the local community benefitted from the wildlife conservation. (Claire et al., 2017) revealed that other than taking care of the well-being of livestock, the benefits from the protected areas ranged from projects helping the health centers in building and equipping them, provision of infrastructure, which include road networks, communication networks, schools and bursaries, creation of more administrative units to provide services to the people, drilling water for both humans, wildlife and livestock, to institutions that provide access to credit facilities (Shah, 2019).

Bruce (2015) concurred with the observation of this study that infrastructural development concerns influence people's livelihood choices directly and that facilities plays a significant role in determining the capacity of the people to achieve sustainable livelihoods and wildlife conservation. Mojo et al., (2020) revealed that the households benefitted from the protection of tourism and business activities related to the protected areas. These findings concurred with observation of this study that business enterprises related to tourism, like artifacts, the establishment of markets for the exchange of goods and services, for instance, at the trading centers of Sekenani, Aitong, Mararianda and Talek would escalate the benefits to more people. Other economic activities associated with wildlife conservation are the trade in livestock and their products like meat and milk between the pastoralists and the lodges and hotels within the MMNR.

Table 4.9: Benefits by gender and age

Benefit by gender	**Male**	**Female**
Yes	69.7 %	30.3 %
Age (years)	**Yes**	**No**
18-27	32 (9.3%)	10 (2.9%)
28-37	72 (21%)	18 (5.2%)
38-47	119 (34.7%)	21 (6.1%)
48-57	45 (13.1%)	10 (2.9%)
58-67	10 (2.9%)	3 (0.9%)
68 and above	3 (0.9%)	0 (0%)
Total	281 (81.9%)	62 (18.1%)

Source: Author, 2022

However, from the FGDs, it was discovered that trade on these livestock products with the establishments in MMNR was hardly there and where it was reported, it was recorded to be very minimal and that most goods and services that were consumed in the lodges and hotels were sourced elsewhere. An extract from FGD conducted stated as follows:

"…there are no other business transactions between the local community and the MMNR camps, lodges and hotels apart from that of beadwork….they don't give us the tender to supply anything including even milk and meat that we produce locally here...the beadwork they allow and we do it at the main gates only and at the airstrips because at the lodges these companies running them own the beadwork business…."

Studies elsewhere in Namibia conservancies, Mosimane et al., (2015) revealed that the provision of socio-economic benefits to the community members is a key component in

the design and implementation of CBNRM initiatives in rural areas. Further, the study suggests that the local governance structures need more external support and oversight to facilitate the distribution of benefits to the community members. Nkhata et al., (2012) argued that benefits sharing is viewed as a concept that enables participants to actualize gains from complex social exchanges. These findings corroborate the observation of this study that during an FGD engagement, participants pointed out at lack of stakeholder involvement in identifying the areas that need to be improved in the 19 % Narok County benefits-sharing scheme arguing that most of the elements in the model were derived from the defunct Narok County Council 19 % benefit-sharing scheme. An FGD extract conducted during the study gave the following account:

"….we are not getting 19 %...it just exists in name, those who get are the ones closest to the ones in charge of that 19 % program…as an individual I have never benefited from it……the only employment opportunities available are just in camps inside and outside the reserve and it could only be 20 %. The locals in these places are employed as drivers, receptionists and majority are security guards…so we are mostly given jobs of lower cadre…"

Further, participants felt that the system had been manipulated by the elite members of the community and most benefits were being channeled towards them to the detriment of the community (Democracy and Environment, 2010).

Plate 1: Female members of an FGD

Source: Author 2022

4.3.2 An association between the distance and the social benefits from MMNR boundary

The study computed the Spearman's rank correlation to find the association between the distance from MMNR boundary and the derived social benefits. The distance was accorded values as 1= 0 -5 km, 2 = 6 -11 km, 3 = 12 -17 km ,4 = 18 -23 km, 5 = 24 -29 km, 6 = 30 - 35 km, 7 = 36 - 41 km and 8 = > 42 km. The social benefits where the benefits under consideration in the study were; employment opportunities, road construction, health care provision, cash transfer, provision of school bursary, availability of clean water and building of schools. The respondents were asked to rate the extent to which they agreed that, employment opportunities, road construction, health care provision, cash transfer, provision of school bursary, availability of clean water and building of schools were the main social benefits derived from MMNR to the local community. A Likert scale was provided where 1= Strongly agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 5 = Strongly disagree. Computed Spearman's rank correlation (table

4.10) revealed a weak negative correlation (r = -.180, df = 284, p = 0.002) between distance and social benefits derived from MMNR to the local community. The p-value = 0.002, (less than 0.01), means there is sufficient evidence to reject the null hypothesis and therefore, socio-economic benefits vary significantly with distance from MMNR boundary.

The findings similarly exhibited a significant weak negative correlation between distance and socio-economic benefits (r = -.180). It is therefore concluded that as distance increases, the socio-economic benefits decrease.

Table 4.10: Spearman's Rank Correlation

			Distance (km)	Social benefits
Spearman's rho	Distance (km)	Correlation Coefficient	1	-.180**
		Sig. (2-tailed)	.	0.002
		N	286	286
	Social benefits	Correlation Coefficient	-.180**	1
		Sig. (2-tailed)	0.002	.
		N	286	286

Source: Author, 2022

4.3.3 The rating of socio-economic benefits from MMNR

The respondents were asked to indicate using Likert scale; (1 = Strongly agree, 2 = Agree, 3-Nuetral, 4 = Disagree, 5 = Strongly disagree), the extent to which they rated the social benefits accruing from MMNR and if each was the main benefit. The social benefits rated were; employment, road construction, school development, cash transfer, school bursary, access to market, provision of relief food, health facilities development, growth of market/shopping centers, provision of energy/solar power, availability of clean drinking water and scholarships to students. A measure of central tendency (median) on each was

computed and the results indicated (table 4.11) that majority of the respondents considered employment, school development, school bursary, health facilities, availability of clean drinking water and scholarship as the main benefit. Provision of energy, especially solar power, growth of market/shopping centers for their livestock and other commodities, provision of relief food to schools and families, access to markets, cash transfer and road construction indicated that the majority of the respondents were neutral hence not sure if they were the main benefits from the MMNR.

Previous studies have shown that where there are benefits to the local community from a protected area, they begin to conserve biodiversity (Shah, 2019). In this study respondents indicated that they were enthusiastic about the traditional medicinal value that the plants offered to them, which prompted them to conserve certain species of trees (Nankaya et al., 2019). Further, Kathleen et al., (2021) noted that the most important activity around MMNR was tourism which provided a source of income and revenue to the local community, who in turn, due to these benefits, accorded support to wildlife conservation around MMNR.

Table 4.11: Median for Socio-Economic Benefits from MMNR

Statement	N	Median
Employment is the main social benefit accessed from MMNR	286	2
Road construction is the main social benefit accessed from MMNR	286	3
School development is the main social benefit accessed from MMNR	286	2
Cash transfer is the main social benefit accessed from MMNR	286	3
School bursary is the main social benefit accessed from MMNR	286	2
Access to market is the main social benefit accessed from MMNR	286	3
Provision of relief food is the main social benefit accessed from MMNR	286	3
Health facilities development is the main social benefit accessed from MMNR	286	2
Growth of market/shopping centers is the main social benefit accessed from MMNR	286	3
Provision of energy/solar power is the main social benefit accessed from MMNR	286	3
Availability of clean drinking water is the main social benefit accessed from MMNR	286	2
Scholarships to students are the main social benefit accessed from MMNR	286	2

Source: Author, 2022

Plate 2: Women Selling their Merchandise to the Tourists at Sekenani Gate

Source: Author 2022

4.3.4 Correlation between distance and number of employed people in MMNR

A Pearson Product Moment correlation coefficient was computed to determine the strength and relationship between distance from MMNR and the number of people employed in MMNR per household as either permanent or casual, including in camps. The results indicated (r_s (343) = -.520, p = 0.000) showed a significantly strong negative relationship between distance and the number of persons employed in each household (table 4.12). These findings implied that as the distance increases away from MMNR, the number of persons employed in MMNR decreases. From the FGDs, it was noted that the majority of the local community members who were employed in MMNR were drivers, wildlife rangers, attendants in restaurants, guards, cleaners, tour guides, tour drivers, and cooks, and hardly were employed as managers in various organizations including hotels and lodges within the MMNR.

Table 4.12: Correlation Between Distance and Employed Persons

		Number of employed members/HH	Distance (km)
Number of employed members/HH	Pearson Correlation	1	-.520**
	Sig. (2-tailed)		0.000
	N	343	343
Distance (km)	Pearson Correlation	-.520**	1
	Sig. (2-tailed)	0.000	
	N	343	343

Source: Author, 2022

4.3.5 Satisfaction level of the socio-economic benefits accruing from MMNR

72 % of the respondents were not satisfied with the socio-economic benefits that came from MMNR while 28 % were satisfied. While the respondents indicated that there were perceived benefits from MMNR, they also felt the benefits were not enough to build resilience, especially in other socio-economic activities that would result in sustainable livelihoods (Sakala et al., 2017). Engagements in FGDs that is the dominance of the elite members of the community and males in decision-making was a major contributing factor to their dissatisfaction level. It emerged that majority of the members were not consulted adequately nor participated in major decision-making processes, especially on matters touching on their livestock and other opportunities within the MMNR.

Table 4.13 depicts the reasons leading to escalated dissatisfaction, and a measure of central tendency (median) was computed for all the scores. The scores were ranked using the Likert scale; (1-Strongly agree, 2- Agree, 3-Neutral, 4- Disagree, 5-Strongly disagree). The respondents were asked to indicate the extent to which they agreed with each statement (table 4.13). Corruption was strongly indicated as responsible for dissatisfaction (median = 1), poor governance, policy issues, lack of political goodwill and inadequate awareness had a median of 2, which reflected that most respondents agreed that it was responsible for

their cases of dissatisfaction to the benefits received from MMNR. The respondents indicated they were not sure whether nepotism, discrimination and ignorance were responsible for dissatisfaction with the benefit-sharing. From the informal conversation with the respondents, it is indicative that most of those who were not getting monetary benefits from the MMNR had formed own opinion that was likely to spur discontent. Livestock herders were unhappy about their restriction to graze their herds in the reserve, saying that they considered that as a cost to their livelihood (Claire and Ogutu 2017).

Table 4.13: Factors Responsible for Dissatisfaction of Socio-Economic Benefits In MME

Statement	N	Median
Poor governance is responsible for your dissatisfaction	251	2
Policy issues are responsible for your dissatisfaction	251	2
Lack of political goodwill is responsible for your dissatisfaction	251	2
Nepotism (in benefit-sharing) is responsible for your dissatisfaction	251	3
Corruption is responsible for your dissatisfaction	251	1
Inadequate awareness is responsible for your dissatisfaction	251	2
Discrimination is responsible for your dissatisfaction	251	3
Ignorance on conservation matters is responsible for your dissatisfaction	251	3

Source: Author, 2022

4.3.6 Distance from where the respondent lived to the nearest selected social facilities

The respondents were asked to estimate the distance from where they lived to the nearest social facilities, which included; the nearest location to a public school, the location of piped water, borehole, or pan and the location of a bank/micro finance or a Sacco. The distances were given in ranges of; 1 = 0-4 km, 2 = 5-9 km, 3 = 10-14 km, 4 = 15-19 km and 5 = above 20 km. Across tabulation of duration (years) the respondent had lived in the study area and the estimate distance from the social facilities was then computed. The findings presented in table 4.14, indicate that most respondents could hardly find access to a bank/microfinance institution or a Sacco. During an FGD session, it was revealed that most residents have to travel to Narok town to access financial assistance, especially credit services, save for the M-Pesa services that were now available. The difficulty of accessing credit was reflected in other investment opportunities especially those who already wanted to try alternative activities that would provide income because most respondents reported lacking adequate capital to invest in any sustainable income activities. From FGDs discussions, youth who, most of them were engaged in motorcycle enterprise (boda-boda) were finding it difficult acquiring their own motorcycles and thus they could only work for other people who were able to acquire one. The following is an FGD extract from the study conducted:

"…there are no programs within to help the bodaboda and women engaged in beadwork access credit..you buy alone using your money or you go to Narok town and borrow money in a bank. Or else you can approach the company selling motorbikes and deposit some amount and then you make agreements on how you can clear the balance as you operate

with the motor cycle….the installments are normally done mostly per month and if you default your bodaboda can easily be repossessed by the company yet its tasking to get the monthly instatements…"

Table 4.14: Mean Values on Distance from The Respondent's Residence to Selected Social Facilities

The length of time lived in this Ward	where you live to the location of a public school	where you live to the location of piped water; borehole; pan	Where you live to the location of bank/microfinance/Sacco
0-3 years	2	2	5
4-7 years	1	1	5
8-11 years	1	2	5
12-15years	1	1	5
16 and above years	2	2	5
Total	1	2	5

Source: Author, 2022

Women who engage in beadwork, carvings and trade in artifacts said it was difficult to save money or form a formal Sacco, which would later help them access credit and other loan facilities. However, schools were within walking distances for the majority of pupils and students because they were at 0-9 km. The same case applied to the availability of water in the form of piped water, borehole, or in pans. This was an indication that the benefits from MMNR had created some impact in the form of these important facilities and that the 19% County benefit-sharing scheme could be slightly felt in these projects. It was

difficult to attest whether the schools and water points had been exclusively built from the proceeds of MMNR or funds had also been sourced from other places.

Previous studies (Crystal et al.,, 2015) indicated that while water sources and nursery schools are needed in all settlement areas, what was imperative was the creation of good quality facilities. Most members of local communities were starting to prioritize quality schools over proximity, though the majority wanted schools, clinics and boreholes closer to their homes. From non-participatory observation and FGDs, most schools in the study area are boarding schools that were well or moderately equipped to meet the needs of the students/pupils.

4.4 Social Factors and Wildlife Conservation Projects

4.4.1 Success of the projects in support of wildlife conservation in MME

From the study, 91 % of the respondents reported that most projects initiated in support of wildlife conservation were not successfully completed. When further probed from FGD discussions, the local community said that most of these projects were left in the hands of the wealthy and elite members of the community who did not engage in public participation or involvement of the people and that they lacked the full commitment of the local community members. The FGDs also revealed that projects that succeeded were those that provided water, schools and health facilities though they were not well equipped. Kathleen et al., (2021) noted that lack of collaboration due to inequity in decision making and participation and corruption continued to hamper the goals of community conservation projects. From one of the FGDs conducted, the following information was gathered:

".....currently there are no known projects associated with MMNR…bosses from the County government come here politically and launch projects then claim they are the ones building this school..this road..equipping that hospital,… and so it becomes very difficult for us to distinguish which of the projects have been built from the proceeds of the reserve..most of the projects here have been branded with the names of our politicians…."

4.4.2 Factors responsible for the success of wildlife conservation projects

In spite of the wildlife conservation projects, high rate of non-completion, the study sought to understand the social factors responsible for their success. A Likert scale was provided for each social factor (health provision, education, security, credit access, food access) and the respondents were asked to rate the extent to which each social factor was responsible for the success of wildlife conservation projects (ICDPs). The Likert scale was as follows; 1. Strongly Agree, 2. Agree, 3. Neutral, 4. Disagree and 5. Strongly Disagree.

The findings of the study (table 4.15) revealed that the majority 56.9 % (median =2), agreed that health care provision had an influence on whether it supported wildlife conservation projects to completion. 55.1 % (median =2) also agreed that education for all the children was a determinant for the support of all the projects geared towards the sustainable conservation of wildlife resources. Income (37.3 %, median = 2) agreed that it influenced the fate of conservation projects, especially where the main livelihood activity (pastoralism), was affected due to wildlife predation or droughts, which on many occasions affected the MMNR. 54.5 % agreed that security was key at affecting the community projects, access to food (both livestock and human) at 43.7 % (median = 2) and water availability at 45.8% (median = 2). Employment opportunities were noted from the majority of the respondents who strongly agreed (58.3 %, median = 1) that it was

responsible for the success of ICDPs. However, the majority 37.6 % (median = 4), disagreed that access to credit was responsible for the success of ICDPs.

Table 4.15: Factors Responsible for the Success of Projects

Socio-economic factors	SA	A % response	N	D	SD	Median (0-5)
Health care provision	10.5	56.9	17.5	9.9	5.2	2
Education	18.1	55.1	12	8.7	6.1	2
Income	23.9	37.3	21.6	10.2	7.0	2
Security availability	15.7	54.5	18.1	5.8	5.8	2
Employment opportunities	58.3	18.7	7.6	7.9	7.6	1
Access to credit	9	18.7	17.5	37.6	17.2	4
Access to food (both livestock and human)	12	43.7	30.3	11.7	2.3	2
Water availability	17.8	45.8	18.1	9.6	8.7	2

Source: Author, 2022

From the findings of this study, health care provision is a crucial element because being, a wildlife area, most of the diseases were shared between livestock, human beings and wildlife. Diseases like brucellosis and Rift valley fever were considered among the prevalent diseases in the MMNR that could be passed to human beings from either wildlife or livestock. Therefore, when community member is sick and hardly afford health care then

it reduces the ability to think and even work. This affects the overall productivity of individuals, and thus the burden that comes with it makes it impossible to participate in projects that are supportive of conservation projects. This implies that for the wildlife conservation projects to have adequate contribution and support from members of the community, it is prudent to address the issue of health care, which may divert the synergy needed to implement the projects (Claire and Ogutu 2017).

The provision of education to the community members would make it easy for them to understand the goals and objectives of the wildlife conservation projects. An enlightened community would find it easier to get the information digested and put them into action than when the population has no formal education. In the Maasai Mara Ecosystem, it was found that the majority of the local community members had no formal education save for their cultural activities that are traditionally supportive of the conservation of wildlife. When the vast majority are educated, then overreliance on natural resources is also reduced as members diversify their income activities courtesy of the skills and knowledge obtained from their training. Building capacity on educated people is also considered easy as dissemination of information does not require a lot of translation which may distort the message and change the intended objectives of the initiatives (Mbaiwa, 2015).

From non-participatory observation, it emerged that most of the residents of the study area relied so much on pastoralism as the main source of income. In addition to leasing of land to conservancies, sale of artifacts, songs and dance for a fee, small and medium enterprises from those living in centres, sale of milk, meat and other livestock products and a number of people earning income from employment in camps lodges and Narok County Government. From the FGD discussion, it was noted that despite these activities being

done as additional income, there was no adequate diversification of income to help mitigate the challenges of climate change, thus droughts that could wipe a number of livestock, rendering herders and livestock owners poor. Income diversification is considered to affect the success of conservation projects initiated in support of wildlife conservation because when the local community is economically empowered, they protect their resources better than poor communities (Fausto, 2011). Employment formed part of the benefits derived from a conservation effort. When employment is shared equitably amongst members of the community, then the likelihood of them joining hands in supporting the implementation of the ICDPs would be very high (Mbaiwa, 2015). The following extract of the account was gathered during an FGD session in the study:

"…. the main economic activities here are pastoralism and tourism. Business activities are just very minimal and they exist mainly for milk that are sold to coolants in Nkoilale…there are lorries and bodaoboda which go around to collect milk from as far as Olailaimutyai and assemble them to the coolants. Other activities are songs and dances in lodges and these are done more so during wedding events, where we get paid through the lodge as little as Ksh 300 per person per dance or Ksh 5000 per dance..we consider this as not good pay…"

The security of humans, livestock and wildlife is vital for the sustainability of conservation and livelihood development. In the Mara Ecosystem, the General Service Unit (GSU) has a camp in Maasai Mara, which provides security to the public, complemented by various police posts within major trading centres. The rangers from Narok County Government and Kenya Wildlife Service (KWS) too offer security services to the wildlife and also the

public. These personnel were noted from the FGD deliberations that they were not adequate to protect all the people, especially from the aggressive wildlife as they conduct their livelihood activities. The extract from one of the FGDs of this account went as follows:

"....as far as security is concerned there are representatives from KWS, who inform them of any incident, by first calling the chief to get a way forward…in the community we have a program where one person per village is selected to record and report cases of wildlife especially in areas considered hotspots. There are also scouts that have been employed in most conservation areas outside MMNR who are about 10 – 20 scouts to also help in reporting incidences of wildlife….however, because of the vast land and population of livestock, we feel this is not adequate to guarantee swift security action…"

The local community felt that their livelihood networks were affected by the presence of wildlife and they were not secure enough to engage in other economic activities for fear of their lives. Their livestock was also not safe because of the frequent attacks from the carnivores. The security of the residents was found to have a bearing on the welfare of the ICDPs because lack of security affected the general perception of these projects and would have a negative perception of the wildlife conservation initiatives (Fausto, 2011). Further, the availability of the administrative units, from the village elders, assistant chiefs, and chiefs who are within the area of conservation, helped in connecting the government and other conservation agencies to the people, especially on matters that touched on livelihood welfare and security. In this way, owing to their duties, responsibilities and authority, they

can easily rally the community to support any project and, more so, conservation-initiated projects (Claire and Ogutu 2017).

The findings of the study revealed that the local community found it difficult to access credit from cooperative societies or banks because they were not within reach. Accessibility to capital to buy livestock by pastoralists, especially after herds are killed by intensive droughts or diseases associated with wildlife conservation or even depredation by carnivores, may work to change their perception towards projects and the entirety matters of wildlife conservation. Entrepreneurs who wanted to diversify in income-generating activities need to have access to credit facilities in order for them to sustain their businesses. The youth who engage in the boda-boda industry hardly have any capital to buy motorbikes and therefore, accessibility to loans would enable them to engage in this business hence when empowered economically, they were likely to support conservation, including the implementation of projects synonymous with conservation of wildlife.

Other social factors contributing to the fate of wildlife conservation projects were access to food and water for livestock and human beings. The study findings indicated that most conflicts arose from the competition for resources, especially on grazing land and water sources between livestock and wildlife (Claire and Ogutu 2017). The situation would be worse off when there are escalating levels of drought and as resources become scarce. The competition between livestock and wildlife and nomadic form of life for the Maasai during the time of harsh environmental conditions do not allow them to participate in any meaningful engagements with the initiators of conservation projects. They, therefore, do not add value to these initiatives, especially by providing their indigenous knowledge that is regarded vital for the survival of wildlife conservation initiatives. In the recent past,

owing to the subdivision of land in the Maasai Mara Ecosystem, the local community has lived a sedentary life. This kind of life has prompted their participation in community engagements, more in projects that benefit the community, like the building of schools, health centers and roads.

4.4.3 Factors responsible for failure of Wildlife conservation projects

Majority (93.6 %) of the respondents, acknowledged that socio-economic factors were responsible for the failure of conservation projects in the MMNR. Only 6.4 % of the respondents said that socio-economic factors were not responsible for the failures that were bedeviling ICDPs in the Maasai Mara Ecosystem.

The study also asked the respondents to rank the extent to which they agreed that socio-economic factors were responsible for the failures of wildlife conservation projects. A Likert scale was provided where 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree and 5 = Strongly Disagree. The socio-economic factors that were considered in this study included; corruption, conflicts amongst the people, insecurity, insufficient funds, poor roads, poor governance, lack of income, political influence and human-wildlife conflicts.

Th findings of this study (table 4.16) revealed that the majority at 58 % (median = 1) strongly agreed that corruption and HWC at 48.6 % (median = 2) were responsible for failures of ICDPs. Conflicts at 60.8 % (median = 2), insecurity at 51.4 % (median = 2), insufficient funds at 46.2 % (median = 2), poor governance at 52.9 % (median = 2), income at 50.5 % (median = 2) and political influence at 56.9 %(median = 2) the respondents agreed that these factors were responsible for failures of wildlife conservation projects. However, the majority 30.9 % (median = 2), disagreed that poor roads were responsible for the failures of wildlife conservation projects.

Table 4.16: Percentage Response on Factors Responsible for Failure Conservation Projects

Socio-economic factor	SA	A	N	D	SD	M
Corruption	58	38.6	2.7	0.5	0.2	1
Conflicts	29.1	60.8	5.5	2.8	1.8	2
Insecurity	9.8	51.4	23.5	4.9	10.4	2
Insufficient funds	14.7	46.2	16.8	3.7	18.6	2
Poor roads	20.5	30.6	15.6	30.9	2.4	2
Poor governance	34.3	52.9	8.2	4.0	0.6	2
Lack of income	17.1	50.5	8.9	7.0	16.5	2
Political influence	35.8	56.9	5.8	0.9	0.6	2
HWC	48.6	44.3	4.4	1.8	0.9	1

Source: Author, 2022

Corruption was strongly agreed by the respondents that it was responsible for the failures of the ICDPs. From FGD discussions, it was observed that most projects stalled because the funds allocated for the project may have been misdirected or plundered by the people in charge of the projects. Corruption led to development of substandard projects and did not meet the requisite quality. Corruption happened at the stage of public participation where the project phases were not adhered to as planned in its life cycles, in order to cut on the budget and possibly squander the money spared from the project. From the

interviews, it emerged that the revenue collection, especially during the defunct Narok County Council and now (automated) the Narok County government tourism revenue collection, collections may escape the technology applied at the point of collection, thus the County may end up not meeting the targeted amount. The 19 % benefit-sharing program by the Narok County government, was reported to be implemented unfairly and inequity at times reigns, because it is controlled by the elite of the society and make it hard for the poor herders who are in dire need of the proceeds from MMNR to access. When such vices are reported from the conservation projects initially intended to support the conservation of wildlife resources, it stirs discontent hence directly cause failures in the important conservation projects that would have changed the livelihoods of the people living around protected areas.

The funds allocated for conservation projects and other benefits for the local community, the locals argued that it was not enough to compensate for the economic costs incurred to them by the wildlife or rather, the economic costs of foregoing their land for conservation and would prefer being raised from the current 19 % to 35 % to be the same as what the counties get from the sharable revenue from the National government. From non-participatory observation, it was noted that health centers were well built but not well or regularly equipped because of insufficient financial support. In the energy sector, homes did not have either solar energy or electricity connected though it was revealed that rural electrification was a mandate of the National Government. The political goodwill is responsible for the creation of the by-laws and also the implementation of the conservation projects. The politicians may, at times, rally their supporters not to support specific programs and projects implemented for conservation. On the contrary, politicians have the

goodwill to have their supporters participate in the implementation process of particular conservation projects. Most employment networks and other beneficial opportunities are always known to politicians and community opinion leaders, and thus sometimes, the benefits may not find the right people that need them, and in the long run, it may have a negative effect on the total implementation of the conservation projects.

Human-wildlife conflicts are issues that are affecting the people living adjacent to PAs so much to the tune that, in some instances, their livelihood networks are distorted. Livestock depredation, crop damage, loss of life, property damage, and general insecurity posed by the presence of wildlife has been reported to cause negative perception about wildlife conservation. Particularly in MMNR, conflicts have arisen where the residents feel that they are denied access to the resources like grass for their livestock, which sometimes they illegally graze their livestock there. Conflicts are further exacerbated by inequity in benefits distributions within the Maasai Mara Ecosystem. These conflicts create negative perceptions and, in the long run affect the implementation cycles of wildlife conservation projects. Consequently, these socio-economic factors have a direct negative effect on conservation initiatives and, by extension, livelihood development.

4.4.4 An association between age and social factors in MMNR

The study sought to establish the association between age and each socio-economic factor (health provision, education, income, security, employment, credit access, access to food and water availability) responsible for the success of the ICDPs in the Maasai Mara Ecosystem. The findings are displayed in table 4.17 and table 4.18.

There is a significant relationship between age and health (x^2 = 43.729, df = 20, p = 0.002), the p-value was less than 0.05 at 95 % confidence level. It was also revealed a significant relationship between age and the following other social-economic factors at 95 % confidence level; education (x^2= 33.911, df = 20, p = 0.027), income (x^2= 46.614, df = 20, p = 0.000), security (x^2 = 42.706, df = 20, p = 0.002), employment (x^2 = 37.430, df = 20, p = 0.010), credit access (x^2 = 40.692, df = 20, p = 0.004), access to food (x^2 = 37.639, df = 20, p = 0.010) and water access (x^2 = 41.243, df = 20, p = 0.003). In all these, the p-value was less than 0.05. Ages of the respondents were most likely to affect the outcome of these factors as most young people below the age of 40, being the majority, were reporting that these socio-economic factors had a bearing on the fate of the ICDPs. These young people were most likely to be affected when there were failures in these conservation projects because most lost employment or failed to be paid due to corruption and misappropriation of funds.

Table 4.17: Crosstabulation of age and socioeconomic factors for conservation project

Health	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	43.729[a]	20	.002
Likelihood Ratio	42.117	20	.003
Linear-by-Linear Association	.924	1	.337
N of Valid Cases	343		
Education	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	33.911[a]	20	.027
Likelihood Ratio	31.781	20	.046
Linear-by-Linear Association	.086	1	.769
N of Valid Cases	343		
Income	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	48.614[a]	20	.000
Likelihood Ratio	44.054	20	.001
Linear-by-Linear Association	3.176	1	.075
N of Valid Cases	343		
Security	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	42.706[a]	20	.002
Likelihood Ratio	35.054	20	.020
Linear-by-Linear Association	7.406	1	.006
N of Valid Cases	343		
Employment	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	37.430[a]	20	.010
Likelihood Ratio	36.453	20	.014
Linear-by-Linear Association	.023	1	.881
N of Valid Cases	343		

Source: Author, 2022

Table 4.18: Age and socioeconomic factors for project success

Credit	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	40.692[a]	20	.004
Likelihood Ratio	39.477	20	.006
Linear-by-Linear Association	1.479	1	.224
N of Valid Cases	343		
Access to food	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	37.639[a]	20	.010
Likelihood Ratio	37.583	20	.010
Linear-by-Linear Association	1.930	1	.165
N of Valid Cases	343		
Water	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	41.243[a]	20	.003
Likelihood Ratio	44.329	20	.001
Linear-by-Linear Association	3.508	1	.061
N of Valid Cases	343		

Source: Author, 2022

4.4.5 Socio-economic factors that influence wildlife conservation projects in MMNR

The study computed the ordinal regression analysis, and from the model fitting information in table 4.19, (x^2= 6.36, df = 1, p = 0.012), it was observed that the model was a good fitting model of the data at 95 % confidence level. It, therefore, means the model improves the ability of the data to predict the outcome. The study's hypothesis at 95 % confidence level was also found to be significant, and thus the null hypothesis was rejected and concluded that socio-economic factors influence the success of wildlife conservation projects in Siana, Mara and Naikarra wards. The final model has one

predictor, which is project success. Table 4.20 is the goodness of fit table, which contains the Pearson Chi-square statistics for the model. From the statistics, it was observed that the data was consistent with the fitted model (x^2= 2.158, df = 3, p = 0.540), and since the p-value was greater than 0.05, then it was an indication that the data and the model have the same predictions and it is a good model.

Table 4.19: Model Fitting Information for Wildlife Conservation Projects Success

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	39.278			
Final	32.912	6.366	1	.012

Link function: Logit.

Source: Author, 2022

Table 4.20: Goodness of Fit for Wildlife Conservation Projects Success

	Chi-Square	df	Sig.
Pearson	2.158	3	.540
Deviance	2.344	3	.504

Link function: Logit.

Source: Author, 2022

From the parameter estimates table 4.21, it exhibits a computation of the relationship between the observed variables. The ordinal regression equation (cumulative logit) for the prediction of the odds of being in one level or category is, **(y = a - bx),** where **y** is the predicted value (dependent variable), **a** is the constant, and **b** is the coefficient of the independent variable. Therefore, the equation for this study would be;

y = 1.076- bx.

Table 4.21: Parameter estimates table for socio-economic factors that influence the success of conservation projects

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Q95 = 1]	-2.125	.179	140.575	1	.000	-2.477	-1.774
	[Q95 = 2]	.768	.120	41.275	1	.000	.534	1.002
	[Q95 = 3]	1.804	.157	132.324	1	.000	1.496	2.111
	[Q95 = 4]	2.987	.248	144.928	1	.000	2.501	3.473
Location	[Projects success= 0]	1.076	.432	6.210	1	.013	.230	1.923
	[Projects success=1]	0[a]	.	.	0	.	.	.

Link function: Logit.

Source: Author, 2022

4.5 Wildlife Conservation Efforts Undertaken by the Local Community

4.5.1 The role of the local community in wildlife conservation efforts

91.3 % of the respondents said there was a role that the local community played in the conservation of wildlife resources in MMNR. The local community is an important partner for successful conservation initiatives because their contribution, even in terms of indigenous knowledge, can assist wildlife managers in developing an executable strategic plan for conservation areas. The local community, more so in MMNR, bear the brunt of conservation, especially from the carnivores, since their main economic activity apart from tourism is pastoralism. If these local people are not treated as important partners and their involvement is treated seriously, then they will grow negative perceptions, and consequently, it will injure the entire concept of wildlife conservation.

The respondents were asked to rate the extent to which they agreed with the statements about activities that supported wildlife conservation. A Likert scale was provided where 1= Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). Descriptive statistics were computed and the percentages and median (M) of each activity were recorded in table 4.22 below.

Majority (59.3 %) of the respondents agreed that public participation was the most important activity in support of wildlife conservation (median = 2). 28.8 % respondents disagreed about capacity building being the most important activity supporting wildlife conservation (median = 3), while good on governance majority (52.2 %) of the respondent agreed that it was the most important activity in support of wildlife conservation (median = 2). 54.3 % strongly agreed that good relationships among partners was the most important activity in support of wildlife conservation (median= 1), creation of awareness

at 38.9 % (median = 2) was also strongly agreed that it was the most important activity in support of wildlife conservation and reporting of wildlife incidences at 50.6 % (median = 1) was also strongly agreed that it was the most important activity in support of wildlife conservation. On the green economy activities, the respondents were neutral at 24.4 % (median = 4) and therefore, most respondents were not sure if it was the most important activity in support of the conservation of wildlife (table 4.22).

From FGDs discussion, it was observed that the local community was not involved in many management's decisions-making process, especially that entailed wildlife conservation and livestock. In many cases, the elite wealth of the society were given priority to represent the community, and in most of such representations, the community's interests were misrepresented or not mentioned at all. Public participation is an important element of any program, plan, or project, and therefore the local community ought to be fully involved so that ownership of the conservation programs and projects is guaranteed by the local community. This is important, especially in project identification and planning the priority needs of the local community. Most conservation projects are chosen by the management or the donors and may not be of any help to the local community because they may not be in dire need at the particular time. It is therefore, essential to develop the capacity of the local community through training so that they fully participate in project cycles and the decision-making process of wildlife conservation initiatives.

Table 4.22: Wildlife Conservation Activities Undertaken by The Local Community

Activity	SA	A	N	D	SD	M
		% response				(Median)
Public Participation	25	59.3	12.3	0.9	2.5	2
Capacity building	16.7	26.6	8	28.8	19.8	3
Good governance	27.2	52.2	11.4	1.5	7.7	2
Good relationships	54.3	27.2	14.5	1.2	2.8	1
Creation of awareness	38.9	42.6	12.7	2.2	3.7	2
Reporting wildlife incidences	50.6	43.8	4	0.9	0.6	1
Green economy	10.8	10.8	24.4	19.8	34.3	4

Source: Author, 2022

Good relationships and a working rapport between members and especially the local community, being the major stakeholder, was noted to be key in ensuring the sustainability of wildlife resources. Better working relationships entail involving all the stakeholders in developing better management strategies and policies where due and putting in place an amicable dispute resolution mechanism. Adjacent to protected areas, a myriad of HWCs were reported on daily basis. The most affected partners, in this case, are the local community because they, in most cases, suffer irreparable consequences of hosting wildlife on their land. Land use issues is also a challenge and especially where resources like pasture and water are involved. These resources tend to be so scarce during the period of droughts

and there is high competition between wildlife and livestock. From non-participatory observation, livestock has been spotted grazing within MMNR against the governing restrictions. Where there are no proper working relationships and good governance, then a negative perception is created about wildlife conservation which may not be good for conservation. From the an FGD discussion, the residents, especially those living closer to MMNR, were denouncing the reserve management as that sometimes they hardly consider their plea whenever they are found grazing livestock in the MMNR. For wildlife to co-exist between wildlife and human beings, there must be a mutual relationship, good understanding, and proper rapport between all the stakeholders so that none feel their rights infringed.

The other important activity that was reported to be main in the study area was the creation of awareness. It was confirmed from FGDs engagement that awareness creation was mostly done in schools and religious institutions and through the social media fora (Facebook, WhatsApp and Twitter). This was more so to the climate change challenge that was affecting both livestock and wildlife. Droughts were a serious concern, and the most important aspect of awareness was reported to be that of advising pastoralists to off-take their livestock and save the money, then buy them when the season was wet again. The same case also applied to reporting wildlife incidences, especially where endangered species were wandering beyond the boundaries of MMNR. Incidences of also carnivores preying on livestock or attacks on human beings were also reported by the local community to authorities for action to be taken. The green economy was noted as a new concept in the study area, and hardly the respondents practiced it. The green economy activities were mostly practiced by women through the sale of beadwork, craftwork from wood, and

ornamental attires. This could only be practiced at major gates to MMNR and in manyattas closer to the reserve, and therefore many people did not get the opportunity to engage in this enterprise. These activities helped earn an alternative living for the entrepreneurs and positively assisted in promoting conservation in MMNR.

4.5.2 An association between distance and conservation efforts activities

This study conducted a Chi-square test of association between distance and wildlife conservation efforts conducted by the local community members. The results were as indicated in table 4.23 and table 4.24.

Public participation (x^2= 61.998, df = 28, p = 0.000), capacity building (x^2 = 87.466, df = 28, p = 0.000), good governance (x^2 = 75.082, df = 28, p = 0.000), good relationship (x^2 = 51.870, df = 28, p = 0.004), and green economy (x^2 = 102.531, df = 28, p = 0.000) of wildlife conservation efforts indicated a significant relationship with distance at 95% confidence level (table 4.23). However, creation of awareness (x^2 = 37.835, df = 28, p = 0.102) and reporting of wildlife incidences (x^2 = 40.552, df = 28, p = 0.059) indicated insignificant relationship with distance from MMNR table 4.24.

Table 4.23 Significant Association Between Distance and Activities

Public participation	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	61.998[a]	28	.000
Likelihood Ratio	67.043	28	.000
Linear-by-Linear Association	4.970	1	.026
N of Valid Cases	324		
Capacity building	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	87.466[a]	28	.000
Likelihood Ratio	88.959	28	.000
Linear-by-Linear Association	29.264	1	.000
N of Valid Cases	323		
Good governance	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	75.082[a]	28	.000
Likelihood Ratio	72.639	28	.000
Linear-by-Linear Association	2.833	1	.092
N of Valid Cases	324		
Good relationships	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	51.870[a]	28	.004
Likelihood Ratio	58.567	28	.001
Linear-by-Linear Association	1.579	1	.209
N of Valid Cases	324		
Green economy	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	102.531a	28	.000
Likelihood Ratio	94.021	28	.000
Linear-by-Linear Association	28.086	1	.000
N of Valid Cases	324		

Source: Author, 2022

Table 4.24: Insignificant Association Between Distance and these Activities

Creating awareness	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	37.835[a]	28	.102
Likelihood Ratio	39.799	28	.069
Linear-by-Linear Association	1.709	1	.191
N of Valid Cases	324		
Reporting wildlife incidences	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	40.552[a]	28	.059
Likelihood Ratio	42.366	28	.040
Linear-by-Linear Association	17.959	1	.000
N of Valid Cases	324		

Source: Author, 2022

4.5.3 Wildlife conservation efforts undertaken by the local community in MME

From the Chi-square test-Final model (x^2 = 12.856, df = 1, p = 0.000), indicated in the model fitting information (table 4.25), the null hypothesis was rejected since the p-value was less than 0.05 at 95 % confidence level and concluded that there are wildlife conservation efforts undertaken by the local community of Siana, Mara and Naikarra wards. The model-fitting information further indicated that the model was a good fit for prediction. Further, in the Goodness of fit table (table 4.26), since the p-value is large for Pearson Chi-square (x^2 = 1.344, df = 3, p = 0.719) indicated that the data observed is

therefore consistent with the fitted model. It means that the observed data can be used to predict the outcome of the dependent variable in the study using the ordinal logistics regression equation y = a- bx, where;

y = is the outcome (predicted variable)

a = constant

b = coefficient of the independent variable

Table 4.25: Model fitting information for conservation efforts undertaken by the local community

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	41.735			
Final	28.879	12.856	1	.000

Source: Author, 2022

Table 4.26: Goodness of fit for conservation efforts undertaken by the local community

	Chi-Square	df	Sig.
Pearson	1.344	3	.719
Deviance	2.194	3	.533

Source: Author, 2022

Table 4.27 shows the parameter estimates of the logistic regressions computed. It indicates the constant as 2.027 and also the threshold for each category where level 1 = 0.306, level 2 = 1.696, level 3 = 2.129 and level 4 = 3.407. The ordinal logistic regression equation for this model would be y = 2.027- bx.

Table 4.27: Parameter estimates for conservation efforts undertaken by the local community

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Q96 = 1]	.306	.589	.270	1	.604	-.848	1.460
	[Q96 = 2]	1.696	.598	8.041	1	.005	.524	2.868
	[Q96 = 3]	2.129	.601	12.566	1	.000	.952	3.307
	[Q96 = 4]	3.407	.611	31.122	1	.000	2.210	4.604
Location	[Conservationefforts=1]	2.027	.603	11.284	1	.001	.844	3.210
	[Conservationefforts=2]	0[a]	.	.	0	.	.	.

Source: Author, 2022

4.6 Livelihood Activities in Siana, Mara And Naikarra Wards Related to Wildlife Conservation

4.6.1 Livelihood activities in support of wildlife conservation

86.3 % acknowledged that there were livelihood activities they were engaged in and were supporting wildlife conservation (table 5.8). Akyol et al., (2018) observed that livelihood is the greatest of all the challenges to communities, households and individuals. Livelihoods comprise the capabilities, assets (including both materials and social resources) and activities required for a means of living and it's about money, food, labor, employment, and assets (Akyol et al., 2018). Research elsewhere indicated that pastoralists were often marginalized by government policy that favors the dominant settled farming lifestyles (Reid et al., 2016). Further, conflicts and illegal wildlife trade in most sub-Saharan countries were exacerbated by a lack of alternative livelihoods. This observation was not farther from what FGDs indicated because the majority of the residents that were over-reliant on pastoralism and tourism as their main sources of income. Fausto (2011) noted that the emergence of the poverty alleviation wave on conservation aimed at addressing the livelihood of people adjacent to protected areas who felt insecure and suggested that empowerment of these local communities would guarantee the protection of biodiversity. (Walpole & Thouless, 2009a) indicated that embracing the local community's economic development, including diversification of livelihoods, is a strategy for wildlife conservation and conflict resolution (Downie, 2015; Jon , 2013; Ogutu et al., 2016).

4.6.2 Livelihood activities in the Maasai Mara ecosystem

The study sought to understand the extent to which the respondents agreed with statements of livelihood activities. The following livelihood activities were considered in this study; ecotourism, tourism (travel and hotel industry), land leasing, beekeeping, green economy, selling of tree seedlings, public education for a fee, pastoralism, trade in tourism artifacts and cultural activities (songs and dances). A Likert scale was provided where 1 = Strongly Agree (SA), 2 = Agree (A), 3 = Neutral (N), 4 = Disagree (D) and 5 = Strongly Disagree (SD). Descriptive statistics were then computed, where percentages and median were computed and represented in table 4.28.

The study observed that majority of the respondents agreed that ecotourism 41.2 % (median = 2), land leasing at 42.9 % (median = 2) and trade in tourism artifacts at 46.8% (median = 2) were the main activity related to conservation in Maasai Mara Ecosystem. Tourism (travel and hotel industry) at 41.9 % (median = 2), pastoralism at 78.1 % (median = 1) and cultural activities (songs and dances) at 42.5 % (median = 2) were indicated by the majority of the respondents that they strongly agreed that these activities were the main livelihood activities. The majority of the respondents also were not sure that beekeeping at 48.2 % (median = 3) and public education for a fee at 29.9 % (median = 3) were the main livelihood activities in the Maasai Mara Ecosystem. However, the majority of the respondents disagreed that the green economy at 48.2 % (median = 4) and sell of tree seedlings at 43.9 % (median = 4) were the main livelihood activities across Maasai Mara Ecosystem (table 4.28). (Katherine et al., 2012; Mutea et al., 2019), observed that half or more than half of households earned off-farm income from trade, business, land leasing, tourism, and cultural activities such as boma performances, sales of beadwork jewelry and other craftwork in

conservation areas that included Maasai Mara, Tarangire, Amboseli, Longido and Kitengela.

Table 4.28: Percentage Response on Livelihood Activities in MMNR-Environs

Activities	SA	A	N	D	SD	M
		% response				(median)
Ecotourism	10.6	41.2	13.3	3.7	5.3	2
Tourism	41.9	41.2	10.6	1	5.3	2
Land leasing	31.9	42.9	8.6	2.7	14	2
Bee Keeping	5	10.3	39.5	26.6	18.6	3
Green economy	5	8.6	14.6	48.2	23.6	4
Sell of seedlings	5.6	6.6	20.9	43.9	22.9	4
Public education	13.3	28.9	13	29.9	15	3
Pastoralism	78.1	16.6	2.3	2.3	0.7	1
Trade in artifacts	34.6	46.8	11.3	4.3	3	2
Cultural activities	43.5	40.9	8.6	4	3	2

Source: Author, 2022

Nyumba et al., 2021, noted that individuals with diverse sources of income tend to have more favorable conservation attitudes than those with fewer sources of income. Nyumba et al., 2021 further associated this with the spread-out effect of income on the costs of conservation, such as livestock predation, crop damage and restriction of movement.

Ecotourism being responsible travel and sustainability of natural resources and livelihoods, is practiced in Maasai Mara Ecosystem in the form of cultural activities that attract tourists and hosting tourists outside MMNR in tented camps (Akyol et al., 2018). These areas must be kept as natural as possible in order to allow the environment to retain its natural effect. Comparatively, within the MMNR, there are several access roads that have been created under the pretext of enabling tourist to spot the much coveted big five animals, but this amounts to the degradation of the environment. It was noted from the FGD discussion that in Tanzania, the Serengeti, unlike in MMNR, there are hardly any access roads for tourists and this has left the environment in its natural setting without much human disturbance. Within the conservancies in the Maasai Mara ecosystem, the locals have been able to make a living from ecotourism activities that attracted both domestic and international tourists. However, it was observed that, it is very challenging to distinguish between the main tourism activities and ecotourism (Akyol et al., 2018). The study felt that immense public awareness, training and capacity building was a necessary consideration to debunk the difficulties surrounding the two.

While 41.9% were able to strongly agree that tourism in the hotel and travel industry was earning them alternative income, this only benefited those who owned conservancies or lived in close proximity to the MMNR. The local community members who lived far, like in Rongena, practiced crop farming for a living. It was observed that the majority of the local community members also benefited from employment opportunities as most young people were employed as cleaners, cooks, drivers, security personnel and junior supervisors in hotels. The local community also was able to supply their livestock products like meat and milk to the small hotel establishments within and without the MMNR but in

small quantities since trade was minimal. Trade too was considerably observed as an alternative income earner as they engaged in supermarkets, wholesale and retail trade of household items. There was also a livestock enterprise where businessmen and women bought livestock from pastoralists and took them to as far as Nairobi and Narok town or elsewhere to sell.

From the FGDs, it was observed that residents, especially those closer to MMNR, consolidated their land together and leased to conservancies, which supported the wildlife from MMNR. These conservancies provided money to the members as proceeds of tourism activities, but there have been reported cases of fencing in most villages which are impeding the movement of wildlife. These conservancies also are constricting grazing land for the local members because of the imposed regulations on grazing. These restrictions members complained about affecting their livestock, especially during periods of droughts. MMNR also does not allow livestock to be grazed within the reserve and HWCs sometimes stem from this as the local community members sometimes try to violate this restrictive measure (Downie, 2015; Jon , 2013).

Pastoralism, trade in artifacts and cultural activities were revealed to be the dominant livelihood activities within the Maasai Mara Ecosystem. Though there are competitions between the livestock of the Maasai and the wildlife, comparatively, it was the most compatible activity to engage in within the savannah grasslands. However, a few households residing far from the MMNR engaged in crop farming, where they planted maize, wheat and tomatoes. Pastoralism was facing challenges from wildlife, especially from livestock depredation and zoonotic diseases. It was also observed that the majority of households were dependent on pastoralism for a living though the numbers of herds each

family owned varied. The Maasai cultural and traditional customs indicated that, the higher the number of livestock one has the higher the perception that the household is wealthier. The artefacts sold to tourists were done at the gates of the MMNR or in the Manyattas of the households living adjacent to the reserve. The same scenario happened for the showcasing of cultural dances and songs which was done mainly in Manyattas. In these bomas, the Maasai also showcased how they traditionally used to slaughter and roast meat and narrated the importance and consequences of certain cultural events in their culture which necessitated actions (slaughter of bull or goat) to be taken.

The study further observed that there are households that practiced afforestation, and a few botanical gardens were noted through non-participatory observation in the Sekenani sublocation. These gardens were rich in medicinal vegetation, which traditionally, the Maasai community used for treating various ailments. The main vegetation occurring was observed to be natural and most planted trees were done in learning institutions like primary and secondary schools and a few homesteads. This trend was worrying and a lot of efforts through awareness of the importance of trees as carbon sinks needed to be made in the Maasai Mara Ecosystem. The trade-off in carbon may most likely encourage the residents to plant more trees and maintain the existing vegetation as it attracted a benefit.

Plate 3: Women Displaying their Wares at Sekenani Gate

Source: Author, 2022

4.6.3 Proceeds supporting livelihoods in MME

78.4% of household heads acknowledged that the proceeds from MMNR were supporting livelihood activities. It is argued that the income from employment, when invested elsewhere, could help create an alternative source of livelihood. The same applied to infrastructural development done by the County Government in urban areas, like street lighting, was aiding in providing lights to support business till late in the night and providing security in the vicinity. From the FGDs it was discovered that most poor households relied on bursaries to take their children to school. The issue of water too had partially resolved by the creation of many pans and dams to provide water for livestock, wildlife and humans, although the majority of households still suffered from water stress.

4.6.4 Satisfaction level on the impact of the proceeds from MMNR on livelihood activities

From figure 4.2 below, the majority of the respondents at 43.4 %, were satisfied that the proceeds from MMNR were changing their livelihood. 33.5 % of the respondents were not sure whether their lives had changed courtesy of MMNR. These findings were in concurrence with the observation of (Nyumba et al., 2021) that in Transmara, the favorable attitudes towards wildlife conservation could be attributed to both the direct and indirect income generation opportunities from the reserve, which included; employment in catering, administration, business opportunities in lodges and sale of Maasai cultural items like embroidery and woodcarvings. (Kathleen et al., 2021), observed that at the community level, when there is higher involvement in tourism activities, it results in more robust support for wildlife conservation in the MMNR. Further, (Mukeka et al., 2019) observed that HWC result in low satisfaction level as an outcome of negative perception. Promoting profitable conservation enterprise and increasing conservation benefits to the local community would improve satisfaction level about the entire concept of wildlife conservation. Kathleen (2018) found out that where there is physical capital benefits support and enhanced ecotourism opportunities, there is an increase in financial revenue streams for the local community. The researcher further noted that the challenge faced by most conservation areas is lack of collaboration due to inequity in decision-making and participation of the locals. Mojo et al., (2020) observed that the relative proportion of benefits gained and losses incurred by the local people in relation to a protected area has important implications for biodiversity conservation and livelihoods. This was corroborated with the accounts of an FGD, that the locals were discouraged when the

control of benefit distribution was left in the hands of the elite and reiterated that, that kind of situation might not guarantee distributive justice of the benefits.

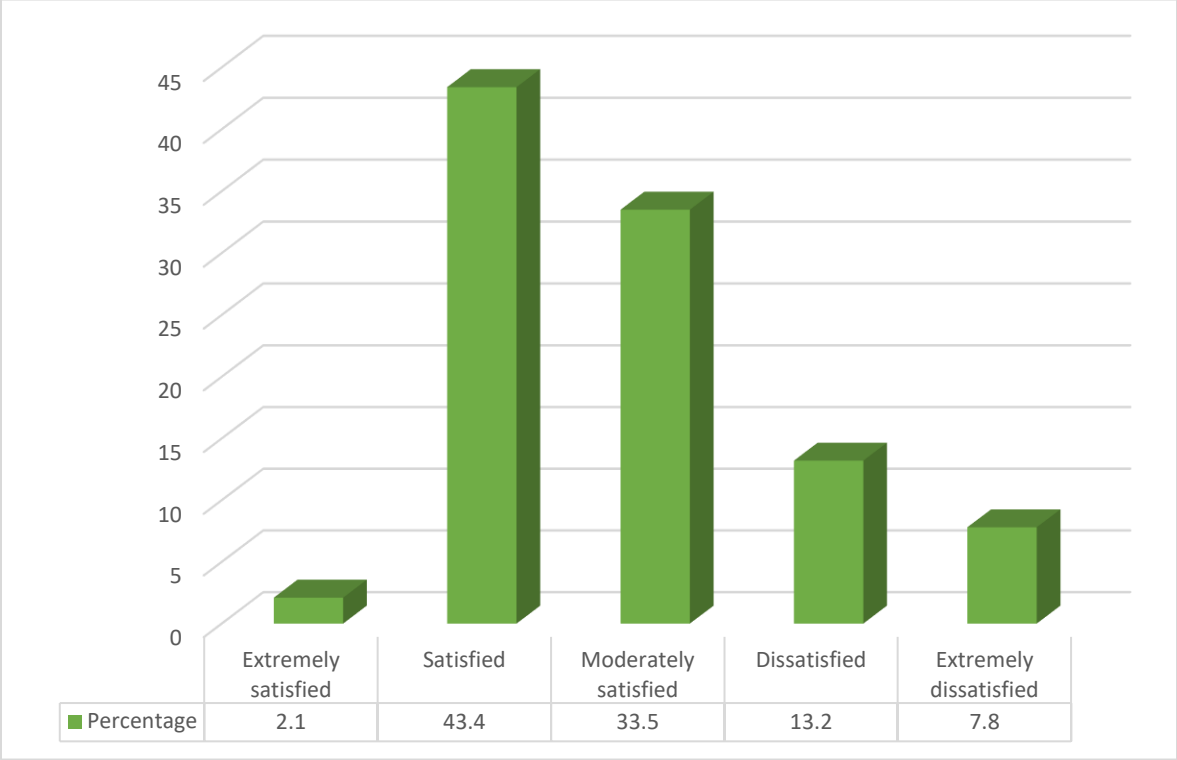


Figure 4.2: Level of Satisfaction to Proceeds from MMNR on Livelihoods

Source: Author, 2022

A chi-square test of association was computed between age, education, distance and satisfaction level. The findings revealed that age (x^2 = 45.059, df = 20, p = 0.001) associated positively with satisfaction level at 95 % confidence level (table 4.29). This suggests that there is a significant positive relationship between the age of the respondents and the satisfaction level of the benefits accruing from MMNR.

Education level (x^2 = 32.985, df = 16, p = 0.007) had a positive association with satisfaction level at 95 % confidence level. This meant that there was a significant positive

relationship between the education level of the respondents and the satisfaction level of the benefits from MMNR. Distance from MMNR (x^2 = 98.010, df = 28, p = 0.000) indicated an association between it and the satisfaction level at 95 % confidence level. It, therefore, indicates that there is a positive relationship between distance from MMNR and the satisfaction level of the benefits resulting from MMNR.

Table 4.29: An Association Between Age, Education and Distance and Satisfaction Level

Age			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	45.059[a]	20	.001
Likelihood Ratio	41.307	20	.003
Linear-by-Linear Association	.418	1	.518
N of Valid Cases	281		
Education			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	32.985[a]	16	.007
Likelihood Ratio	33.832	16	.006
N of Valid Cases	281		
Distance			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	98.010[a]	28	.000
Likelihood Ratio	96.256	28	.000
Linear-by-Linear Association	37.058	1	.000
N of Valid Cases	281		

Source: Author, 2022

4.6.5 Livelihood activities in MME related to conservation efforts

Studies were carried out to understand the relationship between livelihood activities in MME with the conservation efforts. The ordinal logistics regression computed indicated that there was a significant relationship between livelihood activities and conservation efforts (x^2 = 106.401, df = 16, p = 0.000) at 95 % confidence level (table 4.30), rejects the null hypothesis and concludes that, there are livelihood activities in Siana, Mara and Naikara wards related to conservation efforts.

Further, table 4.30 indicates a model fitting information and depicts significance at 95 % confidence level that the model is a good fit for the outcome (dependent variable predicted). Table 4.31 is the Goodness of fit computation, and it affirms that the observed data is consistent with the fitted model (estimated values) since the p-value (x^2 = 52.330, df= 48, p = 0.310) of the Pearson Chi-square was insignificant at 95 % confidence level.

Table 4.30: Model Fitting Information for Livelihood Activities in MME Related to Conservation Efforts

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	242.962			
Final	136.561	106.401	16	.000

Link function: Logit.

Source: Author, 2022

Table 4.31: Goodness of Fit for Livelihood Activities in MME Related to Conservation Efforts

	Chi-Square	df	Sig.
Pearson	52.330	48	.310
Deviance	50.561	48	.373

Source: Author, 2022

From table 4.32 (Q2 is the sub-location) it was observed that only four predictors exhibited significance (Q2 = 11, p = 0.008, Q2 = 12, p = 0.001, Q2 = 7, p = 0.012 and Q2 = 8, p = 0.008) at 95 % confidence level. The ordinal regression equation for this model is;

y = a – bx, each sublocation (being the categorical variable used in prediction) had its constants and could be used for predicting the outcome of the expected value on the dependent variable.

Table 4.32 Parameter Estimates for Livelihood Activities in MME Related to Conservation Efforts

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Q97 = 1]	.230	.388	.353	1	.552	-.529	.990
	[Q97 = 2]	1.501	.403	13.841	1	.000	.710	2.292
	[Q97 = 3]	2.395	.434	30.413	1	.000	1.544	3.246
	[Q97 = 4]	5.151	.817	39.739	1	.000	3.550	6.753
Location	[Q2 = 1]	-1.069	.775	1.903	1	.168	-2.587	.450
	[Q2 = 10]	-.449	.791	.321	1	.571	-2.000	1.103
	[Q2 = 11]	-2.866	1.076	7.103	1	.008	-4.974	-.758
	[Q2 = 12]	2.085	.589	12.557	1	.000	.932	3.239
	[Q2 = 13]	.706	.510	1.917	1	.166	-.293	1.705
	[Q2 = 14]	-.659	.906	.528	1	.468	-2.435	1.118
	[Q2 = 15]	-.091	.507	.032	1	.858	-1.085	.903
	[Q2 = 16]	-1.065	.676	2.482	1	.115	-2.390	.260
	[Q2 = 17]	-.646	.601	1.153	1	.283	-1.825	.533
	[Q2 = 2]	.469	.626	.561	1	.454	-.758	1.695
	[Q2 = 3]	-.246	.590	.173	1	.677	-1.402	.911
	[Q2 = 4]	-1.046	.699	2.235	1	.135	-2.417	.325
	[Q2 = 5]	-21.120	9676.118	.000	1	.998	-18985.963	18943.723
	[Q2 = 6]	-21.120	.000	.	1	.	-21.120	-21.120
	[Q2 = 7]	-2.780	1.101	6.369	1	.012	-4.939	-.621
	[Q2 = 8]	-1.587	.606	6.856	1	.009	-2.775	-.399
	[Q2 = 9]	0[a]	.	.	0	.	.	.
Link function: Logit.								

Source: Author, 2022

4.7 Wildlife Economic Costs in the Environs of MMNR

4.7.1 Experience of human-wildlife conflict

The respondents were asked whether they had ever experienced any kind of HWC/economic costs and from the findings, 99.4% revealed that they had gone through incidences of HWC. Of those who were victims of HWC, the majority at 49.3 %, reported having experienced the incidences of HWC once a year. 25.7 % said they had encountered the conflicts once a month, 24.5% indicated that they had been confronting the challenges with wildlife once every week and a minority 0.6%, reported having had the conflicts with wildlife every day (figure 4.3).

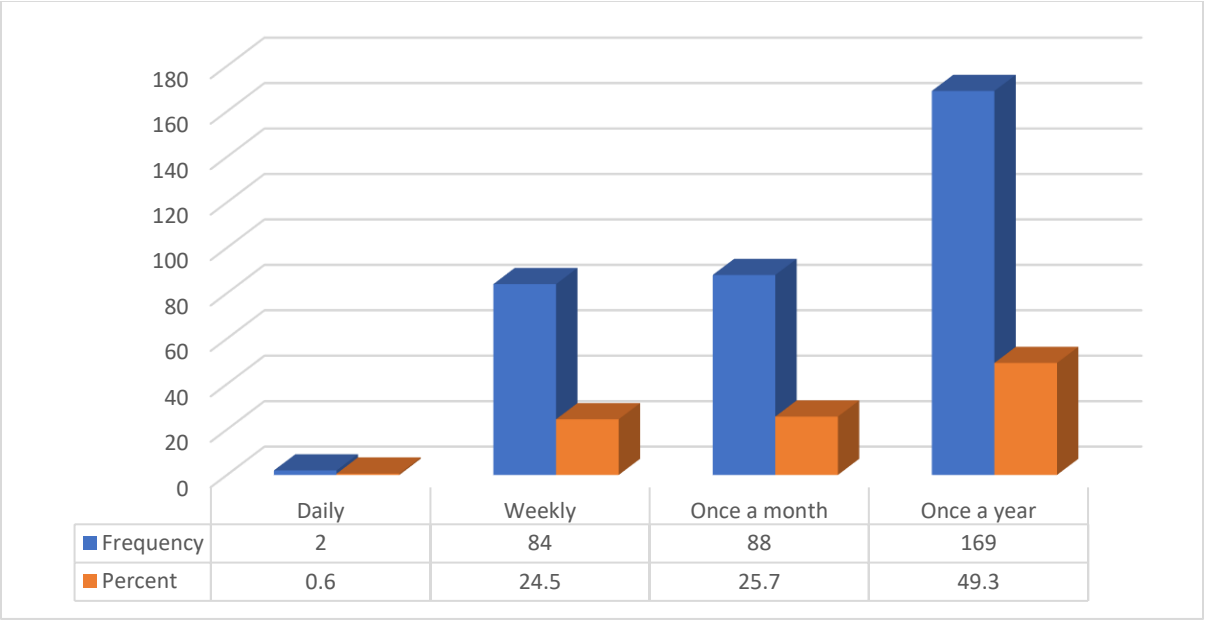


Figure 4.3: Frequency of HWC experience

Source: Author, 2022

It was observed that HWC in 15 sublocations (Mararianda, Aitong, Enelerai, Naikarra, Osarara_Entarado, Leshuta, Olderkesi, Nkoilale, Siana, Megwara, Oldoinyo Narasha, Olkinyei, Talek, Lemek and Rongena) all the people interviewed reported that they had been victims of human-wildlife conflicts while in the other remaining two, that is, Sekeneani (92.3 %) and Esoit (97.1%) the majority of the respondents reported that they had encountered HWC. It was further observed that the majority of these sublocations, with all the respondents reporting having encountered wildlife conflicts, are those in close proximity to the MMNR. It was noted from the study that the majority of the respondents encountered challenges with the carnivores who were attacking their livestock. The commonly reported wildlife that threatened livestock were the lions and the hyenas.

4.7.2 The most prevalent economic costs in MMNR

The study sought to know the most prevalent economic costs from several under investigation such as; livestock predation, human life loss, property damage, crop raiding and infections from zoonotic diseases (Brucellosis and Rift Valley fever). A Likert scale was provided as 1. Strongly agree to 5. Strongly disagree. In each case and the respondents were then asked to rate the extent to which they agreed with each statement. Descriptive statistics were then computed in each, which consisted of frequency, percentages and the corresponding median.

The study indicated (table 4.33) that most respondents at 77% agreed that livestock predation was the most prevalent economic cost in MMNR, 72% also strongly agreed that property damage was the most prevalent economic cost and 56% strongly agreed that human life loss was the most prevalent. However, 48.4% disagreed about crop damage being the most prevalent, economic cost. Majority of the respondents were mostly pastoralists and that

wildlife conservation, especially where herbivores were roaming, around could not be compatible with crop farming. Majority of the respondents were not sure whether zoonotic diseases were most prevalent in the study area at 48.4% and were not sure of the kind of diseases that sometimes attacked their livestock. Whenever their livestock were sick, they just bought injectable drugs from the locally available agro-vets. This indicated that livestock herders did not allow the vet to check the health status of their livestock hence lack of good record by the individual pastoralist on the type of disease prevalent within their herds (Downie, 2015; Jon , 2013). From non-participatory observation, areas with close proximity to MMNR, livestock intermingled freely with the wildlife, and in some instances, livestock was spotted being grazed a few meters within the boundaries of MMNR. This could exacerbate the challenges of infection because most bovine animals shared diseases, and could be a great risk factor to pastoralists living around MMNR.

Table 4.33: Prevalence of Economic Costs in MMNR

HWC	SA Frequency	A (%) response	N	D	SD	M (median)
Livestock predation	264 (77)	65 (19)	11 (3.2)	2 (0.6)	1 (0.3)	1
Human Life loss	192 (56)	136 (39.7)	10 (2.9)	4 (1.2)	1 (0.3)	1
Property damage	247 (72)	69 (20.1)	21 (6.1)	4 (1.2)	2 (0.6)	1
Crop raid	33 (9.6)	28 (8.2)	48 (14)	166 (48.4)	68 (19.8)	4
Zoonotic diseases	16 (4.7)	84 (24.5)	166 (48.4)	60 (17.5)	17 (5)	3
Total	**343 (100)**	**343 (100)**	**343 (100)**	**343 (100)**	**343 (100)**	

Source: Author, 2022

Livestock predation was considered a significant drawback to the strides to conservation because being the main livelihood activity for the local community, they were finding it a loss if their herds were attacked by wildlife. From an FGD experience, a whole herd of sheep could be wiped off by a leopard one night making the owner lose their source of income. Most of their herders had encountered severe injuries, most of them fatal, while trying to protect their livestock from lion's attack. The FGDs indicated that HWCs were exacerbated further by the challenges of climate change, especially the drought. This enabled the livestock and wildlife to compete for the resources that were already scarce, resulting in frequent altercation between livestock and wild animals. In some other extreme instances, the pastoralists were taking their livestock to the National reserve, which was against the

regulations guiding the MMNR. Occasionally the herders and owners of livestock who participated in this illegal activity were penalized, something they think it was imposing costs to their main source of livelihood.

Previous studies have shown that HWC was causing a negative perception towards wildlife conservation. These findings concurred with this study because 98.5% of the respondents acknowledged that the presence of wildlife in the study area had significantly disrupted their livelihoods. Such disruption will most likely significantly affect the local community's perception of wildlife conservation (Mojo et al., (2020). It is, therefore, beneficial if the County government of Narok to distributed the benefits accruing from MMNR equitable and fairly, especially to deserving cases and people who always bear the brunt of wildlife conservation. In this way in wildlife conservation livelihoods may be sustainability.

4.7.3 Wildlife depredation and its variance with distance in MME

The Spearman's rank correlation was used to test whether livestock depredation vary with distance from MMNR boundary. From the findings (r_s = - 0.337, n = 343, p = 0.000), the p-value is less than 0.01 at 99 % confidence level, the null hypothesis is rejected and it is concluded that livestock depredation vary significantly with distance from MMNR (table 4.34). It indicated a significantly negative relationship between distance and livestock predation (cattle, sheep, goats and donkeys). As the distance increased away from the MMNR, the number of livestock preyed on by the wildlife decreased. The correlation between distance and number of livestock preyed on indicated that close proximity to the MMNR by pastoralists made their livestock vulnerable to attacks from wildlife, especially the lion, leopard and hyena. This is an area where there is a high density of wildlife and

livestock being domesticated animals were weaker prey to wildlife because they needed not to spend a lot of energy hunting (Downie, 2015; Jon , 2013; Mojo et al., 2020).

Table 4.34: Spearman's rank correlation test

			Distance (km)	Number of livestock preyed on
Spearman's rho	Distance (km)	Correlation Coefficient	1	-.337**
		Sig. (2-tailed)	.	0.000
		N	343	343
	Number of livestock preyed	Correlation Coefficient	-.337**	1
		Sig. (2-tailed)	0.000	.
		N	343	343

Source: Author, 2022

The area bordering MMNR act as dispersal areas for wildlife. In this case, it was observed through non-participatory observation that most conservancies have been set up in these areas. These conservancies, though they are helping to host wildlife from MMNR, were depriving the livestock of grazing land and water, which were resources competed upon by livestock and wild animals. Additionally, land owners in these areas have sub-divided their land, and most are fenced off, rendering wildlife movement more difficult. These activities have been considered as risk factors for conservation, especially where the pastoralists retaliated and killed the wildlife that trespassed or killed their livestock.

4.7.4 Effect of wildlife economic costs on livelihood networks

98.5 % of the respondents reported that their livelihood network had been disrupted by the presence of wildlife. The FGD finding also confirmed that the local community were living in fear every day from attacks from wildlife to their lives and their livestock. It was further noted that the creation of conservancies increased the density of wildlife in the community

land, which increased the level of competition for resources. The interviews with key informants indicated that most residents viewed the reserve as a resource for grazing their livestock but were prohibited from doing so.

From FGDs it was reported that children going to school had to be escorted by an adult in fear of attacks from elephants and other wild animals, which was wasting productive time. Adults themselves could not go about their business during the day and especially at night when wild animals were roaming freely. Since wildlife conservation may not be fully compatible with crop farming, the community members who wanted to engage in this economic activity found it difficult because they feared being raided by wildlife, especially the elephants and baboons. Members of the community had shown interest in crop farming, but were afraid they could run into losses, especially during the droughts when wildlife moved far away from the reserve in search of food and water (Mojo et al., 2020).

Farmers from Rongena sublocation in Mara ward reported that they had been experiencing crop raids, especially from the zebras and baboons and occasionally, ended up not making any good harvest.

4.7.5 An association of education and livelihood networks in MME

A cross-tabulation between education level and network disruptions indicated that the majority of the respondents (46.6 %), who had no formal education, were of the opinion that the presence of wildlife in the Maasai Mara Ecosystem were disrupting their livelihoods (table 4.35). A minority at 6.4 % who were at University or graduated from University, concurred that wildlife were disrupting their livelihoods. Previous studies (Kemboi, 2020) indicated that the level of education attained by an individual had a direct bearing on the decision-making process based on the enlightened mind. However, the

findings in this study (x^2 = 7.096, df = 4, p > 0.05) did not concur with other studies elsewhere, as there was no significant association between the level of education and disruption of livelihood networks (table 4.36). This may be attributed to the Maasai culture, where the head of the household, mostly elders, dominates the spheres of decision-making from the household to the community level, and most of these elderly people had no formal education (Nyumba et al., 2021). However, studies show that most Maasai young people have since gone to school to acquire knowledge through formal education and training (Nyumba et al., 2021) , and therefore, there was a need to give them the space to take charge of conservation issues where it mattered. Most of these educated young people are reported to be out of their villages and are searching for well-paying jobs in Narok town and other minor towns within the conservation area. This could explain their lack of concern for conservation because their livelihood has either been threatened or disrupted by the presence of wildlife in their settlement areas.

Table 4.35: An Association of Education and Livelihood Networks in MME

Education level	Yes (n)	Percentage (%)	No (n)	Percentage (%)
None	160	46.6	2	0.6
Primary	48	14	0	0
Secondary	81	23.6	1	0.3
Tertiary college	27	7.9	2	0.6
University	22	6.4	0	0
Total	**338**	**98.5**	**5**	**1.5**

Source: Author, 2022

Table 5.20: An Association Between the Level of Education and Disruption of Livelihood Networks

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.096[a]	4	0.131
Likelihood Ratio	5.3	4	0.258
N of Valid Cases	343		

Source: Author, 2022

4.7.6 Satisfaction towards intervention on lost livelihoods by Narok County Government

The study established that majority of the respondents at 36.7 %, were extremely dissatisfied with initiatives by Narok County Government and MMNR management to compensate for their lost livelihoods (table 4.37).

Table 4.37: Satisfaction to intervention by NCG

Level	Frequency	Percent
Extremely dissatisfied	126	36.7
Dissatisfied	104	30.3
Moderately satisfied	55	16
Satisfied	47	13.7
Extremely satisfied	11	3.2
Total	**343**	**100**

Source: Author, 2022

4.7.7 An association of gender and satisfaction on wildlife conservation

22.4 % of males (table 4.38) indicated that most males engaged in wildlife conservation issues. The Maasai culture considers male as the dominant decision-makers and their cultural system of governance, like most African traditions, allowed men to be head of the households and to own property like land more than women do (Nyumba Tobias et al., 2021). Most of the benefits generated from the MMNR went to men, and therefore they were most concerned about the compensation more than women. Narok County government, by way of policy, are supposed to channel 19% of the proceeds of MMNR as either direct or indirect benefit, but the entire process has been noted that it may be taken over by the elite (Democracy and Environment, 2010), leading to inequitable distribution of resource through the applicable compensation policy. Land owners feel that they are giving out too much to conservation and the benefits may not be commensurate with the costs of foregoing their land for conservation. From FGDs, it was observed that the benefit-sharing scheme sometimes is marked by issues of corruption or inadequacy, and justice to the victims sometimes is delayed through long bureaucracies.

Table 4.38: An Association of Gender and Satisfaction with NCG Interventions

	Male	**Female**	**Total**
	% response		
Extremely dissatisfied	77 (22.4)	49 (14.3)	123 (36.7)
Dissatisfied	62 (18.1)	42 (12.2)	104 (30.3)
Moderately satisfied	38 (11.1)	17 (5)	55 (16.1)
Satisfied	30 (8.7)	17 (5)	47 (13.7)
Extremely satisfied	5 (1.5)	6 (1.7)	11 (3.2)
Total	**212 (61.8)**	**131 (38.2)**	**343 (100)**

Source: Author, 2022

Further, the study computed a Pearson Chi-square test of association (x^2 = 2.801, df = 4, p = 0.592), which revealed that there was no significant association between gender and the satisfaction level of compensation initiatives by the Narok County Government and MMNR management since the p-value was greater than 0.05 at 95% confidence level (table 4.39).

Table 4.39: An Association Between Gender and the Satisfaction Level on Compensation

Chi-Square Tests	value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.801[a]	4	0.592
Likelihood Ratio	2.794	4	0.593
N of Valid Cases	343		

Source: Author, 2022

4.7.8 The relationship between the cost of hosting wildlife and benefits

The respondents were asked to give their opinion on the ensuing relationship between the costs of hosting wildlife on their land and the benefits that were derived from MMNR through the conservation of wildlife. Majority (58.9 %), noted that the relationship was positive, which meant that it resulted in improved livelihood development while (41.1 %) of the respondent indicated that it was negative and therefore it was responsible for the loss or deteriorating livelihoods (table 5.24). From the FGD discussion, conservation of wildlife across the Maasai Mara Ecosystem, despite having challenges to livelihoods, was highly commended for its benefits resulting from tourism activities. Kathleen et al., (2021)

observed that the higher involvement of communities in tourism resulted in stronger support for wildlife conservation which was not different from the finding of this study. Further the researcher noted that involvement in tourism activities could generate positive outcomes for conservation despite the economic costs resulting from foregoing land for conservation.

Table 4.40 indicates a crosstabulation between distance and the relationship between the costs of hosting wildlife on their land and the benefits that were derived from MMNR through the conservation of wildlife. Majority (37.3 %) said the relationship was beneficial to those living between 12 km to 35 km away from MMNR. Those who lived in close proximity to the MMNR, a distance of between 0-11 km (13.9 %), suggested that they were not happy with the benefits derived as compared to the land they had surrendered for conservation. The results suggest that most conservancies established in areas closer to respondents, which meant they were likely to encounter a lot of human-wildlife conflicts, which to them, was causing a lot of disruption to their livelihoods.

Table 4.40: Relationship Between Distance and the Costs of Hosting Wildlife

Distance (km)	Positive (n)	%	Negative (n)	%	Total	Total %
0-5 km	20	5.8	8	2.3	28	8.1
6-11 km	28	8.1	14	4.1	42	12.2
12-17 km	33	9.6	9	2.6	42	12.2
18-23 km	29	8.5	12	3.5	41	12
24-29 km	19	5.5	10	2.9	29	8.4
30-35 km	47	13.7	22	6.4	69	20.1
36-41 km	13	3.8	30	8.7	43	12.5
42 and above km	13	3.8	36	10.5	49	14.3
Total	**202**	**58.9**	**141**	**41.1**	**343**	**100**

Source: Author, 2022

Further, the study revealed a significant association between distance (km) and the relationship between the economic cost of hosting wildlife and the benefits derived from the conservation of wildlife (table 4.41). The computation at 95 % confidence level was reported as (x^2 = 50.696, df = 7, p = 0.000) and p< 0.05 indicates that distance has an influence on the relationship between the costs of hosting wildlife on their land and the benefits that were derived from MMNR through the conservation of wildlife.

Table 4.41: Chi-Square Test for Distance and Economic Costs

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.696[a]	7	0.000
Likelihood Ratio	51.257	7	0.000
N of Valid Cases	343		

Source: Author, 2022

CHAPTER FIVE

SUMMARY, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter presents summary of the findings, conclusion and recommendations. It presents the demographic characteristics of the respondents, socioeconomic benefits from MMNR boundary, success and failures of wildlife conservation projects and the role of the local community in wildlife conservation. Additionally, the chapters present livelihood activities supporting wildlife conservation in MMNR, wildlife economic costs, conclusion and recommendations.

This study sought to examine the influence of the existence of MMNR on the livelihoods of the local community. The study covered three Narok County Assembly Wards, namely; Siana, Mara and Naikarra Wards. The main aspect of the study was to investigate whether distance from MMNR was affecting livelihood networks, especially with regards to access and distribution of the benefits from MMNR and the intensity of the wildlife economic costs that households faced because of hosing wildlife in their lands.

5.2 Summary of the Findings

5.2.1 Demographic characteristics

Demographic characteristics are vital information because they assist in understanding the respondents and their environment, especially in this case, the capacity to use the available resources to have sustainable livelihoods. In this study, the distance from MMNR was a critical variable, especially when considering the severity of wildlife economic costs and the distribution of benefits due from MMNR.

The study revealed that the majority of the respondents were males who also dominated the decision-making process (especially the elderly). Despite this, the females also had a role in ensuring that the households earned a livelihood through their engagement in the trade of milk (sold at the shopping centers), beadworks and craft woodworks that they mainly sold at the main gates to MMNR and in their manyattas. Most men, especially the elderly, embraced the culture of polygamy since the majority of the women interviewed acknowledged they were in a polygamous marriage.

While the males were dominating almost all the spheres of livelihood networks, they were also engaged in many activities that exposed them to the benefits derived from MMNR, unlike the women, of whom the majority spent time at home dealing with household chores and engaged in micro-enterprises. Apart from decision-making rights, women are considered not to be direct owners of land, and so unless they were widows, they hardly owned any parcel of land. In the study area, land is an essential factor of production because they are used mostly for livestock and especially important for the creation of conservancies which act as dispersal areas for wildlife from MMNR. When women do not own land, it complicates issues further because they are excluded from directly benefitting from the proceeds of conservation. Participation in decision-making, especially in conservancy committees, just remains nominal. This issue requires adequate attention in order to achieve equity in the distribution of resources and benefits derived from wildlife conservation.

The youthful population, on the other hand, raised concerns that despite their education and knowledge gained from institutions of higher learning, their expertise was not taken seriously, especially on matters relating to cultural practices, wildlife conservation benefits

and decision-making. They felt their knowledge was misplaced, and for sustainability in developing livelihood networks, the young generation resorted to other economic activities, especially the motorbike enterprise. The elderly, on the other side, still value pastoralism and thus are mostly faced with challenges of competition with wildlife for pasture and water, intensive droughts caused by climate change and zoonotic diseases. Adverse droughts which affect these pastoralist regions kill livestock and threatens livelihoods and it's crucial for pastoralist to off-take their livestock whenever droughts overcome their ability to tolerate it.

The majority of the respondents indicated that they were married and had household members of 4-6. Most of them were pastoralists and mainly dependent on this activity to feed, school and shelter their families. Majority (47.2 %) of the respondents did not have formal education, which complicated their chances of being employed in most MMNR establishments. To resolve this challenge, it was imperative that the young educated generation needed to be given opportunities to make decision and participate in key community project cycles.

The proceeds from MMNR require that they contribute to building, equipping and hiring of human resources for educational facilities within the MME. Due to the expansive nature of the savannah, wildlife presence, and the general landscape of the place, it's important that nursery schools were established at close ranges to be feeder schools to primary schools within the region. This will go a long way to increase primary schools' uptake and ensure that children attend school at the recommended age.

Most respondents have lived in the study area long enough to understand the landscape, opportunities, threats and challenges facing wildlife conservation, especially in view of

how it was influencing their livelihood networks. The distance from MMNR was also an important consideration with regard to the severity to which the economic costs were felt and the distribution of the benefits obtained from MMNR. Those people who have lived long around the reserve had developed an adaptive mechanism as compared to those who had not lived there for long. However, these residents who had lived there considerably long, were not necessarily the major beneficiaries of the proceeds from MMNR because its distribution was controlled by the elite of the community. Despite the challenges emanating from hosting wildlife, the community still perceive wildlife conservation as considerably part of them.

5.2.2 Socio-economic benefits from MMNR

Majority of the local community members had benefitted either directly or indirectly from MMNR. Contrary to the expectation that those who lived closer to the reserve could benefit a lot more because of the brunt of hosting wildlife, it was observed that the majority of the beneficiaries lived at a distance of between 30-35 km from the MMNR. It was also noted that the County Government of Narok has a benefit compensation plan put in place to assist those living adjacent to the reserve to mitigate the interference they frequently experienced in their livelihood networks from wildlife. Despite the fact that the 19 % compensation plan existed, the local community did not feel its impact because it was realized that the scheme had been taken over by the elite in the community and that the actual beneficiaries were hardly being considered for compensation.

Most tourism-related activities happened within the range of between 0 – 11 km from MMNR. Such activities as the sale of artifacts, beadwork, song and dances formed part of the additional benefits derived from MMNR. Indeed, trade was reported to be minimal

between the local community and the establishments within the MMNR. This was a significant setback because it was narrowing the ability of the residents to diversify in livelihood activities and was likely to create a negative perception of wildlife conservation. It is argued out that the priority in trade ought to be given to the local community, who had the capacity to supply milk, meat, labor and other commodities found locally. In this way, the prospects of the benefits derived from MMNR would be widened beyond what was perceived during the period of this research. The main socio-economic benefits that were noted to be derived from MMNR were; employment, road construction, health care provision, cash transfer, bursary allocation, availability of clean water and building of school infrastructure.

5.2.3 Distance and number of persons employed

A correlation of distance from MMNR boundary and the number of people employed in MMNR from the study area revealed that there was an inverse relationship, meaning as distance advanced away from MMNR, the number of persons employed decreased. However, even the people living adjacent to the reserve complained that job opportunities they could only access were as guards, cooks, or other junior jobs from the establishments in MMNR. The youth further revealed that despite their education level, many of whom had finished college and university education, their input into the community matters, especially on how to manage the natural resources in order to open up employment opportunities, were often disregarded by the elders.

Employment opportunities in MMNR did not favor women primarily because, out of the Maasai cultural perceptions, women were not allowed to make pertinent decisions in the society. Since men were outgoing, they could interact a lot with employment and other

benefit networks more than women. It is observed that other benefits perceived were not adequately distributed or were not provided in sufficient consideration. Even water distribution and availability were not reliable hence a serious concern because, being a semi-arid area coupled with the presence of wildlife, conflicts related to water scarcity were common, especially during the dry period. The main intervention was the presence of pans and dams, which the locals reported that they were not from the proceeds of MMNR.

The majority of MMNR locals were not satisfied with the contribution of MMNR to their livelihood. The socio-economic benefits they perceived from MMNR were inadequate to commensurate with the challenges posed to their livelihood network by the presence of wildlife. The local community thus felt that Narok County Government ought to have involved them adequately in coming up with the 19 % compensation policy. The majority suggested that a proper mechanism of identifying the neediest must be introduced into the scheme and that there was a need to eliminate the chances of it being taken hostage by the elite of the society. It was their overall suggestion that the 19 % compensation plan was inadequate and should be increased to 35 % for it to adequately compensate for disrupted livelihoods.

Members of the community were also revealing that they were not allowed to graze their livestock in the reserve and if they did illegally, their livestock were impounded by the management until they paid a fine of $ 100. This was another major contributor to their dissatisfaction because they felt this fine imposed on them was too high. Other factors that contributed to discontent were; poor governance of resources, policy issues, nepotism in resources distribution, discrimination and ignorance on conservation matters.

Most local community members were not accessing credit facilities because they lived far from the locations of banks or microfinance institutions. They could only rely on M-Pesa or travel to Narok town to access these financial services. The lack of credit facilities within their proximity impeded the establishment of alternative livelihood activities as most required lump sum start-up capital. The inability of women who engaged in beadwork to access credit was affecting the growth of this enterprise. Boda-boda business in the region was stifled for lack of capital because the youth who wanted to begin this business did not also access credit easily to acquire a motorcycle. To resolve this, it was vital that major trading centres like Talek, Sekenani, Aitong and Mararianda be considered for the establishment of financial institutions to allow the local community to access credit.

5.2.4 Success and failure of wildlife conservation projects

The majority of the respondents indicated that most wildlife conservation projects in support of wildlife conservation were not successfully implemented because the locals were not even aware of which projects were initiated for that purpose. However, they noted that water projects, school developments and health facilities had been implemented but were not well furnished. The local community associated the little success registered on conservation projects with factors such as; health care provision, education, income availability, security provision, employment opportunities, access to food for livestock and humans and water availability.

On the other hand, the respondents indicated that the cause of failure of conservation projects was associated with socio-economic factors, which included; corruption, conflicts, insecurity, insufficient funds, poor road networks, poor governance, lack of income, political influence and human-wildlife conflicts. There is a significant relationship between

age and these socio-economic factors responsible for the success of conservation projects at 95 % confidence level and they included; education, income availability, security, employment, credit access to food and water access.

5.2.5 The role of the local community in wildlife conservation in MME

The local community provides indigenous knowledge on important aspects of wildlife conservation and cultural heritage. The local community contribute to wildlife conservation in ways such as; public participation, capacity building, good governance, good relationships with stakeholders, creation of awareness, reporting of wildlife incidences and in the green economy.

5.2.6 Livelihoods activities supporting wildlife conservation in MME

As observed by (Akyol et al., 2018), livelihood is the greatest of all the challenges faced by communities and individuals living adjacent to protected areas. Further, the conflicts and illegal trade in most sub-Saharan countries were exacerbated by a lack of alternative livelihoods. Fausto (2011) noted that the poverty alleviation wave in conservation areas was meant to ameliorate people from poverty by addressing their livelihood alternatives, thereby guaranteeing the conservation of biodiversity.

In this study, livelihood activities that were supporting the conservation of wildlife conservation resources which included; ecotourism, tourism (hotel and travel), land leasing, beekeeping, green economy, sale of tree seedlings, public education for a fee, pastoralism, trade of artifacts and cultural activities such as song and dances. These activities assisted in enhancing the livelihood networks of the local community though they did not have sufficient funding and infrastructural support. Land leasing, for instance, was earning land owners income because the land they contributed to the conservancies gave

them revenue from tourism activities. Songs and dances performed in Manyattas, as gathered from FGD discussion, earned them money as each individual could be paid up to $ 3 per performance. Artifacts wares sold at the major gates of the MMNR were another enterprise falling under MSMEs and required support in terms of funding and robust marketing of these wares. These livelihood activities were, however, was not common with members of the community who lived far away from MMNR.

5.2.7 Wildlife conservation economic costs in MME

The majority of the respondents acknowledged that they had experienced wildlife economic costs, most of whom pointed out that they had done so at least once a year. Those living within 0 – 5 km indicated that they had experienced these HWC on a weekly basis. Livestock depredation was the most prevalent economic cost, while property damage, especially fencing materials, was strongly agreed to be prevalent. This was occasioned by the fact that wildlife and livestock share resources like pasture and water and whenever there are droughts, wildlife move out of the reserve to areas where people live in search of water and pasture. In this case, the livestock ends up contracting zoonotic diseases like brucellosis and Rift Valley Fever. When herders took their livestock to graze inside the MMNR created friction between the MMNR management and the pastoralist and, by extension, endangered human life and that of the livestock.

From the FGDs, it was confirmed that the majority of the respondents reported that their livelihood networks were affected by the presence of wildlife. Further, they noted that the process of compensation was so long in bureaucracy and that it was short of their expectations in terms of matching the cost of foregoing their land for conservation.

5.3 Conclusion

This study concludes that there are socio-economic benefits vary significantly with distance from MMNR boundary. There is a weak inverse relationship between distance and the socio-economic benefits such as; employment opportunities, road construction, health provision, cash transfer, provision of school bursaries, availability of clean water and building of schools. As distance increases the socioeconomic benefits received from MMNR reduces.

Socio-economic factors influence wildlife conservation projects. Socio-economic factors such as ; health care provision, education provision, income availability, employment opportunities, access to credit, access to food and availability of water have an influence on the success of wildlife conservation projects. Majority of these socio-economic projects were stalling, and it was pointed out that it could be due to the misappropriation of funds. Despite the benefits, the local community was dissatisfied with the benefit distribution model because it promoted inequity. There are wildlife conservation efforts undertaken by the local community of Siana, Mara and Naikarra Wards. The efforts undertaken include; public participation, creation of awareness, good governance, reporting wildlife incidences, good relationship and green economy.

In Siana, Mara and Naikarra Wards, there are livelihood activities related to conservation. To enhance theses livelihood networks, financial institutions within the proximity of the local community would help in making credit facilities accessible. The availability of credit facilities will help the residents to diversify in their livelihoods development and this would be possible by ensuring that financial institutions are established in major trading centres within. It is worth noting that businesses and many transactions relied on M-Pesa, and it

would be of more help if banks, micro-finances and saccos were set up in the vicinity of most local community members.

Livestock depredation vary significantly with distance from MMNR boundary. As distance increase away from MMNR boundary, livestock depredation reduces. The adjacent areas to the MMNR are exposed to intense livestock depredation. The locals living closer to the reserve requires commensurate compensation from the benefit scheme to help them recover from the shocks of depredation.

5.4 Recommendations

Wildlife conservation to be sustainably managed, the livelihood systems of the people living adjacent to the MMNR must also be sustainable through diversification of livelihood networks. In this regard, the study made the following recommendations;

i) That the County government of Narok should enhance the 19 % policy on the allocation of the resources emanating from MMNR to the adjacent local community from the current 19 % to at least 35 %. The process of reviewing this policy must also be participatory, and the views of all the stakeholders, especially the local community, taken into account in the development of the reviewed benefit distribution policy.

ii) That the National government and the private sector in Kenya should consider investing in the financial sector through the establishment of financial institutions (banks, microfinance and saccos) in the trading centres adjacent to MMNR, especially in Talek, Sekenani, Aitong and Mararianda to help the business community and other entrepreneurs to access credit for their enterprises. This

would enhance the creation of alternative livelihood activities and thus ease the economic burden of overreliance on livestock and tourism.

iii) The Kenya Wildlife Service under the County Wildlife Conservation and Compensation Committee (CWCCC), with the help of stakeholders, should review the procedures therein by invoking the use of technology and erasing the long procedures of assessing the damage and finally compensating the deserving cases. By speeding the process and removing unnecessary bureaucracies around compensation, it would restore the trust and confidence in the service of KWS, and it will reflect positively on conservation initiatives.

iv) That the establishments within the MMNR (hotel and camps) should create a memorandum of understanding with the local community on; giving at least 30 % of the employment opportunities to the local community since they are the people who bear the brunt of wildlife conservation and partnering in trade, especially on the locally available commodities like milk, meat, and space to sell their beadwork materials within those establishments.

v) The County Government of Narok and the National Government Ministry of Water must put in place water infrastructure that would facilitate water supply in these pastoralist areas. This would be possible by increasing the number of boreholes in each sublocation, in schools and trading centres, establishing water pans and dams in each village, and ensuring that the water is clean for drinking and use for other economic purposes.

vi) The bursary award model used by the County Government of Narok requires rethinking and remodeling to ensure that it is serving the needy students /pupils as

it was originally intended. In this case, serious public participation should be done to ensure that vital elements providing an equitable distribution of the bursary allocation to needy students/pupils, especially in identification are well outlined.

5.4.1 Areas for further research

The study assessed wildlife conservation and livelihood development. The findings of this study indicated that for livelihoods to be sustainable, there must be diversity in the livelihood activities available for the people living adjacent to protected areas. In this case, when their livelihood systems are sustained, they would actively participate in wildlife conservation activities. This study points out the following areas for further investigation;

1. A comparison study between MMNR and the adjacent conservancies on the socio-economic benefits it accords to the local community. This would provide information on whether the economic importance of the existence of MMNR is worth foregoing the land for conservation as compared to the numerous conservancies surrounding the reserve.
2. The aspect of climate change that has continued to escalate desertification and affected the pastoral and wildlife conservation areas. The drought associated with climate change has caused pasture and water for livestock to diminish and hence likely to escalate human-wildlife conflicts. It will be interesting to know if climate change is among the causes of wildlife economic costs within the Maasai Mara Ecosystem.
3. An assessment of the adoption of the green economy concept by the MMNR establishments (hotels and camps) in terms of whether there is any compliance

with the principles of the green economy, more so on the welfare of the local community and the planetary principle. This will yield information on how the institutions have mainstreamed the issues of socio-economic empowerment of the local community in their policy framework.

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APPENDIX I: QUESTIONNAIRE

Questionnaire No: ……

Introductory information

_____ is my research assistant. My name is Kipkosgei Meshack Lagat (REG NO: TP02/JP/MN/8634/2019), a PhD student at Maasai Mara University and conducting research on**: 'WILDLIFE CONSERVATION AND LIVELIHOOD DEVELOPMENT IN THE MAASAI MARA ECOSYSTEM, KENYA'.** I wish to kindly request you to fill this questionnaire to enable me meet the objectives of my thesis. The information you provide shall only be used for the purpose of this research and shall be treated with a lot of confidentiality. Thank you.

County Assembly Ward; _____

Sub-location: _____

Tick (√) appropriately where applicable.

A. Demographic information

1. What is your gender
   a) Male [ ] b) Female [ ]
2. What is your age?
   a) 18-27 [ ] b)28-37 [ ] c) 38-47 [ ] d) 48-57 [ ] e) 58-67 [ ] f) 68 and above [ ]
3. State your marital status
   a) Married [ ]b) Divorced [ ]c) Widow [ ] d) Widower [ ]e) Single [ ]

4. Education level

   a) None [ ] b) Primary [ ] c) Secondary [ ] d) Tertiary college [ ] e) University [ ]

5. Indicate your occupation

   a) Pastoralist [ ] b) Farmer [ ] c) Trader [ ] d) Driver [ ] e) Doctor [ ] f) County officer [ ] g) Any other (specify)----------

6. What is the size of your family?

   a) 1-3 [ ] b) 4-6 [ ] c) 7-9 [ ] d) 10-12 [ ] e) 13 and above [ ]

7. How long have you lived in this Ward?

   a) 0-3 years [ ] b) 4-7 years [ ] c) 8-11 years [ ] d) 12-15years [ ] e) 16 and above years [ ]

8. What is the estimate distance in kilometers (km) from where you live to MMNR?

   a) 0-5 km [ ] b) 6-11 km [ ] c) 12-17 km [ ] d) 18-23 km [ ] e) 24-29 km [ ] f) 30-35 km [ ] g) 36-41 km [ ] h) 42 and above km [ ]

B. The socio-economic benefits of wildlife conservation

9. a) Have you ever accessed any benefit associated with wildlife conservation in MMNR?

   a) Yes [ ] b) No [ ]

   b) Using the Likert scale provided indicate the extent to which you agree with the statement that ; employment opportunities, road construction, health care provision, cash transfer, provision of school bursary, availability of clean water and building of schools are the main benefits accessed from MMNR.

1-Strongly agree [ ] 2- Agree [ ], 3-Nuetral [ ] 4- Disagree [ ] 5- Strongly disagree [ ]

c) Indicate the extent to which you agree with each of the statement in the table below using the Likert scale; (1-Strongly agree, 2- Agree, 3-Nuetral, 4-Disagree, 5-Strongly disagree)

SNO.	**Statement**	**Indicate by number**
1	Employment of the locals is the main benefit accessed from MMNR	
2	Road construction is the main benefit accessed from MMNR	
3	School development is the main benefit accessed from MMNR	
4	Cash transfer is the main benefit accessed from MMNR	
5	School bursary is the main benefit accessed from MMNR	
6	Access to market-(Trade in livestock products) is the main benefit accessed from MMNR	
7	Provision of relief food is the main benefit accessed from MMNR	
8	Health facilities development is the main benefit accessed from MMNR	
9	Growth of markets/shopping centers is the main benefit accessed from MMNR	
10	Provision of energy/solar power is the main benefit accessed from MMNR	
11	Availability of clean drinking water is the main benefit accessed from MMNR	
12	Scholarships to students is the main benefit accessed from MMNR	

10. How many members of your household are currently employed (permanent and casual, including in camps) as a result of wildlife conservation associated with MMNR? _____

11. a) Are you satisfied with the socio-economic benefits accruing from MMNR?

    a) Yes [ ] b) No [ ]

b) If No, indicate the extent to which you agree with each of the statements in the table below using the Likert scale; (1-Strongly agree, 2- Agree, 3-Nuetral, 4-Disagree, 5- Strongly disagree)

SNO.	**Statement**	**Indicate by number**
1	Poor governance is responsible for your dissatisfaction	
2	Policy issues is responsible for your dissatisfaction	
3	Lack of political goodwill is responsible for your dissatisfaction	
4	Nepotism (In benefit sharing) is responsible for your dissatisfaction	
5	Corruption is responsible for your dissatisfaction	
6	Inadequate awareness is responsible for your dissatisfaction	
7	Discrimination is responsible for your dissatisfaction	
8	Ignorance on conservation matters is responsible for your dissatisfaction	

12. In your own opinion, give the approximate distance from where you live to the location of the following physical facilities;

a) Public school

i) 0-4 km [ ] ii) 5-9 km [ ] iii) 10-14 km [ ] iv) 15-19 km [ ] v) above 20 km [ ]

b) Piped water; borehole; pan

i) 0-4 km [ ] ii) 5-9 km [ ] iii) 10-14 km [ ] iv) 15-19 km [ ] v) above 20 km [ ]

c) Bank/micro finance/sacco

i) 0-4 km [ ] ii) 5-9 km [ ] iii) 10-14 km [ ] iv) 15-19 km [ ] v) above 20 km [ ]

C. Wildlife conservation Community projects

13. List one community project started in support of wildlife conservation within your locality

    _____

14. Do you think the project has been successfully implemented?

    a) Yes [ ] b) No [ ]

15. In your own opinion are there other community projects that were started and you think did not succeed to be conclusively implemented?

    a) Yes [ ] b) No [ ], If Yes List one.

    _____

    15 Using the Likert scale provided indicate the extent to which you agree with the statement that; health care provision, education provision, income availability, employment opportunities, access to credit, access to food and water availability are the main socio-economic factor responsible for the success of wildlife conservation projects.

    1-Strongly agree [ ] 2- Agree [ ], 3-Nuetral [ ] 4- Disagree [ ] 5- Strongly disagree [ ]

    16 In your own opinion indicate the extent to which you agree with each of the statement below using this Likert scale; (1-Strongly agree, 2- Agree, 3-Nuetral, 4- Disagree, 5- Strongly disagree)

SNO.	Statement	Indicate by number
1	Health care provision is the main factor responsible for the success of wildlife conservation projects	
2	Education provision is the main factor responsible for the success of wildlife conservation projects	
3	Incomeavailability is the main factor responsible for the success of wildlife conservation projects	
4	Security availability is the main factor responsible for the success of wildlife conservation projects	
5	Employment opportunities is the main factor responsible for the success of wildlife conservation projects	
6	Access to credit is the main factor responsible for the success of wildlife conservation projects	
7	Access to food (both livestock and human) is the main factor responsible for the success of wildlife conservation projects	
8	Water availability through Pipe water/borehole/pan is the main factor responsible for the success of wildlife conservation projects	

17 a) Do you think there are socio-economic factors that are responsible for the failure of wildlife conservation projects?

a) Yes [ ] b) No [ ]

b) If yes, rate the extent to which you agree with each of the statement in the table below using Likert scale; (1-Strongly agree, 2- Agree, 3-Nuetral, 4- Disagree, 5- Strongly disagree)

SNO.	Statement	Indicate by number
1.	Corruption is responsible for the failure of wildlife conservation projects	
2.	Conflicts amongst people is responsible for the failure of wildlife conservation projects	
3.	Insecurity is responsible for the failure of wildlife conservation projects	
4.	Insufficient funds are responsible for the failure of wildlife conservation projects	
5.	Poor roads are responsible for the failure of wildlife conservation projects	
6.	Poor governance is responsible for the failure of wildlife conservation projects	
7.	Lack of income is responsible for the failure of wildlife conservation projects	
8.	Political influence is responsible for the failure of wildlife conservation projects	
9.	Human wildlife conflicts are responsible for the failure of wildlife conservation projects	

D. Conservation efforts

18 Using the Likert scale provided indicate the extent to which you agree with the statement that; public participation, good governance, good relationship, creating awareness, creating awareness, reporting wildlife and green economy are collectively the most important activities in supporting wildlife conservation

1-Strongly agree [ ] 2- Agree [ ], 3-Nuetral [ ] 4- Disagree [ ] 5- Strongly disagree [ ]

19 a) In your opinion do you think the local community have a role in wildlife conservation efforts?

a) Yes [ ] b) No [ ]

b) If yes, rate the extent to which the statement in the table below using Likert scale; (1-Strongly agree, 2- Agree, 3- Neutral, 4- Disagree, 5- Strongly disagree)

SNO.	Statement	Indicate by number
1.	Public participation is the most important activity in supporting wildlife conservation	
2.	Capacity building is the most important activity in supporting wildlife conservation	
3.	Good governance of wildlife resources is the most important activity in supporting wildlife conservation	
4.	Establish good relationship between the locals and wildlife management is the most important activity in supporting wildlife conservation	
5.	Creating awareness on wildlife conservation is the most important activity in supporting wildlife conservation	
6.	Reporting wildlife incidences is the most important activity in supporting wildlife conservation	
7.	Green economy (Micro, Small and Medium Enterprises) is the most important activity in supporting wildlife conservation	

20 Who are the other partners within your locality that are supporting wildlife conservation?

(List one and what they do)

_____

E. Livelihood activities related to wildlife conservation

21 a) Are there any livelihood activities that you do and are related to wildlife conservation efforts?

a) Yes [ ] b) No [ ]

b) If yes indicate the extent at which you agree with the statement provided in the table below using the Likert scale: (1-Strongly agree, 2- Agree, 3-Nuetral, 4- Disagree, 5- Strongly disagree)

SNO.	Statement	Indicate by number
1	Ecotourism is the main livelihood activity related to conservation	
2	Tourism (travel and hotel industry) is the main livelihood activity related to conservation	
3	Land leasing for conservation is the main livelihood activity related to conservation	
4	Beekeeping is the main livelihood activity related to conservation	
5	Green economy is the main livelihood activity related to conservation	
6	Selling of tree seedlings is the main livelihood activity related to conservation	
7	Public education awareness for a fee is the main livelihood activity related to conservation	
8	Pastoralism is the main livelihood activity related to conservation	
9	Trade in tourism artifact (beadwork wares) activity related to conservation	
10	Cultural activities (songs and dance) is the main livelihood activity related conservation	

22. Using the Likert scale provided indicate the extent to which you agree with the statement that; ecotourism, land leasing, beekeeping, green economy, selling of seedling, pastoralism and cultural activities are collectively the main livelihood activity related conservation

23. 1-Strongly agree [ ] 2- Agree [ ], 3-Nuetral [ ] 4- Disagree [ ] 5- Strongly disagree [ ]

24. a) In your opinion, do you think the proceeds from MMNR are supporting livelihood activities?

a) Yes [ ] b) No [ ]

b) If yes rate the extent of your satisfaction

1. Extremely satisfied [ ]

2. Satisfied [ ]

3. Moderately satisfied [ ]

4. Dissatisfied [ ]

5. Extremely dissatisfied [ ]

24. State what you think it can be done to enhance the contribution of these livelihood activities to wildlife conservation.

_____

F. Wildlife economic costs

25 a) Have you ever experienced any kind of human-wildlife conflict?

a) Yes [ ] b) No [ ]

b) If YES how often do you experience these challenges? (Select one)

c)

Frequency	**Tick (√)**
Daily	
Weekly	
Once a month	
Once a year	

23 In your own opinion rate using the Likert scale how you agree with the statement provided in the table below of the kind of human-wildlife conflicts/economic costs you have experienced (1-Strongly agree, 2- Agree, 3-Nuetral, 4- Disagree, 5-Strongly disagree)

SNO.	Economic cost	Indicate by number
1	Livestock predation is the most prevalent economic cost/HWC	
2	Human life loss is the most prevalent economic cost/HWC	
3	Property damage is the most prevalent economic cost/HWC	
4	Crop raid is the most prevalent economic cost/HWC	
5	Zoonotic diseases (livestock affected by either Rift-Valley Fever or brucellosis) are the most prevalent economic cost/HWC	

24 In your opinion, estimate the number livestock that have been preyed on by wild animals in the last one year in your household: Goat_____Sheep_____Donkey_____Cow_____

25 Mention one wild animal that has offered the greatest human-wildlife conflicts in your locality.

_____

26 How do you think in the contemporary times, human-wildlife conflicts can be reduced?

_____

27 a) Do you think these damages caused by the presence of wild animals in MMNR has significantly disrupted your livelihood networks?

a) Yes [ ] b) [ ]

b) If YES, are you satisfied with the initiatives put in place by the Narok County Government and MMNR management to compensate for the lost livelihood?

Extent of satisfaction	Tick (√)
Extremely dissatisfied	
dissatisfied	
Moderately satisfied	
satisfied	
Extremely satisfied	

c) If No, state how it is affecting the conservation of wildlife.

_____

_____

_____

_____

28 In your own opinion do you think is the current relationship between the costs of hosting wildlife in your land and the benefits derived from the conservation of these wild animals?

a) Positive (result in improved livelihood development) [ ]

b) Negative (responsible for loss or deteriorating livelihoods) [ ]

29 Give your opinion, rate the extent to which you agree with the statement in the table below using Likert scale; (1-Strongly agree, 2- Agree, 3-Nuetral, 4- Disagree, 5-Strongly disagree)

SNO.	Statement	Indicate by number
1.	Creation of more conservancies outside MMNR is likely to balance both wildlife conservation and the socio-economic losses resulting from hosting wild animals	
2.	Increasing the benefits to the local communities is likely to balance both wildlife conservation and the socio-economic losses resulting from hosting wild animals	
3.	Effecting compensation schemes is likely to balance both wildlife conservation and the socio-economic losses resulting from hosting wild animals	
4.	Giving the local community priority in employment is likely to balance both wildlife conservation and the socio-economic losses resulting from hosting wild animals	

APPENDIX II: INTERVIEW SCHEDULES

INTERVIEW FOR GOVERNMENT OFFICIALS

1. What does your institution play in conservation initiatives in MMNR?
2. What are the perceived benefits to the local community from Maasai Mara National Reserve?
3. Do the revenue collected get back to the local community as benefits to them?
4. What is the criteria used in sharing the benefits?
5. Are there any projects/ programs run by the government in support of livelihood?
6. How do you address the issue of wildlife depredation in terms of damaging livelihoods?
7. What are the factors that you think cause success/failure of conservation projects?
8. In what ways is improving the livelihoods of the local people contributing to sustainable wildlife conservation?

COUNTY VERTERINARY SERVICES

1. What is the prevalence of zoonotic diseases in the entire Maasai Mara Ecosystem?
2. How is the distribution of brucellosis and Rift Valley Fever and other zoonotic diseases as one moves away (distance factor) from Maasai Mara National Reserve?
3. What is the estimated cost of managing these diseases within the region per household?
4. In your opinion does these diseases contribute to human wildlife conflict with the Maasai Mara Ecosystem? ……if yes explain
5. What do you think pastoralists can do to mitigate against regular infection of these diseases?...

6. Mention any other important information with regards to zoonotic diseases in this region……

COUNTY LIVESTOCK DEVELOPMENT

1. What is the estimated rate of livestock depredation in Naikarra, Siana and Mara Wards?
2. what is the estimated loss associated with livestock depredation in the Mara Ecosystem?
3. Is livestock depredation a major contributor to human wildlife conflict in this region?

   …….. if yes how are pastoralist assisted to overcome the challenge

4. In your opinion, do you think livestock depredation affected by distance from Maasai Mara National Reserve
5. Give any other important information with regards to livestock depredation in the Maasai Mara Ecosystem.

APPENDIX III: Proportion of gender per Sublocation

Sublocation	Male (frequency)	Percentage	Female (frequency)	Percentage
Sekenani	8	61.5	5	38.5
Mararianda	5	55.6	4	44.4
Aitong	13	54.2	11	45.8
Enelerai	10	55.6	8	44.4
Naikarra	21	70.0	9	30.0
Osarara/Entarado	7	87.5	1	12.5
Esoit	24	68.6	11	31.4
Leshuta	11	57.9	8	42.1
Olderkesi	13	59.1	9	40.9
Nkoilale	9	64.3	5	35.7
Siana	12	60.0	8	40.0
Megwara	12	70.6	5	29.4
Oldoinyo Narasha	11	55.0	9	45.0
Olkinyei	7	70.0	3	30.0
Talek	13	61.9	8	38.1
Lemek	22	57.9	16	42.1
Rongena	14	56.0	11	44.0
Total	212	61.8	131	38.2

Source: Author, 2022