GENDER DYNAMICS AND HUMAN-WILDLIFE CONFLICTS IN MAASAI MARA GAME RESERVE, NAROK COUNTY, KENYA

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DECLARATION

Student's Declaration

I hereby declare that this research project is my original work and has not been presented to any other examination body.

Signature:…….. Date:……..

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Supervisor's Declaration

I confirm that this research project has been submitted with my approval as the University supervisor

Supervisor

Signature:…….. Date:……..

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DEDICATION

This work is dedicated to my family and friends who have been a great source of support during my entire study period.

ACKNOWLEDGMENTS

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LIST OF ACRONYMS AND ABBREVIATIONS

CBO: Community-Based Organization

CWCC: Community Wildlife Conservation Committee

FAO: Food and Agriculture Organization

FGD: Focus Group Discussion

GIS: Geographical Information Systems

GoK: Government of Kenya

HWC: Human-Wildlife Conflict

KNBS: Kenya National Bureau of Statistics

KNCS: Kenya National Compensation Scheme

KWS: Kenya Wildlife Service

MFT: Moral Foundations Theory

MWCC: Ministerial Wildlife Conservation Committee

MMWCA: Maasai Mara Wildlife Conservation Association

MCDM: Multiple Criteria Decision Making

NACOSTI: National Council for Science, Technology and Innovation,

NGO: Non-Governmental Organization

WWF: World Wildlife Fund

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ABSTRACT

Human-Wildlife Conflict is a phenomenon that affects a wide range of the world's population. Especially those who live in rural African communities. The people in the Mara are a good example of such a community that is African, rural, not economically well off and living near wildlife. Among the greatest issues that the Mara faces is Human-Wildlife Conflict and despite previous attempts to mitigate it, it continues to persist. One of the reasons why this plague has been so persistent is because the rules and regulations are too broad and do not factor in the differences within the communities that live in close proximity to wildlife populations. This research has singled out the main difference in these communities as being gender and as such focuses on it. The objectives of this research are to examine the gender dynamics that affect Human-Wildlife Conflicts, to examine how the gender dynamics can then be used in wildlife conservation and create conservation strategies from the evaluation of gender dynamics relevant to Human-Wildlife Conflicts. To fulfil the objectives the research set out to test the hypothesis of whether gender dynamics influence wildlife conservation measures. This study will significantly change the view of wildlife conservation by giving it a gendered perspective. The methodology for this research was guided by a descriptive research design which entailed the use of observation, questionnaires and interviews to gather data. The samples were automatically disaggregated by gender. The research instruments used (questionnaires and indicator matrices) were able to distinguish the experiences that these two genders face when it comes to Human-Wildlife Conflicts based on occupation, income, household roles, and losses incurred. The research did this by summarizing the key findings of the survey it conducted and drawing conclusions from the gathered data. The findings were categorized by the outlined objectives. The study concluded that the following attributes affect how the genders interact with Human-Wildlife Conflicts: household roles, agricultural occupation, income loss, injuries, land ownership and marital status. This was because the null hypothesis was disproved. After all, the p-value: =0.006435 was less than the agreed significance level of 0.05. From the conclusions, the research managed to generate recommendations regarding Human-Wildlife Conflicts as relates to gender on the issue of conservation in the Mara. These included: barriers, repellents, disguises, data management systems, Airbnb manyattas, rainwater harvesting, performance payment and transport for school-going children. The research also put forth suggestions for further research like age dynamics in the conservation discourse.

CHAPTER ONE

INTRODUCTION

1.0 Chapter Overview

This chapter established the context of Human-wildlife conflict (HWC) concerning gender dynamics. It states the problem being discussed, the research questions, the objectives, the hypothesis that would be tested, the justification for the study, the scope of the study, significance, theoretical framework and conceptual framework.

1.1 Background of the Problem

Human-wildlife conflict (HWC) is not a new phenomenon, it occurs in most countries in the world but its consequences can vary for both the animals and the humans involved from physical harm to various parties, crop damage, predation on domestic animals, the destruction of habitats and poaching (Gore & Kahler, 2012). Populations across the globe are increasing and resources are finite, HWC will continually be a cause for concern for the sustainability agenda. Forms of coexistence must be established between humans and wildlife for the world to mitigate the harmful effects of HWC(Gross et al., 2021). With over 11.7% of the world's surface covered by conservation spaces and a majority of these spaces being located in the developing world, which have poor resource management strategies it is important to find ways of maintaining a positive balance between wildlife and humans (Ogra & Badola, 2008). This issue is further heightened when conservation spaces are located next to rural communities whose income levels tend to be minimal, have high population growth rates and have increased the intensity of their agricultural practices (Gore & Kahler, 2012; Muruthi, 2005).

Human-Wildlife Conflict has been mainly attributed to lacking land use management issues in Sub-Saharan Africa. This is because Sub-Saharan Africa is registering high population growth rates and there are no new ways of managing the scarce resource and still keeping the natural environment intact. Previously used strategies like community empowerment and job creation have only gone so far since wildlife populations are still falling drastically. New HWC strategies need to be thought out and implemented from the bottom up and with fewer donor funds to appropriately see if the habits are engrained and not dependent on outside funding (Olson, 2015).

As illustrated in the discourse above, resource management is considered to be a key in alleviating HWCs. For effective resource management to occur various stakeholders have to be accounted for, and previously in the assessment of resource management as pertaining to conservation females have been side-lined. Meaning that their ability to participate in environmental decisions has been curtailed and thus, the policies that are formulated discount their views and experiences(Keane et al., 2016). The reasons for this vary from cultural stereotypes to the fact that most men in these societies have a larger economic pull. Luckily, the global perspective has begun to shift and gender mainstreaming in conservation is gaining popularity. Taking into account gendered perspectives for the management of natural resources is new, it has already shown tangible positive effects in some parts of the world. An example is in the traditionally male-dominated timber orientation in forest management where a gendered study helped experts realize the importance of non-timber forest products for household livelihoods in some parts of the world like Asia, this study has helped in empowering women to fight for conservation in the region. Similarly, wildlife conservation has been an area where most of the perspectives gathered were male and the inclusion of a female voice might create new information that will better the conservation efforts by helping humans and wildlife to co-exist (Carter & Allendorf, 2016; Ogra, 2008).

1.2 Statement of the Problem

According to World Wildlife Fund (WWF), the previously used initiatives for HWC have been land-use planning, Community-based natural resource management, compensation plans, and payment for environmental services just to name a few; but these initiatives are hard to monitor and evaluate based on actual effectiveness since community buy-ins and involvement are low plus these solutions are more of one size fits all which is not always the case (Olson, 2015; WWF, 2020). With that in mind, it is important to consider other methods for this persistent plague. Because there is a disparity in how the genders view and are affected by HWCs (Muruthi, 2005) there is a need to address the gender disparity in how African communities react to HWCs especially since there is little that has been written on this subject in the region (Gore & Kahler, 2012). Therefore, there is a need to understand the underlying drivers that influence gender attitudes and actions towards wildlife; we assess whether these gender dynamics are relevant to conservation efforts and

create strategies that will incorporate the varying gender dynamics to create better management strategies for the HWC.

The areas adjacent to the Maasai Mara National Reserve have a high rate of HWC per year. In 2015 Narok County reported 152 HWC cases through the KWS community department. The cases were as follows: 26 fatalities caused by retaliation attacks, 112 cases of property damage caused by leopards, snakes and lions, 58 cases of crop destruction caused by zebras, buffaloes and waterbucks, 57 incidents of livestock predation whereby 90 animals were predated upon, and 5 cases of injuries caused by buffaloes, snakes and hippopotamus (Machoka, 2017). The latter statement is proof of the rampant problem of HWC within the Mara region. This study, therefore, found the Mara to be conducive for the data collection on HWC.

1.3 Research Questions

1. What gender dynamics affect HWCs in the Mara?
2. Which conservation measures address HWCs in the Mara?
3. How are gender dynamics relevant to the conservation of the Mara?
4. What gender-sensitive strategies can minimize HWC within the Mara?

1.4 Objectives

1. To examine the gender dynamics that affect HWCs in the Mara.
2. To examine the conservation measures that address HWCs in the Mara.
3. To assess whether gender dynamics influence conservation measures at the Mara.

1.5 Hypothesis Testing

Chi-square can be used to test for an association between two categorical variables. The null hypothesis will indicate that there is no association between the variables in question and the alternative hypothesis indicates that there is an association between the variables in question (Code Academy, 2021). To assess whether gender dynamics influence conservation measures at the Mara, relevant aspects of gender dynamics were identified and a Chi-square test was performed based on the two variables male and female. These aspects included: the likelihood of encountering wildlife conflicts, the severity of wildlife conflicts and household roles that were affected by wildlife conflicts. From this rationale the following hypothesis was formulated:

H1: In this case, the null hypothesis is that there is no association between the identified gender dynamics and HWC.

H2: the alternative hypothesis is that there is a relationship between the identified gender dynamics and HWC.

1.6 Justification

Wildlife itself is a valuable renewable natural resource with ecological, social and economic importance. It can act as a significant resource for rural development especially if proper land use planning is applied to ensure sustainable development in terms of resource management to ensure adequate food supply, tourism, scientific research and the preservation of cultural heritage while safeguarding human and environmental health (Food and Agricultural Organization, 2016). The Maasai Mara Game Reserve was chosen as a point of observation because it is one of the largest conservancies in the country with among the largest populations of wildlife in the continent. It was therefore suitable to observe it to get tangible and reliable data (Mukeka, Ogutu, Kanga, & Roskaft, 2018). Between 1984 and 2018 crop agriculture increased in the Mara-Serengeti plains from 37% to 54%. Cattle population growth rates per year have increased from 0.9% (between 2002 and 2012) to 4.2% per year within the Mara-Serengeti plains. Due to the increased intensity of human agricultural activities, an increase in competition for resources between wildlife and humans has occurred (Veldhuis et al., 2019) this makes the region ripe for HWC. Apart from changing land use, the Mara has been working on community-based conservation. Community conservation has been a bone of contention for a while now. Research is showing that community conservation can be effective if well-managed (Lee & Bond, 2018). The Mara established a community-based management system in the form of the Maasai Mara Wildlife Conservancies Association (MMWCA). Effective participation will be key in ensuring the success of this project. This research seeks to gauge the effectiveness of this community-based wildlife management scheme by gauging how men and women interact with wildlife thus affecting the current conservation measures. From that data, the study hopes to clearly outline the need for gender-responsive wildlife conservation to facilitate human-wildlife coexistence.

1.7 Significance of the Study

The study has significance to a variety of stakeholders. It will specifically have value for the following stakeholders for the reasons stated below:

The findings of this study will be helpful to the Kenya Wildlife Service (KWS) and the whole Maasai Mara Game Reserve managers on the understanding of HWC using a gendered perspective that can help them streamline mitigation measures accordingly. It will also help communities living within the area or in other protected areas to better understand their predicament and help in creating sustainable solutions. The National Government and the Narok County Government. The two can use the findings to update their conservation efforts and create or review policies dealing with resource management, especially where humans and wildlife interact. This study will also be beneficial to other researchers who want to look at gender issues as pertaining to resource management. Since it will act as reference material that can guide further research.

1.8 Scope and Limitations of the Study

This study specifically looked at the way gender influences humans' reactions to interactions with wildlife and how one can tailor-make intervention measures for the genders to reduce HWCs. The study mainly focused on the communities living within towns in the Maasai Mara Conservancies in 2020. These communities were chosen because they share the area with wildlife unlike within the Maasai Mara National Park where human settlement is prohibited.

Cultural beliefs curtailed women from speaking freely when asked questions individually by male researchers, hence group discussion forums were held to bypass this issue. There was also a language barrier since most respondents could only speak in Maa this was countered by the use of translators from within the community.

1.9 Theoretical Framework

The uptake of conservation measures is usually influenced by how people value nature and why they put different amounts of value on nature. When considering the value placed on conservation it is important to assess societal behaviours that affect conservation attitudes. A good amount of research has been done on how societal norms and morals influence value systems examples include: cognitive hierarchy and value-belief norm theories.

However, very little research has linked societal morals to increased conservation support (Lute, Navarrete, Nelson, & Gore, 2016). Therefore the research chose to explore this route and look at the Moral Foundations Theory (MFT). Moral Foundation Theory was presented by Professor Jonathan Haidt and a group of researchers from the University of Virginia. The theory claims that moral systems are developed from an interlocking set of values, norms, virtues, identities, practices, evolved psychological mechanisms and technologies that work together to regulate social life and make it as selfless as possible. The theory goes on to state that because humans face a myriad of social problems, they have a legion of moral values and therefore they rely on an indiscriminate amount of foundations when making moral decisions(Graham et al., 2013). MFT defines morals as institutions founded in the following 5 sections that generally determine how people perceive right and wrong:

1. Authority: this focuses on respect for predetermined traditions and hierarchy; the study used this tenet to analyse the nature of predetermined gender traditions and hierarchies and how they affect HWC.

2. Care: this is mainly focused on avoiding harm and encouraging care. Moral perceptions of care affect the way humans gauge risk (Lute & Gore, 2019). At this juncture, the study scrutinized how the two genders perceived risks posed by HWC, their likelihood to participate in hunting/retaliation activities, their attitudes towards conservation and their roles in conservation efforts so far.

3. Fairness: is mainly related to autonomy, rights and justice. The study used this tenet to look into the way the genders viewed their rights, autonomy and justice towards matters that pertain to HWC.

4. In-group loyalty focuses on maintaining social group obligations. People's perception of risk and vulnerability can be affected by how their society (this includes governmental institutions) can help them recover after facing a problem (Lute & Gore, 2019). Therefore, the study looked at how the two genders participate in their social obligation of wildlife conservation and how others' participation in this social contract affected how they perceived risk and vulnerability.

5. Purity: is founded on the separation of what is considered clean or decent from what is not. This usually results in societies striving to be noble and shunning all sub per

behaviours. (Lute et al., 2016). Thus, the study used this tenet to analyse the ways through which the Mara Conservancy residents sought to uphold conservation measures to be noble and achieve communal good.

It is impossible to create conservation strategies without first understanding the moral values that power societies that interact with wildlife (Hadidian, Fox, Camilla, & Lynn, William, 2006). In the modern African setting, very few communities place value on wildlife and therefore feel little to no moral obligation to conserve them. This is because most communities only have negative interactions with wildlife. Most rural communities in Africa that place value on wildlife obtain from wildlife and the local beliefs associated with different animals (Food and Agricultural Organization, 2009). Value systems that are related to wildlife conservation are affected by factors like gender and age which then affect attitudes and perceptions of risk. Understanding the causal chain that links human value systems towards wildlife, human responses, HWC and conservation measures is key to unlocking effective wildlife conservation measures that allow for human-wildlife co-existence (Bhatia, Redpath, Suryawanshi, & Mishra, 2020). This research has decided on using gender to assess the link amongst human value systems towards wildlife, human responses, HWC, and conservation measures.

1.10 Conceptual Framework

For one to fully grasp the gender dynamics that address HWCs the framework of gender analysis should be elaborated. The following is an elaboration of the gender analysis framework and its influence on the study. Gender analysis is the process of systematically outlining the variations in roles and norms for females and males of different ages; the amount of power they wield; their varying needs, constraints, and opportunities; and the consequences that these differences bring to their lives. Gender analysis has become increasingly important since it shows that projects meet international standards, apart from this it enables one to fully understand how a project will be accepted by the various genders and this further leads to one being able to tweak it to meet their needs to increase the project's lifespan. Gender analysis should ideally be conducted at the start of a project because it provides the basis for creating gender-responsive indicators that will allow one to follow fluctuations in gender disparities in female and male decision-making, resource

control, leadership, and HWC indicators to monitor any difference in vulnerabilities and risk (Jhpiego, 2020; Swedish International Development Cooperation Agency, 2015)

A good gender analysis of any project or issue thoroughly examines the following issues:

a) Access and control of resources: under this sub-section access is defined as the ability to use a resource while control is defined as the ability to decide how a resource is used and who can have access to it. Society allocates access and control to resources based on gender dynamics (March, Smyth, & Mukhopadhya, 1999). According to this, the study looked into issues that influence access and control of resources like income levels, and participation in conservation efforts.
b) Role and status: based on gender women and men are assigned a status which determines the roles that they are given and how these roles are valued by their communities (March et al., 1999). The project addresses this point by looking into factors that affect the roles in the households and the status that people have based on their gender or roles.
c) Gender classification of policies: under this sub-section policies can either be gender blind or gender aware. Gender-blind policies are policies that do not distinguish between the genders and therefore perpetuate the inequalities that already exist between the genders. Gender-aware policies are policies that acknowledge the disparities between the two genders and their unequal nature and seek to create a checks and balances system that tries to generate equity-based regulations (March et al., 1999). The study looked into the policies and laws that govern wildlife conservation with a gender lens to address this point.

Building on the theoretical framework we can deduce that human-wildlife interactions result in particular human reactions that range from positive to negative. These human reactions are varied because of certain factors such as environmental values, attitudes toward wildlife, interest in seeing wildlife, attitudes toward particular species, risk perception and other cognitive and motivational variables which are also affected by the gender of the human in question. Cognitive and motivational variables include an array of interactions which can range from direct impact (this is whereby the human physically encounters the animal), indirect impact (this is whereby the human only finds the aftermath

of animal activity), and behavioural feedback (this is whereby human activities affect the reaction of both the animals and other humans). This complex interaction among these variables affects the quality of the ecosystem available for both wildlife and humans. Investigating how gender affects these variables will enhance our understanding of how policies and cultural attitudes can be fine-tuned to enhance efficiency in controlling HWCs to conserve wildlife (Morzillo, de Beurs, & Martin-Mikle, 2014; Ogra, 2008).

The conceptual framework for evaluating HWC and gender dynamics is a hybrid of the theoretical framework coupled with the gender analysis framework. In **Fig 1** the arrows indicate unidirectional (single arrows) and bidirectional (double arrows) interactions and feedback between system components and characteristics. Based on the arrow directions HWC is classified as a dependent variable since it is affected by gender dynamics and rules and regulations. Gender dynamics are therefore the independent variable since they affect HWC. The rules and regulations are classified as intervening variables since they affect the relationship between the variables being discussed.

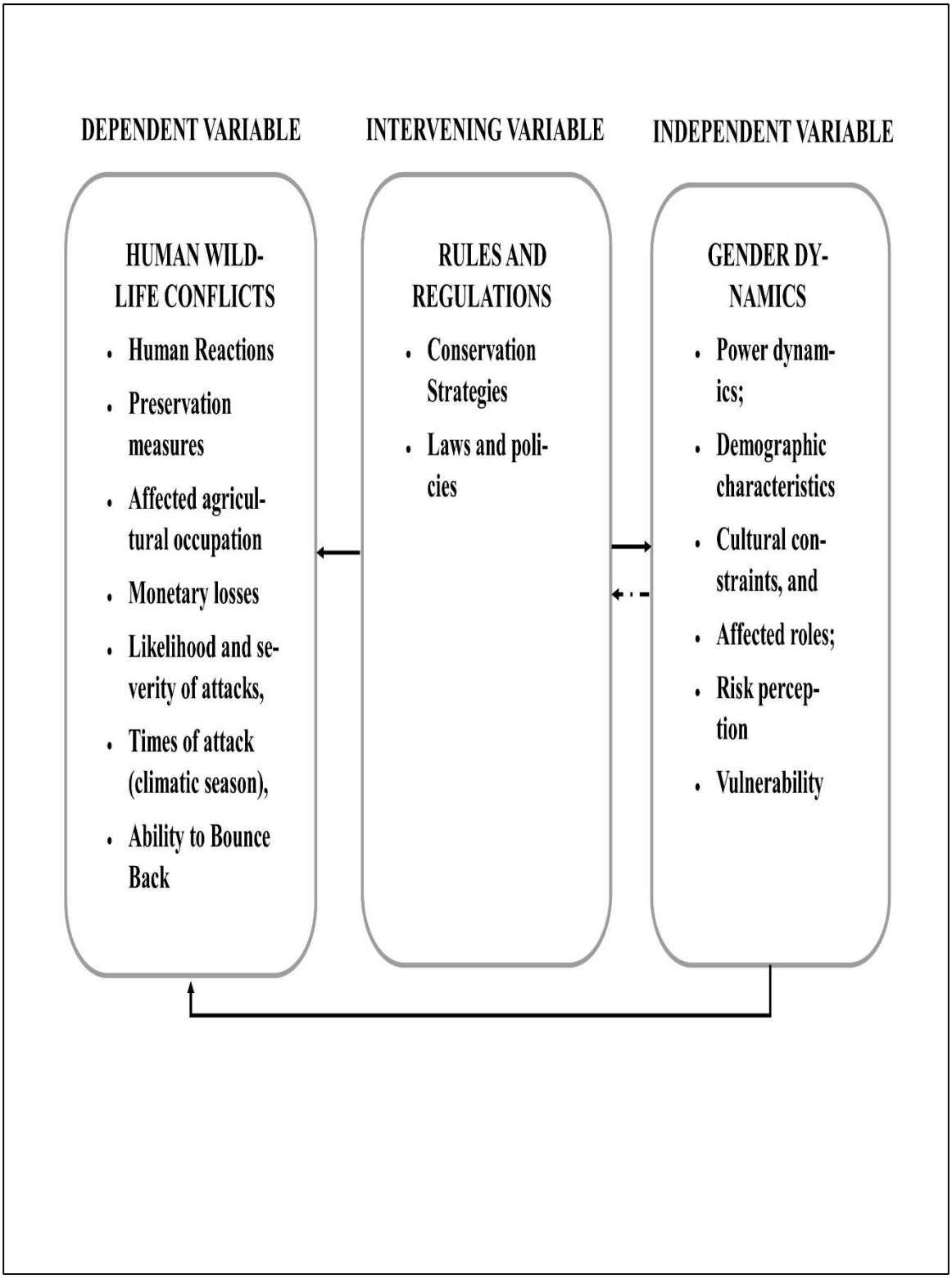

Figure 1.1 Conceptual Framework

Source: Author

1.11 Definition of Terms

HWCs; are human-wildlife interactions that are negative and result in negative effects for either the humans or animals involved (Gore & Kahler, 2012).

Retaliation killing; is when communities organize attacks to kill animals after they have caused damage to their property or lives (Shilongo, Sam, & Simuela, 2018).

Gender/ Gender dynamics; this is a social construct that includes roles and modes of interaction of the sexes based on the specific culture in which it exists (Swedish International Development Cooperation Agency, 2015). These assigned roles and modes of interaction account for the power dynamics between the sexes as per the specific community (Epure & Mihăeş, 2019; Food and Agricultural Organization, 2004; World Health Organization, 2022).

Encroachment; refers to when human activities go beyond their designated space and into what has been allocated for wildlife (Argueta-Villamar, Smith, & Salcido, 2017).

Protected areas; refer to areas that have been designated as wildlife spaces and should have no major intrusions from humans (Ogra, 2008).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviewed literature that was relevant to the research problem. The chapter discusses gender dynamics that address HWCs, the impacts of gender dynamics on wildlife conservation and the effects of gender dynamics on HWC policies.

2.1 Gender Dynamics that Address HWC

It is a common assumption that women and men interact with the environment similarly. However, their cultural roles distinctively distinguish their interactions with the environment. It is therefore important to understand the gender dynamics that affect environmental resource management (World Wildlife Fund United Kingdom, 2012). To clearly outline the gender dynamics involved in HWC the study reviewed ethical considerations that come into play in the wildlife management discourse. Ethical considerations are a growing aspect of wildlife management. This is because ignoring ethical issues in wildlife management influences a wide variety of things like the credibility, efficacy and acceptance of wildlife management policies. Discussions on how different categories of people relate to ethical concerns on wildlife management are important (Hadidian et al., 2006). Environmentalists have heavily relied upon the ethic of care to explain gender differences regarding conservation, this is because the ethic of care questions the concept of nature being passive and thus insists on the need for it to be cared for as one would care for a human due to its living qualities. The ethic of care is a moral theory that exemplifies “care”, it speaks of maintaining the world via meeting the needs of ourselves and others. The theory builds on the motivation to care for the vulnerable and dependents because we were also cared for. This theory is plucked from the belief that women are cultured to approach the world through care and empathy, unlike their male counterparts who are taught to approach the world using a problem-solving/ analytical way. From this, it is argued that men use an ethic of justice while women tend to use the ethic of care when faced with moral dilemmas. Consequently, it is evident that generally men and women tackle world issues differently and one can draw a conclusion that the case would be similar in environmental issues. From the arguments posed some

environmentalists have brought forth the need for policies to be created based on the differences in gender to strengthen our conservation abilities (United Nations Office on Drugs and Crime, 2020; Whyte, 2012). This theory insinuates that the motivations for men and women to participate in conservation measures differ (Anthony, 2004), and from there one can draw a logical line to there being differences in the way the two genders interact with wildlife conflicts.

Research has indicated that these differences mainly occur because gender dynamics create a variance in risk and vulnerability perceptions. Vulnerability and risk are interlinked concepts and according to research. Analysing vulnerabilities enables one to understand that the ability of the genders to cope with afflictions caused by HWC depends on what power their specific cultures have endowed them with. To therefore appropriately contextualize HWC and vulnerabilities it is important to examine how the different genders are impacted by HWC and why they are impacted thusly (Khumalo & Yung, 2019; Ogra, 2008). However, it should be noted that vulnerability is not a constant and can change if factors that relate to it are altered like cultural dynamics, economic status and human decision-making (Hurlbert & Krishnaswamy, 2019). An example of the disproportionate experiences between men and women regarding HWC is in Uttarakhand, India, whereby women and men experienced different levels of anxiety based on decreased food security, changes to workload, decreased physical and psychological well-being, and economic hardship because of crop-raiding by elephants (Nyhus, 2016). To get a clear view of how these dynamics affect HWCs the research will dissect the gender dynamics into manageable portions to enable ease in data collection. Previous research has shown that gender dynamics can be divided into three these are:

- Productive work (refers to work that earns income). One can correlate productive work with the issue of economic occupation which comes into play since different genders have different attitudes to how they should interact with wildlife for their economic benefits. This then affects their attitude towards conservation. A study in China indicated that men have more geographical knowledge of protected areas because of their occupations hence, they are more aware of the benefits that they can afford unlike their female counterparts (Seager, 2021). This occupational advantage could be the reason why other studies state that men are more likely to participate in conservation

efforts because they understand the economic benefits. Vulnerability is an important factor to consider when assessing poverty and gender relations. Poverty in this context is defined as being at a higher risk of facing increased economic hardship, especially when faced with hazards. In this case, the risk of facing hardships is based on one's ability to withstand stressors on fiscal wealth, reproductive abilities and social capital. Historically women have been more vulnerable to environmental conflicts due to direct and indirect impacts that they face economically and socially, especially in rural communities (Bob, Perry, & Potgieter, 2010). Therefore it is important to know of the varying attitudes between the two genders concerning conservation to create elaborate policies and adequate conservation strategies. Furthermore, the use of fiscal values to evaluate gender dynamics in HWCs is important because it helps give a measurable value to damage incurred, but this does not rule out any emotional damage incurred (Ogra, 2014; Swedish International Development Cooperation Agency, 2015). The study took this into account because it was one of the principles in the gender analysis framework, under access and control of resources.

- Reproductive work (refers to work done to maintain a household). It has been noticed that women tend to rate situations as risky based on how they affect the health and safety of their households and their environment while men rate situations as risky when they affect their potential to earn income and support their families. Understanding how these perceptions of risk differ lends an insight into how communities affected by a specific risk (in this case HWC) make decisions, program uptake rates, and how they would support the design of intervention measures is vital to creating effective mitigation measures for HWC (Cullen, Anderson, Biscaye, & Lawrence, 2020; Hitchcock, 2001). It has been reported that women also feel vulnerable based on other factors that do not cause them direct harm an example of this is their concern for their children (Birkhoff, 2021). The study looked into this because it falls under the principle of care in its theoretical framework.
- Community work (this refers to work put in to maintain political, social and religious networks); In most communities men have deeper community ties than their female counterparts due to the value cultural beliefs accord to their opinions (Swedish International Development Cooperation Agency, 2015). The study took this into

account because its gender analysis framework emphasized the importance of role and status in affecting how the genders perceived human-wildlife interactions.

The latter tenets have been used because they easily summarize gender interactions within a community. From the three categories of gender dynamics (productive work, reproductive work and community work) it is evident that despite both men and women affecting the environment which in turn affects HWC, women's roles are less recognized with little value given to them (World Wildlife Fund United Kingdom, 2012). However, from the discussion above one can deduce that although women generally rate a lot of situations as risky, the assumption that women are more sensitive to risk is a cultural misconception. It has been noted that men and women perceive risk differently based on their societal roles and their geographic context. Therefore the need to identify the dynamics that affect how men and women interact with wildlife is essential to creating a path to better conservational practices. To assume that men are inherently advantaged in this discourse discounts their experiences which may result in skewed HWC mitigation measures.

Research and experience so far have indicated that gender mainstreaming is vital to the creation of sustainable natural resource management strategies. An example is observed in the number of environmental treaties that are ratified in countries with more gender-diverse leaderships (International Union for Conservation of Nature, 2020). However, due to cultural and economic barriers gender mainstreaming in conservation issues is still low. It is important to note that gender mainstreaming does not mean that these cultural and economic issues will be immediately reversed but it allows for everyone's voice to be heard and reduce the vulnerability to environmental problems (World Wildlife Fund United Kingdom, 2012).

2.2 Gendered Conservation Measures that Address HWC

A majority of the environmental conflicts in Sub-Saharan Africa are caused by HWC because of the region's dependency on tourism and conservation structures (Bob, Perry, & Potgieter, 2010). (Ogra & Badola, 2008) outlines the gender dynamics within HWC in India that could also be relevant in the African context. Their research indicates that the impacts of HWC range from reduced food security, increased workload, impaired physical

and mental capabilities, socio-economic hardships and the propensity to engage in illegal activities. The research indicated that men and women faced varying effects based on their gender roles and it called for more research on the topic.

Within the pastoralist communities in Kenya, women have culturally very little say in the decision-making processes. This has resulted in women having very little to do with conflict management when in it comes to wildlife despite them being an impacted party. Generally, women have not been fully incorporated into the conflict management strategy when it comes to HWC. Their limited incorporation can be due to a lack of full understanding as to how they react to such conflicts and restricting cultures that demean their opinions (Achieng, 2015). The need to study and understand the variations in reactions to HWC is important in creating effective conflict management strategies that are inclusive.

The belief that patriarchal resource management has desiccated the earth is widespread and the need for gender mainstreaming has grown throughout the world (Zimmerman, Callicott, Sessions and Warren, 1993). Many are joining the belief that equality in decision-making will reduce the conflicts caused when sharing resources. Women are joining the eco-feminist movement which is created under the ecofeminist theory which states that no entity is greater than the other and all living things should be regarded as equal and treated as such. This theory is based on the similarities between women and nature in terms of their suffering and assumed passive nature despite their having great abilities. Women who subscribe to this line of thought have managed to do great things when it has come to wildlife conservation like the Black Mamba majority-female anti-poaching group in South Africa, the Akashinga all-female anti-poaching group in Zimbabwe, and the female rangers in Virunga, Africa's women are showing the world that protecting natural resources provides opportunities to rise from social and financial oppression (Coric, 2014). Men have predominantly been the main enforcers in wildlife management. This has been partly because men are thought to be more suited for the job. Excessively masculine enforcement agents cause alienation between them and communities living within protected areas because they can practice enforcement through violent means (Seager, 2021). However, this assumption that male involvement in resource management has desiccated the world discounts the archetype of male roles in society and

affects the effectiveness of conservation measures. This is illustrated by research that outlines the linkages between patriarchal societal structures in perpetuating negative conservation attitudes toward men. The common rhetoric is that in most cases when men are unable to provide for or protect their families as societies expect them to, they often engage in destructive behaviours like poaching and retaliation killings (Collaborative, Boyer, & Granat, 2021). Hence, there is a need to strike a balance between patriarchal systems and ecofeminism. Whereby, equity in decision-making and enforcement is maintained for better implementation of conservation efforts.

2.3 Gender Dynamics and HWC Policies

Public policies are a common way of managing HWC globally and a variety of these policies exist depending on the country and the region (Nyhus, 2016). Internationally there are no laws or conventions that directly speak on HWC. International conventions generally speak on the over-exploitation of endangered species (The Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973) and the illegal ivory trade (African Elephant Conservation Act 1989). A convention that comes close to speaking on HWC is the Convention on Biological Diversity (CBD, Rio de Janeiro, 1992). This convention has three main objectives which include: the sustainable use of biodiverse components which can be translated to include wildlife, the maintenance of cultural practices that effectively protect biodiversity by indigenous groups and the use of the ecosystem approach to ensure that biodiversity is maintained within particular ecosystems. This convention is further fortified by Decision VII/14: the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity. With regards to gender dynamics, this convention is what comes close since it speaks on public participation. The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention, 1998) allows for the following activities to take place: i) public institutions to provide its citizens environmental information upon request and proactively collect environmental data for dissemination, ii) public institutions to create forums that allow transparent and fair participation of its citizens in environmental matters that may include plan and law/policy preparation, iii) public institutions are also tasked with providing justice with matters concerning the environment by providing procedures that allow its citizens to legally pursue information

or challenge acts facilitated by public or private entities as stated in their national laws (Morgera & Wingard, 2008).

In Kenya apart from the Kenyan Constitution 2010 that calls for gender equity in all aspects of life for all Kenyan citizens the laws concerning wildlife conservation in Kenya only speak of gender when it comes to hiring and when policies are being created. The Wildlife Conservation and Management Act, 2013 states that the Cabinet secretary is allowed to create executive orders that can mitigate HWC, while The National Wildlife Conservation and Management Policy only speaks of HWC in terms of compensation (Government of Kenya, 2012, 2013). The National Wildlife Conservation and Management Policy 2012 is ambiguous in its strategy to improve community capacities to deal with HWC (Government of Kenya, 2012). The County Wildlife Conservation and Compensation Committee does not require HWC experts to be members so that they adequately influence wildlife conservation issues although it allows for them to be invited to discuss conservation issues. The Wildlife Conservation and Management Act, of 2013 allows for wildlife to be destroyed once it has been involved in an HWC incident which could be a bit harsh since this allows for retaliation activities (Government of Kenya, 2013). Internationally there are no regulations that mandate the use of gender dynamics to eradicate HWC but some organizations like FAO (Food and Agriculture Organization) and WWF highly recommend it.

2.4 Summary of Gaps in the Literature

There is clear evidence that gender dynamics greatly affect HWC but very little is done to see how these dynamics can be used to resolve the conflicts. Therefore the following table summarizes the reviewed literature while highlighting the author's remarks and gaps.

Table 2.1 Summary of Literature Review and Gaps to be filled

Author	Topic of discussion	Remarks & Gaps
WWF-UK, 2012	• Gender dynamics affect wildlife conservation measures and policies	**Remark:** It is important to understand the link between gender dynamics and wildlife conservation strategies. **Gap:** To do this there is a need to create a baseline data set of gender-disaggregated data. The research tries to address this by suggesting the gender dynamics that are related to HWC.

	• Women's roles are less recognized with little value allocated to them which in turn affects conservation efforts.	**Remark:** It is important to recognize women's roles that affect HWC and create strategies for better conservation. **Gap:** the reviewed literature mostly recognizes the male role in conservation as negative which may lead to an unwanted bias. The study looks into how both genders are marginalized by their cultural roles by clearly defining their interactions with HWC from a neutral standpoint.
	• Gender mainstreaming in conservation issues is still low.	**Remark:** It is important to allow both genders to voice their concerns on HWC to reduce their unique vulnerabilities to HWC.
Swedish International Development Cooperation Agency, 2015	• Gender dynamics can be divided into productive, reproductive and community work.	**Remark:** Categorizing gender dynamics is useful in assessing the impacts of HWC on each gender based on the roles assigned to them by their community. **Gap:** There is a gap in identifying productive, reproductive and community work for both genders and assigning them equal value or acknowledgement to limit negative cultural bias towards some of them. The study tries to address this gap by assessing gender roles affected by HWC and explicitly recognizing the impact HWC has on both genders
	• Gender analysis in conservation projects helps them to meet international standards and increase projects' lifespan	**Remark:** Gender analysis allows for one to understand the disparities between the two genders with regards to HWC, therefore creating strategies based on them that allow for effective conservation measures.
Ogra. M, 2014	• Gender dynamics create a variance in risk and vulnerability perceptions	**Remark:** It is crucial to understand how gender dynamics affect risk and vulnerability perceptions pertaining to HWC.
Seager. J, 2021	• Attitudes towards wildlife conservation differ based on gender dynamics	**Remark:** Understanding how gender dynamics affect attitudes towards wildlife conservation allows for the creation of elaborate policies and adequate conservation strategies.

Nyhus. P.J, 2016	• The link between risk perception and actual risk. • The disproportionate effects of HWC on the genders • Tailor-made policies to manage HWC	**Remark:** It is important to distinguish between what affects risk perception and the actual risk based on the rates of HWC reported. **Remark:** The two genders face different kinds of effects when they encounter HWC and it is important to know them to create appropriate strategies. **Remark:** It is important to tailor-make policies concerned with HWC based on the factors that influence it in the specific area in question. **Gap:** there is very little literature on how to create laws and policies that are gender aware
Bob, Perry and Potgieter, 2010	• The correlation between poverty and vulnerability	**Remark:** It is important to correlate vulnerability to environmental conflicts and the stress that they disproportionately cause to the genders. **Gap:** there is a need for data on how rural communities are to economically perpetuate conservation with minimal outside influence
GoK (Government of Kenya), 2012 & 2013	• Gender dynamics and HWC policies	**Remark:** The laws and policies governing wildlife management in Kenya are gender-blind.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter defined the study area and elaborated on the methods of data collection, research design, study location, target population, sampling sizes, sampling techniques, data collection procedures, validity and reliability, data analysis, logistics and ethical considerations.

3.1 Research Design

This study is descriptive, therefore it used a descriptive research design. A mixed method approach was used in data collection due to the allowances that descriptive research designs give in the forms of data collection it allows. The mixed method approach allows the collection and analysis of both qualitative and quantitative data. This approach is usually recommended when a study requires a better understanding of the problem being researched and just one form of data cannot achieve the research requirements alone(Almalki, 2016). Taking this into account the research used a variety of surveys and data collection tools to gather information as guided by the research objectives. This ensured that the data obtained was relevant to the study. This study sought to gather unbiased information that will expound on the gender dynamics concerning HWCs in the Mara. This method was agreed upon because it factored in the limited resources made available to the researcher while still being effective enough to gather the required information.

3.2 Study Area

The Mara is located within Narok County, between 34° 46' 54.805" E and 35° 28' 41.635" E, it exists within Kilgoris and Narok West constituencies (Google Maps, 2021; ESRI, 2021). The study area is a conglomeration of the Mara National Reserve and the Maasai Mara Wildlife Conservancies. According to the Maasai Mara Wildlife Conservation Association (MMWCA), about 70% of the wildlife in the Mara region is living outside the Maasai Mara National Reserve. This means that the majority of the wildlife is located in the adjacent land where the conservancies are located and the land is owned by the local communities. Given that the conservancy area is an HWC hotspot since it has an adequate

human and wildlife population, human settlements within that region were chosen for the study.

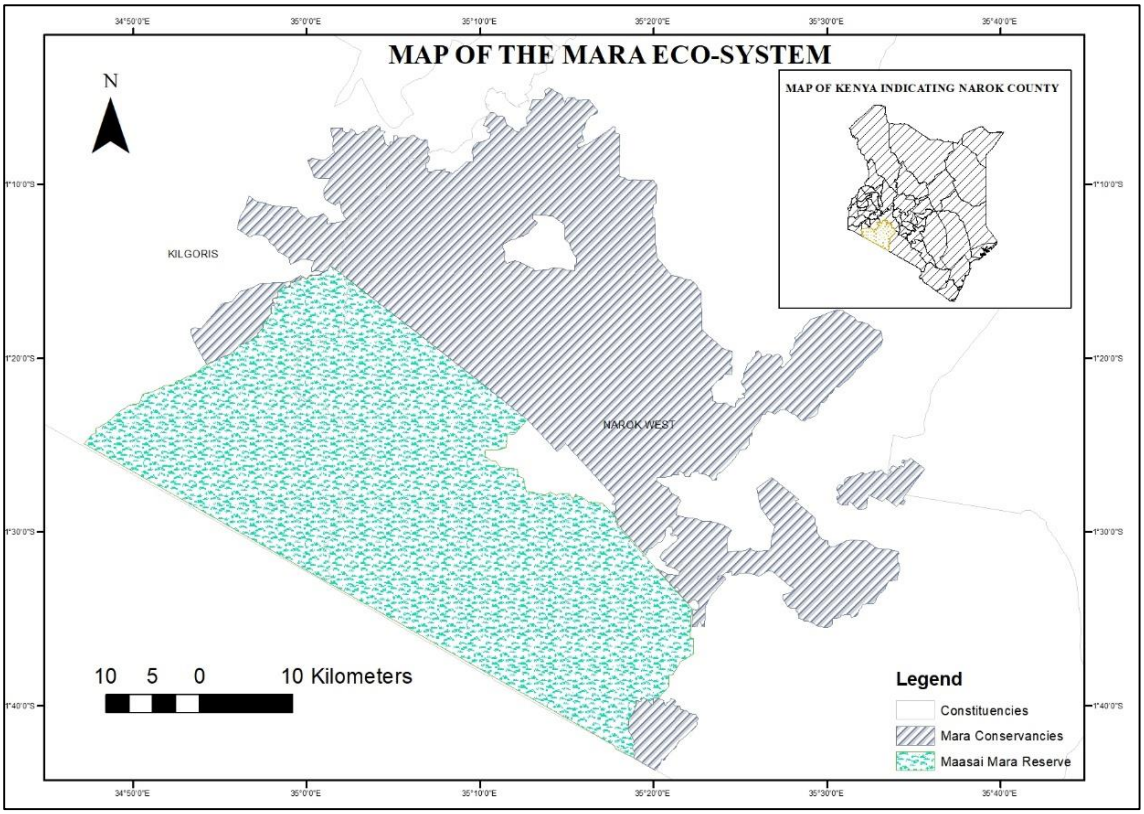

Figure 3.1 Maasai Mara Location Map

Source: ESRI 2020

Table 3.1 Environmental and Socio-Economic Characteristics of the Study Area

Environmental Characteristics	Savannah Plains
Adjacent land uses	Serengeti Park in the South and agricultural land uses to the North, East and West
Climate	Dry season December to March 28°C to 32°C Rainy season July to September 12°C
Rainfall	500 mm during the dry season to 2,500 mm in the wet season.
Major wildlife resources	Lion, African leopard, cheetah and African bush elephant
Size	Over 510 km^2
Economic activities	Economic activities range from tourism, crop farming and livestock farming

Ethnicities	Maasai

Source: (Kenya Interagency Rapid Assessment & Red Cross, 2014)

3.3 Sample Size and Sampling Procedure

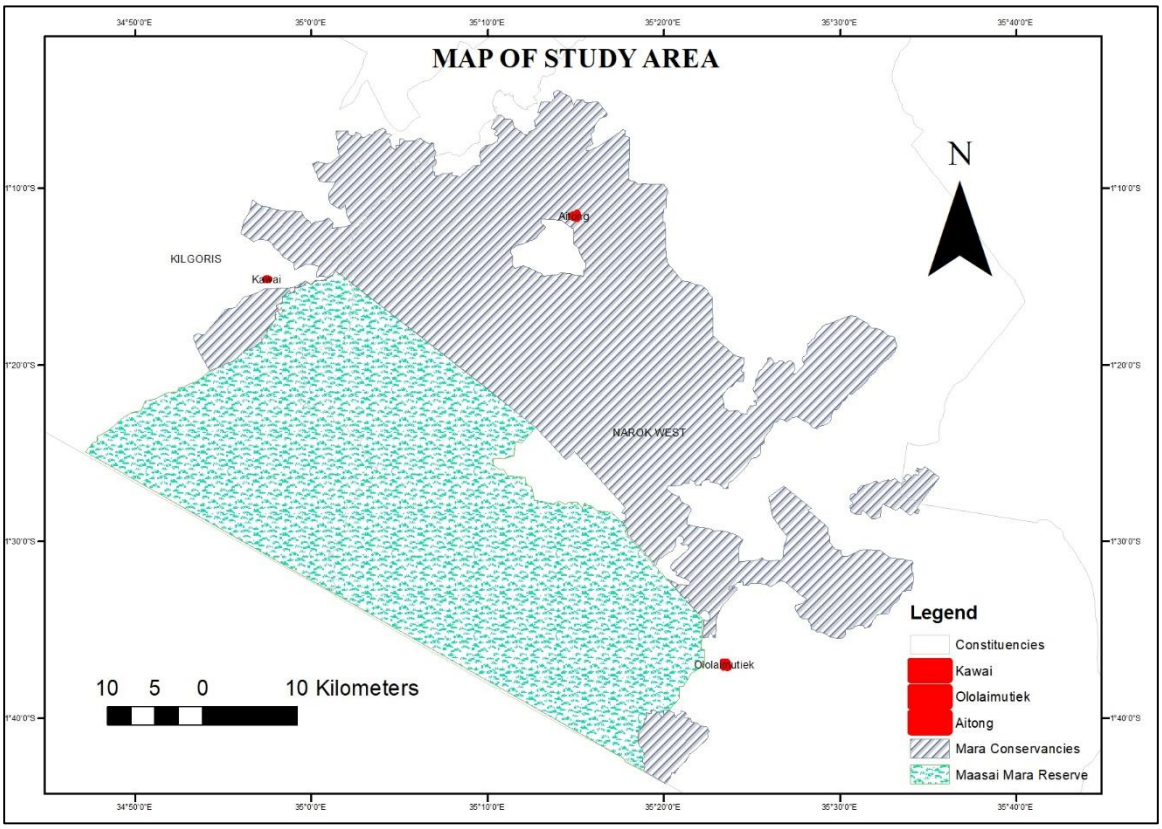

Figure 3.2 Map Indicating Sampling Areas

Source: ESRI 2021

3.3.1 Target Population

This study targeted communities living near the Mara Game Reserve (this mainly entailed the communities within the Maasai Mara Wildlife Conservancies. Three towns within the conservancies were chosen randomly to represent the whole) and relevant government organizations that deal with the area like the KWS, department of wildlife in the county government of Narok, NGOs operating around the area.

3.3.2 Sampling Procedures and Techniques

The sampling techniques and procedures were based on the key target population which were the households and the key informants. The procedures and techniques were as

follows: Snowball sampling: Snowball sampling is a non-probability method where the research participants refer the researchers to other participants with relevant information who could then refer to other participants. The result is a chain of participants. It is useful in qualitative studies with the advantage that it is useful in collecting a wide range of information. It could, however, result in limited variation of information where references belong to the same network. This method helped acquire information from key informants, this is because the informants had better knowledge of different organizations, their mandates and their locations.

Purposive sampling: Purposive sampling technique is a non-probability sample which is selected based on the objectives and purpose of the study. It is subjective and helps to get information about specific research objectives by bringing additional ideas and information to the study which would not otherwise be gotten. It is a successful technique when used purposely to get information that is relevant to certain research information. This method helped acquire information from the households, this is because the researcher tried to specifically target both male and female respondents to get data that is relevant to the research.

Simple random sampling: All the towns in the conservancies were targeted using this sampling technique. Three out of the nine major towns in the area were selected randomly and each town had an equal chance of being selected for the study. This formed a sample of 30% which according to (Grix, 2004) was adequately representative. The selected towns were Aitong, Ololaimutiek and Kawai. Aitong and Ololaimutiek are located in Narok West while Kawai is located in Kilgoris.

3.3.3 Sample Size

In 2009 Kilgoris had a population of 2,538 while Narok West had a population of 5,453 the combined total is 7,991(Kenya National Bureau of Statistics, 2010). The research used 2009 data because at the time that the research was conducted the 2019 census had not published data from the smallest administrative units. All the published data ended at the county level and the research occurred in two wards. The population growth rate for the county of Narok is 4.7% (County Government of Narok, 2018), and the projected population in 2019 will be 12,786 using the formula $P=P_{o*}e^{rt}$

Where P is the projected population,

P_o is the current population,

e is the natural log 2.71828,

r is the growth rate and

t is the time within which the population is expected to grow.

Using a formula recommended by (Daniel, 1999) the sample size is 373 using the formula $n = N*X / (X + N – 1)$,

Where, $X = Z\alpha/22\ p\ (1-p) / MOE2$,

and $Z\alpha/2$ is the critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96), MOE is the margin of error, p is the sample proportion, and

N is the population size.

The sample size generally affected household surveys other surveys are not part of the sample size. Considering that West Narok has a larger population concentration and it accounts for 70% of the population in the study area it was allocated two-thirds of the questionnaires while the remainder went to Kilgoris. Since the study is analysing gender dynamics in HWC the household surveys were divided according to the gender structure of Narok County meaning females got 185 questionnaires based on 49.58% while the males got 188 questionnaires based on 50.42% (Kenya National Bureau of Statistics, 2010).

Table 3.2 Distribution of Questionnaires and Respondents per Town

No.	Name of town	Number of samples individuals per selected town	Total individuals who participated in the study per town	Men	Women
1	Aitong	124	90	63	27
2	Ololaimutiek	124	74	52	22
3	Kawai	125	81	57	24
	Totals	**373**	**245**	**172**	**73**

In addition, eight key informants participated in this exercise. They included:

Table 3.3 Distribution of Respondents per Organization

No.	**Category**	**Number of respondents**
1	Maasai Mara Wildlife Conservation Association Workers	2 (1- Male, 1-Female)
2	Mara North Conservation Workers	2 (2-Male)
3	County Government Officials(Department of Wildlife and Tourism)	2 (1- Male, 1-Female)
4	Mara Predator Conservation Programme	1 (Male)
5	Kenya Wildlife Services	1 (Male)
	Total	**8 (6- Male, 2-Female)**

Due to the low turnout of women, two Focus Group Discussions (FGDs) were held each having 10 female participants to discuss the questions in the interview schedule. The FGDs were conducted in Aitong and Ololaimutiek. The ages of the women ranged from 18 onwards. The same interview guide used on the key informants was what was used to guide the FGDs. An FGD was not conducted in Kawai since women in that area did not avail themselves and neither was one conducted for the men since their turnout was adequate.

3.4 Data Collection

This study used both qualitative and quantitative data collection methods because the required data was of both types.

3.4.1 Sources of Data

The study used both secondary and primary data that would help expound the issue. Secondary data included: journals, books, articles etc. while primary data included: questionnaires and interviews

3.4.2 Instruments for Data Collection

This study employed a variety of data collection instruments, they included; observational methods (photography, indicator matrices and maps), questionnaires (household), and interviews (institutional, and focus group discussions).

a) **Observation Methods**

Photography: Photos of relevant meetings, locations and activities were taken during data collection as a method of documenting activities during the study.

Indicator Matrix: The indicator matrix was used to confirm data of some of the information from secondary sources and key informant interviews. This helped the researcher verify some occurrences through first-hand observations.

Maps: Relevant maps were drawn to help with the identification of sampling points, they helped the researcher track progress of those who helped out in data collection and locating some institutions that were not known prior to the start of the study.

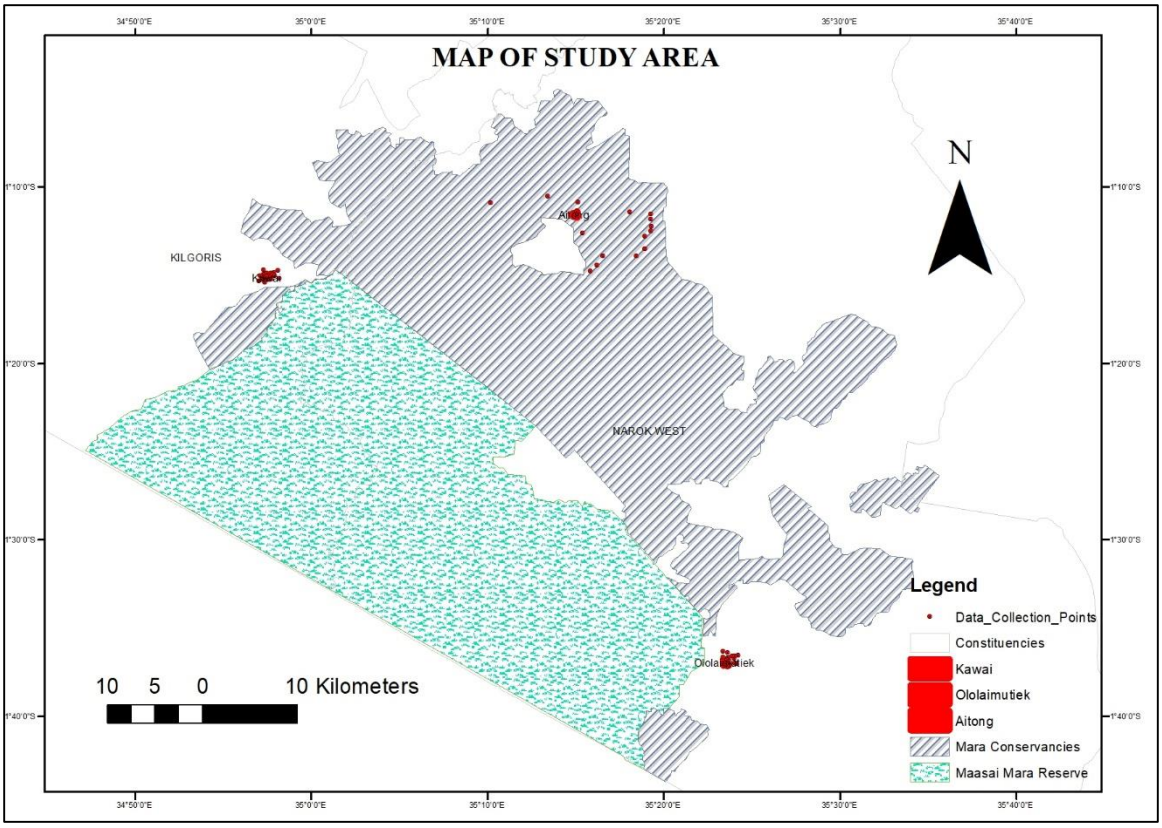

Figure 3.3 Map Indicating Data Collection Points

Source: ESRI 2021

b) Questionnaires

The study used one questionnaire for both female and male respondents. The questionnaire was structured to obtain data as per the set objectives.

c) Interviews

An interview guide was used to amass specific data from the FGDs and the key informants. This data collection instrument contained open-ended questions that were based on the study's objectives. This was to enable the researcher to gain more perspective on the HWC issues based on gender based on the opinions of professionals hired to tackle the issue.

3.5 Reliability and Validity

3.5.1 Validity

Research instruments are considered valid if they accurately measure what they are intended to measure and achieve the purpose for which they are designed. Despite the fact

that research instruments cannot be perfect the researcher needs assurance that the measurement instruments chosen will be effective. Therefore, validity is determined based on the appropriateness of the research instruments chosen (Fraenkel & Wallen, 2009).

The research relied on expert advice to determine whether the research instruments used were appropriate and useful. From the experts' advice (the Department of Tourism and Wildlife in Narok County provided 3 of its workers who deal with HWC to act as experts and advice on the questionnaire), the research improved on the content and the structure of the research instruments.

3.5.2 Reliability

For a research instrument to be considered reliable it should produce consistent results when measuring a single phenomenon that is not changing. Any inconsistencies in methods of measurement like inconsistent wording can change responses and alter the responses (Robinson, Shaver, & Whrightsman, 1991).

For the research to attain reliability the questions in the research instruments contained several questions on similar themes that touched on different aspects of the said theme to ensure that the responses obtained were reliable. Questions that did not fit in with associated themes were reviewed and restructured so that they could result in associated data.

3.6 Data Analysis

Questionnaire data was subjected to statistical analysis using SPSS and Microsoft Excel applications. Descriptive statistics were used to describe relative frequencies for some of the collected data. This included: the gender of the respondent, the types of conflicts, their spatial distribution, the affected animal/crops, times of attack (day and year), conflict hotspots, retaliation activities, prevention measures, compensation programs, ability to bounce back which will be summarized in tables, maps and figures. Percentages and means of the collected data were used to compare variables. Chi-square was used to evaluate whether gender dynamics are relevant to the conservation of the Mara. Photographs and indicator matrices helped with proving that what has been said occurred.

3.7 Logistics and Ethical Considerations

Preceding data collection Kenyatta University Graduate School issued an Authorization letter which allowed for the National Council for Science, Technology and Innovation, (NACOSTI) to issue a research permit (See Appendices VI – NACOSTI Research Permit and VII- Kenyatta University Graduate School issued an Authorization letter). Copies of these letters were handed into all the offices visited to establish rapport and act as a means of identification.

The data collection process avoided the use of identifiable data like names and identification numbers to ensure the privacy and confidentiality of participants was maintained. Participants were also informed that the data was for academic purposes and would be used for that purpose only. Only participants who consented to be questioned or photographed were interviewed or photographed.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.0 Introduction

This section presents the findings and discussions obtained from the participants of the data collection exercise in the Maasai Mara Game Reserve, Narok County, Kenya. The output presented is guided by the study's objectives and other relevant data like demographic characteristics like gender, age, marital status, education level, income level and economic occupations. This was because this data helps add context to the data stipulated by the objectives, especially because different genders' access to income and public services influences their ability to conserve the environment (Bechtel, 2010). The first section is on demographic characteristics, the second section is on gender dynamics that affect HWC, the third section is on conservation measures that address HWC in the Mara and the fourth section is on assessing whether gender dynamics are relevant to the conservation of the Mara.

4.1 Socio-demographic Characteristics of the Respondents

The study appraised the relevant demographic characteristics and they included: gender, age, marital status, education level, income level, and economic occupations.

4.1.1 Gender

This study sought to find out the gender of the respondents since gender dynamics was the main aspect of the research. To understand gender dynamics, the research had to disaggregate all collected data. The figure below indicates the number of men and women that took part in the study.

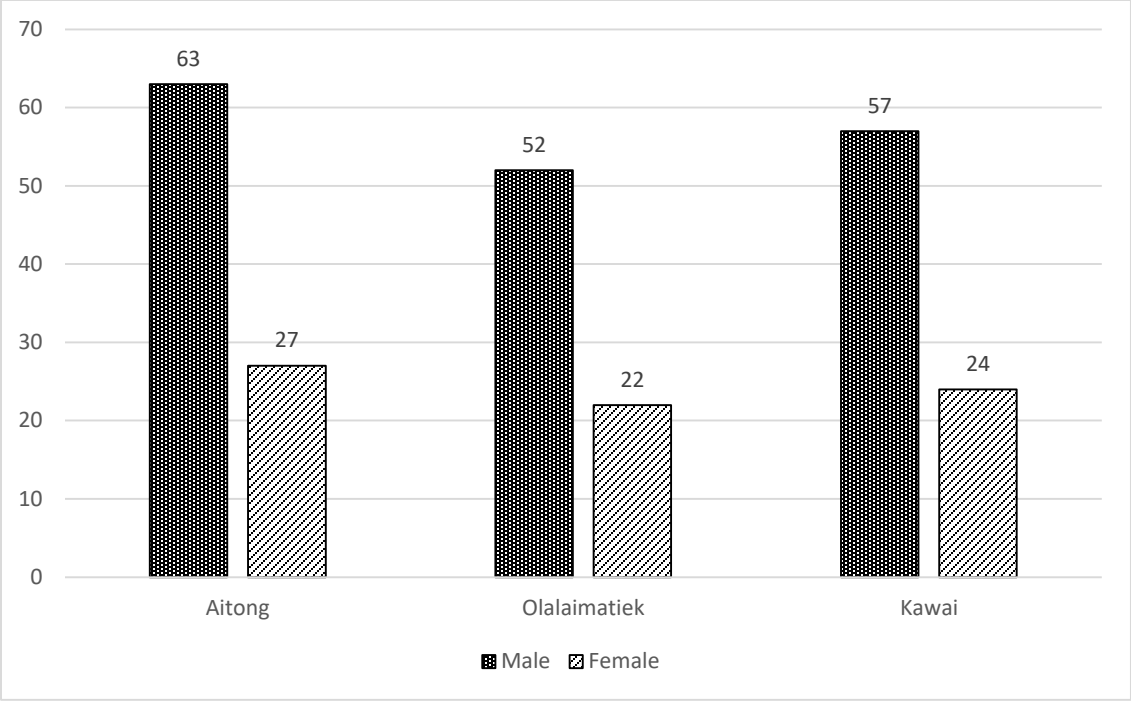

Figure 4.1 Respondents' by Gender per Town

The number of male respondents was considerably higher than their female counterparts despite the Kenya National Bureau of Statistics (KNBS) indicating that their distribution in the area is almost equal (49.58% Female, 50.42% Male). This could imply that men in the conservancies still hold more power in decision-making within the households.

4.1.2 Age

The mean age of the participants was in the 26-35 age bracket and so was the modal class. The standard deviation was 13.26 with a kurtosis of -3.22 and a skewness of 0.53 meaning the distribution is moderately skewed to the positive end. This means that the distribution is not even and there are some outliers in the data.

This study sought to find out the age of the respondents because social roles are usually assigned based on gender and age. This is because age is one of the socio-cultural dynamics that affect a person's ability to participate in conservation efforts (Conservation International, 2019). Furthermore, in most African cultural setups the combination of age and gender dictates the type of roles one is given in the household which then dictates social status (Harnish, 2013), due to this the research looked into

both under section 4.2 of this chapter. The latter figure indicates the age of respondents based on gender.

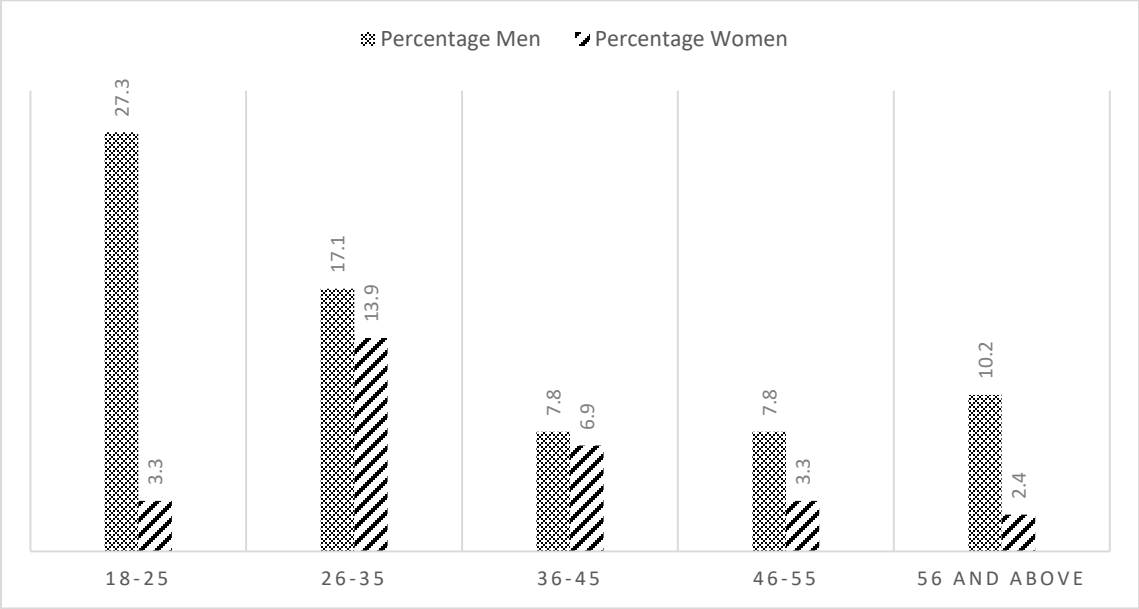

Figure 4.2 Age Distribution of Respondents

4.1.3 Marital status

The standard deviation of 55.25 with a skewness of -1.70 meaning that the curve is extremely negatively skewed**.** This means that the distribution is not even and there are a lot of outliers in the data collected. Figure 7 indicates the distribution of marital status per town.

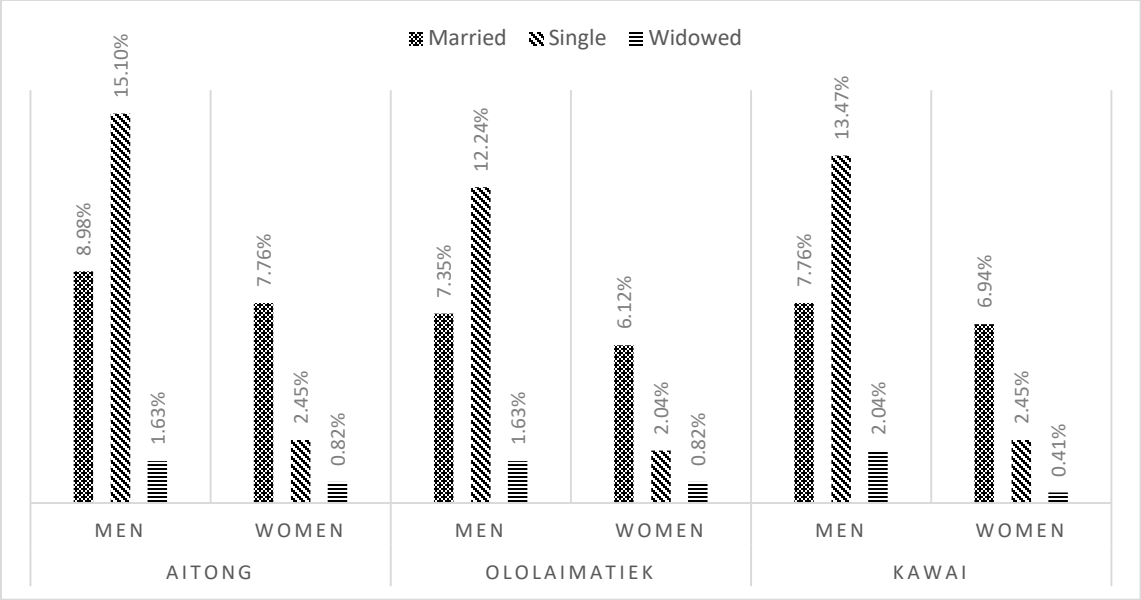

Figure 4.3 Marital Status of the Respondents per Town

There were more single male respondents in all towns and more married female respondents across all towns. This signifies that most women wield more power and feel less vulnerable within the community in marriage than when single or widowed since they are viewed as an extension of their husbands. Research has indicated that in some communities and households women's rights to income and social wealth are dependent on their marital status (Bechtel, 2010). In some communities, unmarried women cannot be seen engaging in some social activities (Conservation International, 2019). This translates to married women participating in more conservation efforts and reporting more cases of HWC albeit through their husbands. When probed further married women stated that depending on their family status they are more economically secure and are more likely to recover from the effects of HWC. (Khumalo & Yung, 2019) study in Kwandu Conservancy, Namibia indicates that marital status for women affects their vulnerability to HWC because married women tend to have more social security, unlike their single or widowed counterparts. For the men marriage did not seem to hinder their wielding of power. This is because a majority of the single men said that they ventured out of the homestead when they had enough income to do so. The study concurs with previous research on this issue because the findings indicate that men's marital status did not affect their participation rates while it did for the women.

4.1.4 Level of education

The research enquired about the respondents' level of education to determine whether education levels based on gender have any relation to HWC. The standard deviation is 14.68661 with a kurtosis of 1.42 and a skewness of 1.09, this indicates that the distribution is not bell-curved and that there were a lot of outliers in the data on the positive end of the curve. According to (Conservation International, 2019), education levels influence a person's interaction with conservation issues. Figure 4.4 outlines education levels per town.

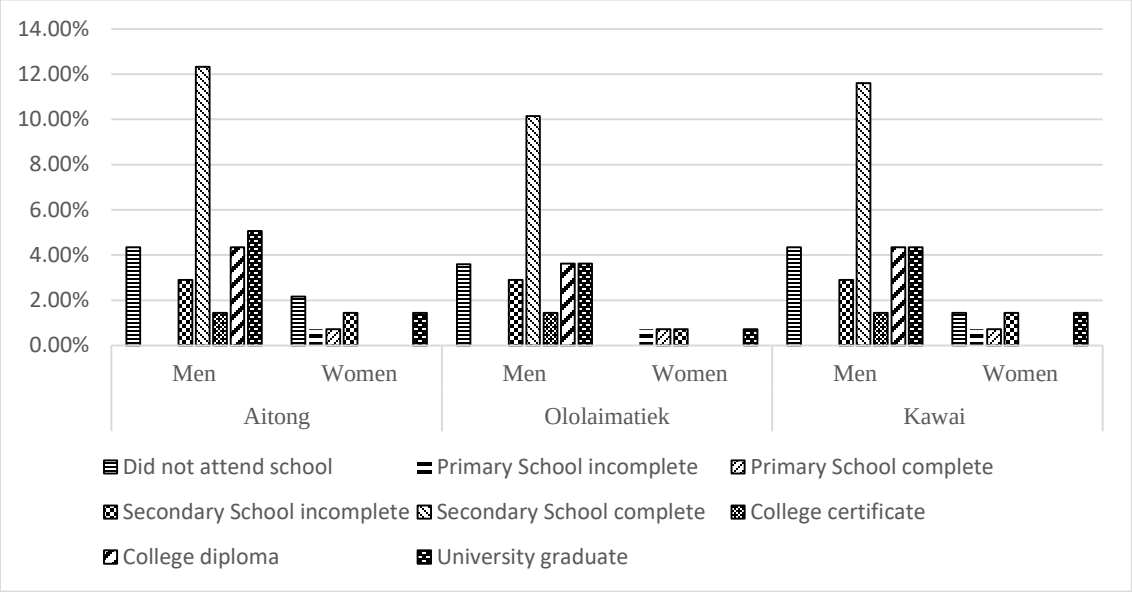

Figure 4.4 Respondents' Level of Education per Town

According to the data education levels among men are higher than those of women at almost every stage except for those who completely have no interaction with formal education. The higher education levels amongst men can be due to culture and economic standing. The lower number of women who did not completely attend school can be attributed to government policies and NGO assertion of female education within the country. The study collected data on the level of education because the Kenyan curriculum educates students on the environment, wildlife and tourism which may have adjusted their perceptions of HWC. However, it should be noted that the Kenyan curriculum focuses on academics rather than holistic, well-rounded human development. The data resonates with statistics on gender parity within Kenya (0.97% for Primary Schools and 0.91% for Secondary Schools) and Narok County (0.94% for Primary Schools and 0.73% for

Secondary Schools) in terms of education (The Maasai Mara Science and Development Initiative, 2015). Studies from countries like Malaysia have indicated that improving educational awareness of wildlife conservation issues greatly affects the way people feel towards wildlife by increasing their levels of empathy, responsibility and awareness towards wildlife and their eco-systems. The education offered about wildlife should be elaborate, meaning that people should interact with wildlife in a controlled setting so that they can have positive attitudes towards them. Researchers recommend that this form of education should begin in the early stages of education since children are known to impact their parents' way of thinking. This early onset of conservation education ensures that both the current and future generations of communities interacting with wildlife have positive attitudes towards them (Arumugam, Shohaim, & Annav, 2019). From the findings of the study, the researcher concludes that the education system in the region is not optimized for women and girls which might affect the rate at which conservation measures are implemented.

4.1.5 Nature of employment

The study enquired about occupations held by the respondents since this directly correlates to assigned gender roles within the home. The standard deviation is 20.45238 with a kurtosis of -1.70 and a skewness of 0.36 which means the distribution is close to normal. This means that the data collected was close to a normal distribution with few outliers. The following figure outlines the distribution of occupations per town based on gender.

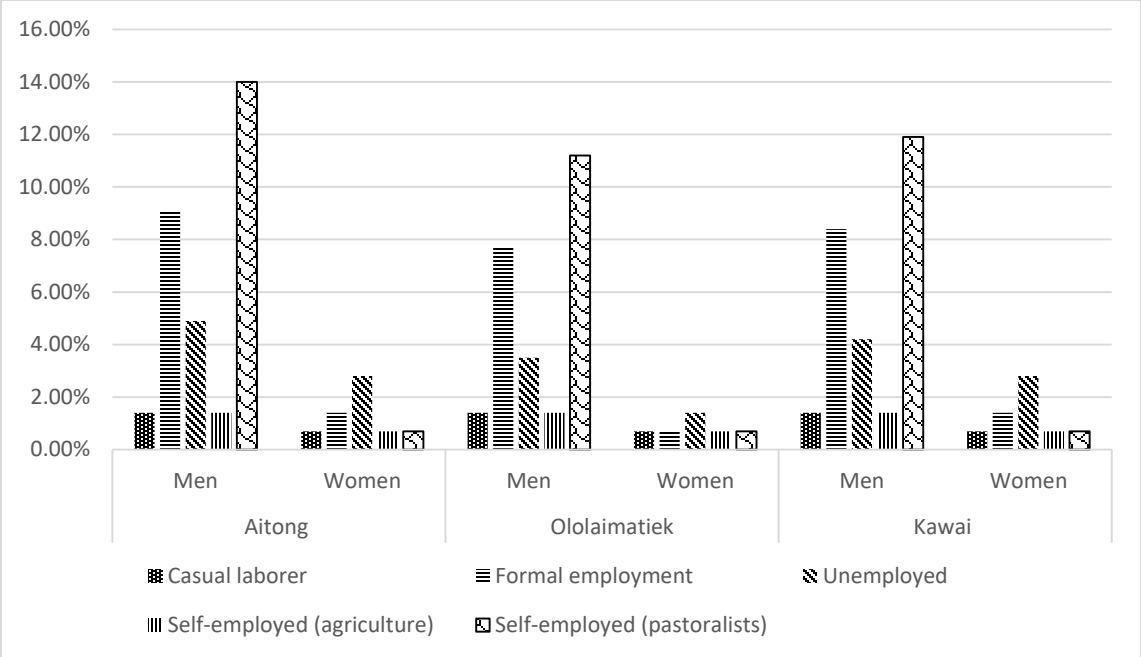

Figure 4.5 Respondents' Occupations per Town

Men were more dominant in all forms of employment statuses, with a majority of them being self-employed as pastoralists (37.1%). Women ranked pretty high in the unemployed category since it was the highest-ranked employment status among them (6.8%). Most of the women stated that they contributed to their homes as home-keepers and this prevented them from joining the workforce. In Kenya, men are more dominant in all employment sectors and earn about 32% more than women (Nyaga, 2010). Recent research has shown the direct correlation between the economy, employment and conservation. This is because of the following aspects of work that are influenced by the environment. They include:

1. Most jobs in a lot of sectors directly rely on natural resources.
2. A lot of jobs rely on ecosystem services (these are services that most ecosystems avail to most industries free of charge). As of 2014, about 40% of the world's employed people were in industries that heavily rely on natural resources. In Africa, the percentage is as high as 59%.
3. The accomplishment of jobs and the quality of work directly rely on the absence of environmental hazards like floods, storms, and drought and the maintenance of proper environmental conditions.

4. The increased risks of environmental hazards affecting women and vulnerable workers (e.g. farmers and those employed in the informal sector) more, therefore such situations exacerbate and perpetuate inequality. Differences in gender dynamics increase the vulnerability of women to environmental hazards and risks because women have less access to resources, unlike their male counterparts which makes it hard for them to adapt and recover from the effects of HWC. This is because most women are employed in informal sectors or are completely unemployed (Montt & Fraga, 2018).

From the findings, the study concludes that women were dependent on men for economic security. This, therefore, indicates that the need for men to provide and protect is high. This need more often than not perpetuates the patriarchal structures that make men act negatively towards conservation efforts.

Plate 4.1 The Milk Market in Aitong

4.1.6 Level of income

The research sought to find out about the level of income since as previously discussed one's level of income directly correlates to how they view natural resources around them. The higher the level of income the more likely people are to take up conservation efforts (Bechtel, 2010). The modal class is those earning 5000 and below who made up 24.5% of the total respondents. The mean monthly income was Ksh.12634.23 and the standard deviation was 7947.172 with a kurtosis of 0.77 and a skewness of -0.66. The distribution

of income was not normal and had a couple of outliers. Wealth levels affect the level of vulnerability that communities feel towards HWC which also affects the amount of hostility that is targeted towards wildlife (Dickman, 2010). Narok County has a poverty index of 41% and about 344,000 people are living in poverty, this is an indicator that poverty is a major issue in the region (The Maasai Mara Science and Development Initiative, 2015).

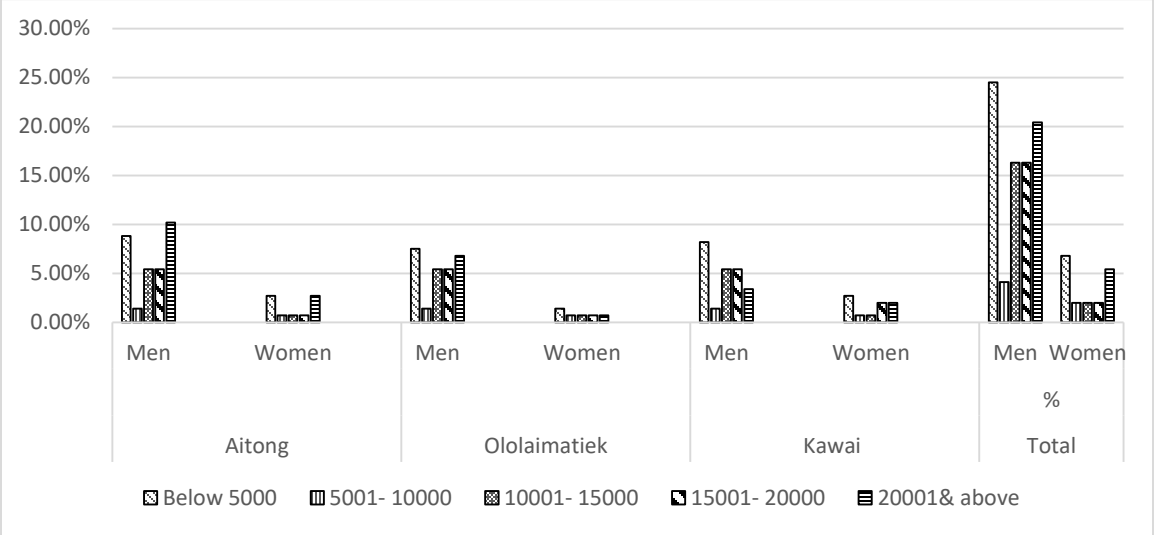

Figure 4.6 Level of Income the Respondents per Town

The research indicated that in every category more men earned more than women, this implies that males are more likely to be breadwinners and that women are more immersed in poverty than their male counterparts.

4.2 Examining Gender Dynamics That Affect HWCs in the Mara

The objective sought to identify measurable units of gender dynamics that affect HWC in the Mara. For the research to manage this, the following questions were put forth:

1. How likely are you to experience HWC in this area? - This was to get an unbiased view of which gender experiences more HWC based on the location they are in.
2. How severe is the HWC in your area? - This was an attempt to gauge what the genders viewed as severe and link it to their locations.
3. Describe your role in the household, is your role affected by HWC and how is it affected? - This question was asked so that the research could draw clear lines between assigned gender roles to the HWC pandemic.

4. Are women or men more affected by HWC or is it the same and why? - This question was used to monitor perceptions on which gender was more affected by HWC and compare them with proven facts which would help in creating conservation measures.
5. Who retaliates after an animal attack and what forms of retaliation are used? - This question was used to harness local knowledge on who, why and through which means was HWC continually propagated hence, help in creating conservation measures.

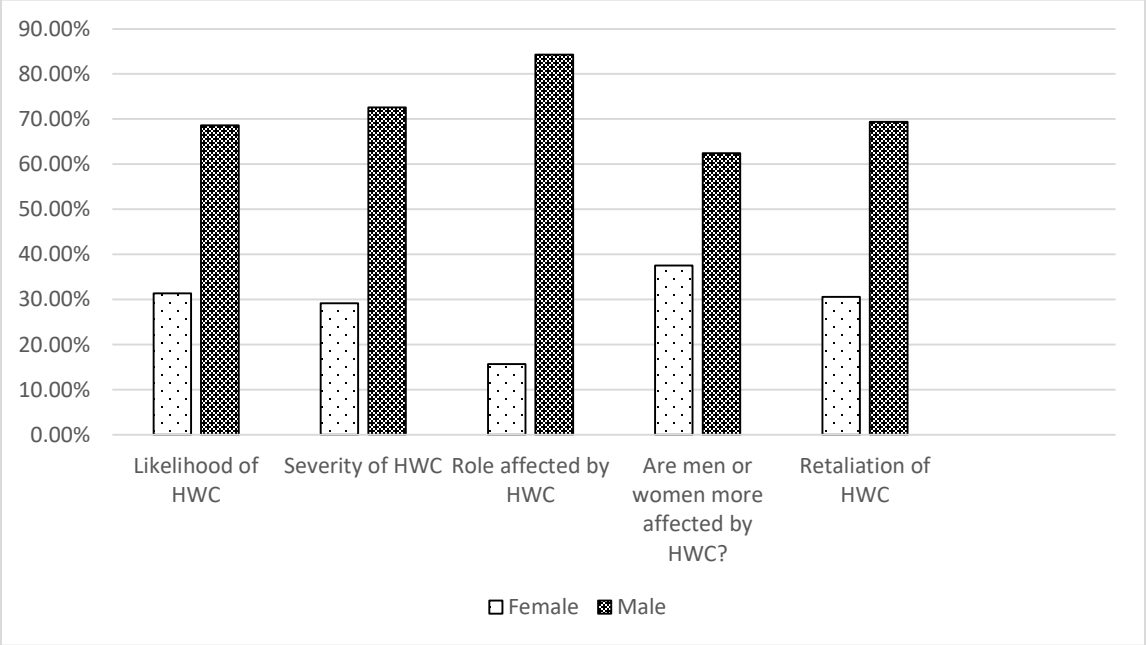

Figure 4.7 Gender Dynamics Related to HWC

These questions helped elaborate on the theoretical framework tenet on in-group loyalty since these questions addressed the issue of how the two social groups (men and women) perceived risk and vulnerability based on their social obligations that are affected by HWC. Furthermore, these questions were in line with the conceptual framework that advised looking into roles and statuses assigned to the genders to determine how they are affected by HWC.

4.2.1 Perceptions of Vulnerability and Risk to HWC

According to figure 4.7 men are perceived to be more vulnerable and at risk of encountering HWC than women. This is because most are assigned the role of herding, unlike women

who do not venture out of the home a lot. Men were also the ones who retaliated to most wildlife attacks and hence were seen to be more at risk of being injured when embarking on retaliation missions. The women who felt more susceptible to HWC were either livestock owners, farmers or mothers who were afraid for their children. As women in the community are engaging in more diverse economic activities and owning more livestock perceptions of risk and vulnerability will change more. The research concluded that the findings were in line with the principle of In-group loyalty that was stated in the theoretical framework. This conclusion is in line with research that indicates that women in other pastoralist communities have a greater work burden because they have had to diversify their economic activities to reduce their vulnerability to poverty because of how climate change has negatively affected livestock production. Some communities in Ghana and Ethiopia were more aware of the hidden vulnerabilities like increased work for women, economic overdependence on men and the lack of social safety nets for women, this was not the case among the women in this sample group (World Bank, 2012). The Maasai community is considered to be extremely patriarchal and provides minimal opportunities for women to diversify their income sources or make community decisions and this makes them more vulnerable when faced with precarious situations (Ndege & Gichuki, 2017). Based on the data illustrated in figure 4.7 the research concluded that the sample group only perceived direct vulnerabilities as real vulnerabilities. The sample group did not understand that despite men constantly being at risk of experiencing injury or death from HWC, they are less vulnerable because they have more income and have better-coping strategies than their female counterparts (Dickman, 2010). The research concludes that household activities, occupations and level of income affect perceptions of vulnerability. However, hidden vulnerabilities have to be discussed more openly to change risk perceptions which may ultimately change the way conservation efforts are addressed.

4.2.2 Roles Affected by HWC

According to the data, 8.42% of the respondents said that adult women guarded their homesteads while 87.62% said that adult men guarded their homesteads and 3.96% said that a person of any gender could guard their homestead. Out of the 15.71% of women who stated that their household roles were affected by HWC most of them indicated that they owned cattle that were preyed on by predators in the region, their crops were ruined and

the rest stated that the animals attacking their children was a way that their roles were affected by HWC. Out of the 84.29% of men who stated that their roles were affected by HWC, a majority of them stated that this was because they lost income due to loss of livestock, reduced grazing land (they felt like after every attack more land was allocated to the wildlife) and personal injuries. A majority of the respondents did not use the predator-proofing that is recommended by MMWCA and used conventional fencing methods like wire fences which can be ineffective because some animals can climb through (Manoa, 2015). In Bhutan, women view an increased influence of environmental factors on their household roles like child-bearing, child-rearing, heading the household when the men are away, farming, and labour-intensive housework (Choden, 2017). The research concluded that gendered household roles were affected by HWC. However, the extent of the effects differed based on how these two genders perceived vulnerability based on their social obligations. This is illustrated when women add child care to why they consider their roles to be affected by HWC and men mostly stating factors that affect their ability to provide for their families.

4.3 Examining the Conservation Measures that Address HWCs in the Mara.

This objective sought to identify existing conservation methods already in use within the Mara and try to gauge their efficacy. For the research to manage this, the following questions were put forth:

1. How much do you lose to HWC per year?
2. Agricultural occupation in relation to frequencies with HWC- (Number of cattle/ crops and frequency of attacks)- This question tries to link agricultural occupations to gender and HWC to generate a baseline from which conservation measures should be targeted and why.
3. Has anyone in this household been injured or lost their life due to HWC?
4. Have you ever received any compensation for HWC, how did you apply for it and what form of compensation was issued?

These questions were used to determine monetary and human losses and how they were compensated since based on the literature review loss compensation played a huge role in conservation measures uptake (Ogra & Badola, 2008). Furthermore, these questions

reviewed whether the two genders felt that they were fairly compensated when they were affected by HWC which was a key tenet in the prescribed theoretical framework.

1. What is your attitude towards the Mara Conservancy and the wildlife conservation efforts in the area and why?
2. Do you know where the boundary of the Mara Conservancy is located and have you let your animals graze past it?
3. Have you ever hunted for wildlife?
4. What are the roles of men and women towards the conservation of the Mara?
5. Which organizations fund the conservation process?

These questions determined whether the locals had adequate knowledge of conservation measures, their roles in the process and their attitudes towards conservation. These questions were in line with the principles of care and purity in the MFT in that they assessed how the two genders avoided harm while encouraging care and how much the genders tried to uphold conservation measures. Moreover, all the questions in this section conformed to the conceptual framework by addressing the principle of access and control of resources since the questions evaluated how access to resources and control over them affected the two genders' ability to participate in conservation efforts.

4.3.1 Agricultural Occupation in Relation to HWC Frequencies

Key informants and the sample population all stated that elephants, lions, hyenas, wild dogs, and wildebeests were the most common causes of HWC in the conservancies. They cause damage in the form of crop raiding, attack on humans, livestock predation and property damage. These attacks mostly occur in the dry seasons between July and September due to scarcity of food for wildlife, humans and livestock. In the Mara North Conservancy (MNC) attacks were also attributed to a lack of adherence to grazing schedules. The MNC has a grazing schedule that guides grazers on how to co-exist with wildlife and minimize HWC. According to KNCS (Kenya National Compensation Scheme) crop raiding is not considered common and compensation claims are not reported from that region (Joseph, Joseph, Erustus, & Eivin, 2019). From the findings, the study concluded that pastoralism was the agricultural occupation that was mostly affected by HWC. This translated into men feeling vulnerable to HWC because they were mainly

engaged in this activity and women feeling vulnerable because more male children actually participated in this activity. The following plate illustrates how wildlife and cattle can co-exist when resources are abundant.

Plate 4.2 Cattle and Wildlife Grazing Together

4.3.2 Monetary Losses to HWC

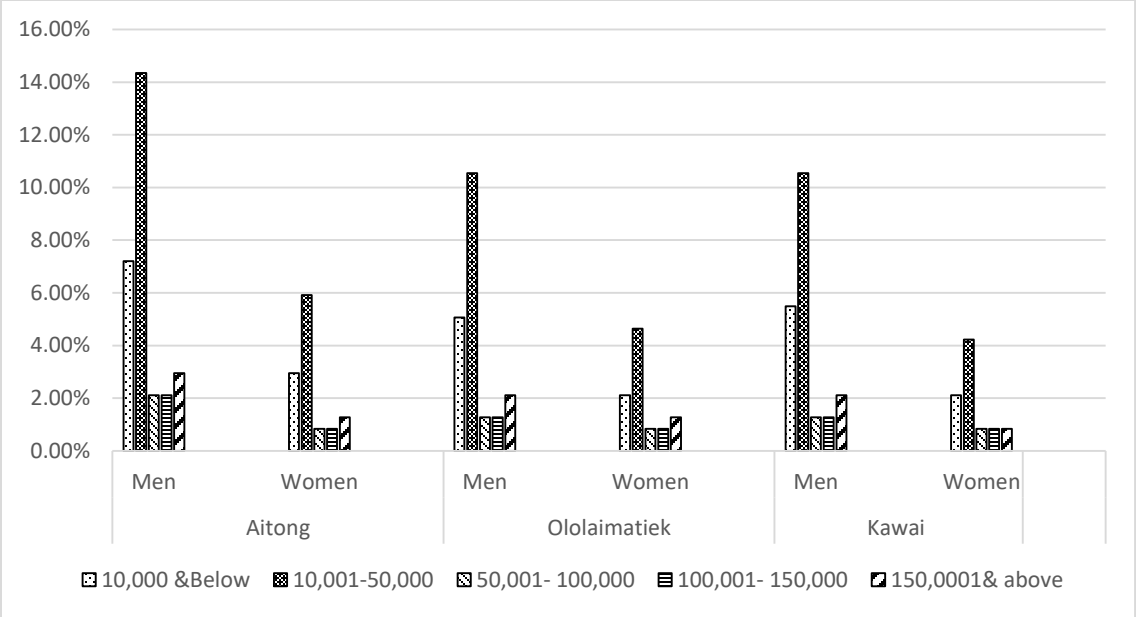

Figure 4.8 Monetary Losses to HWC in the Mara per Year

A majority of the losses incurred were by the men at 69.5%. 50.2% of the sample population who have experienced HWC have lost about 10,001-50,000 per year. 10,001-50,000 per year is high in this area considering the average annual income of the sample population is Kshs. 151,610.76 which is about a third of their annual income. A survey done in the United Kingdom indicated that farmers lost about 500 Euros per annum from HWC and it is estimated that globally about $961 are lost per hectare due to HWC (Wild Alive, 2021). The global average in monetary losses is almost equivalent to the average annual income of the sample group. This indicates that monetary losses are an important factor in the HWC discussion. Losses incurred are not only in terms of predation and crop damage the amount of money spent to guard livestock and farms also cuts into the community's profits. In Namibia, about $22 is spent on purchasing ammunition annually and in Botswana, about four herders are employed at a cost of $30 monthly to help protect homesteads from wildlife (Abudulghafur, 2013). The data available in the Mara on monetary losses need to be fleshed out with discussions into the amount of money lost by gender per hectare and how much locals spend on guarding their farms and what implements they use to guard their farms. Furthermore, from the data, the researcher concluded that HWC leads to the sample population losing approximately a third of their

income which then translates to men in this population being psychologically affected due to them having the role of provider in this culture.

4.3.3 Injuries Suffered due to HWC

About 34.5% of the sample population have had family members injured or killed by wildlife. Within Kenya between 2006 and 2017, based on the compensation claims filed to the Kenya National Compensation Scheme (KNCS) 43.1% of the claims were about human fatalities and 76.9% of the claims were about human injuries. From the KNCS database, Narok county ranks 4th in human fatalities caused by HWC and 2nd in animal predation among Kenya's 47 Counties (Joseph et al., 2019). This led the researcher to conclude that HWC was rampant in the Mara and better mitigation measures must be put in place to alleviate the situation. The researcher also noted that the genders and ages of those affected should be indicated when such data is collected to give a better picture of the distribution of the issue.

4.3.4 Compensation for Losses or Injuries Caused by HWC

Approximately 37.9% of the sample population have been compensated financially for losses or injuries incurred due to HWC. 45.5% of the compensated individuals were women while 54.5% were male and 60% of the compensated women were married while 83.3% of the compensated men were single. All the compensated females and males were pastoralists. Only pastoralists knew how to report cases of losses to the authorities, this might explain the low compensation rates amongst crop farmers a majority of which are female. A majority of them said that they received compensation from the Mara North Conservancy (MNC) and very few from KNCS. This is because the MNC has an elaborate system that is well-known among its residents in that particular conservancy. The system is based on a compensation program that is funded by the lease payment by landowners and tourist camps in MNC. Landowners who incur losses or injuries are compensated but not for the full value of the loss or injury incurred.

Table 4.1 Mara North Conservancy Compensation per Animal

Animal	Monetary Compensation
Bull, steer and cow	Kshs. 10,000
Billy goat, nanny goat, ram and ewe	Kshs. 2,000

However, for a landowner to be entitled to compensation their boma (homestead) has to have met the following standards:

1) Well-fenced;

2) Not located on conservancy non-grazing zones; and

3) Photo documented (both enclosure structure and the remaining livestock).

For depredation events outside bomas (during grazing or herding movement) the following are the stipulated standards:

1) Be attacked in non-grazing zones,

2) The landowner is a paying member of the MNC,

3) The responsible herder must be a minimum of 14 years of age

4) The incidence must occur between 6 am and 6 pm,

5) The herder must wear traditional Maasai attire while herding, and

6) The carcass that justifies compensation becomes MNC property.

If a herder is caught with a herd inside non-grazing zones they will be fined Kshs.10, 000. Currently, there are 2 rangers tasked with investigating claims. The incident report has the following components: The name of the livestock owner, the recording officer, date of incidence, MNC parcel no, sector name, GPS location, mortalities of livestock (sheep, goats and cows), and the involved predator species (Munk, 2016). The MNC estimates that it issues compensation worth 2 million per year since 2013. It should be noted that their compensation method is not channelled to crop farmers who are majorly women. Hence the compensation scheme may be slightly biased against one group of people. Another bias against women is the fact that for you to be eligible for compensation you must be a paying land owner, as of 2018 out of the total 14,528 land owners who were part of the MMWCA only 223 were female (Maasai Mara Wildlife Conservancies Association, 2019). That means that only 1.53% of the whole conservation is female-owned, this translates to very few women participating in conservation efforts or receiving compensation for incurred losses. Research has shown that access to secure land tenure for both men and women allows for better conservation strategies for communities. Secured land tenure especially

for women allows for improved conservation strategies uptake and implementation (Ding et al., 2016; Hurlbert & Krishnaswamy, 2019). Globally women make up only about 13.8% of landowners (International Union for Conservation of Nature, 2020). Female landownership is generally low but the region's rate is even lower.

The rest of the conservancies depend on KNCS to compensate them. Compensations by the KNCS are in accordance with Section 25 of the Wildlife Conservation and Management Act (WCMA, 2013). However, their compensation schemes cover a wider range of mishaps from personal injury, death, damage to property and crops or livestock predation. The scheme requires every county to have a Community Wildlife Conservation Committee (CWCC) that investigates the claims and decides on whether one qualifies to be compensated or not, after which the Ministerial Wildlife Conservation Committee (MWCC) makes the payout. Since the WCMA, 2013 was enacted the Kenyan Ministry of Tourism and Wildlife has paid out Kshs. 1,201,350,000 as follows:

Table 4.2 Payouts per Financial Year

Financial Year	**Payout**
2014/15	147 million
2015/16	235 million
2016/17	230 million
2017/18	150 million
2018/19	439 million

Source: (Kenya Wildlife Service, 2019)**.**

So far the Reports on Human Injury, Crop Damage, Livestock Predation and Property Destruction as compiled by the MWCC were arrived at after examining 13,125 compensation claims for the period 2014 to 2017. The compensation claims distribution is as follows:

Table 4.3 Compensation Claims Distribution

Type of compensation claims	**Number of compensation claims per type of claim**
Human death	452
Human injury	4,555
Crop damages	5,073
Livestock predation	3,012
Property destruction	33

Source: (Kenya Wildlife Service, 2019)**.**

Unfortunately, this data is not segregated by location and gender.

The following is an analysis of compensation schemes in other countries:

Table4.4 Global HWC Compensation Schemes

Country	What does the scheme cover?	Is the scheme active?	Details about the scheme
Namibia	Livestock loss, damage to crops and human death or injury	Yes	In 2003 Namibia implemented the Human Animal Conflict Self-Insurance Scheme (HACSIS) which was a conglomeration of community-based organizations (CBOs) meaning that the members of the CBOs made direct contributions to the scheme for the pay-outs. In 2010 HACSIS morphed into Human Wildlife Self Reliance Scheme. Apart from members of the CBOs the scheme also gets funding from trophy-hunting concessions and external donors. Payments made under this scheme only partially offset HWC losses. The scheme does not cover private land, National Parks and has other prerequisites like reasonable behaviour to adopt preventative measures. Payments made under this scheme are not viewed as compensation. Currently, the Namibian government is reviewing the scheme to incorporate a professional insurance company. The Ministry of the Environment and Tourism monitors the scheme. The scheme has fixed payout amounts depending on the type of loss. The payouts range from 250-100,000 Namibian dollars. the rate of pay-outs

			made in comparison to the total claims made is currently unknown (Wilson-holt & Steele, 2019).
Canada	Livestock loss and crop damage	Yes	In Canada compensation is done via the provincial agricultural service or insurance corporations. Provinces compensate farmers without them having to pay premiums. Farmers are at liberty to take out private insurance against their crops and livestock. The organizations that are in charge of compensation include the Provincial Agricultural Service and insurance corporations. The payouts range from 80-100% if the claim is verified and less than that if the damage is considered probable but not verified. All payouts are made only when it is established that reasonable preventative measures were applied. Provincial compensation methods are completely government-sponsored (Wilson-holt & Steele, 2019).

Considering that other countries had a compensation scheme that required contributions from the affected parties, the researcher thought that this would be a viable system. However, this may be an issue considering that the residents of the Mara are not as wealthy as those in Canada. The researcher also concludes that the current means of compensation should use more inclusive means of identification of damage that might not limit women who have no land tenure.

4.3.5 Knowledge of Conservation Measures, Roles in the Conservation Process and Attitudes towards Conservation

About 96.6% of the sample population claimed to know where Mara conservancy boundaries were located and 41.4% of the sample population still let their herds graze within the conservancies. 75.9% of the sample population had a positive attitude towards current conservation efforts because of the socio-economic benefits that conservation efforts availed to them like employment, land leasing fees (this method was especially common since it is viewed as a method of earning passive income and the lease renewal and enlisting rates have been high), compensation schemes, research on HWC deterrence (the MMWCA has partnered with other organizations to create an app that helps collect data on certain elements that pertain to HWC, the app is known as WILD APP. The USAID provided conservancy managers with smartphones to enable them to collect data on HWC and upload them to a SMART system that enables them to make decisions on how to advise the residents of the conservancies and create a baseline database from which further research can be conducted. These methods only cover the conservancy managers, data needs to be sourced from the people and the rates at which the community in general avails data to managers were not recorded by KWS or the MMWCA. This indicates a need for a unified data management system that allows for direct community input) and livestock breeding (the MMWCA has established breeding and fattening herds in MNC and Naboisho Conservancy). Although the scheme requires a lot of funding which is currently an issue), and educational bursaries (Maasai Mara Conservancies Association, 2019; Maasai Mara Wildlife Conservancies Association, 2019). It should be noted that technological advancements in environmental conservation are usually targeted towards men in the hopes that the benefits will trickle down to women. However, this approach has not been effective since the trickledown is slow (World Wildlife Fund United Kingdom, 2012). In this case, it is evident since the organizations in the area noted that men were the predominant users of the technological approaches for conservation that they have used so far. 90% of the sample population stated that they perceived there to be economic benefits to conserving wildlife. 41.4% of the sample population claimed to have partaken in hunting activities, out of this 16.7% were female and 83.3% were male. Those who hunted stated that they did so in dry seasons, they mainly hunted gazelles and antelopes. They however

did not consume the wildlife due to cultural reasons but sold them to others for trophies and meat. Both genders equated their roles to conservation based on owning land and then leasing the land to conservancies and leadership roles for better decision-making. Traditionally land ownership and leadership roles have been a male role in the Maasai community but MMWCA has tried to change this by training 140 conservancies' female leadership, supporting over 5000 female self-help groups in conjunction with the National Government Affirmative Action Fund-Narok County, and creating a gender sensitization trainings within the conservancies (Maasai Mara Conservancies Association, 2019). From the findings, the study concludes that the knowledge of conservation efforts and benefits is quite high in the region. However, when their ability to provide for their families is affected both genders reverted to negative habits. With men partaking in hunting more than women. This again reiterates the need to topple patriarchal structures that put pressure on men to solely provide and diversify household incomes by redistributing gender roles. Furthermore, the redistribution of gender roles will allow women to hold more leadership positions without being coerced by affirmative action policies/laws. Globally less than 25% of parliamentarians are female and women only hold about 12% of environmental ministerial and local leadership roles worldwide (International Union for Conservation of Nature, 2020). This indicates that the Mara is moving in the right direction but more needs to be done for the equitable management of the wildlife resources in the area. The MMWCA, MNC and USAID were the most common conservation agencies that the sample population were familiar with. Generally, women do not have access to technology and information which limits their ability to adapt to environmental challenges (Choden, 2017). The study's findings concurred with the latter sentiment and concluded that with the redistribution of gender roles that relate to earning capabilities, more women will be able to purchase devices that will allow them access to information that will improve their ability to adapt to environmental challenges.

4.4 Assessing Whether Gender Dynamics are Relevant to the Conservation of the Mara.

To assess whether gender dynamics are relevant to the conservation of the Mara a chi-square analysis was conducted on the likelihood to encounter HWC, the severity of HWC

and if one's gender roles are affected by HWC to draw relations between gender dynamics and HWC.

Table 4.5 Chi-Square Analysis

	Female			**Male**			**Total**
	Actual	**Null-Hypothesis**	**Deviation**	**Actual**	**Null-Hypothesis**	**Deviation**	
Likelihood	37	29.26146	2.046551	81	88.73854	0.674848	118
Severity	33	28.02156	0.884491	80	84.97844	0.29166	113
Actual affected role	22	34.71698	4.658285	118	105.283	1.536065	140
Total	92	92		279	279		371

Chi-square: $\chi^2 = \sum (O_i - E_i)^2/E_i$, where O_i is the observed value and E_i is the expected value.

Level of significance=0.05

χ^2=10.0919

P-value: =0.006435

Since the P-value is less than 0.05 (which is an agreed significance level) we reject the null hypothesis hence the research concluded that there is a relationship between gender dynamics and HWC. From this conclusion and the variables that were tested in the calculation, the research went further to identify which gender dynamics from the presented findings are relevant to the conservation of the Mara. They included:

1. Agricultural occupation; this is because depending on agricultural occupation men and women in the sample group described their levels of risk, vulnerability and losses caused by HWC being different. This was illustrated by the fact that 84.29% of the men (37.1%) stated that their roles were affected by HWC and a majority of them were pastoralists.

2. Income loss and injuries; this is because based on household activities men and women in the sample group described their likelihood and severity of a negative encounter with wildlife which affected their risk levels and vulnerability status.

3. Household duties; as previously stated household roles determined by gender directly relate to the likelihood and severity of having a negative experience with wildlife which in turn affects the risk levels and vulnerability status of the sample group.

4. Land ownership; since land ownership affects compensation methods and decision-making within the conservancies. It is a key component of how conservation decisions are made within the area. Land in the area is distributed based on gender dynamics that are governed by communal cultural beliefs which makes it relevant to this discussion

5. Marital status; for women in this community marital status affects their roles in the community, specifically when it comes to decision-making. This affects their risk and vulnerability status which therefore determines how they recover from HWC, hence it was relevant to this discussion.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter advances an abridgement of the findings, inferences and recommendations derived from the study and as guided by the objectives. The purpose of this chapter was to develop gender-sensitive strategies that will minimize HWCs within the Mara.

5.1 Summary of Findings

Examining the gender dynamics that affect HWCs in the Mara: despite men being more affected by HWC in terms of household roles (herding), women still felt more susceptible to HWC because of their roles (maintaining the home and taking care of children). Despite this gender roles are evolving since roles are intertwining e.g. women owning more land and participating in herding activities. The study, therefore, concluded that household activities, occupation and levels of income affected how both genders rated their vulnerability to HWC. Additionally, the research indicated that reproductive work mainly affected how severely women rated HWC, while productive work influenced how men viewed HWC.

Examining the conservation measures that are addressing HWCs in the Mara: the Mara conservancies have been very innovative with conservation measures that include: predator proofing bomas (although the uptake has been low), compensation schemes (although reporting methods are hindered by the lack of a database, the fact that the system is biased against women and issues with technology to facilitate the reporting process), grazing schedules (although adherence is limited), leasing scheme (uptake and renewal has been quite high) and breeding schemes (although it is expensive and requires more funds and commitment to facilitate). The study, therefore, concluded that agricultural occupations, income loss, injuries suffered and compensation schemes affect how locals viewed conservation measures. Additionally, they affected the baseline data required for creating an HWC-conscious gender-based data system.

Assessing whether gender dynamics influence the conservation of the Mara: a chi-square analysis was conducted on three variables (likelihood to be affected by HWC,

severity of HWC and roles affected by HWC) and it was concluded that there is a relationship between these gender dynamics and HWC. The main gender dynamics that were found to be relevant to conservation measures were: agricultural occupation, income loss and injuries, household duties, land ownership and marital status. The agricultural occupation was identified because the study noted a discrepancy in compensation measures between crop farmers and pastoralists especially because a majority of women practised farming as opposed to their male counterparts who majorly participated in pastoralism being constantly compensated. Loss of income was identified because men being more culturally respected can report more cases of HWC and since most of the land is registered in their names they can register for compensation, unlike their female counterparts who with limited income cannot directly report HWC cases and cannot get compensation since they lack proper documentation. This reduces the actual number of HWC cases reported generally and undermines the compensation schemes. Household duties were identified because the direct impact of HWC was impacted by these roles e.g. herding, and guarding the bomas at night which caused direct injuries and death to men, unlike female roles that are rarely directly affected. Land ownership was identified since as previously mentioned one's ability to apply for compensation or to get income from leasing land and participating in conservation measures are directly correlated to owning land which women own less of thus affecting their ability to effectively participate in existing conservation measures. Marital status was included because it was noted that married women were treated differently from single women since they were deemed to be an extension of their husbands and were more likely to participate in more conservation activities.

5.2 Conclusions

The findings of this research have led to the conclusion that there is a need to disaggregate HWC data based on gender to better cater to the issues affecting both genders that are different. The literature discussed in this research has illustrated the impact of cultural household relations between men and women affecting HWC which has been reiterated by the study's findings. These cultural dynamics affect how men and women approach conservation efforts and they include agricultural occupation (it affected how both genders rated the likelihood to encounter HWC and roles affected by HWC), income loss and injuries suffered (it influenced how both genders rated the likelihood and severity of a

negative encounter with wildlife which affected their risk levels and vulnerability status), household duties (this affected how men and women in the study rated risk and vulnerability based on how their assigned roles were impacted by HWC), land ownership (since land ownership affects compensation methods and decision-making within the conservancies), marital status (for women in this community marital status affects their roles in the community, specifically when it comes to decision-making. This further affects how women rate their risk and vulnerability when faced with wildlife conflicts). Therefore, the conclusion is that there is a need to strategically place gender mainstreaming into the wildlife conservation discourse by availing more gender-disaggregated data.

5.3 Recommendations

Emanating from the findings of the research, the following exhortations were put forth so that they can alleviate the HWC phenomenon through the lens of the outlined gender dynamics. The recommendations were also founded on the MFT which looks into authority, care, fairness, loyalty and purity considerations within communal structures that translate into the creation of effective conservation strategies. Hence, the recommendations were derived from the discussed causal chain amongst human value systems towards wildlife, human responses, HWC, and conservation measures.

1. **The Examination of Gender Dynamics that Affect HWCs in the Mara**

The main gender dynamics that were found to be relevant to conservation measures were: agricultural occupation, income loss and injuries, household duties, land ownership and marital status. The following are the recommendations based on these gender dynamics:

- **Repellents:** these are mechanisms that keep wildlife a safe distance from farms, homes and schools. Villages in Africa have two natural repellents which include bees and hot peppers. These methods are especially effective when dealing with elephants who dislike the chemical capsaicin which is found in chilli peppers, and are terrified of bees. Farmers in Tanzania are smothering a mixture of oil and chilli peppers on their fences to keep elephants away (McCarthy, 2015). Both methods are viable in Narok although livestock and farmers should be aware of hive locations to avoid injuries by stinging (Kasisi & Carroll, 2015). Another similar tactic is planting fruit trees with vibrant colours that are specifically meant for primates to eat and these trees distract them from

invading homes and causing crop damage. In some cases, the use of these trees has allowed tourists to view primates eating fruits which has caused a tourism boom, although this method has to be limited since wildlife populations might overgrow the ecosystem's capacity to maintain them (Hill, 2018). Repellents would be especially helpful to women whose roles are centred on their homes and their children and keeping them safe through these methods would greatly reduce their vulnerability to HWC.

- **Disguise:** in India villagers had noticed that tigers are most likely to attack their prey from behind and they started wearing masks on the back of their heads to prevent attacks. Within three years, no attacks were reported amongst villagers wearing masks, while 29 villagers who were unmasked experienced attacks over the same period. Unfortunately, the effectiveness of this method decreases as the wildlife becomes used to the disguise (McCarthy, 2015). In the Mara, this method can be used by pastoralists and school-going children in the dry months where HWC are more common. This method would be useful to both genders. For the men, it would reduce their risk of HWC as they go herding since it is their assigned gender role. For the women, it would reduce their vulnerability since their household role includes taking care of the children, and this method will reduce the risk of HWC for the school-going children.
- **Airbnb manyattas:** HWC affects the Mara due to income loss which affects their livelihoods and their views on conservation efforts. Ecotourism can be a means of giving wildlife monetary value while alleviating the residents' monetary concerns. Currently, the Mara ecotourism is managed by large corporations and the common person only earns from this via leasing their land to these corporations or working for them. This can evolve since Airbnb has allowed tourism to be decentralized to commoners. Mara residents can take this up and offer tourists a unique native experience while getting direct income that is not dependent on other entities and allows them to appreciate conservation measures since it will directly affect them. This method would be especially useful to women since it would diversify their sources of income and reduce the vulnerability caused by the effects of HWC.
- **Performance payments:** these are payments made to residents of the conservancies based on the abundance of wildlife in the area (Nyhus, 2016). This means that residents of the conservancy can keep wildlife during particular seasons and release them back

in the wild later on and get paid for it. This method will require training on how to keep the wildlife, certification and a baseline database that can assess progress made and provide information on how payments should be made. This method would be useful to men since it would diversify their income and provide them with direct interactions with wildlife which will improve their perception of conservation. The KWS, National Government, County Government and MMWCA would be the most likely institutions that would enable the implementation of this recommendation. These bodies would have to suggest which animals would be legible and create policies that would allow for such a plan. Furthermore, these institutions would have to create performance measurement criteria that would articulate the payment structures.

- **Communal farming:** small scattered crop farming is more susceptible to wildlife attacks and the farmers face the burden of the loss alone. This is opposite to large-scale joint farming which allows farmers to put up a joint effort and distribute the burden (Muruthi, 2005). In this case, a land swap would be appropriate whereby those with land closer to HWC-prone areas can lease their land to the conservancy and share the land with those further away and all can share farming and leasing proceeds accordingly. This method would be useful to both genders since it will increase their production ability, therefore, increasing their ability to earn income. This method is especially important because poverty is among the main issues hindering most conservation strategies.
- **Rainwater harvesting for wildlife:** this is the harvesting of runoff or surface water for wildlife to use to avoid scarcity of water making them trespass into human settlements. Using GIS and Multiple Criteria Decision Making (MCDM) techniques the Mara can find suitable locations for wildlife water harvesting sites based: on slope gradient, elevation, evaporation, distance to roads, distance to watering points, distance to guarding posts, distribution of water scarcity, precipitation, and wildlife distribution. This method requires pastoralists to avoid wildlife-designated watering holes to avoid disease transmission and HWC that may endanger livestock, wildlife and humans (Shalamzari & Khalighi, 2018). This method would be especially useful to the men who usually engage in herding activities. The MMWCA, Narok County Government

and the KWS should create segregated wildlife and cattle-designated watering holes and educate the residents on them and ensure that their use is as prescribed.

- **Provision of school children to and from school**: this entails providing public means of transport for school-going children that will enable them to avoid HWC incidents. This method will be useful to women whose household duties involve taking care of children.

2. Examining the Conservation Measures that Address HWCs in the Mara.

The MMWCA, KWS and other key stakeholders have set up a couple of conservation measures that include the following:

- **Barriers and exclusionary methods:** these can include: trip wires that trigger alarms that scare wildlife, wake residents and signal rangers to come and help out. Vegetative barriers include unpalatable crops like sisal, chilli, tea, ginger, and oilseed. For these crops to be introduced extensive research has to be conducted on how they will affect the ecosystem (FAO, 2008). Unnatural barriers like electric fences and barbed wires are not recommended due to their ability to lethally harm both humans and wildlife. Currently, the MMWCA is creating predator-proof bomas using recycled plastic. The KWS and the Narok County Government should join in the creation of predator-proof bomas by educating the public and how to do it using vegetation or providing funding to the MMWCA to increase its efforts.
- **Data management systems:** in the Western Ghats, India elephant tracking collars are embedded with sim cards that text any person near their proximity warning them of elephants being in the area. This caused human deaths via elephant attacks to drop by 50%, unlike before whereby 75% of elephant attacks were attributed to a lack of knowledge of elephant movements (McCarthy, 2015). This method could be viable in the Mara although it could be very expensive and would need to be modified for other wildlife. Tracking collars, tracking chips and Geographical Information Systems (GIS) software can be used to track hotspots which can help identify places where HWCs are likely to occur. This data can be disaggregated by gender so that rangers can know how to proactively tackle different hotspots. An extensive database will also need to be incorporated and telecommunication

companies will be needed to facilitate this endeavour so that they can facilitate communication while still preserving the ecosystem. This method will also require both men and women to have access to phones so that it can be effective. All these activities require constant electric connections, solar panels would be best to power these activities since most are portable and they have minimal ecosystem changes, unlike electrical lines. These data management systems should also include climatic patterns that affect animal movement and pasture availability to avoid hazardous grazing patterns due to climate change. This method would require the KWS, Narok County Government and the MMWCA to combine efforts and create the database with all its required infrastructure.

- **Compensation schemes:** avail compensation schemes for crops and trees so that the compensation set-up becomes more inclusive for women in the area. Information on how farmers can apply for compensation from KNCS should be more distributed and disaggregated by gender. This allows for both crop farmers and pastoralists in the area to have positive attitudes towards conservation and for better gender-based methods of conservation can be devised. The KWS, KNCS, MMWCA and the Narok County Government can help with the implementation of this recommendation by changing compensation policies and conducting public education exercises on existing compensation schemes.

5.4 Suggestions for Further Research

The study recommends further research on, 'The participation of boys and girls in wildlife conservation in Kenya.' HWC affects children and their genders affect the way they interact with wildlife. There needs to be a study that elaborates on how children can help in conservation since they form the next generation of communities interacting with wildlife.

REFERENCES

Abudulghafur, F. (2013). *Influence of Kenya wildlife conservation education program on reducing human wildlife-conflict.* The University of Nairobi.

Achieng, A. S. (2015). *The Role of Women in Conflict Management: An Assessment of Naboisho Conservancy in Kenya* (The University of Nairobi). https://doi.org/10.1017/CBO9781107415324.004

Almalki, S. (2016). Integrating Quantitative and Qualitative Data in Mixed Methods Research—Challenges and Benefits. *Journal of Education and Learning*, *5*(3), 288. https://doi.org/10.5539/jel.v5n3p288

Anthony, M. (2004). Gender Differences and Citizen Participation in Wildlife-related Decision-making Processes. *Society and Natural Resources*, *17*(02), 395–411. Retrieved from http://www2.dnr.cornell.edu/hdru/pubs/HDRUReport02-5.pdf

Arroyo-Quiroz, I., García-Barrios, R., Argueta-Villamar, A., Smith, R. J., & Salcido, R. P. G. (2017). Local Perspectives on Conflicts with Wildlife and Their Management in the Sierra Gorda Biosphere Reserve, Mexico. *Journal of Ethnobiology*, *37*(4), 719–742. https://doi.org/10.2993/0278-0771-37.4.719

Arumugam, K. A., Shohaim, S., & Annav, G. (2019). Evaluating the effectiveness of wildlife educational program on knowledge, attitude and awareness among three selected secondary school students in Perak, Malasyia. *International Journal of Education and Social Science Research ISSN*, *2*(June).

Bechtel, J. D. (2010). Gender, Poverty and the Conservation of Biodiversity: A Review of Issues and Opportunities. *MacArthur Foundation Conservation White Paper Series*.

Bhatia, S., Redpath, S. M., Suryawanshi, K., & Mishra, C. (2020). Beyond conflict: Exploring the spectrum of human-wildlife interactions and their underlying mechanisms. *ORYX*, *54*(5), 621–628. https://doi.org/10.1017/S003060531800159X

Birkhoff, J. E. (2021). Gender, Conflict and Conflict Resolution. Retrieved August 27, 2021, from Mediate.com website: https://www.mediate.com/articles/birkhoff.cfm

Bob, U., Perry, E., & Potgieter, C. (2010). Environmental conflicts and women's vulnerability in Africa. Retrieved August 13, 2021, from ACCORD website: https://www.accord.org.za/ajcr-issues/environmental-conflicts-and-womens-vulnerability-in-africa/

Carter, N. H., & Allendorf, T. D. (2016). Gendered perceptions of tigers in Chitwan National Park, Nepal. *Biological Conservation*, *202*, 69–77. https://doi.org/10.1016/j.biocon.2016.08.002

Choden, T. (2017). Gender Assessment: Gender Mainstreaming Analysis and Action

Plan Final. *Green Climate Fund*.

Code Academy. (2021). Hypothesis Testing: Hypothesis Testing: Testing an Association Cheatsheet | Codecademy. Retrieved August 17, 2021, from https://www.codecademy.com/learn/stats-hypothesis-testing/modules/hypothesis-testing-testing-an-association/cheatsheet

Collaborative, E., Boyer, A. E., & Granat, M. (2021). *Gender inequality , biodiversity loss , and environmental degradation*. (December), 1–53.

Conservation International. (2019). *Guidelines for Integrating Gender & Social Equity Into Conservation Programming*.

Coric, D. (2014). Ecofeminism as a way of resolving some environmental issues. *Proceedings for Social Sciences Matica Srpska, January*(148), 551–558. https://doi.org/10.2298/zmsdn1448551c

County Government of Narok. (2018). County Integrated Development Plan 2018-2022. *National Civic Review*, *71*(7), 375–378.

Cullen, A., Anderson, C. L., Biscaye, P., & Lawrence, A. (2020). *Gender-associated differences in risk attitudes and perceptions among farmers in Mali*. Wahington DC.

Dickman, A. J. (2010). *Complexities of conflict : the importance of considering social factors for effectively resolving human – wildlife conflict*. *13*(Table 1), 458–466. https://doi.org/10.1111/j.1469-1795.2010.00368.x

Ding, H., Veit, P. G., Blackman, A., Gray, E., Reytar, K., Altamirano, J. C., & Hodgdon, B. (2016). Climate benefits, tenure costs. The economic case for securing indigenous land rights in the Amazon. *World Resources Institute*, 98. Retrieved from https://www.wri.org/sites/default/files/Climate_Benefits_Tenure_Costs.pdf%0Ahttp://www.wri.org/sites/default/files/Climate_Benefits_Tenure_Costs.pdf

Epure, M., & Mihăeş, L. C. (2019). *The Role of Language and Symbols in Promotional Strategies and Marketing Schemes*. Retrieved from https://www.igi-global.com/dictionary/gender-dynamics/65530

Food and Agricultural Organization. (2004). What is gender? Retrieved October 4, 2022, from https://www.fao.org/3/y5608e/y5608e01.htm

Food and Agricultural Organization. (2009). *Human-wildlife conflict in Africa: causes, consequences and management strategies* (No. 157). Rome.

Food and Agricultural Organization. (2016). *Sustainable wildlife management and gender*.

Fraenkel, J. R., & Wallen, N. E. (2009). *How to Design and Evaluate Research in Education*. The McGraw-Hill Companies.

Google Maps. (2021). maasai mara conservancies coordinates. Retrieved August 27, 2021, from https://www.google.com/maps/search/maasai+mara+conservancies+coordinates/@-1.2508784,35.0812749,9.42z

Gore, M. L., & Kahler, J. S. (2012). *Gendered Risk Perceptions Associated with Human-Wildlife Conflict : Implications for Participatory Conservation*. *7*(3), 1–10. https://doi.org/10.1371/journal.pone.0032901

Government of Kenya. (2012). *The National Wildlife Conservation and Management Policy*. Retrieved from http://www.forestpeoples.org/sites/fpp/files/publication/2013/07/draftnationalwildlifeconservation-and-management-policy-2012.pdf

Government of Kenya. The Wildlife Conservation and Management Act. , The Government Printer § (2013).

Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013). Moral Foundations Theory: The Pragmatic Validity of Moral Pluralism. *Advances in Experimental Social Psychology*, *47*, 55–130. https://doi.org/10.1016/B978-0-12-407236-7.00002-4

Grix, J. (2004). *The foundations of research*. London: Macmillan International Higher Education.

Gross, E. M., Jayasinghe, N., Brooks, A., Polet, G., Wadhwa, R., & Hilderink-Koopmans, F. (2021). *A Future for All: The Need for Human-Wildlife Coexistence*. Gland, Switzerland.

Hadidian, J., Fox, Camilla, H., & Lynn, William, S. (2006). The ethics of wildlife control in humanized landscapes. *Ecology Collection*, *13*. https://doi.org/10.5070/v422110054

Harnish, A. (2013). Missing “Links”: Investigating the Age and Gender Dimensions of Development, Conservation, and Environmental Change in a Southern Zambian Frontier (University of Kentucky; Vol. 8). Retrieved from http://uknowledge.uky.edu/anthro_etds/8/

Hill, C. M. (2018). *Crop foraging, crop losses, and crop raiding*. Oxford University.

Hitchcock, J. (2001). Gender Differences in Risk Perception: Broadening the Contexts. *RISK: Health, Safety & Environment (1990-2002)*, *12*(3), 4.

Hurlbert, M., & Krishnaswamy, J. (2019). Risk management and decision-making in relation to sustainable development. In *A Man Without Words*. https://doi.org/10.1525/9780520959316-013

International Union for Conservation of Nature. (2020). Gender and the environment:

What are the barriers to gender equality in sustainable ecosystem management? Retrieved August 13, 2021, from https://www.iucn.org/news/gender/202001/gender-and-environment-what-are-barriers-gender-equality-sustainable-ecosystem-management

Jhpiego. (2020). Introduction : Gender Analysis Toolkit For Health Systems | Jhpiego. Retrieved January 10, 2020, from https://gender.jhpiego.org/analysistoolkit/introduction/

Joseph, M. M., Joseph, O. O., Erustus, K., & Eivin, R. (2019). Trends in compensation for human-wildlife conflict losses in Kenya. *International Journal of Biodiversity and Conservation*, *11*(3), 90–113. https://doi.org/10.5897/ijbc2019.1278

Kasisi, C., & Carroll, T. (2015). Beekeeping Case Study (Kenya 7) Julius Melubo, Narok County. Retrieved July 12, 2021, from African Beekeeping Resource Centre (ABRC) website: http://africanbeekeeping.org/beekeeping-case-study-kenya-7/

Keane, A., Gurd, H., Kaelo, D., Said, M. Y., Leeuw, J. De, Rowcliffe, J. M., & Homewood, K. (2016). Gender differentiated preferences for a Community-based conservation initiative. *PLoS ONE*, *11*(3), 1–15. https://doi.org/10.1371/journal.pone.0152432

Kenya Interagency Rapid Assessment, & Red Cross. (2014). *Narok Secondary Data Review*. (November). Retrieved from http://journal.stainkudus.ac.id/index.php/equilibrium/article/view/1268/1127

Kenya National Bureau of Statistics. (2010). *The 2009 Kenya Population and Housing Census - Population and Household Distribution by Socio-economic Characteristics*. Retrieved from http://www.knbs.or.ke

Kenya Wildlife Service. (2019). HUMAN WILDLIFE COMPENSATION REPORT (2014-2017) LAUNCHED | Kenya Wildlife Service. Retrieved June 30, 2021, from http://www.kws.go.ke/content/human-wildlife-compensation-report-2014-2017-launched

Khumalo, K. E., & Yung, L. A. (2019). *Women , Human-Wildlife Conflict , and CBNRM : Hidden Impacts and Vulnerabilities in Kwandu Conservancy , Namibia*. *13*(3), 232–243. https://doi.org/10.4103/0972-4923.170395

Lee, D. E., & Bond, M. L. (2018). Quantifying the ecological success of a community-based wildlife conservation area in Tanzania. *Journal of Mammalogy*, *99*(2), 459–464. https://doi.org/10.1093/jmammal/gyy014

Lute, M. L., & Gore, M. L. (2019). Broadening the aperture on coexistence with wildlife through the lenses of identity, risk and morals. *Human-Wildlife Interactions: Turning Conflict into Coexistence*, (May), 45–64. https://doi.org/10.1017/9781108235730.006

Lute, M. L., Navarrete, C. D., Nelson, M. P., & Gore, M. L. (2016). Moral dimensions of human–wildlife conflict. *Conservation Biology*, *30*(6), 1200–1211. https://doi.org/10.1111/cobi.12731

Maasai Mara Conservancies Association. (2019). Catalyzing Sustainable Employment for the Youth in the Greater Maasai Mara. *Voice of The Mara*, (July). Retrieved from www.maraconservancies.org

Maasai Mara Wildlife Conservancies Association. (2019). State of Mara conservancies report. *Maasai Mara Wildlife Conservancies Association*. Retrieved from www.maraconservancies.org/wp-content/uploads/2019/11/Conservancies-Report-2019.pdf

Machoka, L. N. (2017). *Factors Influencing Human Wildlife Conflict in Communities Surrounding Protected Areas: a Case of Kenya Wildlife Service Focusing on Maasai Mara National Reserve, Narok County, Kenya* (University of Nairobi). Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/101971/Machoka_Factors Influencing Human Wildlife Conflict In Communities Surrounding Protected Areas.pdf?sequence=1&isAllowed=y

Manoa, D. O. (2015). *Assessment of Predator-Proof Bomas As an Evidence-Based Conservation Tool in Loitokitok Sub-County, Kenya* (University of Nairobi). Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/93505/Owino_Assessment of Predator-proof Bomas as an Evidence-based Conservation Tool in Loitokitok Sub-county%2C Kenya.pdf?sequence=3&isAllowed=y

March, C., Smyth, I., & Mukhopadhya, M. (1999). *A Guide to Gender- Analysis Frameworks* (1st ed.). London: Oxfam GB.

McCarthy, O. (2015). Eight creative ways to reduce human-wildlife conflict. Retrieved July 12, 2021, from Conserve website: https://howtoconserve.org/2015/12/04/human-wildlife-conflict/

Michael E. Zimmerman, J. Baird Callicott, George Sessions, Karen J. Warren, J. C. (Eds. . (1993). Introduction to ecofeminism. *Environmental Philosophy:From Animal Rights to Radical Ecology*. Retrieved from https://systemicalternatives.org/2016/10/24/introduction-to-ecofeminism/

Montt, G., & Fraga, F. (2018). *The future of work in a changing natural environment: Climate change, degradation and sustainability* (1st ed.; International Labour Office, Ed.). Geneva, Switzerland: International Labour Office.

Morgera, E., & Wingard, J. (2008). Principles for developing sustainable wildlife management laws. *FAO Legal Online Papers*, *75*(December), 1–10.

Morzillo, A. T., de Beurs, K. M., & Martin-Mikle, C. J. (2014). A conceptual framework

to evaluate human-wildlife interactions within coupled human and natural systems. *Ecology and Society*, *19*(3). https://doi.org/10.5751/ES-06883-190344

Mukeka, J. M., Ogutu, J. O., Kanga, E., & Roskaft, E. (2018). Characteristics of Human-Wildlife Conflicts in Kenya: Examples of Tsavo and Maasai Mara Regions. *Environment and Natural Resources Research*, *8*(3), 148. https://doi.org/10.5539/enrr.v8n3p148

Munk, M. (2016). *Making sense of human-wildlife conflict in pastoral areas of Maasai Mara , Kenya*. 1–38.

Muruthi, P. (2005). *Human Wildlife Conflict: Lessons Learned From AWF's African Heartlands*. Nairobi.

Ndege, A. W., & Gichuki, N. N. (2017). Factors Influencing Performance of Wildlife Conservation Projects: A Case of Lion Rover Project in Meru National Park, Kenya. *International Academic Journal of Information Sciences and Project Management*, *2*(1), 316–334.

Nyaga, R. K. (2010). *Earnings and employment sector choice in Kenya* (No. 199). Nairobi.

Nyhus, P. J. (2016). Human–Wildlife Conflict and Coexistence. *Annual Review of Environment and Resources*, *41*(1), 143–171. https://doi.org/10.1146/annurev-environ-110615-085634

Ogra, M., & Badola, R. (2008). Compensating Human – Wildlife Conflict in Protected Area Communities : Ground-Level Perspectives from Uttarakhand , India. *Human Ecology*, *36*, 717–729. https://doi.org/10.1007/s10745-008-9189-y

Ogra, M. V. (2008). Human-wildlife conflict and gender in protected area borderlands: A case study of costs, perceptions, and vulnerabilities from Uttarakhand (Uttaranchal), India. *Geoforum*, *39*(3), 1408–1422. https://doi.org/10.1016/j.geoforum.2007.12.004

Ogra, M. V. (2014). *Ecodevelopment , Gender , and Empowerment : Perspectives from India ' s Protected Area Communities*. (February).

Olson, J. (2015). Adaptive Management to End Human-Wildlife Conflict – Global Wildlife Conservation Group. Retrieved February 10, 2020, from The University of Texas at Austin website: https://sites.utexas.edu/wildlife/2015/05/07/adaptive-management-to-end-human-wildlife-conflict/

Robinson, J. P., Shaver, P. ., & Whrightsman, L. . (1991). Measures of personality and social psychological attitudes. Retrieved August 10, 2021, from APA website: https://psycnet.apa.org/record/1991-97206-000

Seager, J. (2021). Gender and illegal wildlife trade : overlooked and underestimated. *WWF*.

Shalamzari, M. J., & Khalighi, S. (2018). *Contents available at ISC and SID Site Selection for Rainwater Harvesting for Wildlife using Multi-Criteria Evaluation (MCE) Technique and GIS in the Kavir National Park , Iran*. (July).

Shilongo, S. M., Sam, M., & Simuela, A. (2018). Using Incentives as Mitigation Measure for Human Wildlife Conflict Management in Namibia. *International Journal of Scientific Research Publications*, *8*(11), 677–682. https://doi.org/10.29322/IJSRP.8.11.2018.p8374

Swedish International Development Cooperation Agency. (2015). Gender Analysis – Principles & Elements: SIDA definitions. *Gender Tool Box*, (March), 1–4.

The Maasai Mara Science and Development Initiative. (2015). *Maasai Mara: The Challenges of a World Unique Ecosystem*.

United Nations Office on Drugs and Crime. (2020). Integrity Ethics Module 9 Key Issues: Ethics of Care. Retrieved January 20, 2020, from https://www.unodc.org/e4j/en/integrity-ethics/module-9/key-issues/ethics-of-care.html

Veldhuis, M. P., Ritchie, M. E., Ogutu, J. O., Morrison, T. A., Beale, C. M., Estes, A. B., … Olff, H. (2019). Cross-boundary human impacts compromise the Serengeti-Mara ecosystem. *Science*, *363*(6434), 1424–1428. https://doi.org/10.1126/science.aav0564

Whyte, K. P. (2012). Indigenous North American ethics and Aldo Leopold's land ethic: a critical view of comparison and collaboration. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2022038

Wild Alive. (2021). Wildlife-Human Conflicts impacting Global Food Security: A challenge and it's Mitigation Strategies. Retrieved August 18, 2021, from https://lifeofsapiens.blogspot.com/2021/05/wildlife-human-conflicts-impacting.html

Wilson-holt, O., & Steele, P. (2019). *Human – wildlife conflict and insurance Can insurance reduce the costs of living with wildlife ?* (March).

World Bank. (2012). *Linking Gender , Environment , and Poverty for Sustainable Development : A Synthesis Report on Ethiopia and Ghana*. https://doi.org/P125713

World Health Organization. (2022). Gender and Health. Retrieved October 4, 2022, from https://www.who.int/health-topics/gender#tab=tab_1

World Wildlife Fund. (2020). Reducing conflict between people and wildlife | WWF. Retrieved February 10, 2020, from https://wwf.panda.org/our_work/wildlife/human_wildlife_conflict/

World Wildlife Fund United Kingdom. (2012). *Natural resource management and the importance of gender*. 1–8.

APPENDICES

Appendix I: Work Plan

Activities	Jan. 2020	Feb.	March	April	Jan 2021	June	July	Aug.	Sept.
Conceptualization									
Proposal formulation									
Drafting and editing the proposal									
Submission to graduate school									
Data collection									
Data Analysis									
Drafting the final project									
Final write-up									
Submission to the school									

Appendix II: Budget

Activities	**Quantity**	**Cost @unit (KSH)**	**Total cost**
Printing and photocopy	3 copies	250@copy	750
Stationeries			500
Travelling expenses			60,000
Binding	3 copies	100	300
Camera for hire	1	1,000	1,000
Miscellaneous			3,000
Total			65,550

Appendix III: Household Questionnaire

QUESTIONNAIRE FOR THE HOUSEHOLD HEADS

(A Structured Interview Schedule)

Instructions:

a) Do not write your name on this questionnaire

b) Tick [√] your answer appropriately or briefly write within the space provided

c) GPS Coordinates……

SECTION 1:

DEMOGRAPHICS

1. Gender: Male [ ] Female [ ]

2. Age:
   - 18-25 [ ]
   - 36-45 [ ]
   - 36-45 [ ]
   - 46-55 [ ]
   - 55 and above [ ]

3. Marital status
   - Married [ ]
   - Single [ ]
   - Separated [ ]
   - Widowed [ ]

4. Number of people living in the house
   - Adult males [ ]
   - Adult females [ ]
   - Children [ ]

5. For how long have you lived in Kilgoris/Narok West
   - 1-2 years [ ]
   - 3-4 years [ ]

5-6 years [ ]

7-8 years [ ]

Above 8 years [ ]

6. Education: Highest standard obtained

None [ ]

Primary Incomplete [ ]

Primary Complete [ ]

Secondary Incomplete [ ]

Secondary Complete [ ]

College Certificate [ ]

College Diploma [ ]

University Graduate [ ]

Any other [ ]

7. Employment

Formal Employment [ ]

Self-employed [ ]

Pastoralist [ ]

Farmer [ ]

Casual laborer [ ]

No employment [ ]

8. Income per month

Ksh. below 3000 [ ]

Ksh. 3001- 4000 [ ]

Ksh. 4001- 5000 [ ]

Ksh. 5001- 6000 [ ]

Ksh. 6000- 7000 [ ]

Ksh. 7001- 8000 [ ]

Above Ksh 8000 [ ]

9. Land size

0.1-1acres	[ ]
1.1-5 acres	[ ]
5.1-10 acres	[ ]
10.1 acres and above	[ ]

10. How likely are you to experience HWC in this area?

a) very likely b)likely c)not likely

12. How severe is the HWC in your area?

Not severe [ ] Severe [ ] Very Severe [ ]

13. Describe your role in the household

……

……

……

b) Is your role affected by HWC? Yes ( ) No ( )

c) How?

……

……

……

14. Number of cattle and frequency of attacks

Type of animal	**Amount**	**frequency of attacks per year**	**Problematic animal**	**Season**
Cows				
Goats				
Sheep				
Donkeys				
Chicken				

15. Type of crop farmed and frequency of attacks

Type of crop	**Amount of land**	**frequency of attacks per year**	**Problematic animal**	**Season**
Maize				
Beans				

16. Who guards your farm?

Adult Male [ ] Adult Female [ ] Male Child [ ] Female Child [ ] Any HH Member [ ]

17. Who guards your animals?

Adult Male [ ] Adult Female [ ] Male Child [ ] Female Child [ ] Any HH Member [ ]

18. a) Are women or men more affected by HWC or is it the same

Women [ ] Men [ ] Same [ ]

d) Why……

……

……

……

19. a) Who retaliates after an animal attack

Women [ ] Men [ ] Same [ ]

b) What are the forms of retaliation?

.....

.....

.....

.....

20. How much do you lose to HWC per year?

(i) 10,000 and below

(ii) 10,001-50,000

(iii) 50,001-100,000

(iv) 100,001-150,000

(v) 150,001-and above

21. Have you ever received any compensation for HWC?

Yes ( ) No ( )

If yes what's the process of claiming and what type of compensation did you receive?

.....

.....

.....

.....

22. Has anyone in this household been injured or lost their lives due to HWC?

.....

.....

……

……

23. Do you know where the boundary of the Mara Conservancy is located?

Yes ( ) No ( )

24. Do you let your herd graze in the Mara Conservancy?

Yes ( ) No ( )

Why?.....

.....

.....

.....

25. What is your attitude towards the Mara Conservancy and the wildlife conservation efforts in the area?

Good ( ) Bad ( ) Indifferent ( )

b) Why?

……

……

……

……

26. Have you ever hunted for wildlife?

Type of Animal	Reason	Season	

27. What are the roles of men and women towards the conservation of the Mara?

……

……

……

……..

28. Which organizations fund the conservation process?

……

……

……

……

……

29. In your opinion are there any economic benefits of conservation? Yes ( ) No ( )

(ii) If yes what are they?

……

……

……

Appendix IV: Institutional Questionnaire

QUESTIONNAIRE FOR THE RELEVANT INSTITUTIONS
(A Structured Interview Schedule)

Instructions:

a) Please write the institution's name and not your name on this questionnaire
b) Tick [√] your answer appropriately or briefly write within the space provided
c) GPS Coordinates……

1. How frequent are HWC incidents in the area….?

2. In what manner are HWC incidents reported (procedures)? And are the locals aware of such procedures?

3. Which animal is frequently mentioned in HWC incidents that locals reported and what type of economic activity does the said animal usually affect?

4. How many of HWCs have been due to retaliation actions from another incident?

5. How likely is one to experience HWC in this region?

6. Which gender is more affected by HWC and why?

7. Which gender is more likely to report HWC incidents?

8. What time of the year are most HWC incidents reported and why?

9. What inhibits people from reporting HWC incidents?

10. What is the estimated loss caused by HWC: to the environment (loss of life for wildlife), In terms of economic loss, In terms of human deaths or injury

11. Do you have community outreach programmes (anti-poaching units, HWC reporting units, educational volunteers)?

12. What is the role of these outreach programmes (anti-poaching units, HWC reporting units, educational volunteers)?

13. Have you witnessed or documented a difference in conservation efforts between the two genders?

14. How many wildlife crimes stem from HWC?

15. Legally what is your role in the mitigation of HWC?

16. What laws would you recommend that would use gender dynamics to mitigate the effects of HWC?

Appendix V: Indicator Matrix

EVALUATION INDICATOR MATRIX TO GUIDE ON REQUIRED DATA

Sector	Evaluation Indicator	Answer
Legal	Rates of HWC per gender	
	Rate of enforcement of rules and regulations pertaining to wildlife protection	
	Number of existing policies guiding HWC	
Social	Proportion of men and women in decision-making positions in the Mara	
	To what extent are men and women aware of legal procedures and rights concerning HWC	
Economic	Rate of employment between men and women	

Appendix VI: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **926260**

Date of Issue: **14/January/2021**

RESEARCH LICENSE

This is to Certify that Miss.. Marie Auma Omedo of Kenyatta University, has been licensed to conduct research in Narok on the topic: Gender Dynamics in Human-Wildlife Conflicts in Maasai Mara Game Reserve, Narok County, Kenya for the period ending : 14/January/2022.

License No: **NACOSTI/P/21/8468**

926260

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix VII: Kenyatta University Graduate School Authorization Letter

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: N50/27743/2018

DATE: 26th October, 2020

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MARIE AUMA OMEDO REG. NO. N50/27743/2018

I write to introduce Ms. Marie Auma Omedo who is a Postgraduate Student of this University. She is registered for M.Env. degree programme in the **Department of Environmental Planning and Management.**

Ms. Omedo intends to conduct research for a M.Env. Project Proposal entitled, *"Gender Dynamics in Human-Wildlife Conflicts in Maasai Mara Game Reserve, Narok County, Kenya".*

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

HI/enj