Original Article

Gender Dynamics and Human-Wildlife Conflicts in Maasai Mara Game Reserve, Kenya

Marie Auma Omedo[1]* & Dr. Christine Majale, PhD[1]

[1] Kenyatta University, P. O. Box 43844-00100, Nairobi, Kenya.
*Correspondence ORCID ID: https://orcid.org/0000-0001-9890-7740; email: marieomedo@gmail.com.

ABSTRACT

A big factor as to why Human-Wildlife Conflict is a major issue in the African context than in the western world is the level of income stability. This is heightened by the fact that most communities that live near wildlife settlements in Africa are poor rural communities. The people in the Mara are a good example of such a community. 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 within reach of wildlife populations. This research has singled out the main difference within these communities as being gender and focuses on gendered differences. The objective of this research is to examine the gender dynamics that affect Human-Wildlife Conflicts. To fulfil the objective, the research set out to test the hypothesis of whether gender dynamics influence wildlife conservation measures. 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 classified into the two established genders, male and female. The findings 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. These results indicate that there is a correlation between gender dynamics and Human-Wildlife Conflict. Therefore, gender mainstreaming needs to be considered in the wildlife conservation discourse.

INTRODUCTION

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). With over 11.7% of the world's surface covered in 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). HWC is mainly a land-use management issue in Sub-Saharan Africa. This is because this part of 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).

Resource management is 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 to reduce HWCs females have been side-lined. The reasons for this vary from cultural points of view to the fact that most men in these societies have a larger economic pull. 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 perspective helped experts realise the importance of non-timber forest products for household livelihoods in some parts of the world like Asia (Convention on Biological Diversity, 2011). 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 (Ogra, 2008; Carter & Allendorf, 2016).

According to World Wide 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. However, 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). A good example is witnessed under the issue of economic occupation. A study in China indicated that men have more geographical knowledge of protected areas and better access to disposable income; hence, they are more aware of the benefits that wildlife can afford them unlike their female counterparts

(Seager, 2021). Therefore, there is a need to address the gender disparity in how communities react to HWCs, especially since there is little that has been written on this subject, especially in the African context (Gore & Kahler, 2012). For that reason, there is a need to understand the underlying drivers that influence the gender attitudes and actions towards wildlife; that 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 258 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 an indicator 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. To assess whether gender dynamics influence conservation measures at the Mara, relevant gender dynamics were identified and a Chi-square test was performed based on the two variables, male and female. In this case, the null hypothesis is that there is no association between the identified gender dynamics and HWC and the alternative hypothesis is that there is a relationship between the identified gender dynamics and HWC.

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 (Stern, 2000). However, very little research has linked societal morals to increased conservation support (Lute et al., 2016). Moral Foundations Theory (MFT) defines morals as institutions founded in the following 5 sections that generally determine how people perceive right and wrong:

- Authority: this focuses on respect for predetermined traditions and hierarchy. In this study, it was noted that predetermined societal traditions and hierarchies are still followed and play a major role in how the two genders interact with wildlife;

- Care: this is mainly focused on avoiding harm and encouraging care. Moral perceptions of care affect the way humans gauge risk;

- Fairness: is mainly related to autonomy, rights, and justice. This study distinguished fairness as a determinant of how locals felt about wildlife interactions. Fairness became an issue when compensation for HWC and retaliation activities were discussed;

- 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). In group, loyalty was especially relevant to this discourse because gender differences bring about varied social group obligations.

- Purity: is founded on the separation of what is considered clean or decent from what is not (Lute et al., 2016). In some studies, the fear of some animals is linked to their lack of purity (Lute & Gore 2019).

It is impossible to create conservation strategies without first understanding the moral values that power societies that interact with wildlife (Hadidian et al., 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. (FAO, 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 toward wildlife, human responses, HWC, and conservation measures is key to unlocking effective wildlife conservation measures that allow for human-wildlife coexistence (Bhatia et al., 2020). This research has decided to use gender to assess the link between human value systems towards wildlife, human responses, HWC, and conservation measures.

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 amongst 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 (Ogra, 2008; Morzillo et al., 2014). Gender dynamics refers to socially constructed roles that communities assign to sexes (SIDA, 2015). These socially constructed roles affect the way the two sexes face HWCs and their reactions to them, this is because gender dynamics create a variance in risk and vulnerability perceptions.

The conceptual framework for evaluating HWC and gender dynamics is coupled with the legal requirements for wildlife conservation. 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.

RESEARCH METHODS

Study Area

This research is based on the Mara which 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. The study area is a conglomeration of the Mara National Reserve and the Maasai Mara Wildlife Conservancies. This area is over 510 km². The study area is within the Savannah Plains and is adjacent to the following land uses Serengeti Park in the South and agricultural land use in the North, East, and West. The climatic conditions within the study area are the dry season from December to March 28°C to 32°C, the rainy season from July to September 12°C, and 500 mm during the dry season to 2,500 mm in the wet season.

Figure 1: Maasai Mara Location Map
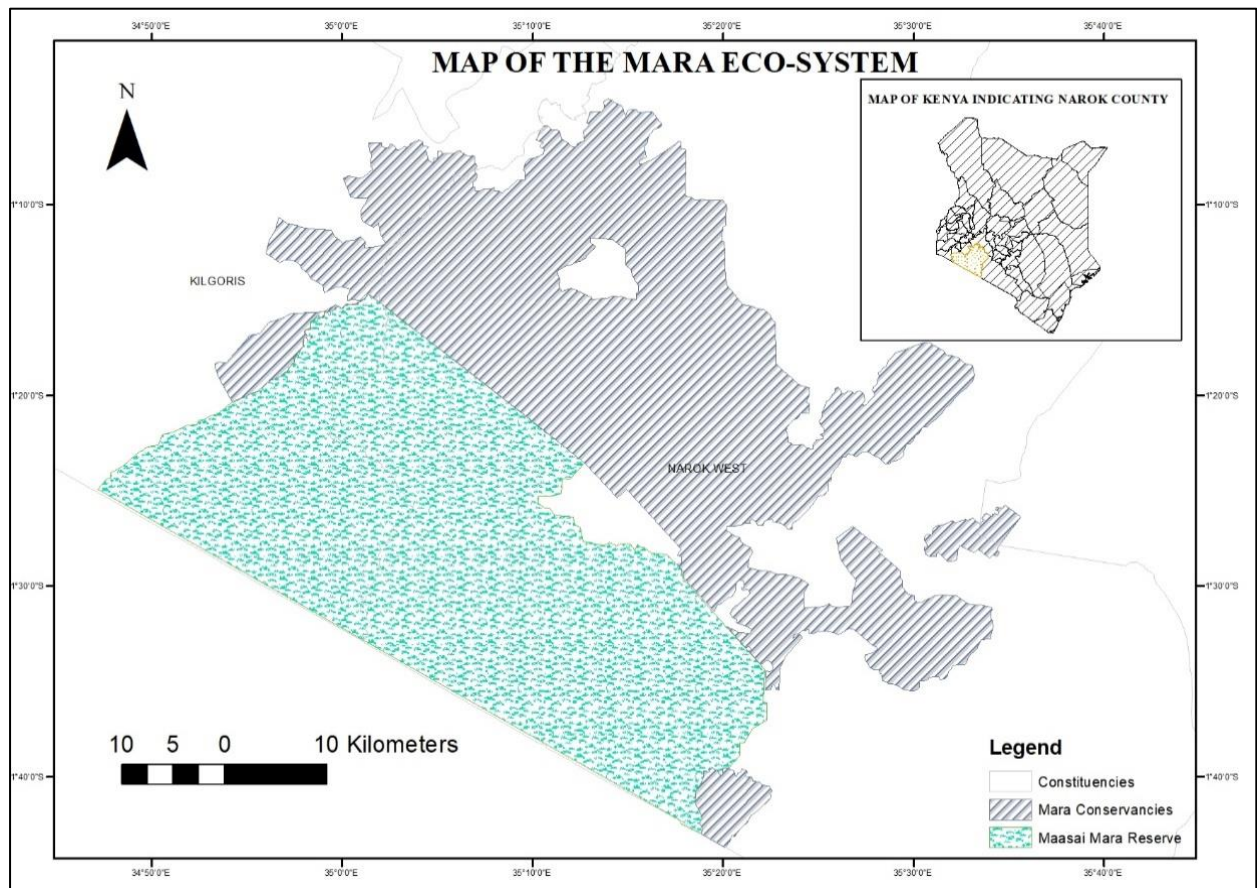
Methodology

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 to represent the whole) and relevant government organisations that deal with the area like the KWS, department of wildlife in the county government of Narok, NGOs operating around the area (these included: Maasai Mara Wildlife Conservation Association Workers, Mara North Conservation Workers, and Mara Predator Conservation Programme). A simple random sampling technique was used to select three out of the nine towns ensuring that each town had an equal chance of being selected for the study. Both male and female research assistants were used in data collection. Questionnaire data were subjected to statistical analysis using SPSS and Microsoft Excel applications. Descriptive statistics were used to describe relative frequencies for some of the collected data. These 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, and the ability to bounce back. 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.

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 the content and the structure of the research instruments.

RESULTS

Gender Dynamics and 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 of encountering HWC, the severity of HWC and if one's gender roles are affected by HWC to draw relations between gender dynamics and HWC.

Table 1: 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 agreed upon significance level), we reject the null hypothesis; hence the research concluded that there is a relationship between gender dynamics and HWC. The research identified the following gender dynamics from the presented parameters as being relevant to the conservation of the Mara. They included:

Agricultural Occupation

Depending on agricultural occupation men and women in the sample group described their levels of risk, vulnerability, and losses caused by HWC as being different. In this instance in terms of general employment, men were more dominant in all forms of employment statuses, with a majority of them being self-employed as pastoralists (37.1%). According to KNCS (Kenya National Compensation Scheme), crop-raiding is not considered common and compensation claims are not reported from that region unlike herd predation which is quite rampant (Joseph et al., 2019). 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 the following aspects of work are influenced by the environment. They include:

- Most jobs in a lot of sectors directly rely on natural resources.

- 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% (Montt & Fraga, 2018).

- 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.

- 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).

Income Loss and Injuries

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. The research sought to find out about the level of income since 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). Wealth levels affect the level of vulnerability that communities feel toward HWC which also affects the amount of hostility that is targeted toward 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). The research indicated that in every category more men earned more than women. This implies that the males are more likely to be breadwinners and that women are more immersed in poverty than their male counterparts. From this logic, it can be deduced that men are more likely to get involved in conservation efforts.

Furthermore, a majority of the losses incurred were by the men at 69.5%. About half of the sample population who have experienced HWC

have lost about KShs.10,001-50,000 per year. KShs.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 is 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 $30 monthly to help protect homesteads from wildlife (Abudulghafur, 2013).

Approximately 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).

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. Eight-point four two percent 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, and 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 Maasai Mara Wildlife Conservation Association (MMWCA) and used conventional fencing methods like wire fences which can be ineffective because some animals can climb through (Manoa, 2015). 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, attacks 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 both the 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 minimise HWC. According to KNCS (Kenya National Compensation Scheme), crop-raiding is not considered common and compensation claims are not reported from that region (Joseph et al., 2019). In Bhutan, women view an increased influence of environmental factors on their household roles like childbearing, child-rearing, heading the household when the men are away, farming, and labour-intensive housework (Choden, 2017).

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. There were more

single male respondents across 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 (2015) 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.

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 communal cultural beliefs which discriminate against women and thus make land ownership relevant to this discussion. Land ownership is especially relevant because it guides how compensation systems work. It should be noted that their current 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 landowner, as of 2018 out of the total 14,528 landowners who

were part of the MMWCA only 223 were female (MMWCA, 2019). That means that only 1.53% of the whole conservation is female-owned, this translates to very few women actually participating in conservation efforts or actually 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 (IUCN, 2020). Female landownership is generally low but the region's rate is even lower.

DISCUSSION

The likelihood to experience HWC and the severity of HWC were used to measure perceptions of vulnerability and risk within the study area. According to the data, men are perceived to be more vulnerable and at risk of encountering HWC than women. Men rated their likelihood of experiencing HWC at 68.64% while women rated it at 31.36%. Men rated the severity of HWC at 72.57% while women rated it at 29.2%. 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.

Risk perception is directly related to rates of HWC. Often there is a disconnect between risk perception and the actual risk (Nyhus 2016). Research has shown 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. 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 (Hitchcock 2001; Cullen et al., 2020).

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 (UN, 2004). 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 et al., 2010). 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).

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 contextualise HWC and vulnerabilities it is important to examine how the different genders are impacted by HWC and why they are impacted thusly (Khumalo & Yung, 2015; 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).

Research indicates that in other pastoralist communities, women 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). 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).

CONCLUSION

The belief that patriarchal resource management has desiccated the earth is widespread and the need for gender mainstreaming has grown throughout the world (Micheal et al.,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 them having great abilities (Salman, 2007). 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). 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. Therefore, there is a need to strategically place gender mainstreaming into the wildlife conservation discourse.

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