The Nature and Extent of Human-Wildlife Conflict Effect on Socio- Economic Development and Educational Development in Baringo North Sub-County, Kenya

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Abstract: **Kenya Wildlife Service has invested heavily in implementation of strategies as a concerted effort by the government to curb Human Wildlife Conflict in Kenya. Despite this effort, cases of Human Wildlife Conflicts are still being reported. Various existing policies seem not to offer solutions to the prevailing Human Wildlife Conflict. It's on this foundation that the study sort to examine the nature and extent of human wildlife conflicts in Baringo North Sub-County, Kenya. This study was guided by Stern Theory of Value Belief Norm; Kenneth's and Kilmann's Conflict Styles theory and Dollard's Frustration Aggression Displacement theory. A descriptive survey research design was used. The study population was; Government field officers, Civil society leaders, KWS official, Opinion leaders, Teachers, Community based organizations, Leaders of Farmers Corporations, Village elders and victims of human wildlife conflicts, totaling to 329 respondents. Both probability and non-probability sampling techniques were used. Data was collected using questionnaires, interview schedules, observation checklist and Focus Group Discussions. Descriptive analysis using quantitative and qualitative techniques were used in the study. While quantitative data was presented in form of frequencies and percentage, in tables, charts and graphs, qualitative data was presented thematically through narratives reports and verbatim quotations. Findings indicated that there was risk of the children meeting wild animals as they cross paths with wild animals as they go to school or attend their daily chores, hence they face imminent injuries and death. Most wildlife attack people during the day as they work in their farms. Snakes and elephants were the most reported as wild animals that attack the people. Shared water and food resources were indicated as the main cause of the HWC. Poverty and overpopulation were identified as the main drivers of HWC and that wildlife habitats are disappearing at an alarming rate. The study recommends that government should resolve HWC by generating, lasting solutions. Such solutions include fencing off the reserve to keep off roaming wildlife and those injured together with the crops destroyed should be adequately compensated.**

Key Words: **Game reserve; Human Wildlife Conflict; Livelihood**

I. INTRODUCTION

Numerous incidents of human-wildlife conflict (HWC) are still being reported in most countries of the world. The

Human wildlife conflict occurs when the needs of wildlife and human populations collide, as stated by the World Conservation Union (WCU) (2002). This is especially true in areas with a high concentration of both human and wildlife, such as cities, rural areas, and protected areas, from which animals frequently wander into neighboring farmland or grazing pastures. According to HWC there are three ways in which humans and wildlife can be harmed during an armed conflict: first, humans can injure or kill wildlife; second, wildlife can injure or kill humans, crops, cattle, and property; and third, both humans and wildlife can be harmed or killed during an armed conflict (World Conservation Union (WCU), 2002)..

The long-term effects of human activity on wildlife are the root cause of the rising risk of extinction for many animal species. Musiani, *et al*. (2003) cites human-caused injuries and deaths as a major factor decline of animal species. These might be the result of carelessness, such as when animals are hit by cars or trains or fall into snares meant for other species or farm wells, or they can be the result of malice, such as when people shoot back or poison those who have shot at them.

Okello *et al.* (2001) note that human-wildlife conflicts have intensified in recent years due to human population growth and the encroachment on wildlife habitats. People and wildlife are increasingly at odds with one another as a result of shifts in land use that are typically associated with activities that are counterproductive to conservation efforts. Due to the expenses associated with wildlife conflicts, such as property damage, livestock depredation, and disease transmission, many people view wildlife as a liability. These costs can include damage to crops, human deaths and injuries, the loss of legitimate and traditional rights, and the destruction or theft of personal property and livestock (Okello *et al.*, 2001).

Pastoralists have co-existed with wildlife in the African Range land for many hundreds of years. There is an increased human/wildlife conflict resulting from; competition for scarce grazing and water resource due to demographic pressure and

the expansion of cultivation to supplement any revenue got from wildlife (Maito *et al*, 2013).

A number of studies in Africa have revealed that there are conflicts between humans and wildlife in all ecosystems, including those in west and central Africa as well as eastern and southern Africa (Treves & Karanth, 2003). The issue is particularly pressing in arid agricultural regions and in water-scarce pastoralist territories. There has been an increase in human-wildlife conflicts in these regions mostly because humans have expanded their activities onto territory that were once populated by wild animals. Although conflicts are most severe and widespread around protected areas, they are growing in other places as well, threatening conservation efforts due to factors like land clearance for agriculture and poaching. Therefore, various management approaches are needed in various locations and at various times (Treves & Karanth, 2003).

Onyango, (2015) observed that in Kenya, human-animal conflicts can be traced back to the development of parks, reserves, and other wildlife protected areas in close proximity to human settlements. Whether by force or treaty, local communities were displaced to make way for the creation of parks and other protected places. Communities subsequently had their land rights taken away from them. For instance, the Maasai people who traditionally grazed in the Amboseli habitat were never paid for the land and water they no longer had access to after the park was established. Tsavo and Nairobi national parks, as well as Maasai Mara national reserve, all had the same problems when they were first established (Onyango, 2015). Since losing so much land, the people in those areas have become increasingly unsupportive of conservation efforts.

Human-animal conflicts have become more problematic due to the rise of human activities, such as agriculture, in areas bordering parks and other protected areas that are mistakenly thought to be wildlife areas (Patterson *et al*., 1999). Some residents have given up their usual routines because of frequent wildlife incursions, and people's tolerance for wildlife is decreasing as shown by the prevalence of poisoning and poaching of wild animals for bush meat, hide, and even trophies (Woodroffe *et al.,* 2005; Patterson *et al*., 1999).

Jones (2012) asserts that the local populations that live close to and around national parks, including Nairobi National Park and game reserves, are those who bear the brunt of the costs associated with wildlife. Property damage and human fatalities or injuries caused by wildlife are the root causes of human-wildlife conflicts in Kenya's protected areas. In the large game reserves and national parks of Kenya, this is especially true. Little-known Lake Kamnarok National Reserve may be found in the breathtakingly gorgeous Kerio Valley, which furrows the North Rift. The African Jacana, grebe, hamerkop, heron, egret, ibis, tree duck, and Egyptian geese are just few of the avian species that may be found in the Reserve. Elephants can be spotted throughout the day under the dense cover of the bush in great numbers; at one

point, the elephant population in this reserve totaled over 500. (Andrew, 2021). Very little prior study has considered community participation in resource usage when examining resource conflicts in Kamnarok National Reserve and the surrounding villages (Dickman, 2010).

Togoch *et al.* (2018) found that expanding human populations and economic constraints are increasing local communities' dependence on wildlife protected areas in marginal rangelands. HWC in areas near to Kamnarok National Reserve was a consequence of unsustainable resource extraction by neighboring family activities, diminishing food resources for wildlife, and ineffective conservation governance by those in charge. The Kamnarok National Reserve has had both positive and negative effects on the lives and livelihoods of neighboring villages, including agricultural damage, cattle predation, property destruction, and even death. The nearby communities' portfolios are diversified for a variety of reasons, including risk reversion linked with wildlife conflicts, higher income, food security, and supporting the needs of people.

Despite the existence of the human-wildlife idea for a number of years, disputes in the wildlife sector have endured. Communities that formerly coexisted with nature are now armed against the same creatures they once admired. There is a need to study how the intensifying conflict might be minimized so that humans and wildlife can once again coexist, particularly in light of the emerging reality that both human and wildlife populations are growing, while the environmental ecosystem can no longer support both ends of existence due to climate change.

Successful conflict management necessitates cordial relationships amongst the many agencies that may be engaged in order to negotiate the maze of rules and regulations and overlapping responsibilities. In addition to regulatory authority issues, several elements influence conflict resolution. State and federal authorities are hampered in their ability to respond by significant budgetary and human resource constraints. These constraints have led some state authorities to work with local governments on conflict resolution and policymaking. There are various partnership models, such as citizen action, citizen-agency partnership, and community vote (Denzin & Lincoln, 2005).

Orina (2009) conducted research on the Nairobi National Park and its surrounding Kitengela and Athi Kapiti plains, covering the resolution of human-wildlife conflict and various strategies the local community had implemented to do so. However, he did not examine the larger ecology of Nairobi in relation to other regions of Kenya, such as Baringo North Sub-County (Slotow, 2008). Togoch (2018) conducted research at Kamnarok National Reserve, but his focus was on how the HWC has influenced the diversification of the residents' means of subsistence in the park's vicinity.

According to Wang and Macdonald (2006), there have only been a few models that have been effectively implemented in managing human wildlife conflict, while others have began

with a very limited grasp of the fundamental reasons of the risks to the protected areas that require conservation.

1.2 Statement of the Problem

Wildlife related conflicts continue to increase each day despite the enormous effort and resources used to mitigate and resolve these conflicts. The nature of conflicts and how they are resolved becomes complex each day (Woodroffe *et al.*, 2005). In some instances, conflicts about wildlife have degenerated into security issues. The human population increase in Kenya that is estimated to reach 60 million people by 2030 and would complicate the dynamics of wildlife related conflicts thus the survival of the tourism sector would be highly threatened (Wang *et al.,* 2006). Kenya continues to lose citizens and animals through these conflicts. The goodwill of the communities that cherished their coexistence with wild animals would be lost. The survival of the wildlife heritage would then be highly threatened. Each year elaborate planning efforts in the sector continue (Wanjau, 2002). These efforts are supplemented by private individuals and by the nongovernmental organizations.

Despite all the multi-sectorial approach, we continue to lose human beings and animals. The psychological impacts and the image of the nation is great. The retaliations towards wildlife killings affect our tourism, which is a main contributor to GDP and consequently the national human development index. This impacts then to our national security and jeopardizes our national interests. It would consequently affect the national vision 2030 delivery unless the situation is addressed now. There is therefore need to have a permanent solution to human wildlife conflicts. There is need to look at conflict management strategies visa-versa the concept of human wildlife conflict. If the wrong concept is in use the most likely is that the wrong strategies are employed. Then a paradigm shift needs to be executed soonest to avoid a national tragedy in a few years to come.

1.3 Objective of the study

Examine the nature and extent of human wildlife conflicts effect on socio- economic development and educational development in Baringo North Sub-County, Kenya.

1.4 Research question

How does the nature and extent of Human Wildlife Conflicts affect the socio-economic and educational development in Baringo North Sub-County, Kenya?

1.5 Justification of the study

1.5.1 Academic and Policy Justification

There's is dearth of information about the HWC and its effects on socio-economic aspects on communities living near Lake Kamnarok National game reserve. Orina (2009) studied conflict resolution on wildlife and various communities around Nairobi national park. His study didn't look at the larger ecosystem in Kenya. Mukeka (2018) did a study on human wildlife conflict and how its correlates in Narok

county and observed that the conflicts were mainly seasonal with annual fluctuations. Most studies on HWC have been done in most game reserves in Kenya (Ogutu *et al*, 2008., Ogutu *et al* 2018., Koech, 2018., Mukeka, 2019).

The findings of this study will form part of reference materials in library and other research works thus providing adequate information to other researchers in the related field of the study. The findings would also act as a source of reference material in the University libraries and other research websites where this work would be published.

While Baringo North Sub-County is located close to Kamnarok National Reserve, it is currently experiencing a growth in human settlement, making it a victim of human wildlife conflict. In the absence of preventative steps, this conflict is likely to escalate to a dangerous level very soon. Therefore, the study's findings might be utilized to assess the efficacy of existing animal conservation measures and to develop new regulations. The Sustainable Development Goal - SDG agenda and its implementation strategy must incorporate the HWC. While it is impossible to totally eliminate HWC, there are methods that, with the full cooperation of local communities, can help diminish it and lead to cohabitation between humans and wildlife. Similarly, the study's recommendations could improve conditions at our nation's national parks. The findings are particularly significant because they give decision and policy makers a deeper understanding of the issues typically connected with wildlife protection.

II. THE NATURE AND EXTENT OF HUMAN WILDLIFE CONFLICT

The term "human-wildlife conflict" has been in common usage all throughout the world for quite some time. Human-wildlife conflict arises when wildlife needs collide with those of human populations, resulting in negative outcomes for humans and non-humans alike, as stated by the International Union for the Conservation of Nature (IUCN) and World Parks Congress in 2003. (IUCN). As long as there have been humans and wildlife, there will be conflicts between the two groups over territory and resources. Not only in Africa do people and animals come into confrontation with one another. Human-animal conflicts occur nowadays in various forms all across the globe. For example, human-crocodile conflict has been documented in 33 tropical and subtropical nations, while it is likely present in many more. Human-wildlife conflict affects every region of the world, both developed and developing. While wealthy people in industrialized countries may be more vulnerable than those living in poverty, agro pastoralists in undeveloped countries are in a different position (Mwagiru, 2000).

Human-wildlife conflict is a major problem across Africa, especially in countries with greater per capita incomes. People are still killed by crocodiles in the Lake Nasser region of Egypt and in cities in Mozambique; leopards kill sheep within 100 kilometers of Cape Town, South Africa; and lions

slaughter cattle on the outskirts of Nairobi, Kenya, as was recently seen in Kitengera (Okello & Washitemi, 2006).

Human wildlife conflicts take many forms including crop damage, damage to property, livestock predation and even attack to man. Studies have shown that local population and especially those living near Protected Areas (PAs) takes the greater burden to shoulder the costs incurred. This is more so because they are in dispersal areas of the protected areas. The increase in human population has continued to increase demand for natural resources including land. The wildlife corridors have been converted into either settlement or in areas of swamps like Kimana and Namelok in Amboseli converted into agriculture. This has witnessed increase in wildlife related conflicts. It's clear that lack of land policies for a long time in Kenya has contributed to the current dilemma. This seriously undermines support for conservation. The cost of this is both direct and indirect through opportunity costs incurred through the conflict mitigation process (Orina, 2009).

Animals and people come into conflict when people's interests and behaviors interfere with the needs of wildlife, or when animals' needs collide with people's interests. The Kenya wildlife contributes enormously to the national Gross Domestic Product - GDP through tourism. The connection of this contribution to the life of the local residents has not been well articulated at the rural areas and more-so pastoral parts of the country. This is one reason why the perception on animals is changing in these communities in Kamnarok area, the communities don't have direct benefits as in most parts of the country. Stakeholders who are informed and engaged are more likely to make sound decisions and plans, which in turn reduces the likelihood of conflicts (Messer, 2009).

Policy formulation in Kenya has had no much involvement of the local populations and stakeholders. The land policy has for a long time been limited in solving the clash between humans and wildlife. The pastoral areas like Kamnarok have had farmer's migration changing the land use in pastoral areas. The in-compactable land use in these areas has witnessed increase in wildlife related conflicts. Lack of national land policy that should have made sure the wildlife corridors are left intact for the national good and world heritage has greatly contributed to this scenario (Wang *et al.,* 2006).

Wildlife conservation initiatives in Kenya address complicated and frequently chronic social and ecological concerns, such as land usage, conflicts between local people and wildlife, local people's suspicion and antagonism toward state wildlife conservation policy, and the rapid degradation of wildlife habitats (Sindiga, 2005).

Kenyans on the savanna and along wildlife corridors face a number of social and economic challenges due to their proximity to protected areas. Due to the severity of the accumulating issues, they cannot afford to give top attention to wildlife preservation efforts. The social and economic challenges have altered the scenario even in places where conservation aims were stated. Recent research has indicated

that the majority of locals living near conservation areas have a negative attitude toward governmental policies and conservation initiatives (Musiani, et al., 2003). Kenya's enormous wildlife reservoir is under increasing pressure, and as a result, the country risks losing the economic, social, and employment benefits it provides. Consequently, the management of this country's government affects the incidence of disputes with animals. The fact that the sector's problems stem from a wide variety of shortcomings across so many areas makes wildlife management that much more difficult.

The adage that nothing operates in a vacuum applies particularly well to the management of human-wildlife conflicts. The places we call home and the places we go to work have been shaped by political, cultural, and social influences. Therefore, the ability of decision makers and wildlife managers to understand, embrace, and include different stakeholder's values, attitudes, and beliefs in crafting policies will be crucial to the success of programs aimed to settle human-wildlife conflicts in this ever-changing context. Values, perspectives, attitudes, and beliefs held by stakeholders have evolved over time. So, there must be long-term shifts in conflict policy and administration. When it comes to resolving conflicts in the wildlife industry, a number of moving parts just add further complexity. Human-wildlife conflict (HWC) has significantly impacted the tourism business in the Kamnarok National Reserve area, hence this study set out to identify the approaches taken by stakeholders to reduce HWC incidents (Vijayan & Pati, 2002).

III. THEORETICAL FRAMEWORK

Wasike and Odhiambo (2016) discuss the role of theories in guiding the thrust of academic studies. They emphasise the importance of theories in offering compelling and incisive causal explanations with calculated precision. They buttress their argument by quoting Smith (1986) who asserts that theories play the role of predicting, prescribing and evaluating socio-political phenomena hence they cannot be ignored.

This study is guided by three theories: the Value – Belief – Norm theory, the Frustration Aggression Theory and the Conflict style theory.

3.1.1 Value - Belief - Norm (VBN) Theory

The theory's comprehension is divided into three sections: moral norm activation, personal values, and the new ecological paradigm.

Schwartz (1977) norm-activation theory of altruism has been applied to pro-environmental behavior with some success. This theory holds that pro-environmental actions occur in response to personal moral norms about such actions and that these are activated in individuals who believe that environmental conditions pose threats to other people, other species, or the biosphere (awareness of consequences, or AC) and that actions they initiate could avert those consequences (ascription of responsibility to self, or ARS). Supportive

evidence comes from studies focused on a variety of pro-environmental actions.

Researchers have used the value measures created in cross-national research, or modified versions of them, for environmental research because they follow the reasoning already described that ties pro-environmental behavior to certain basic types of values (Stern *et al.,* 1999). At its core, this strategy takes into account three distinct "value orientations" or types of values: self-interest, altruism towards other humans, and altruism towards other species and the biosphere. Environmental philosophy and the literature of the environmental movement recognize these three unique motivations for caring about the environment, but actual research has yet to show a difference between human altruism and altruism towards other species and the biosphere. However, in more environmentally conscious populations, such college students in the United States or the general public in some other nations, the contrast may be more salient.

This research delves at the selfless and selfish motivations behind environmental protection, or the Self-Transcendent (ST) and Self-Enhancement Value (SEV) value clusters, respectively. Schwartz identifies two key value categories, conservation (traditional) values and openness to change, and this study investigates both in search of evidence of their effects on environmentalism.

The rise of the environmental movement is linked to growing acceptance of a new ecological paradigm (NEP) or worldview, a view that human actions have substantial adverse effects on a fragile biosphere. The NEP scale primarily measures broad beliefs about the biosphere and the effects of human action on it a sort of "folk" ecological theory from which beliefs about the adverse consequences (AC) of ecological change can easily be deduced (Stern, *et al*., 1999). In a sense, NEP measures awareness of very general adverse consequences of environmental conditions, whereas most studies using the Schwartz norm-activation model use measures of problem specific consequences. The NEP is a worldview that predisposes an individual to accept more narrowly focused AC beliefs.

Stem, *et al.* (1999) link individuals with community and observe the pro- environmental behavior, which comes from moral obligations or personal norms embedded with a certain value orientation. They believe that valued objects are threatened, and believe that their actions can help restore those values, thus experience an obligation as a matter of norm.

The theory reveals a chain of influence on behavior from people's value sets and beliefs that the danger posed by the threats is greater than they feel obliged to address the environmental problems. The VBN - model builds on Schwartz and Howard (1981), topology of value theory that presumes that altruism value lead to awareness of adverse consequences on other people and thus instigates responsibility to help eliminate the problem.

3.1.2 Frustration Aggression Displacement Theory

Dollard *et al*. (1939) introduced the Frustration Aggression Displacement Theory, which was later refined by Miller (1941) and Berkowitz (1969). Aggressiveness, according to the notion, is caused when someone or something prevents a person or group from achieving their goal(s); hence, frustration is the cause of aggression. Aggression is an inevitable consequence of dissatisfaction since it motivates violent actions.

According to this view, aggression is defined as an act whose goal-response is injury to an organism, creature, or human, while frustration occurs when a goal-response experiences interference. According to this view, aggressiveness stems from frustration but is directed elsewhere when the source of that frustration cannot be addressed directly. Riots and revolutions are often attributed to the underprivileged, who feel they have nowhere else to vent their frustrations and rage, and so resort to violence (Berkowitz, 1969).

Dissatisfaction with the study stems from unfulfilled anticipation. The feeling of being ignored contributes to this discontent. The frustration-aggression theory explains how this leads to angry reactions. Anger and hostility can quickly escalate from here. Some disagreements don't become obvious until a certain event has place. High levels of competition for land usage are a major cause of human-wildlife conflicts. The concentration of human activity in places with abundant animals has had a negative impact on the region's ability to provide enough food to sustain its inhabitants. There is still a long way to go until we meet the bare necessities of human existence. Since animals are naturally aggressive, the lack of intelligence when it comes to interacting with humans makes them increasingly frustrated, especially at the first instance of experiencing threat, which compounds the already delicate interaction between wildlife and humans and complicates social-economic activities within areas which are rich in wildlife. However, when human objectives like grain production, animal raring, and security are threatened by wild animals, people get dissatisfied and hostile, which in turn leads to human-wildlife conflict (Berkowitz, 1969).

According to the frustration-aggression-displacement theory, communities that previously coexisted with wildlife resort to their heritage killing of the animals when their basic needs are not supplied. For example, in semiarid places all over the world, residents experience frustration due to a shortage of food in wildlife reserves, a lack of water in both the population and the reserves, and a climate that produces draught. Because of this, conflicts between humans and other forms of wildlife have only increased (Orina, 2009).

3.1.3 Conflict Styles Theory

The Conflict Styles Theory was developed by Kenneth Thomas and Ralph Kilmann in the 1970s. Different levels of cooperation and assertiveness characterize the five primary conflict resolution strategies defined by the theory. In their theory, Thomas and Kilmann claimed that everyone has a

natural tendency toward one particular method of settling disputes. Thomas' conflict theory identifies five strategies for dealing with disagreements: competition, cooperation, accommodation, compromise, and avoidance.

Those who are competitive are those who have strong opinions and goals. In most cases, they are able to exert influence because of their status, level of education, field of expertise, or the ability to persuade others. Collaborative approaches are employed when multiple perspectives must be considered in order to arrive at the optimal answer, when tensions already exist within the group, or when the stakes are too high for a simple compromise. To compromise is to favor seeking out solutions that will, at the very least, leave some people happy.

When both sides have roughly the same amount of power, when progress is at a standstill, and when time is running out, compromise is the best option. By definition, an accommodating personality will sacrifice their own wants and needs in order to make everyone else happy. The accommodating person typically has a good sense of when to give in, but can be convinced to back down from a stance even when it isn't merited. When the other party's interests outweigh your own, when keeping the peace is more important than winning, or if you want to be in a position to collect on this "courtesy" you've given, accommodation is the acceptable response. However, favors may not be returned, and this strategy is not likely to produce optimal results. Finally, avoidant members are those that want to stay out of the conflict altogether. Characteristics of this approach include passing off responsibility for difficult choices, being content with the status quo, and avoiding confrontation out of concern for others' feelings. There are times when it's the right move, such as when you know you can't win, the stakes are too low, or someone else is in a better position to handle the situation. This is a poor strategy to employ in many cases, however (Hamissou & DeSilvestre, 2008).

The Conflict Styles Theory is applicable to this study because it proposes strategies for resolving human-wildlife conflicts in the Baringo North Sub-County. For instance, policies that allow for a range of perspectives to be expressed, some of the policies may not please the community leaders or the national and county government leaders but a neutral groud of understanding must be reached if conflicts have to be avoided or solved. The study concludes that so long as people and wildlife in the Baringo North Sub-county coexist, conflict will inevitably arise, and that there are both immediate and long-term options for resolving the many forms of conflict that have been documented. When fighting breaks out, it forces people to rethink their relationships with one another and whether or not they can live together in a way that is both peaceful and productive for the economy and society of the Baringo North sub-county. Therefore, since conflicts are driven by unmet demands, managing them well should eliminate the negative and damaging impacts, turning them into a net positive. The existing degree of human-wildlife conflicts can be reduced if the Baringo North Sub- county

implements one or more parts of Conflict system theory, including competitiveness, collaboration, compromising, accommodation, and avoidance.

IV. CONCEPTUAL FRAMEWORK
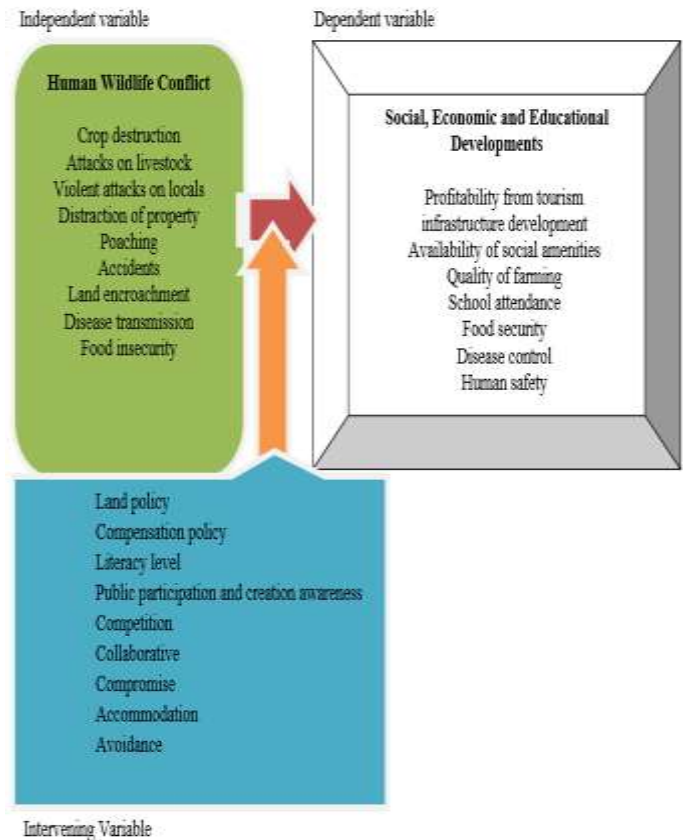
Figure 1 Showing Conceptual Model Framework Model

Figure 1: Conceptual Framework Model

Source: Researcher, 2021)

V. RESEARCH METHODOLOGY

5.1 Research Design

Creswell and Miller (2000) define a study design as "a description of techniques that researchers employ to gather, analyze, interpret, and present their research results." Researchers follow the rationale established by their study design when conducting their investigations and analyzing their data (Flick, 2002). This study used a descriptive survey method to identify factors that either increase or decrease the likelihood of human-wildlife conflict in the Baringo North Sub-County. The study's methodology was judged adequate since it uncovered factors like population growth, shifts in land use, and the biased application of policies that contribute to human-wildlife conflict. As an added bonus, this method allows the researcher to survey a sample of the population to gain insight into how its members think, feel, and act, as well as what they know. Since the conflicts in the area span the entirety of Baringo North Sub-County, it was necessary to

adopt a cross-sectional study design to provide an accurate picture of the community at large.

5.2 Study Area

The research was conducted in the Baringo North Sub-County of Kenya, which lies roughly 270 kilometers north-west of Nairobi and is part of the country's former Rift Valley Province. It has a total area of 1,703.50 square kilometers. To the east are Samburu and Laikipia, to the north and north-east are Turkana, to the south is Nakuru, to the west is Elgeyo Marakwet, to the north-west are West Pokot and Uasin Gishu, and to the south-west are Kericho and Uasin Gishu (IEBC, 2017).

The southern half of the Sub- County experiences milder weather, with temperatures averaging 25°C in June and July and 30°C in the hottest months of January and February, while the northern parts have warmer weather, with temperatures averaging 30°C to 35°C throughout the year. Every year, the county's hills get between 1,000 and 1,500 millimeters (mm) of precipitation, while the lowlands only get 300 millimeters (mm) of rain. March through June (long rains) and November (short rains) are the two rainy seasons that Baringo North Sub-County experiences (Kenya Metrological Department, 2018).

The county's topography mostly consists of river valleys and plains, the Tugen Hills, the floor of the Rift Valley, and a northern plateau. The Kerio valley is notable as one of the major river valleys in the area. Located in the western part of the county, this plain is quite level. The height above sea level varies from 1000m to 2600m (Kenya Metrological Department, 2018).

The research focussed on the reserves in the Baringo North Sub-County, one of which being the Rimoi National Reserve, a sanctuary for endangered animals. The Kenya Wildlife Service guards the 66-square-kilometer reserve. It is a component of a conservation area that is five times greater than its size and is located next to the dried-up Lake Kamnarock. In addition to the world's rare white crocodiles, which may be seen at the campsite along the Kerio River, the reserve is home to a variety of reptiles such as Agama, lizards, tortoises, and snakes. Based on the efforts of the Kenya Wildlife Service (KWS) to include local communities in the management of wildlife resources in these locations, this study uses Rimoi National Reserve as a proxy for the other reserves. Which has helped local communities maintain its natural resources, but has had unintended negative consequences and has not improved their standard of living, hence the study's urgency (Woodroffe *et al.,* 2005). Therefore, KWS is eager to support and cooperate with people in Baringo North Sub-County, Rimoi being one of the reserves, to identify and implement optimal land uses that have high conservation and livelihood values (WWF, 2006).
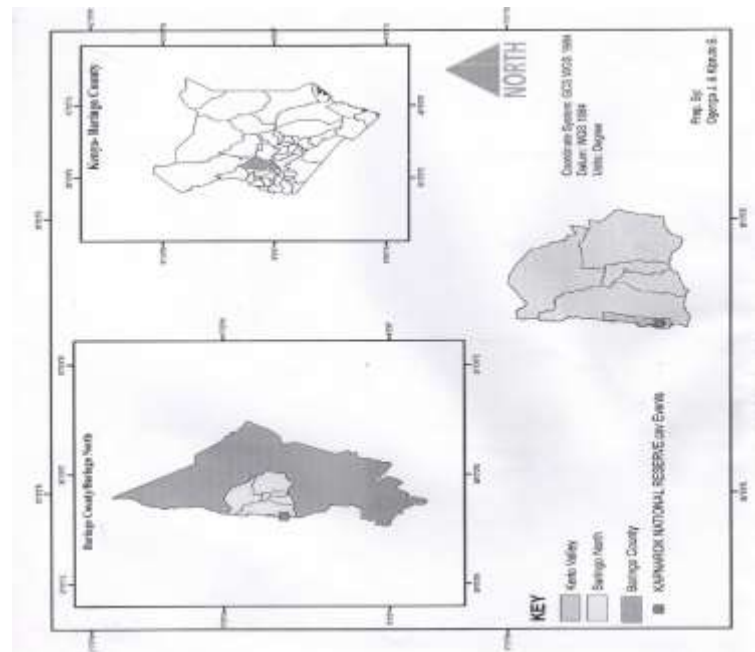

Figure 2. Baringo North Sub County

Source: Researcher's (2021)

5.3 Sampling Procedure and Sampling Size

The researcher employed purposive sampling in selecting the respondents to constitute the sample for the study. The sample population of the respondents was calculated based on Krejcie and Morgan Table 1970, Conroy (2018) who suggested that a sample of 30% of the subjects can be sufficient and Creswell (2018) who said 10% of the sample is sufficient especially for phenomenological research.The total sample size was therefore 286 respondents. The sample included 6 government field officers which were purposively sampled, 3 civil society leaders, 3 KWS officials, 3 opinion leaders, 6 teachers, 20 community based organization leaders and farmers, 3 village elders and 242 victims of human wildlife conflicts.

Sample technique used in this study included purposive and simple random sampling. Purposive sampling was used to select government field officers and identified key informants while simple random sampling was used in selecting the victims of human wildlife conflicts.

5.4 Data Collection Method

The study used the questionnaire, interview guides and observation guides in data collection. The questionnaire contained open ended questions which allowed the respondents to give their own views. These were; Government field officers, head teachers, KWS officials, and HWC survivors while interviews method was used to collect information from officials from the Ministry of Forestry and Wildlife with use of structured and semi-structured interview questions. The reason for use of interviews was that they are easy to administer since the questions are prepared in advance. They also allow a great deal of information to be gathered in a short period of time. Interviews also eliminate

many sources of bias common to other instruments like observations.

Observation checklist was used to provide researchers with ways to check for nonverbal expression of feelings, determine who interacts with whom, grasp how participants communicate with each other, and check for how much time is spent on various activities (Schmuck, 1997). Participant observation allows researchers to check definitions of terms that participants use in interviews, observe events that informants may be unable or unwilling to share when doing so would be impolite, or insensitive, and observe situations informants have described in interviews, thereby making them aware of distortions or inaccuracies in description provided by those informants.

5.5 Data Analysis and Presentation

Analyzing data entails establishing some kind of hierarchy or framework for the gathered data in order to draw conclusions from it. The data analysis and visualizations employed a wide range of approaches. Mixtures of quantitative and qualitative methods were used. Statistical software for social sciences (SPSS, version 27.0), together with proportions, percentages, and averages, were used in the studies, all of which are indicative of the quantitative method and were used to paint a broad picture from which conclusions could be drawn. The qualitative information gathered through surveys and in-depth interviews was subjected to a theme analysis. But statistical tables, bar graphs, charts, and even maps were all derived using quatitative methods (Espinosa & Yamashita, 2015).

VI. RESULTS

6.1 Risk of Wild Animals attacking Children

The study sought to establish the risk of wild life attacks that was faced children in Baringo County. This was based on three considerations namely; whether the children cross paths with animals; whether the schools that children attend are close to wildlife reserve and the history of wild animals attacks among the survivor's children. Based on these units of analysis, the study revealed that there is a risk of the children meeting wild animals as indicated by 178 (61.2%) of the survivors who stated that children cross paths with wild animals, another 178 (61.2%) of the survivors stated that the schools are located close to wildlife reserves and 172 (60.2%) of the survivors reported knowing either their or other people's children who had been attacked by wild animals.

Table 1: Risk of Children getting attacked by Wild Animals

Risk of Children getting Attacked by Wild Animals	YES		NO		N
	%	n	%	n	
Children crossing path with animals	62.1	178	37.9	108	**286**
Is the school close to wildlife reserve	62.1	178	37.9	108	**286**
Has your child been attacked by wild animals	60.2	172	39.8	114	**286**

Source: Field Data, 2021

Greater percentage of respondents was in agreement they were exposed to the risk of wild animal's attacks as they use paths network in and around the protected area. This is because some of the schools are located inside the national reserve. Some respondents also confirmed children's injuries or deaths from wild life attacks.

6.2 Incidences of attack by Wild Animals

The study sought to establish the incidences of wild life attacks in Baringo North Sub-County. The respondents were asked whether they had been attacked by wild animals in the past, out of the 286 respondents, 274 (95.70%) stated that they had been attacked by wild Animals while 12 (4.3%) indicated that they had not faced any wild life attacks. The results were as indicated in Figure 3.
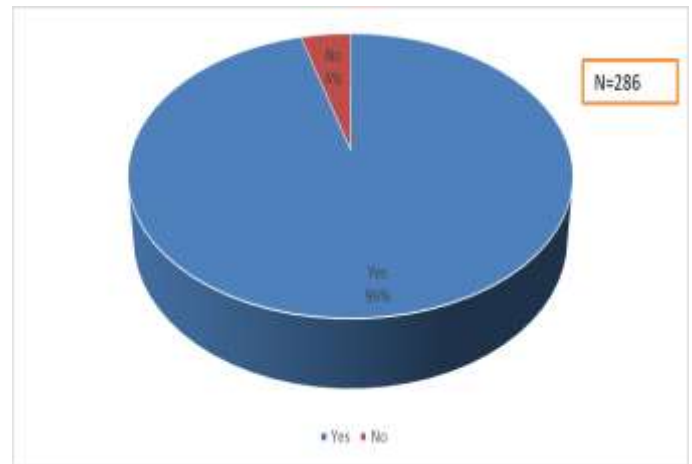

Figure 3: Whether Respondents had been attacked by Wild Animals

Source: Field Data, 2021

The findings indicate that most respondents had directly or indirectly experienced wild animal's attacks. This could have been destruction of wild life habitats inside the reserve in which the wild animals are forced to roam/move outside the protected area. Human encroachment into the reserve could be also be another pre-disposing factor. Competition for limited resources such as water especially during the dry sessions could also be another case in point.

6.3 Frequency of Wild Animal Attacks based on time of the Day when the animals attack.

The study sought to establish the time of the day when most wildlife attacks occurred in Baringo North Sub-County. The results from the 286 respondents revealed that most of the attacks occurred during the day with 22.4% stating that the wild animal attacks occur in the afternoon, 21.1% revealing that the attacks occurred before noon, 12.4% stating that the attacks were common early morning and 11.8% of the opinion that the attacks were common in the evening. The results were as show in Figure 4
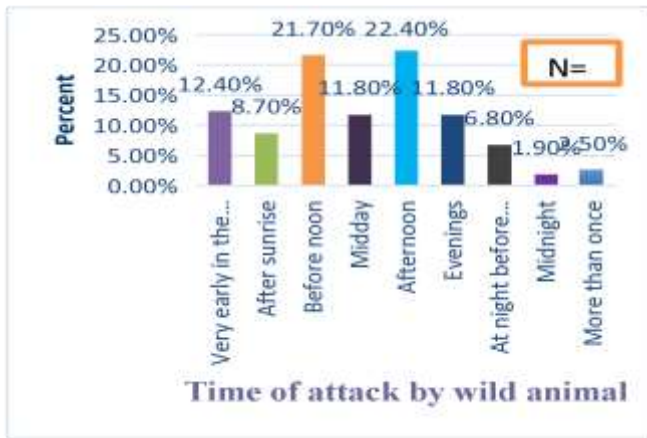
Figure 4: Time of Wild Animal Attacks

Source: Field Data, 2021

Most wild animals' attacks occur during the day, mostly in the afternoon. This is because of movements of people and livestock. This is the time life stock and people move around in search of pasture and water. Such movements are more pronounced before noon and are at its highest level in the afternoon. Early morning attacks could be attributed to farming activities which are carried out early before the scorching heat of the sun, common phenomena in ASAL area.

6.4 Types of Wild animals that Attack People in Baringo North Sub-County

The study sought to establish the types of wild animals that attacked residents of Baringo County. The results of the study revealed that among the animals, the snake had the highest reports of attacks to humans at (37.3%), followed by elephants (25.5%), Crocodiles (13.5%), buffalo (12.4%) while hyena and rhino having the least incidences of 1.20%. The findings were as shown in Figure 5
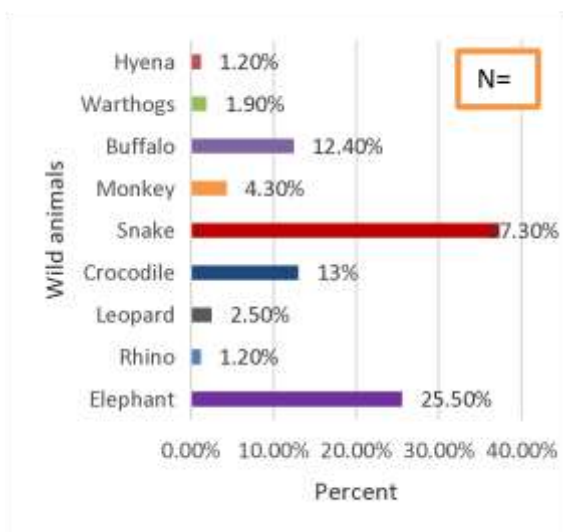

Figure 5: Wild animals that Attacked people in Baringo Sub-County

Source: Field Data, 2021

During the Interviews and FGD it emerged that the types of wild animals involved in HWC included: inside the reserve; Elephants, warthogs, snakes, zebras introduced from Rimoi / Zoi but crossed to Baringo North Sub-County; crocodiles; hyena; baboon; monkeys; outside the reserve, foxes, honey-burgers, snakes, baboons, wild-dogs.

In reference to these findings, Snakes were found to generate most attacks on people. Baringo North Sub-County has an ecological niche that harbors several types of deadly snakes. This cuts across the entire Baringo North Sub-County. Residents are therefore highly exposed to the risk of snake bites. Elephants attack people in the area because of destroyed vegetation cover inside and outside the protected area. This has forced the Elephant's to move out of the reserve in search of forage. In the process they invade people's farms/ crops hence a trigger of conflict as farmers attempt to repulse them back. Pouching which is influenced by commercial ornaments of wild life products such as ivory is systematically carried out. This at times leaves some elephants wounded. Such injured elephants become very wild and aggressively attack people and livestock as well. Whenever they come their way (Musyoki, 2007). Lack of electric fence around the national reserve elephants allows move from Karmnarok national reserve to people's farms and places of residents. Based on their instincts they have permanent migratory routes and can move from one conservancy to another.

Additionally, overstocking of elephants in the protected area is also a contributing factor. Initially, the elephant population in the reserve was about 206 in total. Presently, they number over 1000; a population size the carrying capacity of the reserve cannot sustain (Obunde *et al.*, 2005). Crocodiles are the least attackers in HWC because they attack mostly during dry season when people look for water for both domestic and livestock consumptions. They prey on them especially at Lake Kamnarok and water berms. Crocodiles are prime killers of livestock at water points. This escalates in the area since the main livelihood / source for people in Baringo North Sub-County ward rests in livestock keeping. Hyena population in Baringo North Sub-County ward is too small to trigger major attacks. A few live inside the reserve while others migrate from outside the area. Hyenas predate on small live stocks such as sheep and goats. This finding is in contrast to what Mutunga *et el* (2022) found out in terms of response to disasters in Kakamega County. In their article "Psychological First Aid Practices Applied by Humanitarian Responders during Disasters in Kakamega County, Kenya" they found out that: There are many volunteers across Kakamega County and during such traumatic events, they are activated using the volunteer management system so as to assist where necessary during times of traumatic events. Together with community members, volunteers offer physical and psychological first aid before ambulances and other responders arrive to the scene. They normally use locally available materials to save lives.

These results are consistent with a study done by Mukeka *et al.* (2019) that found 80.8% of HWC in Narok county were caused by elephants, 10.6% by buffallo, 7.6% by Burchell's

zebra, 7.3% by leopards, 5.8% by spotted hyenas, and 3.3% by lions; 11.7% were caused by non-human primates. Raids on crops (50%) were the most common cause of conflict, followed by attacks on humans (27%) and animal depredation (17.6%). The areas where wheat and maize are cultivated commercially experienced the highest rates of crop raiding. Carnivores were more likely to attack animals that were about the same size as themselves. Consequently, leopards (44.0%) and spotted hyenas (37.9%) were the primary predators of sheep and goats, while lions (63.1%) and spotted hyenas (14.5%).

The findings concur with that of Kitampui and Odhiambo (2021) in their article "Forms of Human-Wildlife Conflict in Transmara West Sub-County, Kenya" when they said: The most manifested human-wildlife conflict in Transmara west Sub County is destruction of crops. Findings indicate that elephants were considered to be responsible for more deaths than any other large animal in Mara triangle. Greatest of the deaths especially those occurring at night are often not registered by the relevant authorities for lack of clear reporting mechanism. Basically large carnivores are responsible for various lethal attacks on Humans, while large herbivores, such as elephants, are involved in human deaths every year which occurs when people are protecting their crops against raiding animals usually at night.

This study was in agreement with a study by Masago & Kweingoti (2018), which showed that livestock depredation was one of the kinds of human-wildlife conflict. Here, carnivorous and omnivorous fauna (particularly species with a broad range and high body size) often prey upon livestock, causing substantial economic damage as supported by Kissui (2008). Examples from the developed world include wolf predation on ranched and free-ranging domestic animals (Boitani et al., 2010; Lance *et al.,* 2010), while examples from the developing world include wolf predation of pastoral livestock (Inskip and Zimmermann, 2009). As a result, subsistence tillage is often the only option for people living in locations with high human population densities, limited arable land, and high prices, all of which make pastoral herding of cattle impossible. This is made worse in places bordering wildlife preserves, which are home to numerous herbivorous and omnivorous species. It's possible that a lack of food or the area's maximum population size for a certain species are determining factors in animal raiding behavior in protected habitats (Van Aarde and Jackson, 2007).

VII. SUMMARY AND CONCLUSION

The study revealed that there was risk of the children meeting wild animals as indicated by 178 (61.2%) of the respondents indicating that children cross paths with wild animals. According to the findings among the animals that attacked people, the snake had the highest reports of attacks to humans at (37.3%), followed by elephants (25.5%), Crocodiles (13.5%), buffalo (12.4%) while hyena and rhino having the least incidences of 1.20%. The findings also indicated that, 148 (52%) of the participants agreed that shared water sources

was a cause of human wildlife conflict, while 92(32%) strongly agreed respectively. Study findings further indicated that 137 (48%) of the participants strongly agreed sources of food for both humans and wild animals was another major cause of human-wild life conflicts. On examination of the place where wild animals attacked survivors on Baringo North Sub-county, findings indicated that most of the attacks occurred at work/ in farms as supported by 140 (49.1%) while 53 (18.6%) were of the opinion that the attacks were common inside/near wild life park. The study further revealed that poverty and overpopulation are drivers to human wildlife conflicts as wildlife habitats are disappearing at an alarming rate, as supported by 194 (68%) response rate. The study concludes that HWC has caused loss of lives including loss of body parts of victims due to snake bites and crocodiles. There has been increased insecurity around schools adjacent to the national reserve caused by roaming animals and which has remained a perennial problem but government agencies have not taken care of proactive stand to get a permanent solution.

VIII. RECOMMENDATION

The study recommends that government should resolve HWC by generating, lasting solutions. Such solutions include fencing off the reserve to keep off roaming wildlife and those injured together with the crops destroyed should be adequately compensated.

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