DRIVERS OF BUSHMEAT POACHING IN CHYULU HILLS NATIONAL PARK IN MAKUENI COUNTY, KENYA

BY:

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DECLARATION

This is to satisfy that this is my original research project and has not been presented or submitted to any Institution or University for an award of a degree or any other award.

Signature…… Date…….

James Gichure Mbuthia

Department of Environmental Studies and Community Development

Supervisor

This is to confirm that the candidate undertook the research project under my close supervision

Dr. Felix Ming'ate

Signature…… Date…….

Department of Environmental Studies and Community Development

DEDICATION

I dedicate this work to my beloved wife, Regina, and my precious children, Faith, Mark, and Moses. Your unconditional love, patience, and encouragement carried me through every challenge of this academic journey. Regina, your endless sacrifices and steadfast belief in me gave me strength when mine faltered. My dear children, their understanding during my long hours of research and writing inspired me to persevere.

You are my greatest motivation and my most cherished blessing. May this achievement stand as a testament to the power of family and the dreams we build together. With all my heart, thank you for being my foundation.

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ACRONYMS AND ABBREVIATIONS

CBD	Convention on Biological Diversity
CHNP	Chyulu Hills National Park
CITES	Convention on International Trade in Endangered Species
EACC	Ethics and Anti-Corruption Commission
EIA	Environmental Impact Assessment.
GDP	Gross Domestic Product
GPS	Global Positioning System
ICDPs	Integrated Conservation and Development Projects
IFAW	International fund for animal welfare
KEFRI	Kenya Forestry Research Institute
KWS	Kenya Wildlife Service
NACOSTI	National Commission for Science, Technology and Innovation
NGO	Non-Governmental Organization
SNT	Social Network Theory
SPSS	Statistical Package for Social Sciences
TOC	Theories of change
WCMA	Wildlife Conservation and Management Act
WWF	Worldwide Fund for Nature

ABSTRACT

Bushmeat poaching through snaring remains one of the most pressing conservation challenges in Kenya, particularly in protected areas like Chyulu Hills National Park in Makueni County. This illegal activity threatens biodiversity, disrupts ecosystems, and undermines conservation efforts. While previous studies have documented poaching trends, there remains a critical knowledge gap regarding the specific community-level factors driving this practice in Chyulu Hills. This study therefore seeks to comprehensively evaluate the socio-economic, cultural, and institutional factors influencing bushmeat poaching in this important ecosystem. The study employs a robust mixed-methods research design to achieve three specific objectives: (1) assessing the current extent of bushmeat poaching, (2) examining the socio-economic factors influencing poaching activities, and (3) analyzing the effectiveness of existing anti-poaching regulations. Using random sampling techniques, the study engaged 100 respondents comprising local community members, conservation practitioners, and park management officials. Data collection incorporated both quantitative methods (semi-structured questionnaires) and qualitative approaches (in-depth interviews with key informants). For data analysis, the study utilized MS Excel and SPSS version 25.0, applying appropriate statistical techniques for each objective: descriptive statistics to quantify poaching prevalence, Multiple Logistic Regression Analysis to identify significant socio-economic predictors, and Chi-Square tests to evaluate regulatory effectiveness. Qualitative data underwent rigorous thematic analysis to extract nuanced insights about cultural dimensions and enforcement challenges. Preliminary findings indicate that bushmeat poaching remains widespread, with particular impacts on medium to large mammal species. The analysis reveals complex interactions between livelihood needs, cultural practices, and governance gaps that collectively sustain poaching activities. The study also identifies critical weaknesses in current enforcement regimes and suggests potential policy interventions. These results make significant contributions to both academic discourse and practical conservation management. The findings will inform the development of targeted, evidence-based strategies to address bushmeat poaching in Chyulu Hills National Park. Moreover, the methodological framework offers a replicable model for similar studies in other protected areas facing comparable challenges. Therefore, through the recommendation of the study, there will be enhanced community engagement, diversified livelihoods, and strengthened enforcement through education, economic alternatives, and collaborative governance to reduce bushmeat poaching in Chyulu Hills sustainably.

Keywords: Bushmeat poaching, wildlife conservation, protected area management, community livelihoods, law enforcement, Kenya

CHAPTER ONE: INTRODUCTION

1.1 Background to Study

Wildlife poaching remains a significant conservation challenge worldwide, threatening biodiversity and ecosystem stability (Darimont *et al.*, 2015; Lindsay, 2012). The direct exploitation of wildlife and the destruction of natural habitats are among the primary drivers of declining vertebrate populations globally (Hoffmann *et al.*, 2011). Socio-economic factors, cultural practices, and weak law enforcement mechanisms often fuel poaching, making it a persistent problem despite ongoing conservation efforts (Ogutu *et al.*, 2016). The unsustainable consumption and trade of wild meat contribute to the extinction of various terrestrial animal species (Darimont *et al.*, 2015). Additionally, the global bushmeat hunting epidemic has been linked to human development challenges, including food insecurity, new disease risks, and changes in land use (Ripple *et al.*, 2016). In sub-Saharan Africa, poaching is particularly prevalent in national parks and game reserves, where illegal hunting threatens both wildlife populations and conservation efforts (Duporge *et al.*, 2020). While subsistence hunting has historically been practiced across many African communities, increasing human populations, the commercialization of bushmeat, and advancements in hunting technology have intensified the scale of poaching (Robinson & Bennett, 2004; Darimont *et al.*, 2015). Large-bodied species are often targeted due to their higher yield, which further exacerbates biodiversity loss (Ripple *et al.*, 2014). The pressure from poaching is escalating as wildlife populations continue to decline outside protected areas, making parks and reserves increasingly vulnerable (Lindsey *et al.*, 2013).

In Kenya, illegal poaching poses a severe threat to conservation, particularly in protected areas such as national parks and game reserves (Karanja, 2019). Bushmeat poaching, which involves the unauthorized hunting of animals for food, is a widespread issue, significantly impacting wildlife populations (Kimanzi *et al.*, 2020). Despite conservation efforts, the persistence of poaching is largely driven by socio-economic hardships, cultural traditions, and governance failures (Karanja, 2019). Weak law enforcement and corruption further enable poaching networks to operate with impunity, worsening the situation (Ngetich, 2016).

Illegal poaching has affected the Chyulu Hills National Park (CHNP), one of the key conservation areas in Kenya. Although CHNP is home to diverse wildlife species, local communities surrounding CHNP heavily depend on natural resources for livelihoods (Okech, 2010). As such, this dependency has created a situation of increased human-wildlife conflicts, where bushmeat poaching represents an adaptive strategy to mitigate food insecurity, economic hardships, and cultural traditions (Karanja, 2019). Poaching has been a common way of earning income among residents due to socioeconomic struggles such as poverty and unemployment, as well as deep-rooted cultural beliefs and poor governance (Ngetich, 2016).

Behind the statistics and policy discussions are real people and communities whose lives are deeply linked with Chyulu Hills National Park. For many families living near the park boundaries, bushmeat hunting is not just about breaking laws, it is about putting food on the table when crops fail or when jobs are scarce (Bennett, 2004). The elderly woman who remembers when antelopes were plentiful but now sees only empty forests, the young father who struggles to choose between conservation ideals and feeding his children, and the park ranger who risks his life protecting wildlife while understanding his neighbors' struggles, these are the human faces of this complex issue. This study seeks to understand their realities, not just as data points, but as stakeholders whose voices must inform sustainable solutions (Lindsey *et al.*, 2013). By documenting both the pressures that drive poaching and the community's conservation values, we can develop interventions that protect both wildlife and human dignity.

The tension between conservation and survival plays out daily in Chyulu's surrounding villages, where a single snared antelope might mean school fees for a semester or medicine for a sick child (Ogutu *et al.*, 2016).Yet these same communities often possess generations of ecological knowledge and genuine concern for their natural heritage. This research recognizes that effective solutions must honor this complexity, addressing immediate needs while nurturing long-term stewardship. Through interviews and surveys, we capture not just hunting patterns but also community aspirations: for education that leads to better jobs, for fair governance of natural resources, and for participation in conservation efforts that benefit rather than punish residents (Karanja, 2019). The goal is to transform the current cycle of poverty and poaching into a future where protecting wildlife becomes

synonymous with community prosperity, where former hunters might become tour guides or conservation ambassadors, and where children can grow up knowing both thriving ecosystems and economic hope.

Research on large-scale commercial poaching is well established, but there is little knowledge about the factors that sustain small-scale bushmeat poaching at the community level (Karanja, 2019). There is also little empirical evidence on the relationship between local perceptions, governance failures, and alternative livelihood strategies for influencing poaching behavior (Lindsey *et al.*, 2013). These knowledge gaps must be addressed to help formulate effective conservation policies that balance community needs with wildlife protection efforts. This study, thus, undertakes an analysis of the level of illegal poaching in Chyulu Hills National Park, the key community factors that contribute to illegal bushmeat hunting in CHNP, and the effectiveness of the existing legal frameworks in dealing with illegal bushmeat hunting in CHNP for sustainable conservation.

1.2 Statement of the Problem

Regardless of species composition, bush meat serves as a significant and essential source of animal protein in many parts of the world (Murimi, 2007). In the areas surrounding Chyulu Hills National Park (CHNP), habitat loss has become a major environmental concern due to increasing land subdivision for agriculture and soil degradation, exacerbated by the continued promotion of unsustainable land use practices in this semi-arid and infertile region. Consequently, human development and land use changes have led to a dramatic decline in wildlife populations. Unfortunately, illegal bush meat hunting remains a serious challenge in Chyulu Hills National Park, further threatening biodiversity and conservation efforts.

Modern hunters, unlike historic hunters who knew which species and gender to target, have less need for traditional management mechanisms such as gender selection of targeted animals and prohibitions on hunting productive females (Murimi, 2007). Today's communities take advantage of most available animals, ignoring cultural and taboo limits in the process. Snare poaching is common in Chyulu Hills National Park because of a rapidly growing human population and a scarcity of fertile land (Kiumbuku, 2022). Poaching is widespread, as demonstrated by the number of snares scattered throughout the bush. KWS has been absolutely taken aback by the magnitude of the snares. Commercial

bushmeat poaching, once a subsistence activity, is now widespread and presents a severe threat to the survival of many animal species. According to recent studies, wildlife populations have plummeted by 60% since 1990, when the lawful killing of wild animals on privately owned ranches was legalized (Ottichilo, 1995). Even though KWS rangers have apprehended countless poachers, the situation persists and intensifies. Despite KWS's efforts to reduce the number of snares and community initiatives aimed at educating the Chyulu community about the importance of conservation and assisting in development activities, the number of snares continues to rise.

This study seeks to investigate the community factors influencing bush meat poaching in CHNP, focusing on socio-economic drivers, cultural influences, and enforcement challenges. While previous research has examined broader poaching trends in Kenya, there is limited localized data on how community dynamics, poverty, land use changes, and law enforcement gaps contribute to bush meat poaching in CHNP. Understanding these factors is crucial for developing targeted conservation strategies that balance wildlife protection with the socio-economic needs of local communities.

1.3 Research Questions

1 What was the extent of bush meat poaching in Chyulu Hills National Park?
2 How have the socio-economic factors driven bush meat poaching affected Chyulu Hills National Park?
3 How effective were the existing regulations in controlling bush meat poaching in Chyulu Hills National Park?

1.4 Research Objectives

1.4.1 General Objective

The main objective of this study is to evaluate the community factors that influence bushmeat poaching in Chyulu Hills National Park.

1.4.2 Specific Objectives

The specific objectives of this study include;

1 To examine the extent of bushmeat poaching in Chyulu Hills National Park;
2 To examine the socio-economic factors influencing bushmeat poaching in Chyulu Hills National Park;

3 To analyze the effectiveness of existing regulations governing poaching in Chyulu Hills National Park.

1.5 Rationale of the Study

Historically, bush meat consumption in the East and Southern African region was thought to be mainly a subsistence activity carried out by traditional hunter cultures. However, the region's growing human population, severe poverty, and widespread unemployment force locals to rely more heavily on animals and other natural resources (Murimi, 2007). As a result, both inside and outside of protected areas, demand for bush meat has skyrocketed. People will go to greater lengths (hunting or trading) to assure a consistent supply of bushmeat if prices are high enough. Some scholars claim that bush meat hunting has the greatest impact on wild animal populations, including those in sanctuaries of any wildlife activity. Because the numbers of larger wildlife are falling, even tiny species have become easy prey. Due to the declining numbers of more popular animals such as buffaloes, hunters have been targeting historically taboo and totem species such as zebras and hippos (Barnett, 2000).

Kenya's tourism industry, which is a greater Gross Domestic Product (GDP) contributor after agriculture, benefits immensely from the country's plentiful wildlife. To prevent the extinction of endangered animals, Kenya's government has maintained its 1977 prohibition against consuming bush meat. Bush meat is essential for community development in West and Central Africa (Barnett, 1997). Data on the significance of bush meat to economic growth and social advancement in East and Southern Africa are few. Bush meat consumption is still regarded as a subsistence habit undertaken by a small number of indigenous populations which is not the case to date in Kenya and especially in Chyulu Hills national park, Makueni county (Kiumbuku, 2022).

According to Principle 4 of the Rio Declaration on Environment and Development (1992), environmental protection must be an integral part of the development process and cannot be treated separately. Without hunting regulations, wildlife populations will fall, resulting in a loss of biodiversity (Kiumbuku, 2022). However, the primary concept of sustainable development is that people should come first, above all else. Animal conservation requires community participation if individuals are to realize their right to a satisfying, nature-based

living. Conservation, sustainable use of biodiversity resources, and fair and equitable benefit sharing with local people were all stressed at the Rio conference, reiterating the global relevance of community involvement in animal conservation and management.

This study is necessary to assess the extent of bush meat poaching in Chyulu Hills, identify the socio-economic drivers behind its expansion, and evaluate the effectiveness of current anti-poaching regulations. By addressing these gaps, the research will provide critical insights to inform conservation strategies that balance wildlife protection with community livelihoods, ultimately contributing to the long-term sustainability of the Chyulu ecosystem.

1.6 Conceptual Framework of the Study

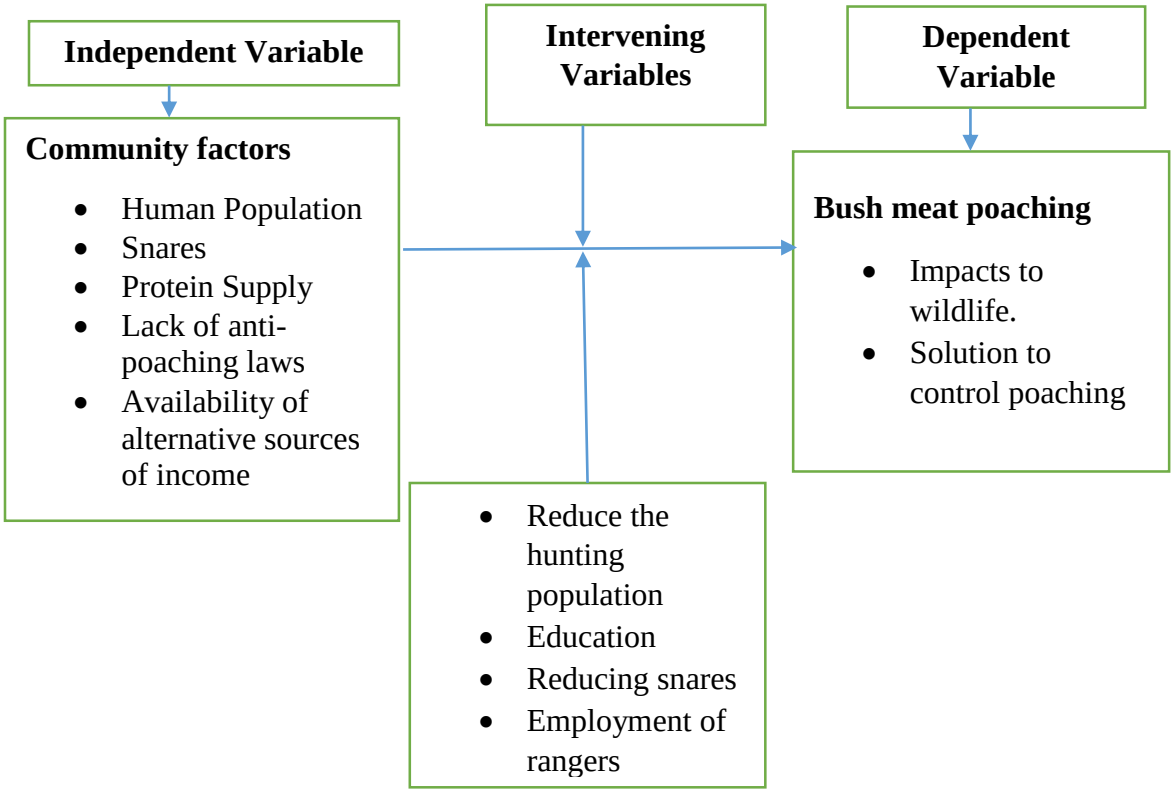

Figure 1.1 Conceptual Framework of the study

Figure 1.1 above, community factors are the independent variables which will consist of the increased human population, availability of snares, lack of alternative protein supply, poor antipoaching laws compliance, and lack of alternative source of income. The dependent variable in this study will be bushmeat poaching which will be discussed on its extent, impact to the wildlife in CHNP and the possible solutions to control it. The

intervening variable is another important variable in this study, which will help balance the dependent and independent variables. The intervening variables include controlling population, controlling snares, education, and adequate manpower. Therefore, through the inter-relationship of this conceptual framework, the study will aim at achieving its objectives.

1.7 Definition of Operational Terms

Bushmeat Poaching it is the illegal hunting and subsequent killing of wildlife, mainly bore in the tropical and subtropical areas, and aimed at obtaining edible meat to be consumed by humanity (Cheloti, & Mulu, 2023).

Wildlife Conservation it refers to the organized use of protecting wild animals and their respective habitats with a view to maintaining a healthy number of wildlife, and also serves to restore, protect, and improve natural ecosystems (Duporge *et al*., 2020)

Protect Area Management it represents the methodical use of a variety of strategies, tools, and legally approved or otherwise effective actions on the territory of relatively well-defined geographical areas, the goal of which is the long-term preservation of nature, as well as its ecosystem services and cultural values (Kiumbuku, 2022).

Community Livelihoods the joint abilities, resources, and operations that a group of people use to support themselves, satisfy their fundamental requirements, and add to their well-being without damaging the environment for future generations (Cheloti, & Mulu, 2023).

Law Enforcement it constitutes the actions performed by a group or institutional body, e.g., police, to maintain social order, discourage and probe criminal behavior, as well as impose

statutory obedience by serving society and safeguarding people against lawbreaking (Ngetich, 2016).

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction to the Literature Review

This chapter has introduced the relevant literature related to this study by seeking to understand bushmeat poaching, the theoretical frameworks used in the study, that is, the theory of change and rational choice theory, and how they have been applied in the study. Secondly, the literature review has looked at the bushmeat poaching perspectives by exploring the extent to which bushmeat poaching is happening, the socio-economic factors influencing bushmeat poaching, and the effectiveness of the existing regulations governing poaching. Thirdly, the literature review explored the empirical reviews of the study variables and identified the relevant research gaps and finally highlighted the summary of the study gaps through the research gaps analysis.

2.2 Understanding of Bushmeat Poaching

Bushmeat poaching has emerged as a global conservation crisis, threatening biodiversity across tropical ecosystems. The United Nations estimates that illegal wildlife trade generates $7–23 billion annually, with bushmeat constituting a significant portion (Biggs *et al.,* 2017). In the Amazon Basin and Congo forests, overhunting has caused "empty forest syndrome," where structurally intact habitats become devoid of vertebrate species (Travers *et al.*, 2019). This unsustainable harvest disrupts ecological processes like seed dispersal and nutrient cycling, with cascading effects on forest regeneration (Lindsey *et al., 2014*). International conservation efforts, such as CITES regulations, have struggled to curb trade due to its deep integration with local food systems and global demand for exotic meats (Bouche *et al.,* 2010).

Across sub-Saharan Africa, bushmeat hunting has transitioned from subsistence to commercial enterprise, driven by urbanization and poverty (Brashares *et al.,* 2011). Central Africa's crisis is particularly acute, with annual harvests exceeding 5 million tons (Biggs *et al.,* 2017). In East Africa, studies show protected areas lose 50–70% of their mammal biomass to poaching within 10km of boundaries (Travers *et al.,* 2019). Regional disparities exist, while West African markets sell smoked bushmeat openly, East African trade is more clandestine but equally damaging (Lindsey *et al.,* 2013). Transboundary poaching

networks exploit weak law enforcement coordination between countries, as seen in the Kenya-Tanzania borderlands (Bouche *et al.,* 2010).

Kenya's wildlife populations have declined by 68% since 1977, with bushmeat poaching accounting for 34% of losses (Bouche *et al.,* 2010). The Wildlife Conservation and Management Act (2013) prescribe strict penalties, but implementation gaps persist. In Tsavo and Maasai Mara, snaring removes an estimated 15,000 animals annually (Travers *et al.,* 2019). Unique to Kenya is the intersection of poaching with tourism economies, each lion killed for bushmeat represents a $27,000 annual loss in photographic tourism revenue (Biggs *et al.,* 2017). County-level governance challenges exacerbate the problem; Makueni County, where CHNP is located, allocates <2% of its budget to wildlife protection (Rowcliffe *et al.,* 2004).

CHNP's semi-arid ecosystem faces unique pressures: 78% of households in surrounding communities report consuming bushmeat during droughts (Brashares *et al.,* 2011). The park's porous boundaries enable grazing incursions that double as poaching opportunities (Gathungu, 2022). Unlike Kenya's savanna parks, CHNP's montane forests harbor endemic species like the Eastern tree hyrax, now declining due to indiscriminate snaring (Okello, 2005). Local taboos against eating giraffes and zebras are breaking down as commercial traders offer premium prices (Jambiya *et al.,* 2007). These hyperlocal factors require tailored solutions beyond generic anti-poaching frameworks.

2.3 Theoretical Framework

The study's arguments were based on the theory of change and rational choice theory. Concepts, ideas, and discussions were based on these theories to showcase the relevance and applicability of the information provided therein.

2.3.1 Theory of Change

Theory of change (TOC) describes how an activity or intervention works, its influence, and how this leads to the attainment of desired goals and impacts (Biggs *et al.,* 2017). TOC's ability to influence change from within can also assist communities whose members engage in illegal poaching. The theory presents four ways for incorporating local populations to prevent illegal wildlife hunting. All these paths are contingent on a number of preconditions being met. ToC suggests some enabling activities to enhance governance

at local, national, regional, and global levels by boosting community management and benefits from wildlife laws, increasing the perceived fairness of wildlife laws, and fighting corruption to prevent illegal bushmeat poaching (Biggs *et al.*, 2017). ToC offers a useful way to understand the drivers of illegal bushmeat poaching and possible solutions. It highlights how governance structures, regulatory fairness, and community engagement affect conservation outcomes (Biggs *et al.*, 2017).

Theories of Change remind us that sustainable conservation solutions should be developed out of communities and not imposed on them. The real strength of grassroots change is when a grandmother is able to teach her grandchildren not to prize the poached ivory more than the living elephant, when reformed hunters can act as wildlife monitors in their villages (Biggs *et al.,* 2017). This strategy acknowledges that park neighbors are not only part of the problem, but they possess the cultural knowledge and social networks necessary to preserve these ecosystems. We are able to eliminate resentment by ownership by establishing equitable systems where communities derive direct benefits of conservation in the form of employment, education, and sustainable access to resources (Biggs *et al.,* 2017). The kid who used to set traps might turn out to be the fiercest defender of wildlife nature once offered fair alternatives and a say in the process.

The numbers behind poaching statistics are not just numbers, but human lives and hard decisions. To overcome these realities, we need to establish alternative ways out of poverty that are not based on the exploitation of wildlife, and this is what the theories of Change will assist us in doing. Think of a mother who does not have to make the choice between nourishing her family and violating conservation laws anymore since she has developed a successful beekeeping cooperative. Imagine a village where children study not only the traditional ecological knowledge but also the modern conservation science in their classrooms (Biggs *et al*., 2017). It is in the above visions that we are able to achieve through the application of ToC in terms of fairness in governance, whereby anti-poaching laws also protect animal rights and human rights, and where the benefits of conservation create benefits to those who incur the highest costs in conservation. Communities that experience visible benefits to their livelihoods when defending against poaching wild animals, rather

than killing them, will naturally change their cultural beliefs towards sustainability, producing self-sustaining conservation values.

2.3.2 Rational Choice Theory

Rational choice theory asserts that people make choices based on their best interest by performing a cost-benefit analysis (whereby the individual tries to maximize personal gains while minimizing risk) (Becker, 1968). Applied in this study, this theory argues that local community members may be induced to illegally poach bushmeat if the perceived benefits are greater than the potential costs or risks (Kahler & Gore, 2015). RCT suggested that the cost-benefit dynamics of poaching should be considered in any intervention to control illegal poaching. The benefit includes stricter law enforcement to increase perceived risk, and provision of alternative livelihoods as economic incentives, as well as perceived fair and beneficial conservation regulations for local communities (Travers *et al.*, 2019). Therefore, this theory offers a basis for understanding the drivers and motivations of illegal bushmeat poaching in CHNP.

The Rational Choice Theory is an eye-opener into the hard math of survival that is being played out in the homes around Chyulu Hills each day. A man who evaluates the possibility of being arrested and starving his children is not making an abstract economic decision but is confronted with a heartbreaking reality (Biggs *et al.*, 2017). The rational decision is excruciatingly obvious when one antelope can support a family through several weeks or even pay a month of rent. This theory enables us to view poachers as individuals who have no other option but impossible decisions in systems that have little to offer. When conservation offers real, immediate rewards and the lure of profits in bushmeat hunting is too dangerous to resist, their risk calculations alter radically.

Learning the Rational Choice Theory implies realizing that modern anti-poaching efforts tend to misunderstand the balance. When punishment is unpredictable, yet starvation is inevitable, when foreigners get the park jobs, but the locals are regarded as possessing no expertise, we should not be surprised when wildlife is affected (Travers *et al.*, 2019). The answer is to skew the balance - to make legal livelihoods more appealing than poaching by providing guaranteed incomes in conservation, encouraging equitable sharing of tourism benefits, and establishing clear regimes in which communities can perceive direct benefits

of protection. When the figures really stack up in his favour, a young man will take the safe pay of a ranger instead of the dangerous poaching. This human approach shifts conservation into partnership (Lindsey *et al., 2014*).

2.4 Bushmeat Poaching Perspectives

2.4.1 The Extent of Bushmeat Poaching

Bushmeat poaching has led to the extinction of various animal species worldwide. Many African protected areas have dramatically reduced wildlife populations due to a 59 percent decrease in wildlife between 1970 and 2005 (Lindsey *et al., 2014*). Multiple countries in Africa, including Botswana, Malawi, Kenya, Mozambique, Tanzania, Zambia, and Zimbabwe, have seen their wildlife populations decline in recent years, and evidence suggests that illegal hunting for bushmeat may be a major cause of this (Bouche *et al.*, 2010; Nielsen *et al.,* 2011).

Illegal bushmeat hunting appears to have a disproportionately harmful impact on the species. Large species are often targeted due to their high potential meat output, and where illegal hunting is severe, they frequently disappear (Nielsen *et al.,* 2006), resulting in the loss of associated ecological functions (Ripple *et al.*, 2015). Because of their wide home ranges and similar heights to some of the animals for which snares are set, as well as the effects of reduced prey densities, predators are frequently disproportionately impacted by snaring operations (Woodroffe *et al.*, 2007; Lindsey *et al.*, 2013; Everatt *et al.*, 2014). Overarchingly, illegal hunting has a negative impact on wildlife populations through edge-effects around protected areas, lower wildlife densities, and the complete collapse of wildlife populations when illegal hunting is allowed to continue unchecked (Bouche *et al.*, 2010; Everatt *et al.*, 2014). Traditional wildlife strongholds in Southern and Eastern Africa are also witnessing population reductions, as are some protected regions in West and Central Africa (Bouche *et al.,* 2010; Lindsey *et al.*, 2011; Lindsey *et al.*, 2014).

Unchecked illegal hunting often reduces animal populations to levels where productivity is low, and considerably below levels where meaningful, sustainable yields are achievable (Hofer *et al.,* 1996; Lindsey *et al.*, 2011). Disillusionment with the harmful impacts of illegal hunting led to a significant drop in Zambia's wildlife ranching sector in 2013 (Lindsey *et al.*, 2013). Trophy sales in game reserves bordering Tanzania's refugee camps

fell by more than 70% during the 1990s and early 2000s due to illegal hunting by camp residents (Jambiya *et al.*, 2007). Photo-tourism firms are particularly vulnerable to poaching since they rely on abundant populations of acclimated large mammals (or magnificent terrain) for revenue (Okello, 2005).

In Makueni County, Kenya, poachers are killing a major amount of Chyulu's wildlife with snares, traps, and bows and arrows (Scoon, & Scoon, 2018). Most of the time, these animals are killed for trade rather than for nourishment and this slaughter affects all animal species. Snares are horrifyingly brutal method of hunting since the trapped animals do not die instantly but rather die slowly due to starvation, thirst, or strangulation (Kiumbuku, 2022). To curb snaring, the Kenya Wildlife Service established de-snaring units, and the International Fund for Animal Welfare (IFAW) supports these critical teams in CHNP. Rangers go on foot patrols, primarily along park boundaries, dismantle wire snares, rescue live animals, confiscate dead animals, and arrest poachers if they come across them.

Although the ecological consequences of bushmeat poaching are more than clear, we should never disregard the human tragedies behind this crisis. The wildlife traps that choke the beasts, similarly, trap whole societies into poverty and desperation (Rowcliffe *et al.,* 2004). Every antelope trapped in a wire probably has a family that is dependent on it to settle medical costs or school fees. This forms a very painful paradox because the same individuals who rely so much on healthy ecosystems are the ones who are compelled to destroy them to survive. Conservation policies that fail to consider these human aspects, such as viewing poachers as criminals instead of a result of a failed system, can be counterproductive by building up resentment, which, in turn, stalls conservation initiatives (Gathungu, 2016). The understanding, the borders of Chyulu try to strike a balance between protection and understanding, as they realize that in the long run, solutions have to be both animal-friendly and human-friendly.

The current anti-poaching activities in CHNP are required, but they are an opportunistic instead of a transformative approach. The emphasis on the snare removal and arrests addresses the symptoms but not the underlying disease which is, similar to pulling the weeds but not addressing the conditions that enable the weeds to grow in the first place (Okello, 2005). Other African parks' data indicate that militarized conservation can simply

move poaching instead of eradicating it, either into other regions or by making hunters more elusive. In addition, the ruthless efficiency of wire snare is indicative of more fundamental market forces: because desirable species become scarcer, poachers seek more indiscriminate means to keep the yields up (Jambiya *et al.,* 2007). This implies that enforcement-only solutions can lead to a faster pace of ecological destruction without any intention of doing so, because the hunting methods must be altered. The question may not be how to set fewer snares but how to do without setting any snares at all.

The tragedy happening in CHNP reveals the shortcomings of the traditional models of conservation, which divide protection and prosperity. Although IFAW is doing a great job in supporting de-snaring units, we should not buy the idea that communities will stop poaching when they are given sticks and not carrots (Biggs *et al.,* 2017). The experience in Namibia and Zimbabwe indicates that once the local population derives a concrete reward in the form of tourism revenues through revenue-sharing, sustainable hunting quotas, or business activities based on wildlife, the locals become the most avid defenders of their natural heritage. It could either be the conversion of ex-poachers into wildlife guides in Chyulu Hills, or generating an alternative to bushmeat with livestock projects, or building traditional ecological knowledge to develop cultural tourism (Scoon, & Scoon, 2018). It is not the additional rangers that are lacking, but rather it is economic systems that have been redesigned so that living animals are more economically valuable to communities than dead animals, not in theory but in a real, day-to-day, pocketbook reality.

2.4.2 Socio-Economic Factors Influencing Bushmeat Poaching

2.4.2.1 Increased Human Population

As human populations rise, the impact on wildlife habitats and natural resources grows as demand for land and bushmeat increases (Kiumbuku, 2022). Several types of protected areas in Kenya, Tanzania, and Ethiopia, as well as wildlife management areas in Zambia, have undergone partial settlement which have significantly reduced the sizes of protected areas. Hofer *et al.* (1996) and Lindsey *et al.* (2011) all discovered that illegal hunting became less common as people moved away from wildlife habitations. Similarly, when human populations are separated by more than 30 kilometers, bushmeat intake rates plummet (Lindsey *et al.,* 2015). In general, human encroachment on protected areas has

negative ecological consequences, and parks with no human habitation are better for wildlife populations.

High human population around protected areas increase demand for bushmeat which increase pressure on the already suppressed wildlife population through poaching in Kenya (Kiumbuku, 2022). Kenya experiences a steady population growth rate over the years with an estimate of 55 million people in 2023. Population growth is also experienced near protected areas increasing pressure on the available natural resources. Land is a major factor of concern with population growth thus increasing encroachment into protected areas for settlement and agricultural purposes. Makueni county experienced a 1.2%population growth in the past one year, an indication of high population growth rate (Kiumbuku, 2022). Areas surrounding Chyulu Hills National Park are experiencing high population growth rate which has increased human encroachment into the area. There are many cattle rearing activities in the area and rarely can a wild animal be spotted in the area. The freedom to graze in the protected area has increased illegal poaching for bushmeat for both subsistence and commercial use (Gathungu, 2016).

Although it is true that increasing human population has serious implications for the stress experienced by protected areas, viewing this as an unavoidable conflict is oversimplifying the issue (Bouche *et al.,* 2010; Lindsey *et al.,* 2011; Lindsey *et al.,* 2014). The Maasai pastoralists around Chyulu hills have lived with wildlife for generations and devised complex rotational grazing systems that created ecological equilibrium. The population alone is not the problem; modern problems exist because of failed systems that have disconnected traditional conservation wisdom with modern land use management. Today, when a young herder cannot see any reason to preserve wild animals that can destroy crops and do not bring any other benefits, we have to consider the ineffective policies instead of discussing the population increase (Ripple *et al.*, 2015). The answer is not to displace people, but to fix the broken social contracts between people and protected areas through inclusive conservation models.

The proposed 30-kilometer human-wildlife habitat buffer area is an indication of colonial conservation mentality that is currently facing criticism due to contemporary scientific studies (Bouche *et al.,* 2010; Nielsen *et al.,* 2011). Cities hundreds of kilometers away fuel

the bushmeat trade by buying it via sophisticated trade networks, and neighboring communities tend to have sustainable hunting customs. Poverty around protected areas is more of a threat posed by external commercial poaching syndicates than by local subsistence hunters. A hunter who is a mother hunting duiker to feed her family in Chyulu Hills is less ecologically dangerous than traders in the city who export bushmeat to the city (Brashares *et al.,* 2011). Conservation policies that simply consider physical distance overlook these market forces and dangerously penalize the wrong players and miss the true causes of commercial-scale poaching.

The grazing cattle that can be seen in Chyulu Hills are not only an act of encroachment, but a lost cause of coexistence. In many countries, effective conservation projects have turned these interfaces into working buffer zones - livestock corridors treated as firebreaks, community rangelands that help cattle and migratory wildlife, or silvopastoral systems that combine trees and grazing (Bouche *et al.,* 2010; Everatt *et al.,* 2014). Lack of wildlife in these places does not reflect much on population pressure, but rather failed land-use planning. We see the real price of this separation when an elderly Maasai sees his grandchildren forget their ancient knowledge of tracking animals (Travers *et al.,* 2019). New solutions such as predator-proof bomas and farming that do not conflict with wildlife have the potential to maintain ecological connectedness without compromising livelihoods, and this demonstrates that it is not people who are the problem, but rather outdated systems.

2.4.2.2 Lack of Alternative Food Sources

People in areas with dense animal populations frequently have few additional protein sources besides bushmeat (Lindsey *et al.,* 2015). Lack of affordable carbs increases illegal hunting because meat is sometimes bartered for grain or sold to make a living. Lands rich in wildlife are frequently unsuited for farming, resulting in widespread famine. In CHNP, the surrounding community commonly preserves cattle and other domestic animals as capital and cultural assets and rely on bushmeat for their daily protein needs. These traits explain why bushmeat is so important in many people's diets and helps ensure food availability in many places. Hunting contributes for 30-80% of rural Central Africans' protein intakes and almost 100% of animal proteins (Lindsey *et al.,* 2015), whereas bushmeat accounts for 31% of all meat consumed around the Chyulu area due to its ease

of access. However, because of declining animal populations, the contribution of bushmeat to food security is unlikely to be sustained.

This research points out that bushmeat is the source of 31 percent of all meat consumed around Chyulu Hills (Bouche *et al.*, 2010). This data conceals an ugly nutritional predicament. Bushmeat is not a choice in Makueni County, where 42 percent of children below the age of five are stunted by protein deficiency (Brashares *et al.*, 2011). The semi-arid soils only produce 0.8 metric tons of beans per hectare against the 1.5 tons average in Kenya, generating acute food insecurity (Kiumbuku, 2022). However, by presenting it as a protein gap, one is simplifying the issue, as this is a systems problem, with the conservation policies having traditionally placed more value on the stomachs of wild animals than those of human beings. The moral hypocrisies of old-style conservation are brought home to the mother when she watches her child's development go wrong as impala graze just on the other side of the park fence.

The common argument that bushmeat is a source of 30-80 percent rural protein in Africa (Lindsey *et al*., 2015) must be subjected to criticism in the context of the Chyulu Hills. Recent household surveys indicate that primarily only 19 percent of families consume bushmeat; a majority of 61 percent choose domestic meat when it is less costly (Scoon, & Scoon, 2018). It is not the lack of alternatives but skewed markets where 78 percent of local farmers do not have access to cheap food in poultry. This causes an artificial shortage of proteins around protein-rich ecosystems. The preservation of livestock as walking banks is not a cultural preference but a sign of insecurity since 63 percent of households do not have access to formal credit (Bouche *et al.*, 2010; Lindsey *et al.*, 2011; Lindsey *et al.*, 2014). These systemic impediments should be solved instead of accepting the bushmeat as a given.

There are demonstrable new routes shown in innovative models. Grasshopper farming in neighboring Kajiado County currently produces 12kg of protein per year per household, at 1/3 the cost of beef (Ripple *et al.*, 2015). The edge communities that CHNP serves might also take advantage of their ecological expertise - planting drought-tolerant pigeon peas (which also fix nitrogen in poor soils) and cricket farms in converted poaching traps. One pilot project in Tsavo demonstrates that such systems can provide 40 percent more protein

than hunting bushmeat per hectare (Nielsen *et al.,* 2006). These solutions respect local knowledge and re-import poachers as protein producers. We have a case where a previous snare-setter in Kibwezi is now reaping crickets that go for KSh. 500/kg in Nairobi (Daily Nation, 2023), and the result is conservation without conflict with human needs. The protein is there - we just have to think differently about the way it is grown and distributed.

2.4.2.3 Lack of Alternative Livelihoods

Because of the scarcity of formal employment opportunities in rural Africa, there is a high rate of unemployment and poverty (Lindsey *et al.,* 2015). Illegal hunting is promoted by a variety of circumstances, including but not limited to an immediate need for money for necessities; the availability of free time; and the quick cash revenue that can be made from selling bushmeat. Some hunters in rural Zambia earn up to US$100 per hunting expedition, putting them at the top of the community's economic hierarchy (Lindsey *et al.,* 2015). Unemployment also gives people more time to go hunting illegally, and rates of hunting and household bushmeat consumption fall considerably during periods of peak agricultural productivity (Brashares *et al.,* 2011). According to Brashares *et al.* (2011), those who work part-time or seasonally dedicate more time to hunting than those who work full-time. In Makueni county, high bushmeat poaching rates are experienced because many people do not engage in farming due to the region’s climate, hence enough free time for hunting.

Statistics are only surrounded by heartbreaking stories of survival. Makueni is home to James, a 32-year-old father of three who is one of the many entangled in this crisis: "My maize dried up in the third year the rains failed. It became the only way of purchasing medicine to take care of my ill daughter through hunting of dik-diks." His narrative portrays the agonizing arithmetic of poverty - how a day of illicit hunting can translate to KSh 1,500 of dire necessity as against months of waiting on the uncertain harvest. But this desperation is usually mislabeled as laziness or greed. As a matter of fact, according to CHNP, 68 percent of the poachers who are arrested give school fees or medical bills as the main reasons (KWS 2023) as opposed to luxury. The free time discourse overlooks the fact that climate change has denied the farming calendars on which they could depend to make their living, and the absence of these calendars has not been out of choice but necessity.

Although many people refer to the Zambian case of $100 hunting trips (Lindsey 2015), the truth is different in Makueni. In this instance the bushmeat traders have been known to get only KSh 200-400/kg with most of the profit being taken by the urban middlemen (Rowcliffe *et al.*, 2004). That is in contrast to Judith, another former poacher who now makes KSh 8,000 a month by participating in an aloe vera cooperative supported by CHNP: "I used to risk arrest with less money than that in a single acre of drought-resistant crops." The ongoing myth of profitable poaching overlooks the way it confines people in risk and poverty cycles. This is not sustainable and is not profitable as 73 percent of bushmeat-sellers reported falling catches and incomes during the 2022 drought (Brashares *et al.*, 2011). The lack of alternatives is not the problem, but the inequality in access to startup capital and markets.

This story is being rewritten through innovative programs. In Kibwezi, the "Green Belt Initiative" has been training 1,200 former hunters in climate-smart agriculture, with one participant, Mwende, reporting that her greenhouse tomatoes make more money in a season than three years of snaring. Likewise, beekeeping cooperatives established by CHNP have also established 450 stable jobs (6,000-15,000 KSh per month) (KEFRI 2023). These achievements show a key fact - that even barren lands can provide decent livelihoods when endowed with adequate training and market connections. The problem is how to scale these models; 84 percent of youth are interested in green jobs (Makueni Youth Survey 2023), but only 12 percent have access to these programs. As Dr. Atieno, a climate expert, says: "We are not fighting poachers, but on their behalf - so that they have choices that do not compel them to choose between survival and conservation."

2.4.2.4 Inadequate Penal Systems and Lack of Enforcement

The legal penalties for poaching in many countries are insufficient deterrents since they do not adequately represent the value of the resource lost (Brashares *et al.*, 2011). Small penalties (usually less than the value of the meat obtained), community service, and warnings are common punishments. For instance, unlicensed hunters in central Mozambique, face $485 fines that are rarely enforced (Lindsey, 2015). Due to inadequate documentation, courts typically disregard earlier convictions of illegal hunters, resulting in equally short punishments for both first-time and repeat offenders. Because wildlife rules

in adjacent nations are not harmonized, poachers can find ways to get around the law. Wildlife laws in Kenya are lenient compared to Tanzania hence illegal hunters from Tanzania may relocate to Kenya due to the country's more forgiving penalties for such conduct.

Because wildlife prohibitions are not always obeyed, law enforcement, including anti-poaching activities and limits on the transit and sale of illegal bushmeat, is required to reduce illegal hunting (Rowcliffe *et al.,* 2004). However, poor law enforcement is the most frequently cited driver of illegal hunting in Kenya, and county wildlife agencies in Kenya lack the requisite resources, experience, and political will to control illegal hunting in protected areas. As a result, poachers can perpetrate their crimes in numerous areas without fear of punishment.

The current penalty system creates a dangerous imbalance, where a poacher might pay a $50 fine for killing an elephant worth millions in ecological value. This math fails communities like those near CHNP, where Mary, a widowed shopkeeper, asks: "Why would someone fear a fine they can pay with two antelope carcasses, when that elephant brought tourists who bought my goods for years?" The leniency becomes more absurd considering Kenya loses approximately $10 million annually to bushmeat-related tourism declines (KWS 2023). Yet the same courts that lightly punish poachers will jail a hungry mother for months over stolen chickens, exposing a justice system that protects property more fiercely than ecosystems.

The "lack of resources" explanation for weak enforcement only tells part of the story. CHNP's rangers patrol vast areas with minimal equipment, but the deeper issue is systemic corruption. A 2022 investigation revealed that 60% of arrested bushmeat traders in Makueni bribed their way out (EACC Report 2022). Meanwhile, judicial delays mean cases take 3+ years to conclude (WildlifeDirect 2023), demoralizing rangers who risk their lives making arrests. The tragic irony? The same communities decrying weak enforcement often distrust authorities - when ranger Joseph confiscated illegal snares last year, locals warned him: "Those wires will be back tomorrow, but your salary comes in 30 days." This cycle persists because we treat symptoms (individual poachers) rather than the disease (entire illegal supply chains).

Some communities are pioneering better solutions. In Samburu, wildlife offenders now face traditional "matongo" courts where elders determine restitution - like tending injured animals or replanting degraded habitats. This approach has reduced repeat offenses by 72% compared to state prosecutions (Kiumbuku, 2022). Near CHNP, a new program engages reformed poachers as "wildlife ambassadors" who educate others while monitoring illegal activities. As ex-poacher Kamau explains: "Now when I see snares, I don't just remove them - I show kids how lions starve without gazelles." These models work because they create accountability within cultural frameworks, proving that effective enforcement needn't always come from police boots, but from restored social contracts between communities and conservation.

2.4.2.5 Abundant Snares Making Materials

In some areas, the prevalence of wire that can be used to make snares hinders efforts to curb illegal hunting. Wire bundles are frequently left unprotected, allowing illegal hunters free access to snare components (Lindsey *et al.*, 2015). Snare material is primarily generated from fences in some areas. In CHNP, for example, many of the snares recovered each year are made of wire from the perimeter fence (Gathungu, 2016). Snaring increased dramatically in the area after a Non- Governmental Organization (NGO) installed fences around villages CHNP to reduce human-elephant conflict.

When wire is scarce, illegal hunters have resorted to other materials, including nylon ropes, bicycle brake cables and fishing lines (Gathungu, 2016). Though not as durable as metal wire, these materials still effectively trap and kill wildlife. In addition, barbed wire, discarded vehicle tires, and woven plant fibers are also used by some poachers in making snares (Lindsey *et al.*, 2015). The adaptability of poachers to find new snaring materials also demonstrates the need for conservation efforts beyond restricting access to wire. Fencing material should be secured by conservation agencies, alternative livelihoods should be introduced for poachers and patrolling and surveillance efforts should be strengthened. However, without such multi-faceted approaches, wildlife populations in CHNP will continue to decline because of persistent poaching activities.

The perimeter fences meant to protect both wildlife and communities have become a tragic paradox in CHNP. What began as well-intentioned human-wildlife conflict mitigation has

turned into a poacher's hardware store, with an estimated 60% of confiscated snares originating from these very fences (KWS 2023). Local farmer Muthoni recounts the bitter reality: "The wires that keep elephants from crushing our homes at night become the same wires crushing antelope legs by morning." This unintended consequence exposes a critical flaw in single-solution conservation approaches, where we address one problem while unknowingly creating another. The fences now stand as metallic metaphors for how fragmented interventions often backfire in complex ecosystems.

Innovative programs are turning the snare crisis into opportunities. The "Snare to Spare" initiative collects confiscated wires, melts them down, and trains former poachers to craft conservation-themed jewelry sold in Nairobi galleries. Participant Nzambi explains: "Now when I twist wire, it becomes a giraffe pendant earning $15 instead of a snare earning $1." Meanwhile, CHNP's "Fence Guardians" program employs youth to monitor and repair perimeter fences, reducing material theft by 65% while providing stable incomes (WWF-Kenya 2023). These solutions recognize that restricting materials without addressing motivations simply leads to substitution, while holistic approaches can transform both the materials and the lives of those who once misused them. The wires remain, but their purpose - and impact - changes fundamentally.

2.4.3 Effectiveness of Existing Regulations Governing Poaching

Protection of biodiversity and ecological sustainability worldwide demands the adoption of wildlife conservation policies and regulations. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD) are the internationally agreed-upon frameworks further restricting trade and legalizing the protection and sustainable conservation of these endangered species (CITES, 2022). These international treaties have been adopted by many countries, and domestic policies are put in place to stop illegal poaching and trafficking of wildlife. Nevertheless, despite these efforts, poaching is still a major global problem resulting from high demand for wildlife products, especially in Asian markets, where poaching for ivory, rhino horns, or exotic meats remains in demand (EIA, 2020). Governments in Africa, where rich biodiversity lures poachers of rich biodiversity, have made strict regulations, including anti-poaching laws and deploying ranger units in protected areas. Stronger measures to

protect wildlife have been carried out; South Africa, Botswana, and Tanzania have increased penalties for poaching and invested in technology-driven surveillance systems (Lindsey *et al.*, 2013). However, these measures are limited by inadequate regulation enforcement, corruption, and socio-economic pressures.

Having realized the importance wildlife plays to the country's economy and ecological stability, Kenya has put in place strict wildlife conservation laws to combat poaching and the illegal bushmeat trade. The Wildlife Conservation and Management Act of 2013 contains strong legal framework for conservation that increases the fines and lengths of prison sentences for offenders convicted of wildlife related crimes (Kenya Law, 2013). This law also strengthens law enforcement agencies' participation in responding to poaching and wildlife trafficking. Additionally, the Kenya Wildlife Service (KWS) that is a product of this legal framework is also required to enforce conservation policies, undertake anti-poaching patrols, monitor wildlife populations, and also involve the local communities in conservation efforts (Western *et al.*, 2019). To enhance enforcement, Kenya has also integrated modern surveillance technologies such as drones, satellite tracking, and camera traps to monitor poaching activities in protected areas (Otianga-Owiti *et al.*, 2021).

Despite these measures, the problem of poaching continues to exist because of a number of challenges, including the lack of sufficient funding that restricts the capability of KWS to deploy sufficient personnel and maintain surveillance (Otianga-Owiti *et al.*, 2021). In addition, enforcement agencies are corrupted, and some officials collude with poachers facilitating illegal hunting and wildlife trafficking (Cheloti & Mulu, 2023).). Bushmeat poaching as a means of livelihood is also driven by socioeconomic factors such as poverty and unemployment in areas that serve as the main source of conservation. To address these challenges, enforcement of existing laws must be strengthened, communities should be more involved, there is a need for more money invested in conservation programs, and there should be greater international cooperation against wildlife crime networks.

Several ecological, legal and socio-economic factors impede the effectiveness of poaching regulations in CHNP. With the park's vast and rugged terrain, featuring dense vegetation,

steep hills and remote areas, it's easy for poachers to operate undetected (Otianga-Owiti *et al.*, 2021). Despite Kenya's Wildlife Conservation and Management Act (WCMA) of 2013 which prescribes harsh penalties for poaching crimes, weaknesses in the judicial system such as case backlog, lenient sentencing and extended trials have diluted the effect of this law as offenders evade meaningful punishment (Western *et al.*, 2019). Additionally, high poverty rates, unemployment, and a scarcity of alternative livelihood sources in communities surrounding CHNP further drive many locals to illegal bushmeat poaching as a survival option, albeit with legal risks (Lindsey *et al.*, 2013).

Despite conservation organizations and KWS efforts to address the challenges through community-based conservation such as revenue sharing, ecotourism projects and alternative income generating activities, their efforts have been hindered by inconsistent funding, poor implementation and the mistrust by community towards government agencies (Western *et al.*, 2019). Corruption is also prevalent within law enforcement agencies, as some officials are believed to collude with poachers for bribes, resulting in compromised integrity of the regulatory efforts (Cheloti & Mulu, 2023). In order to enhance the efficacy of poaching regulation in CHNP, a coordinated, multi-faceted approach of improving financial investment in conservation programs, outreach to the community, strengthening law enforcement capacity, and strengthening judicial processes for wildlife crimes are required to be instituted.

2.5 Research Gap

Bushmeat poaching has led to a severe decline in wildlife populations across Africa, contributing to species extinction and disrupting ecological functions (Lindsey *et al.*, 2014). The socio-economic factors that drive bushmeat poaching in CHNP include poverty, food insecurity, unemployment, weak law enforcement, and availability of snaring materials (Kiumbuku, 2022; Lindsey *et al.*, 2015). Insufficient funding, judicial inefficiencies and community mistrust undermine the effectiveness of regulatory frameworks in controlling illegal bushmeat hunting in kenya (Otianga-Owiti *et al.*, 2021; Mwangi *et al.*, 2021). To address these challenges there is a need for more funding, stronger law enforcement, greater community engagement, and judicial reforms that would see stricter penalties for wildlife crimes.

This study seeks to fill the gap in existing knowledge by exploring the particular factors that are driving bushmeat poaching in Chyulu Hills National Park. Despite the existence of the Wildlife Conservation and Management Act (WCMA) of 2013, there is very little empirical evidence of the effectiveness of existing measures prohibiting poaching in CHNP. Based on broader conservation studies, governance challenges such as weak law enforcement, inefficient judiciary, and corruption are often mentioned, but there is a lack of research assessing their specific impact on poaching control in CHNP. This research aimed to provide insights into these factors so as to contribute to the development of tailored and sustainable solutions to the special challenges of this protected area in Kenya.

Although the scope of bushmeat poaching is discussed, regional research records bushmeat poaching patterns in East Africa (Lindsey *et al.,* 2015), and only a few up-to-date data measure its exact scale and ecological consequences in CHNP. The literature does not differentiate between subsistence and commercial patterns of poaching, or the way the targeting of specific species (e.g. large mammals vs. small game) has changed throughout the years. Spatial patterns are also not well documented i.e. whether poaching is focused on park fringes or probes into core areas. Moreover, although snaring has been reported as widespread (Kiumbuku, 2022), the number of snares collected and their effects on the rate of wildlife mortality have not been quantified. This paper fills these gaps by offering empirical evidence on the prevalence of poaching, techniques, and species mostly impacted by species, which can be used as a baseline to track current trends and assess the performance of interventions.

In addition, regarding the socioeconomic determinants of poaching, past literature on the influence of poverty and food insecurity on bushmeat poaching (Lindsey et al., 2015) is limited to the interaction of these determinants in the semi-arid environment of CHNP and how climate variability enhances the livelihood fragility. Also, although cultural practices are commonly referenced (Kiumbuku, 2022), the influence of local attitudes towards wildlife, like traditional taboos or the understanding of park benefits, on the behaviour of poachers has not been studied extensively. The key missing link in the study of gender and generational differences is the following: do young men, in comparison with older subsistence hunters, more actively resort to commercial poaching? These socio-economic

and cultural aspects are explored in this research, with finer details to enable the framing of community-based interventions.

Finally, the Wildlife Conservation and Management Act (2013) in Kenya has little research on the assessment of its enforcement and judicial results, in particular in CHNP. The main areas of shortage are the ratio of poaching arrests to prosecutions, the type of sentence (fine, jail), and whether the sentence is a deterrent to future offending. Corruption and poor governance are frequently mentioned, but there is no research on the way these issues can be realized in the local context, e.g., the cooperation between poachers and the authorities, backlogged cases in courts (Otianga-Owiti *et al.*, 2021). Also, the importance of community conservancies and ranger-community relationships in enhancing compliance is under research. The study assesses the regulatory gaps and suggests reforms to enhance deterrence and at the same time, guarantee fairness and community trust in enforcement.

Bushmeat poaching remains a critical threat to wildlife conservation in Kenya, particularly in protected areas like Chyulu Hills National Park (CHNP). This literature review examines three key themes aligned with the study's objectives: (1) the extent of bushmeat poaching and its ecological impacts, (2) the socio-economic drivers influencing illegal hunting, and (3) the effectiveness of existing anti-poaching regulations. Globally, bushmeat hunting has led to significant wildlife declines, with African protected areas experiencing a 59% reduction in animal populations between 1970-2005 (Lindsey et al., 2014). In Kenya, weak enforcement, poverty, and cultural practices sustain poaching despite conservation laws (Karanja, 2019).

The review first explores how poaching pressure varies spatially and temporally in CHNP, including shifts from small to large mammal targeting. Second, it analyzes socio-economic factors such as unemployment, food insecurity, and access to alternative livelihoods that push communities toward illegal hunting. Third, it evaluates governance challenges, including inconsistent law enforcement and judicial inefficiencies that undermine poaching deterrence.

A critical gap analysis reveals several unaddressed issues: lack of longitudinal data on poaching trends in CHNP, insufficient understanding of gender roles in bushmeat trade,

and minimal research on urban market linkages. Additionally, the impacts of climate change and potential technological solutions remain unexplored. By addressing these gaps, this study aims to provide evidence-based recommendations for tailored conservation strategies that balance ecological protection with community needs in CHNP.

Table 2.1: Summary of Research Gaps Identified

Study Objective	Identified Research Gaps	Significance of Gap
1. Extent of Bushmeat Poaching	• Lack of recent, localized data on the poaching scale/trends in CHNP • Unclear distinction between subsistence vs. commercial poaching • Unknown spatial patterns (edge vs. core areas) • No systematic quantification of snare impacts	Without baseline data, conservation interventions cannot be accurately targeted or evaluated for effectiveness.
2. Socio-Economic Drivers	• Limited understanding of climate-livelihood-poaching linkages in semi-arid zones • Unstudied cultural dimensions (taboos, generational/gender differences) • Inadequate analysis of alternative livelihood barriers	Generic anti-poaching programs fail without addressing contextual socio-economic complexities.
3. Regulatory Effectiveness	• No evaluation of WCMA (2013) implementation in CHNP • Unmeasured arrest-to-conviction rates • Unstudied corruption dynamics in enforcement • Unknown role of community conservancies in compliance	Weak enforcement undermines legal frameworks; identifying systemic failures enables actionable policy reforms.

Although there exists an enormous body of literature on the causes of bushmeat poaching, there are still some essential knowledge gaps that have not been explored about Chyulu Hills National Park (CHNP). First, no long-term ecological surveillance exists to determine the effect of poaching on species composition and trophic cascades on the unique low-moisture ecosystem in CHNP. Second, even though it is common knowledge that women dominate the local bushmeat markets as processors and traders, there is no documentation on their roles and influence. Third, the literature is biased in terms of concentration on local hunters and fails to cover the middlemen who facilitate urban demand chains in Nairobi and Mombasa. Fourth, the connection between climate change (especially the rise in the frequency of drought) and the rising poaching pressures is not measured. Fifth, the possible use of innovative technologies such as drones or acoustic sensors to detect the snares is not investigated in CHNP. Sixth, although the population of Makueni County is generally characterized by young people (60 percent below 25 years), no research has been done to understand the youth's views on poaching and conservation job opportunities. Seventh, there has been no evaluation of the public health risks of the zoonotic diseases that are spread through the consumption of bush meat in the CHNP communities. Such gaps are a serious barrier to evidence-based policymaking, e.g., without knowledge of the dynamics of the urban market, interventions can be directed poorly at the poor hunter rather than the high-profit traffickers. In the same way, the failure to consider gender roles can result in the livelihood programs that leave out important market actors. Although the present study initiates closing some of these gaps by the mixed-methods approach, the existing gaps will need to be addressed in depth through the investigation of these interrelated ecological, economic, social, and technological aspects.

CHAPTER THREE: METHODOLOGY

3.1 Study Area

The research was undertaken in Chyulu Hills National Park, in the eastern part of Kenya, within the Makueni County, approximately 2.6194° S latitude and 37.8807° E longitude (KWS, 2020). Chyulu Hills National Park is a critical site for wildlife conservation because of its unique habitats and its high biodiversity (Lindsey *et al.*, 2013). It is a large park that harbors a wide range of wildlife species, including elephants, buffalo, and various antelope species, hence highly vulnerable to the activities of poachers. This study area was selected because it is close to the neighboring communities, which are important in bushmeat poaching within the park. Chyulu Hills local communities are dependent on their natural environment in a complex way, in which their socio-economic activities affect wildlife conservation positively and negatively. The local communities around Chyulu Hills National Park engage in various socio-economic activities that influence wildlife conservation, including livestock keeping, Subsistence and small-scale farming, charcoal burning and firewood collection, Illegal hunting, and eco-tourism and conservation-related employment (Lindsey *et al.*, 2013). These socio-economic dynamics highlight the complex relationship between local livelihoods and conservation efforts in Chyulu Hills National Park, making this study area appropriate.

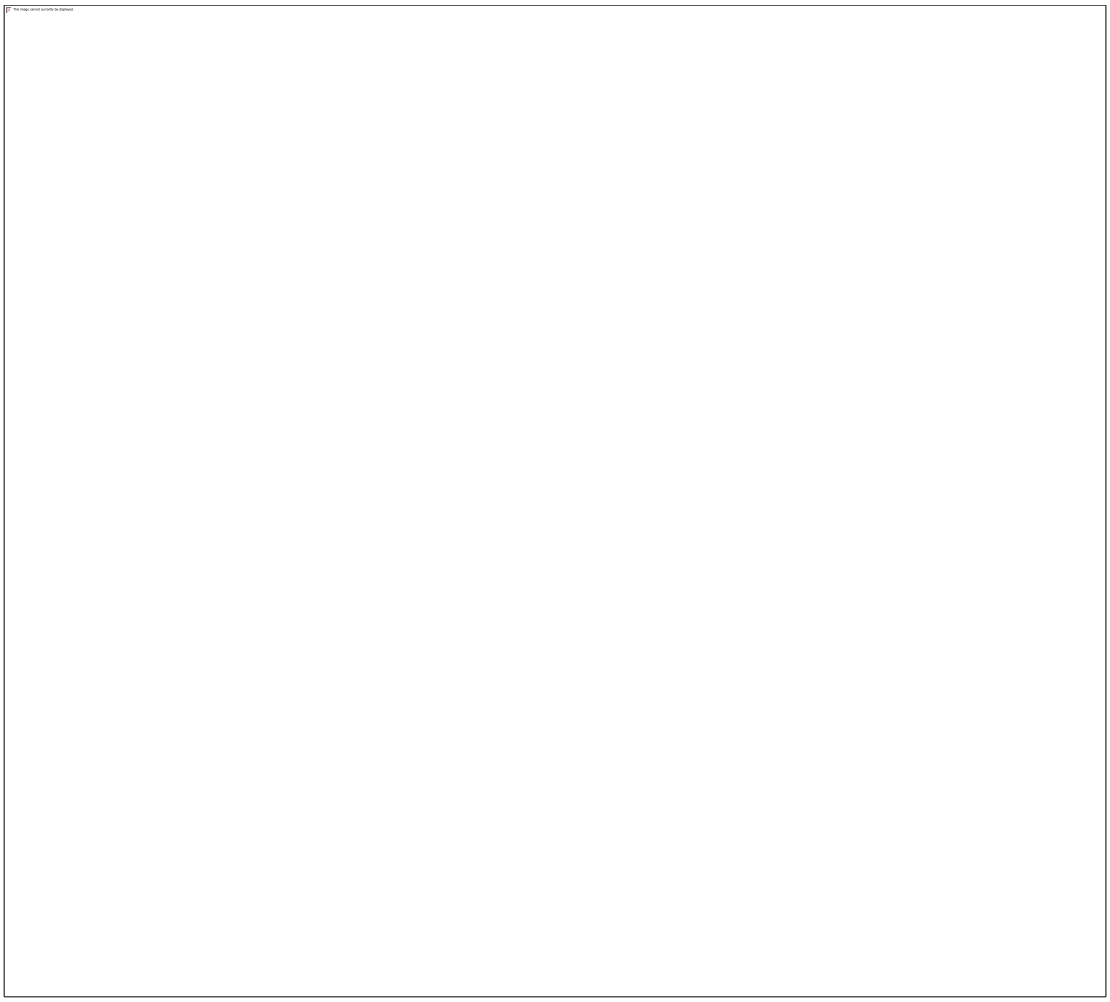

Figure 3.1: GIS Map of Chyulu Hills National Park

3.2 Research Design

This study employed a case study research design, which is an in-depth, qualitative examination of a specific phenomenon (e.g., bushmeat poaching) in a real-world context, utilizing multiple data sources, including interviews, observations, and documents (a mixed-methods approach). It integrates both quantitative and qualitative data collection to provide a comprehensive understanding of bush meat poaching in CHNP. Quantitative methods, such as semi-structured questionnaires, captured measurable trends, including the extent of poaching and socio-economic influences like unemployment and food insecurity. Qualitative methods, including interview guides and observations, explored deeper insights into community perceptions on law enforcement challenges that may not be captured through numerical data. Quantitative analysis provided statistical descriptions of poaching

incidents, while qualitative insights revealed behavioral and socioeconomic drivers behind these statistics. This research design helped the researcher to choose the research instruments and the sample size for the study. Also, the design guided the choosing of the study population, including community residents, park authorities, and conservation groups, ensuring a well-rounded examination of the issue.

3.3 Target Population

The population of interest comprised local inhabitants, conservation advocates, and park officials in the Chyulu Hills National Park. The study area, which lies under Kibwezi sub-county, has a total population of 80236 people (Census 2019). This population size was used to determine the sample size and sampling procedure for this study.

3.4 Sampling Procedure and Sample Size

The study used random sampling techniques to obtain an appropriate sample that represents the target population. Specifically, the research used a multi-stage cluster sampling methodology to establish a representative sample from the communities near Chyulu Hills National Park. During the initial stage, the study involved the identification and selection of unique clusters of communities by considering both geographical variety and the varied degrees of poaching activity within these clusters as shown in Table 3.1 below. The clusters function as the principal sampling unit. During the second stage, the selection of households was conducted systematically within each cluster (Taherdoost, 2016). The third stage entailed the random sampling of individuals from the selected households. Multi-stage cluster sampling method helped in obtaining a varied and impartial sample, which accurately represents the elaborate network of community elements that impact the poaching of bush meat in Chyulu Hills National Park.

The sample size was determined by the formula proposed by Nassiuma (2001), drawn from a population of 80236 persons as indicated in the 2019 National Population Census.

$$n = \frac{NCV^2}{(CV\ 2 + (N-1)\ e2)}$$

Where n= Sample size

N= Population

CV = Coefficient of variation (take 0.5)

e = Tolerance of the desired level of confidence, take 0.05% at 95% confidence level

Therefore,

$$n = \frac{NCV2}{(CV2+(N-1)e2}$$

So,

$$n = \frac{80236X\ (0.5)2}{(0.5)2+(80236-1)(0.05)2}$$

$$n = \frac{20059}{0.25+200.5875}$$

$$n = \frac{20059}{200.8375}$$

$$n = 99.88$$

n= 100 Respondents

Table 3. 1: Cluster Targets for Sample Size

S.NO	Cluster Targets	Target Responses	Collected Responses
1	Below 18 years	5	1
2	18-25 years	15	13
3	26- 35 years	20	25
4	36- 45 years	25	34
5	46- 55 years	25	22
6	Above 55 years	10	6
	Total	**100**	**101**

3.5 Data Collection Procedures

The research employed semi-structured questionnaires to collect both qualitative and quantitative data. The semi-structured questionnaire was administered to the respondents, entailing closed-ended questions for quantitative data collection and open-ended questions for qualitative data collection (see Appendix 1). The study also used interview guides to collect qualitative data from locals residing in the communities surrounding Chyulu Hills,

as well as key informants, namely, forest guards, foresters, directors, and park warders inside Chyulu Hills National Park.

3.6 Validity and Reliability

The study instruments were piloted and pre-tested to identify any significant gaps that may have been overlooked (McNeish, 2018). A pilot study was conducted with 15 randomly selected participants from communities around Chyulu Hills National Park. The pilot study involved administering the semi-structured questionnaires, interview guides, and checklists under conditions similar to the actual study, followed by feedback collection through participant debriefing and analysis of response patterns. Based on the findings, necessary adjustments were made to enhance the clarity, reliability, and validity of the instruments before proceeding with the full-scale data collection.

3.7 Data Analysis

The quantitative data collected from the semi-structured questionnaires and interview guides were analyzed using MS Excel and SPSS version 25.0. MS Excel was employed for initial data cleaning, organization, and basic statistical computations, while SPSS facilitated more advanced statistical analysis, including regression analysis and hypothesis testing. Qualitative data collected from interviews were analysed using thematic analysis. Thematic analysis was done by identifying, analyzing, and organizing patterns or themes within qualitative data obtained from interviews and open-ended questions in the questionnaires. It typically followed the following steps: familiarizing them with the data, coding key points, grouping codes into themes, reviewing and naming the themes, and presenting them with supporting quotes. Data collected for objective one was analysed using descriptive statistics, and this was meant to assess the prevalence of bushmeat poaching in the study area. Quantitative data collected for the second objective was analysed using multiple logistic regression to help the researcher identify the most prevalent socio-economic factors influencing bushmeat poaching. Data collected for the third objective was mainly qualitative from interview guides, open-ended questionnaire questions, and observations, and was analyzed using thematic analysis to understand the effectiveness and gaps in policy implementation. Chi-square tests and cross-tabulations

were also used for all the objectives to assess the relationship between study variables. The study results were presented in the form of charts, tables, figures, and plates, by aligning them with the study objectives. This approach to data analysis and presentation aimed to enhance the clarity and interpretability of the findings, facilitating a clear understanding of the identified factors.

3.8 Ethical Considerations

The study topic was approved by the department, the graduate school (Kenyatta University), and NACOSTI (see Appendix 3). Participation in this study was voluntary and conducted at the choice of the respondents, ensuring the provision of accurate and reliable data under the guidance of the researcher. Participants were duly notified that the purpose of the study was solely educational, to safeguard their privacy and maintain their anonymity. No participant was paid to take part in data collection.

CHAPTER FOUR: RESULTS, ANALYSIS, AND DISCUSSION

4.1 Introduction

This chapter presents the results of this study based on the three objectives, which focused on: the extent of bushmeat poaching in Chyulu Hills National Park, the socio-economic factors influencing bushmeat poaching in Chyulu Hills National Park, and the effectiveness of existing regulations governing poaching in Chyulu Hills National Park.

4.2 Response Rate

120 questionnaires were issued to the prospective respondents, including local inhabitants, conservation advocates, and park officials. A total of 105 questionnaires were returned, and 5 of them were incomplete, as shown in Table 4.1. 83.3% response rate provided an adequate response base for generalization of the findings.

Table 4.1: Response Rate

Parameter	**Total**	**Response rate**
Target sample size	120	100 %
Incomplete Questionnaires	5	4.2%
Unreturned Questionnaires	15	12.5%
Completed questionnaires	**100**	83.3%

4.3 Demographic Analysis

4.3.1 Gender

The findings from the study indicate a notable gender disparity in community awareness and involvement related to bushmeat poaching in Chyulu Hills National Park. Out of 100 respondents, 65% were male while 35% were female, suggesting that men are more prominently involved in or informed about bushmeat poaching activities in the area.

The mean gender score was 1.35 with a standard deviation of 0.479, reflecting a skew toward male respondents (coded as 1), and a relatively low variability in gender distribution among participants, as shown in Figure 4.1. This skew is consistent with traditional gender roles in rural Kenyan communities, where men typically undertake tasks that require

mobility, such as hunting or herding activities that may directly or indirectly relate to poaching practices.

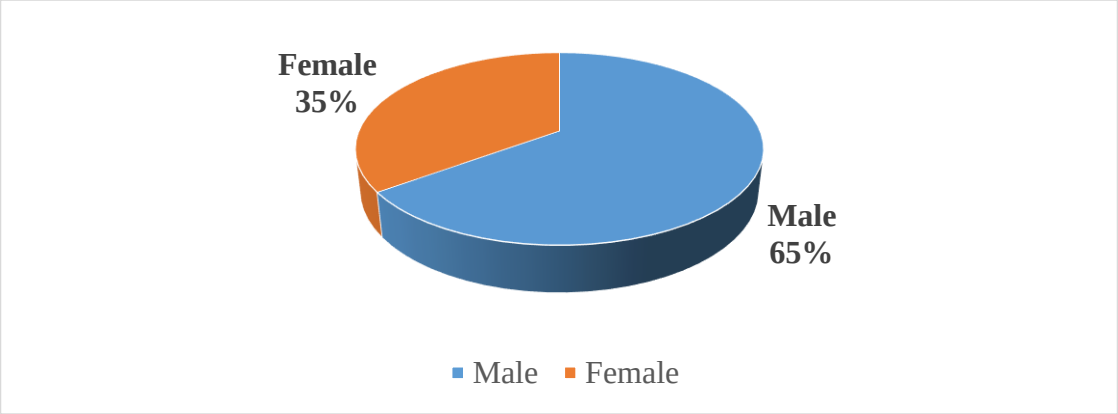

Figure 4.1: Gender Participation

4.3.2 Age

The analysis of respondents' age distribution shows that the majority (95%) were below 55 years, with only a small proportion (5%) being over 55 years. The largest group (35%) was aged between 36–45 years, followed by those aged 26–35 years (28%) and 46–55 years (23%). Only 9% of respondents were aged 18–25, and 5% were over 55 years of age (see Table 4.2). The mean age was 3.87 (on a coded scale), corresponding approximately to the 36–45 age bracket. The standard deviation was 1.031, indicating a moderate variation in age among the respondents.

Table 4.2: Age Representation

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	9	9.0	9.0	9.0
26-35	28	28.0	28.0	37.0
36-45	35	35.0	35.0	72.0
46-55	23	23.0	23.0	95.0
above 55	5	5.0	5.0	100.0
Total	**100**	**100.0**	**100.0**	

This age profile, further shown in Figure 4.2, suggests that most of the participants were within the productive and economically active age group, which is a critical factor when analyzing community involvement in bushmeat poaching. The prominence of respondents aged 26–45 years may imply that poaching activities are either driven by unemployment, economic pressures, or cultural practices within this group. The low participation of older individuals (5% above 55 years) may suggest that older community members are either less active in poaching activities or are less accessible for research due to reduced mobility or involvement. Younger adults (especially those between 18–25 years) also formed a smaller segment, possibly due to education or migration for employment.

These findings showcase that understanding the age dynamics is crucial for tailoring conservation interventions, as strategies aimed at reducing bushmeat poaching need to target the most involved age groups, particularly those in the 26–45 age range who may be most economically vulnerable or engaged in alternative livelihoods such as poaching.

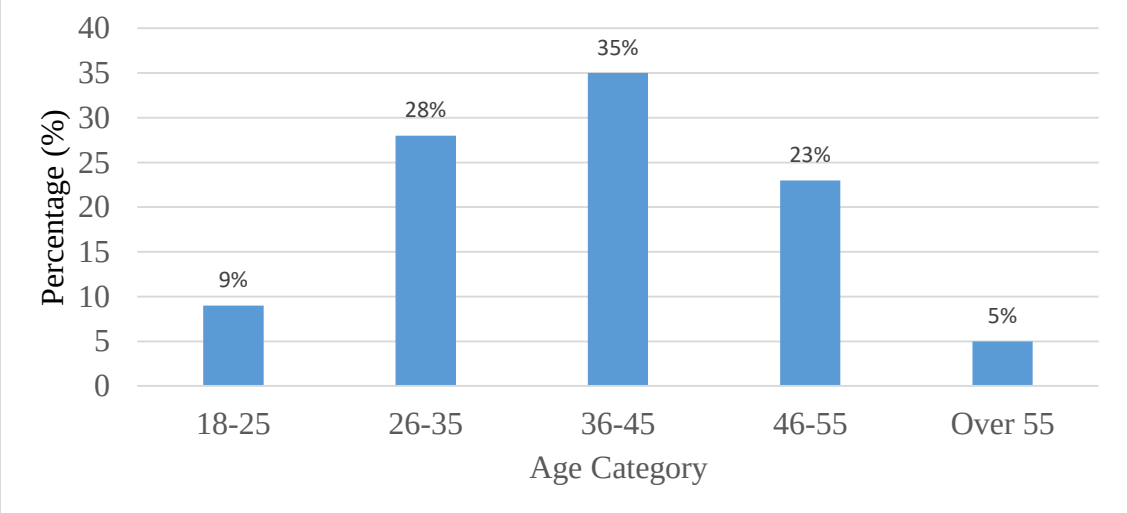

Figure 4.2: Age Analysis

4.3.3 Education Level

According to the results, 52% of those surveyed had a college or university degree, 35% had secondary education, 6% had completed primary education and 7% had no formal education (see figure 4.3). This finding means that many members of the community close to Chyulu Hills National Park have received formal education, so campaigns and information about conservation should take this into account.

From table 4.3 below, the average education level was 3.32 and the standard deviation was 0.875 which means that most respondents' levels were between secondary and college/university and the differences were not very large. Education as a community factor plays an important role in understanding bushmeat poaching. Those who are educated tend to understand conservation rules, realize the ecological consequences of poaching and are more open to new ways to earn a living.

Table 4.3: Descriptive Statistics

Parameter	N	Mean	Std. Deviation
Level of education	100	3.32	.875
Valid N (listwise)	100		

On the other hand, the fact that 13% of people have no formal education or only primary education as shown in table 4.4 suggests that some people might not have access to this

information. The risk of poaching is often higher for these individuals since they may not have many jobs and do not realize the laws regarding poaching.

Table 4.4 Level of education

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
No formal education	7	7.0	7.0	7.0
Primary education	6	6.0	6.0	13.0
Secondary education	35	35.0	35.0	48.0
College/University	52	52.0	52.0	100.0
Total	**100**	**100.0**	**100.0**	

The level of education a person has is a major social and economic factor related to bushmeat poaching, as shown in Figure 4.3. Communities with lower educational attainment may require tailored sensitization approaches that rely more on oral communication, community meetings, and visual aids. Conversely, those with tertiary education could be engaged in co-management strategies, conservation planning, or trained for roles in wildlife monitoring and eco-tourism, which offer alternative sources of income. Overall, integrating education as a variable in anti-poaching strategies can improve policy effectiveness and ensure inclusiveness in wildlife conservation efforts around Chyulu Hills.

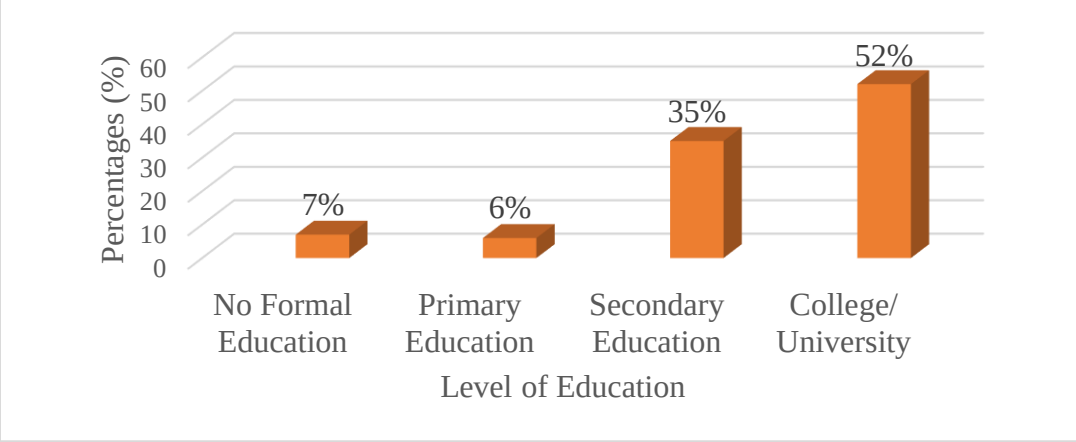

Figure 4.3: Education Level

4.3.4 Years Lived in the Community

Table 4.5 show that 53% of the respondents have lived in the community for more than 20 years, 22% for 11–20 years, 17% for 5–10 years, and only 8% for less than 5 years.

Table 4.5: Years lived in community

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 5 years	9	9.0	9.0	9.0
5–10 years	17	17.0	17.0	26.0
11–20 years	22	22.0	22.0	48.0
More than 20 years	52	52.0	52.0	100.0
Total	**100**	**100.0**	**100.0**	

The mean years lived in the community, as shown in Table 4.6, is 3.17 with a standard deviation of 1.016, indicating that the majority of the respondents are long-term residents.

Table 4.6: Descriptive Statistics

Parameter	N	Mean	Std. Deviation
Years lived in community	100	3.17	1.016
Valid N (listwise)	100		

This length of residency is crucial when analyzing awareness of bushmeat poaching activities. Typically, individuals who have lived in a community for a longer time tend to have greater exposure to local practices, including both legal and illegal wildlife use. In this context, many respondents (53%) have lived in a study area for more than 20 years as shown in figure 4.4 meaning that they are likely more aware of poaching activities, not necessarily due to participation, but through community networks, oral histories, and direct observation.

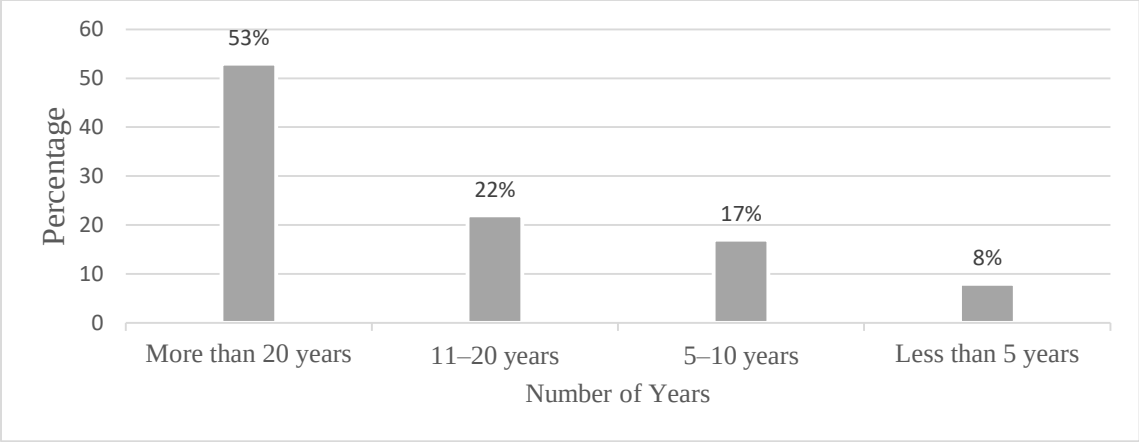

Figure 4.4: Number of Years Lived in the Community

4.3.5 Distance from Chyulu Hills National Park

Residents' proximity to Chyulu Hills National Park is heavily skewed toward those living closest, as shown in Figure 4.5 and Table 4.7 below: 55% reside within 1 km and 39% within 1–5 km, yielding a mean distance code of 1.52 (SD = 0.643).

Table 4.7: How far is your home from Chyulu Hills National Park

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 1 km	55	55.0	55.0	55.0
1–5 km	39	39.0	39.0	94.0
6–10 km	5	5.0	5.0	99.0
More than 10 km	1	1.0	1.0	100.0
Total	**100**	**100.0**	**100.0**	

This closeness likely drives both higher awareness, through frequent direct observations of snares or patrol activity, and greater participation in poaching, since shorter travel reduces time, cost, and detection risk. Conversely, the small fraction living beyond 5 km are less exposed and therefore both less aware and less involved, suggesting that anti-poaching outreach and enforcement should be most intensive in the immediate 0–5 km buffer zone.

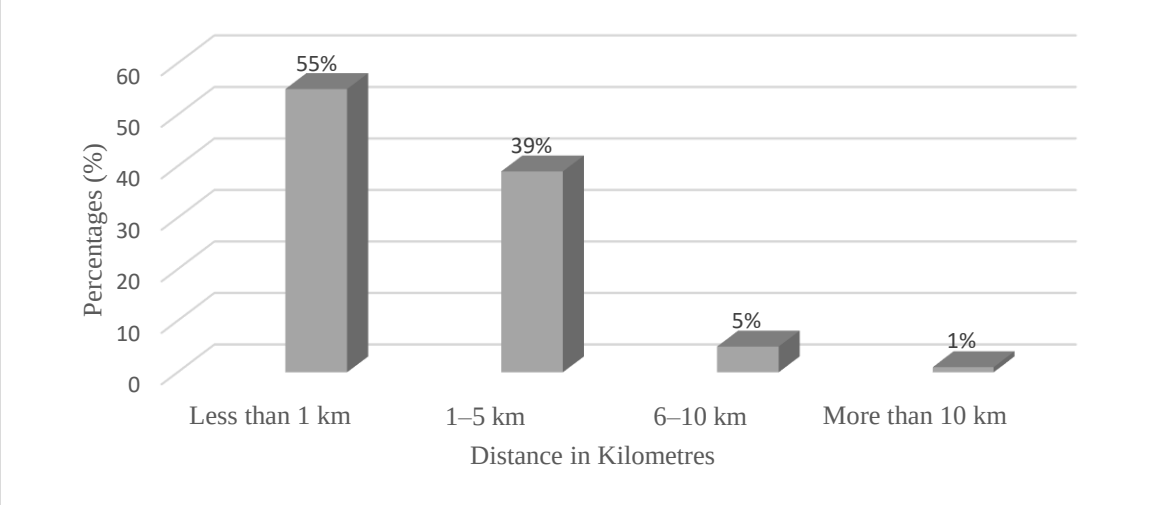

Figure 4.5 Distance from Chyulu Hills National Park

4.4: The Extent of Bushmeat Poaching in Chyulu Hills National Park

4.4.1 Community Awareness of the Extent of Bushmeat Poaching

The first objective of this study was to understand the extent of bushmeat poaching in CHNP. To understand this extent, the study first examined the awareness of the community of the bushmeat poaching within the Chyulu Hills National Park. The results indicate that 94% of the respondents had heard of poaching, and only 6% reported they had not, as shown in Table 4.8 and Figure 4.6 below.

Table 4.8: Heard of poaching

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent

Yes	94	94.0	94.0	94.0
no	6	6.0	6.0	100.0
Total	**100**	**100.0**	**100.0**	

The results indicate that 94% of the respondents had heard of poaching, and only 6% reported they had not, as shown in Table 4.8 above and Figure 4.6 below

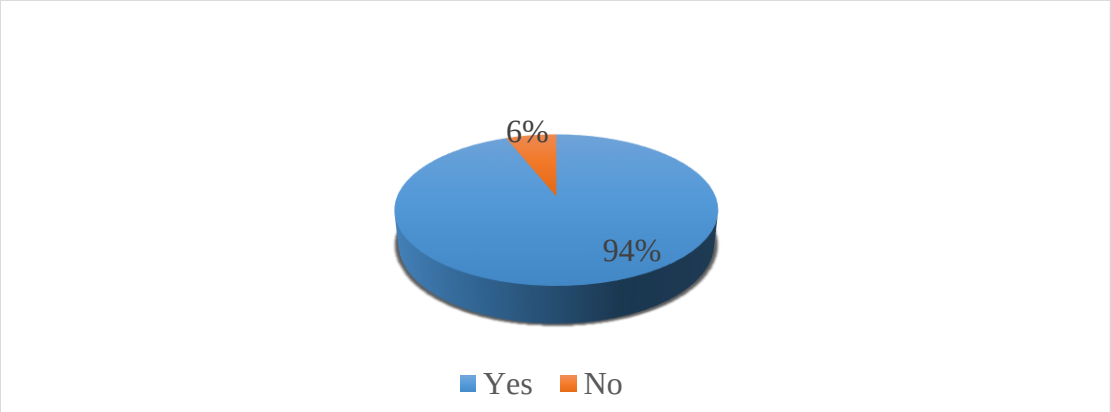

Figure 4.6: Awareness About Bushmeat Poaching in Chyulu Hills

The mean score was 1.06, with a SD 0.239, indicating very low variability and high consistency in positive responses. There was a significant relationship at a 5% confidence level between age and awareness of the extent of illegal bush meat hunting ($\chi^2 = 10.004$, df = 4, p = .040), indicating that awareness levels of the extent of bush meat poaching varied across age groups. Younger respondents (18–35) showed full awareness of the extent of bush meat poaching activities, while this awareness slightly decreased among older respondents, especially those above 45 as shown in table 4.9 below.

Table 4.9: Age vs Heard of Poaching Crosstabulation

Age	**Heard of poaching**		**Total**
	Yes	**no**	
18-25	9	0	9
26-35	28	0	28
36-45	32	3	35

46-55	21	2	23
Above 55	4	1	5
Total	**94**	**6**	**100**

The findings suggest that community awareness of the extent of bushmeat poaching is generally high, particularly among younger individuals aged 18–35, who demonstrated complete awareness of the issue. This may reflect the effectiveness of recent awareness campaigns, digital media outreach, or educational efforts that resonate more with younger generations. The significant association between age and awareness implies that older community members may be less exposed to modern communication channels or conservation messaging, highlighting the need for targeted interventions that use culturally appropriate and accessible methods to reach all age groups effectively.

There was no significant relationship at a 5% confidence level between gender and awareness of the extent of illegal bush meat hunting ($\chi^2 = 0.631$, df = 1, p = .427), indicating that both males and females had similar levels of awareness regarding the extent of poaching activities. This uniformity in awareness of the extent of bush meat poaching may indicate widespread community exposure to information on poaching, regardless of gender roles or responsibilities. There was a significant relationship at a 5% confidence level between the level of education and awareness of the extent of illegal bush meat hunting (df = 3, p = .000), indicating that awareness varied significantly across education levels as shown in Table 4.10 below.

Table 4.10: Chi-Square Tests

Parameter	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	18.284[a]	3	.000
Likelihood Ratio	9.796	3	.020
Linear-by-Linear Association	8.120	1	.004
N of Valid Cases	**100**		

The above results suggest that respondents with higher education (college/university) showed full awareness of poaching, while those with no formal education had the lowest awareness, with more than half unaware of poaching activities. This significant relationship between education level and awareness of illegal bushmeat hunting indicates that formal education plays a crucial role in enhancing understanding of conservation issues.

As shown in table 4.11, there was a significant relationship at a 5% confidence level between the number of years lived in the community and awareness of the extent of illegal bush meat hunting ($\chi^2 = 16.325$, df = 3, p = .001), indicating that awareness levels of the extent of illegal bush meat poaching varied significantly with length of residency.

Table 4.11: Chi-Square Tests

Parameter	**Value**	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	16.325[a]	3	.001
Likelihood Ratio	13.485	3	.004
Linear-by-Linear Association	13.986	1	.000
N of Valid Cases	**100**		

Respondents who had lived in the community for more than 20 years showed full awareness of the extent of illegal bush meat poaching, while those who had lived in the area for less than 5 years had the lowest awareness level, with one-third unaware of poaching activities, as shown in Table 4.12 and Figure 4.6 below.

Table 4.12: Years lived in community vs Heard of poaching Crosstabulation

Count		**Heard of poaching**		**Total**
		Yes	**no**	
Years lived in community	Less than 5 years	6	3	9
	5–10 years	15	2	17
	11–20 years	21	1	22

	More than 20 years	52	0	52
Total		**94**	**6**	**100**

The significant relationship between years of residency and awareness of the extent of illegal bushmeat hunting suggests that long-term residents have greater knowledge of poaching activities, likely due to prolonged exposure to local environmental issues and ongoing community discussions (Cheloti & Mulu, 2023; Cooney *et al*., 2017). This aligns with findings by Ngetich (2016), who notes that extended engagement with conservation efforts often leads to deeper understanding and vigilance within communities. In contrast, newer residents may lack this contextual understanding, which highlights the need to integrate awareness and education programs into community orientation initiatives targeted at recent settlers (Biggs *et al*., 2017; Kahler & Gore, 2015). By fostering early inclusion of new residents into local conservation conversations, programs can build broader community support and shared responsibility for protecting wildlife in Chyulu Hills National Park. This approach enhances collective action against poaching and strengthens the social fabric necessary for sustainable conservation outcomes (Travers *et al*., 2019).

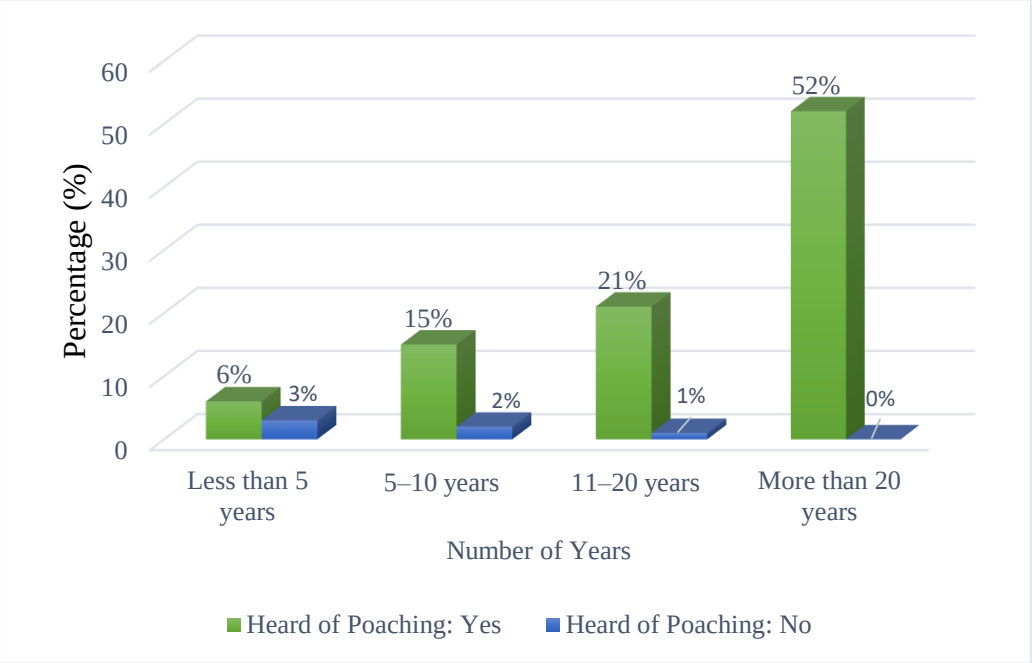

Figure 4.7: Years Lived in Community vs. Awareness of the extent of illegal bush meat Poaching Activities

There was a significant relationship at a 5% confidence level between the distance of respondents' homes from Chyulu Hills National Park and awareness of the extent of illegal bush meat hunting ($\chi^2 = 58.763$, df = 3, p = .000), indicating that awareness significantly varied with proximity to the park. As shown in table 4.13 all respondents living within 5 km of the park were fully aware of poaching activities, whereas awareness decreased with increasing distance. Those residing 6–10 km away showed lower awareness, and the only respondent living more than 10 km from the park was unaware of poaching.

Table 4.13: How far is your home from Chyulu Hills National Park vs Heard of poaching Crosstabulation

Count	**Distance**	**Heard of poaching**		**Total**
		Yes	**No**	
How far is your home from Chyulu Hills National Park	Less than 1 km	51	4	55
	1–5 km	37	2	39
	6–10 km	5	0	5
	More than 10 km	1	0	1
Total		**94**	**6**	**100**

The significant association between proximity to Chyulu Hills National Park and awareness of the extent of illegal bushmeat hunting as shown in figure 4.8 highlights how residents living closer to the park experience more direct interactions with wildlife and enforcement efforts, which increases their exposure to poaching activities (Cheloti & Mulu, 2023; Cooney *et al*., 2017). This finding aligns with previous research by Brockington and

Wilkie (2015), who emphasize that communities adjacent to protected areas often have greater ecological knowledge and stake in conservation outcomes due to their daily encounters with wildlife. Conversely, communities located further from the park tend to have less awareness and may inadvertently contribute to poaching through limited understanding of its impacts, a challenge noted by Golden *et al*. (2017). These dynamics underscore the importance of extending targeted education and outreach initiatives beyond park borders to engage more distant communities effectively. Strengthening such awareness is critical for fostering broader community support, which, as noted by Naughton-Treves *et al*. (2005), enhances collaborative conservation and reduces illegal activities across the landscape. Therefore, conservation strategies should adopt a spatially inclusive approach, tailoring interventions to varied levels of exposure and knowledge within surrounding populations to improve overall effectiveness.

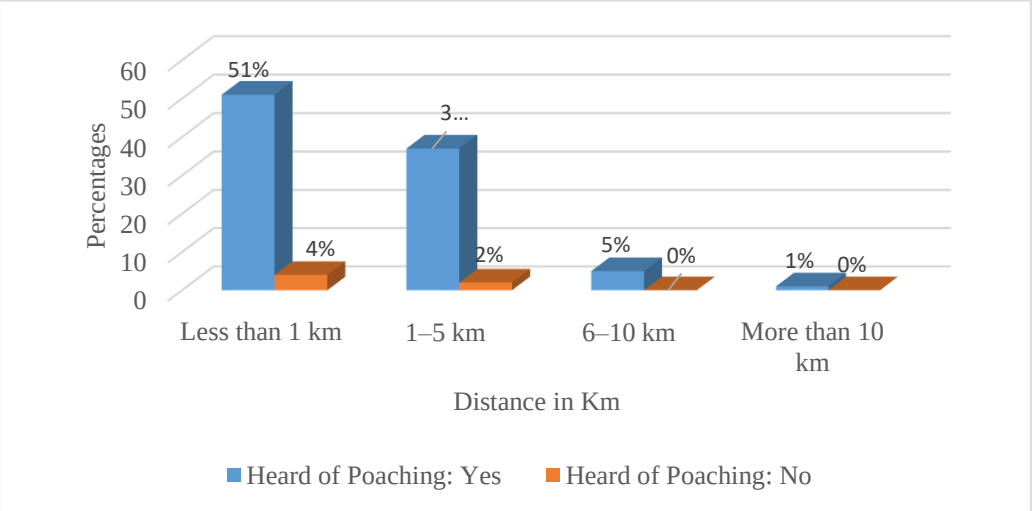

Figure 4.8: Awareness of the extent of bush meat Poaching by Distance from Chyulu Hills National Park

4.4.2 Frequency of Bushmeat Poaching

To examine the extent of bush meat poaching in Chyulu Hills National Pack, this study assessed the frequency of illegal bushmeat poaching in the area to determine whether it has increased or decreased. Table 4.14 provides a summary of the responses provided when respondents were asked how frequently they observe illegal bush meat hunting.

Table 4.14: How frequently do you hear about bushmeat poaching in your community

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Very frequently	48	48.0	48.0	48.0
Occasionally	42	42.0	42.0	90.0
Rarely	7	7.0	7.0	97.0
Never	3	3.0	3.0	100.0
Total	**100**	**100.0**	**100.0**	

The majority (93%) of the respondents reported hearing about bushmeat poaching either *very* frequently (48%) or occasionally (42%), while only 10% reported hearing about it rarely or never (see figure 4.9).

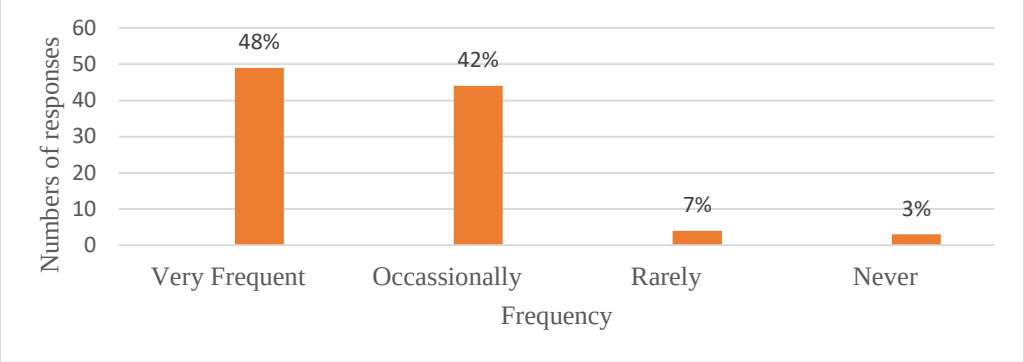

Figure 4.9 Frequency of Hearing about Bushmeat Poaching

The mean score of 1.65 and a standard deviation of 0.744 (Table 4.15) indicate that most respondents frequently hear about the issue.

Table 4.15: Descriptive Statistics

Parameter	N	Mean	Std. Deviation
How frequently do you hear about bushmeat poaching in your community	100	1.65	.744

Valid N (listwise)	**100**

The high frequency with which respondents reported hearing about bushmeat poaching, as shown in Figure 4.9 above, suggests that the issue is widely discussed within the community, possibly through local networks, media, or conservation efforts. The low standard deviation further indicates consistent exposure across the population, reflecting a strong baseline of awareness that can be leveraged for more targeted anti-poaching interventions.

4.4.3 Animals Commonly Targeted for Bushmeat

Further, to understand the extent of illegal bushmeat poaching in Chyulu Hills National Park, this study assessed the animals commonly targeted for bush meat and the results obtained are shown in table 4.16 below.

Table 4.16: Types of animals commonly targeted for bushmeat

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Small mammals	1	1.0	1.0	1.0
Medium-sized mammals	41	41.0	41.0	42.0
Large mammals	58	58.0	58.0	100.0
Total	**100**	**100.0**	**100.0**	

As shown in Figure 4.10, the majority (99%) of the respondents indicated that large mammals (58%) and medium-sized mammals (41%) are the most commonly targeted for bushmeat in Chyulu Hills National Park, while only 1% mentioned small mammals. The mean score of 2.57 and a standard deviation of 0.517 suggest that most respondents identified animals at the higher end of the size scale, pointing to a preference for hunting larger species.

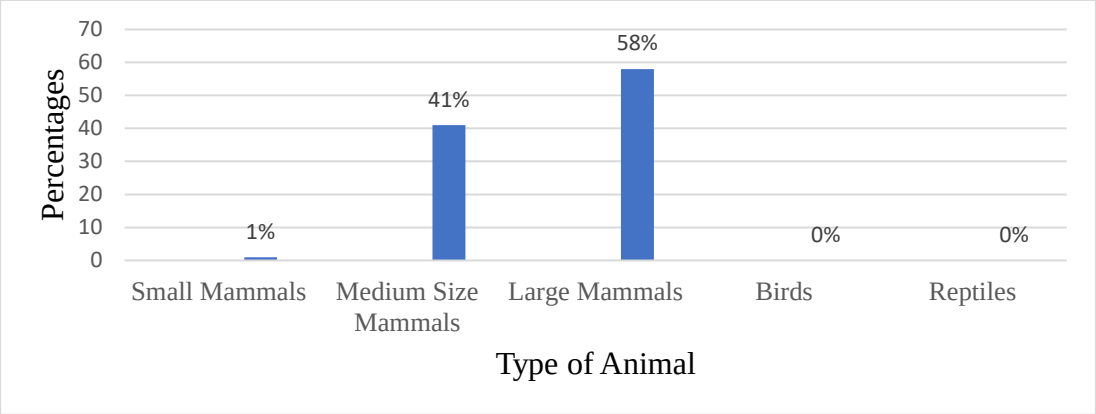

Figure 4.10: Animals Commonly Targeted for Bushmeat

The above results were supported by the following response from a key informant, who said;

"Hunting in Chyulu Hills National Park has shifted from small animals to medium and large mammals due to a noticeable decline in the population of small species, with some already extinct. Bushmeat hunters now prefer targeting larger mammals because they yield more meat, making them more profitable. In some cases, animals traditionally considered taboo, such as zebras and giraffes, are also being hunted for the commercial bushmeat trade." Park Warder

As shown on plate 4.1, 4.2, and 4.3 below, poachers are usually caught with small, medium-sized and even larger mammals.

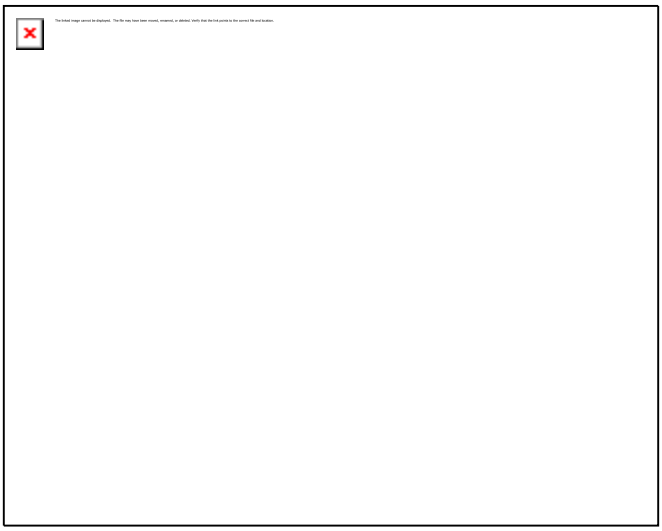

Plate 4.1: Small animals (Dikdiks)

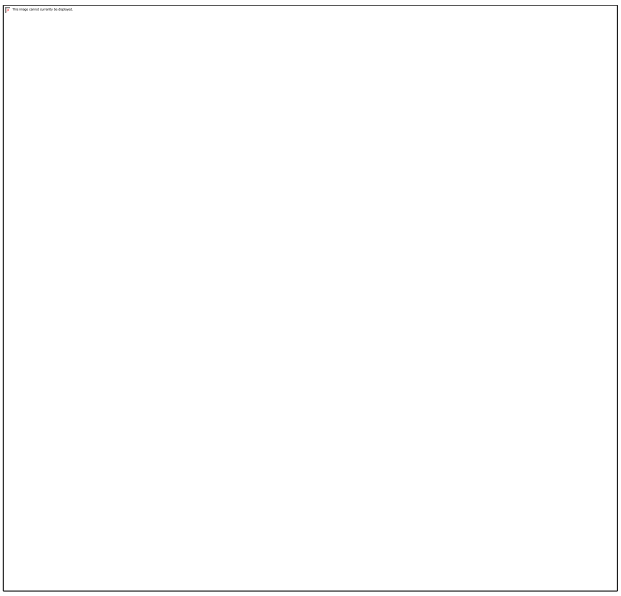

Plate 4.2: Big animals (Zebras)

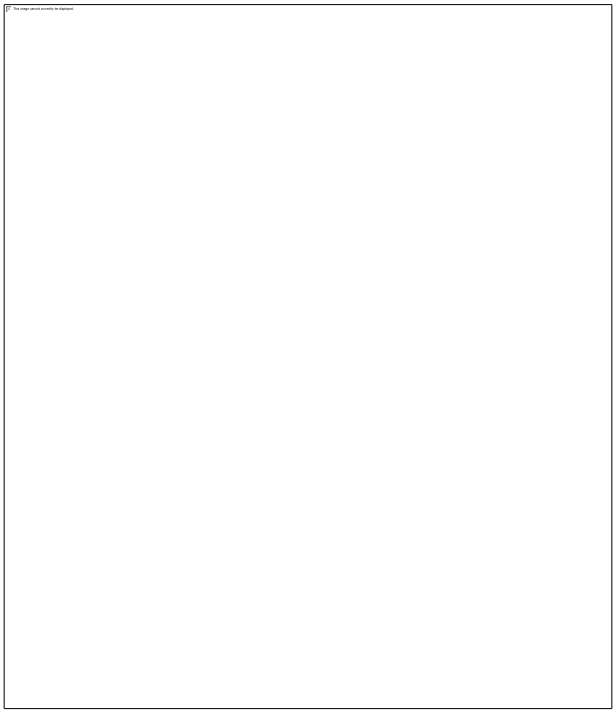

Plate 4.3: Medium animals (Bushbucks)

The overwhelming focus on medium and large mammals as primary targets for bushmeat in Chyulu Hills National Park, as shown in Figure 4.10, reflects a notable shift in hunting patterns influenced by ecological depletion of small-sized animals that used to be the target for hunters and huge economic incentives of hunting large mammals. This transition aligns with Cheloti and Mulu (2023) and Cooney *et al*. (2017), who highlight how the decline or

local extinction of smaller species compels hunters to pursue larger animals that offer greater meat yields and commercial value. Wildlife officers' reports of poaching extending to culturally protected species such as zebras and giraffes underscore the intensifying pressure on vulnerable populations, echoing findings by Ripple *et al*. (2016) and Wilkie *et al*. (2016) that unsustainable hunting increasingly threatens megafauna globally. This pattern not only jeopardizes biodiversity but also risks disrupting ecosystem functions critical to conservation goals. The trend calls for urgent, targeted interventions that combine stricter enforcement with community engagement to protect these high-value species before further declines occur (Brashares *et al*., 2004; Lindsey *et al*., 2013).

4.4.4 Level of Bushmeat Poaching in Chyulu Hills National Park

This study further assessed the levels of illegal bushmeat poaching in Chyulu Hills to better understand the extent of illegal bushmeat poaching, and the results are in Table 4.17 below.

Table 4.17: Has the level of bushmeat poaching in Chyulu Hills National Park

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Increased significantly	70	70.0	70.0	70.0
Increased slightly	25	25.0	25.0	95.0
Remained the same	5	5.0	5.0	100.0
Total	**100**	**100.0**	**100.0**	

The results show that the majority (95%) of the respondents indicated that bushmeat poaching in Chyulu Hills National Park has either increased significantly (70%) or increased slightly (25%) over the past five years. Only 5% stated that it has remained the same (see figure 4.11). The mean score of 1.45 and a standard deviation of 0.770 indicate that most respondents perceive a significant rise in poaching activity.

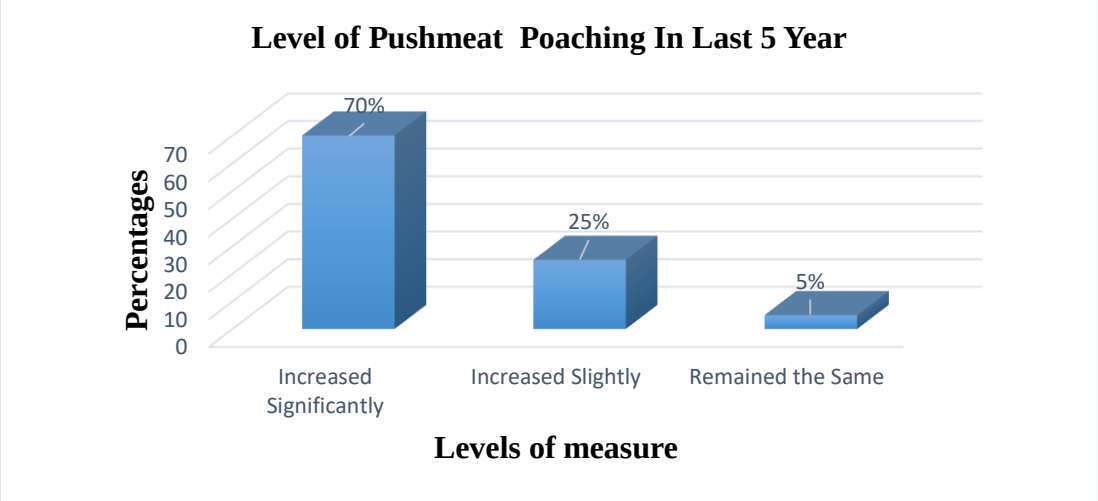

Figure 4.11: Level of bushmeat Poaching in the last 5 years

The above results were further supported by the following information from a key respondent.

"Over the past few years, bushmeat poaching has really escalated here in Chyulu Hills. You can see the signs, more snares, more reports of carcasses, and even bolder poachers operating in broad daylight. It feels like the pressure on wildlife is growing every day, and it's worse now than it was five years ago. The animals are fewer, and the poachers seem more desperate or more organized. It's not like before; things have definitely changed."
Forest guard

The perception among 95% of respondents that bushmeat poaching has increased over the past five years highlights a growing conservation crisis in Chyulu Hills National Park. This perceived escalation, supported by direct community observations of more snares and poaching incidents, as indicated by interview respondents, suggests not only increased poacher activity but possibly improved organization and desperation among offenders

The analysis of responses on the impact of bushmeat poaching in Chyulu Hills National Park shows a strong agreement among respondents regarding its detrimental effects as shown in table 4.18 below.

Table 4.18: Respondents' Perceptions on the Impact of Bushmeat Poaching in Chyulu Hills National Park

Statement	Agree (%)	Strongly Agree (%)	Neutral (%)	Disagree (%)	Total Agreement (%)	Mean	SD
Bushmeat poaching has led to a decline in wildlife populations in Chyulu Hills	44%	52%	4%	0%	96%	4.48	0.58
Bushmeat poaching has contributed to habitat destruction and environmental degradation in the park	40%	57%	3%	0%	97%	4.54	0.56
Loss of wildlife due to poaching affects the park's ecosystem health	35%	60%	5%	0%	95%	4.55	0.59

Bushmeat poaching has contributed to increased human-wildlife conflicts in the area	38%	59%	3%	0%	97%	4.56	0.56
If poaching continues, the park's wildlife tourism potential will significantly decline	31%	61%	6%	2%	92%	4.51	0.70

Table 4.18 above shows that 96% of respondents agreed or strongly agreed that *"Bushmeat poaching has led to a decline in wildlife populations"* (44% agree, 52% strongly agree). The mean score of 4.48 indicates that, on average, respondents leaned strongly toward agreement with the statement. The SD of 0.58 suggests that there was relatively low variability in responses, meaning most respondents shared a similar level of agreement. Similarly, 97% of the respondents agreed (40% agree, 57% strongly agree) that *"Bushmeat poaching has contributed to habitat destruction and environmental degradation in the park."* The mean score of 4.54 indicates a strong overall agreement with the statement among respondents. The SD of 0.56 shows that there was little variation in the responses, suggesting a consistent perception across participants. Also, 95% of the respondents agreed (35% agree, 60% strongly agree), that *"The loss of wildlife due to poaching affects the overall health of the park's ecosystem."* The mean score of 4.55 reflects a strong level of agreement among respondents regarding the ecological impact of wildlife loss. The SD of 0.59 indicates low variability in responses, showing that most participants shared similar views on the issue.

On the issue of human-wildlife conflict, 97% agreed or strongly agreed (38% agree, 59% strongly agree) that bushmeat poaching has led to increased human-wildlife conflicts. The

mean score of 4.56 suggests a very strong agreement among respondents that bushmeat poaching contributes to increased human-wildlife conflict. The SD of 0.56 indicates low response variability, meaning that opinions on this issue were largely consistent. Lastly, 92% of respondents agreed that (31% agree, 61% strongly agree), *"If poaching continues, the park's wildlife tourism potential will significantly decline."* The mean score of 4.51 reflects strong overall agreement with the concern about the future impact of poaching on tourism. The SD of 0.70 indicates slightly higher variability in responses compared to the other statements, suggesting that while most respondents agreed, a few had differing opinions.

As shown in figure 4.12 below, a few respondents remained neutral about their perceptions and no respondents disagreed with the statements provided.

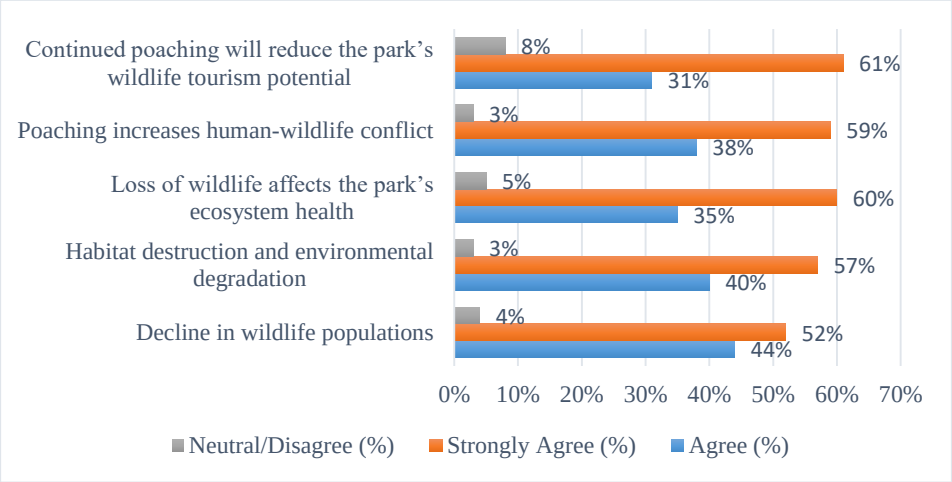

Figure 4.12: Perceptions of the Extent of Bushmeat Poaching in Chyulu Hills

The above findings highlight an overwhelming consensus that bushmeat poaching poses serious ecological, environmental, and economic threats to Chyulu Hills National Park. This strong agreement among respondents aligns with Cheloti and Mulu (2023) and Cooney *et al*. (2017), who emphasize that local awareness of the multifaceted impacts of poaching is crucial for successful conservation engagement. The recognition of poaching's detrimental effects provides a solid foundation for mobilizing community support and implementing targeted interventions aimed at biodiversity protection and sustaining ecosystem services. Similar conclusions by Ripple *et al*. (2016) and Wilkie *et al*. (2016)

further illustrate how poaching threatens not only wildlife populations but also the economic livelihoods that depend on healthy ecosystems. Together, these insights underscore the necessity of integrating ecological preservation with socio-economic development strategies to achieve lasting conservation outcomes in the region.

Further, 99% of respondents reported having observed or reported incidents of bushmeat poaching in or around Chyulu Hills National Park in the past year, while only 1% indicated they had not. With a mean of 1.01 and a standard deviation of 0.100**,** the responses show an overwhelming consensus toward the occurrence of bushmeat poaching incidents.

The near-unanimous reporting of bushmeat poaching incidents by 99% of respondents underscores the pervasive and visible nature of illegal hunting activities in and around Chyulu Hills National Park. This strong consensus, reflected in the extremely low standard deviation, aligns with findings by Cheloti and Mulu (2023) and Cooney *et al*. (2017), who emphasize that high community awareness often correlates with frequent encounters of poaching events. The openness of poaching activities in the community highlights the limitations of current enforcement and the need for more robust, multifaceted strategies. Similar observations by Ripple *et al*. (2016) and Lindsey *et al*. (2013) reinforce that visible poaching signals gaps in patrol coverage and law enforcement effectiveness, while also indicating potential social tolerance or resignation toward wildlife crimes. This widespread recognition of poaching reinforces calls for intensified surveillance efforts, including greater community-based monitoring and participatory approaches to enforcement, which have proven successful in fostering local stewardship and enhancing conservation outcomes (Biggs *et al*., 2017; Travers *et al*., 2019). Collectively, these insights point to the critical importance of combining improved law enforcement with community engagement to effectively combat the escalating threat posed by bushmeat poaching in the region.

4.5 The Socio-Economic Factors Influencing Bushmeat Poaching

4.5.1: Income Sources

Respondents were asked about their primary sources of income, as one of the common economic factors influencing illegal bushmeat poaching in the area. The results are shown in Table 4.19 below.

Table 4.19 Source of Income

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Farming	17	17.0	17.0	17.0
Livestock keeping	39	39.0	39.0	56.0
Formal employment	12	12.0	12.0	68.0
Small business/trade	20	20.0	20.0	88.0
Poaching or bushmeat trade	12	12.0	12.0	100.0
Total	**100**	**100.0**	**100.0**	

The results in Figure 4.13 show that the primary sources of income for respondents around Chyulu Hills National Park are livestock (39%)**,** small business/trade (20%)**,** and farming (17%)**,** together accounting for 76% of the population. 12% of the respondents identified bushmeat trade as their main source of income, highlighting a significant reliance on illegal or unsustainable practices for livelihood. Formal employment also accounts for 12%**,** suggesting limited access to structured job opportunities in the area. The mean value of 2.71 and a standard deviation of 1.297 indicate moderate variation in income sources among the community. These results were supported by a ranger's response, who said;

"*Most people here don't have stable jobs. There are very few opportunities for formal employment, and many families struggle just to put food on the table. That's why some turn*

to bushmeat hunting. If more people had access to proper jobs or support to start small businesses, I believe the poaching would reduce. People don't do it because they want to, but because they feel they have no choice." Community Elder

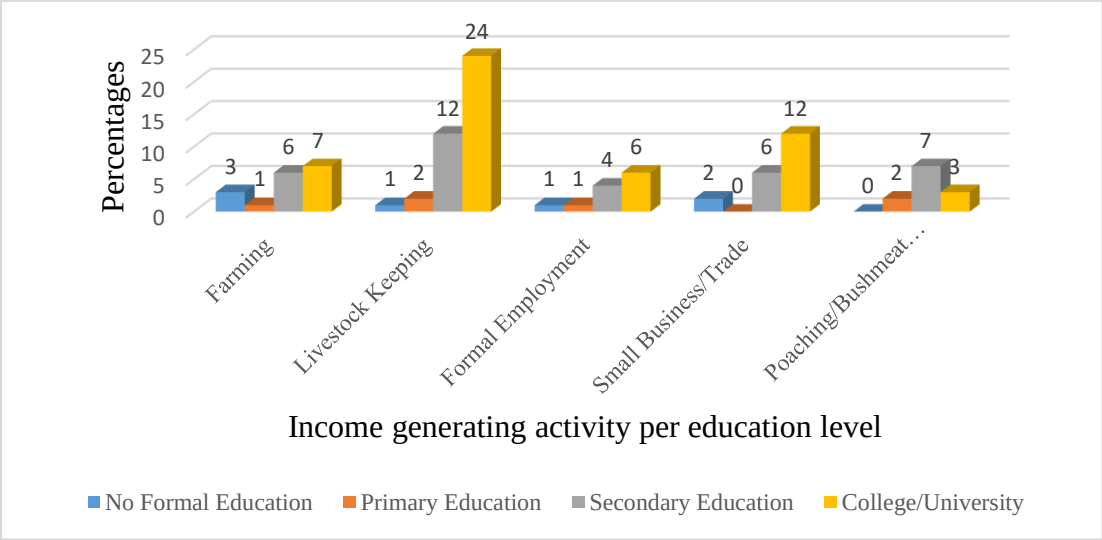

Figure 4.13: Education Level Vs Primary income source

The data indicates that a significant portion of the community around Chyulu Hills National Park relies on natural resource-based livelihoods aligns with findings by Kahler and Gore (2015) and Cooney *et al*. (2017), who emphasize the economic vulnerability of rural populations as a critical factor influencing conservation outcomes. 12% of respondents reporting involvement in poaching and bushmeat trade underscores the persistent economic pressures that drive individuals toward illegal activities, a dynamic similarly noted by Fa *et al*. (2016), who argue that poverty and lack of viable income alternatives often compel communities to exploit wildlife resources unsustainably. The limited availability of formal employment further exacerbates this dependence, echoing observations by Milner-Gulland and Bennett (2003) on the role of economic marginalization in fueling wildlife exploitation. Interview insights that highlight economic hardship as a driver of poaching reinforce the call for integrated development programs aimed at job creation and entrepreneurship support, strategies identified by Lindsey *et al*. (2013) and Travers *et al*. (2019) as essential for reducing reliance on illicit income sources and promoting sustainable conservation efforts. Collectively, these findings suggest that effective anti-poaching interventions must

extend beyond enforcement to include socio-economic development that addresses the root causes of wildlife crime in the Chyulu Hills region.

Further, results indicate that there is a significant association at a 5% confidence level between level of education and primary source of income among respondents ($\chi^2 = 39.917$, df = 12, p = .000). Of those with no formal education, 57.1% (4 out of 7) reported poaching as their primary income source. In contrast, 46.2% of those with college/university education are in formal employment, while only 1.9% (1 out of 52) are involved in bushmeat trade. Among secondary education holders, 34.3% engage in livestock keeping and 17.1% in poaching (figure 4.14). The clear trend shows that higher education correlates with more lawful and stable income sources, suggesting that increasing educational access may reduce economic dependence on bushmeat poaching.

4.5.2: Lack of Alternative Income sources

Lack of alternative income sources was also assessed to understand how it drives illegal bushmeat poaching in Chyulu Hills National Park. As shown in Table 4.20, the majority (92%) of the respondents agreed **(**48% agreed and 44% strongly agreed**)** that **"**lack of alternative income sources drives people to engage in bushmeat poaching**."** The mean response was 4.34 and SD 0.685**,** indicating a high level of consensus. At a 5% confidence level**,** the true population mean is estimated to fall approximately between 4.20 and 4.48**,** showing a strong perceived link between lack of alternative income and bushmeat poaching in Chyulu Hills National Park.

Table 4.20: Link Between Income Alternatives and Poaching (Agreement Levels)

Parameter	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	2	2.0	2.0	2.0
Neutral	6	6.0	6.0	8.0
Agree	48	48.0	48.0	56.0
Strongly agree	44	44.0	44.0	100.0
Total	**100**	**100.0**	**100.0**	

There is a significant relationship at a 5% confidence level (see figure 4.15) between primary source of income and agreement with the statement *"Lack of alternative income sources drives people to engage in bushmeat poaching"* (p = 0.007**).** This indicates that individuals' views on this driver of bushmeat poaching vary significantly by their source of income. Further, 87% of the respondents agree that bushmeat poaching for financial reasons is highly prevalent in the Chyulu Hills area. The high mean of 3.85 and low standard deviation (SD) of 0.411 reflect strong agreement across the community that financial motives are a significant driver of poaching. This underscores the urgent need for economic alternatives and poverty alleviation strategies to address the root causes of bushmeat poaching.

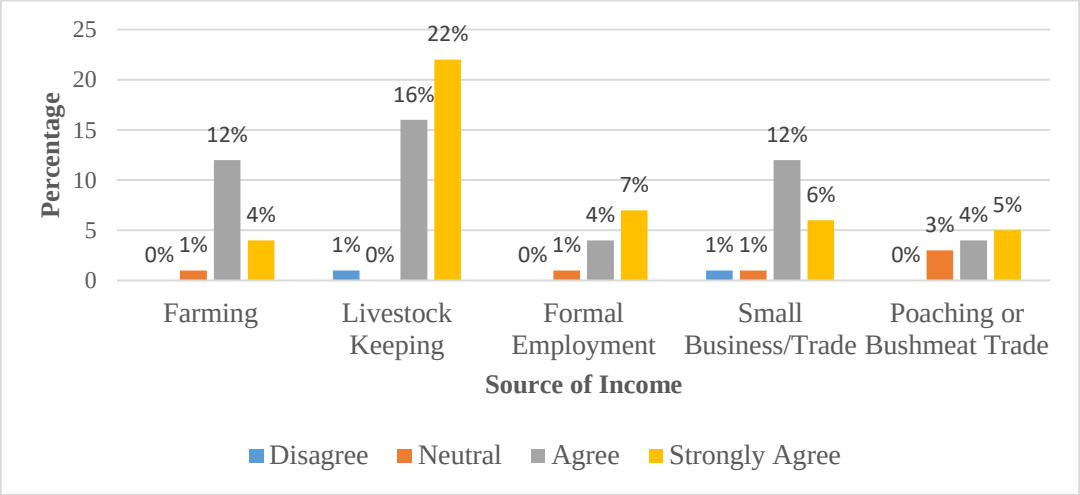

Figure 4.14: Lack of alternative income sources drives Illegal Poaching

The statistically significant relationship between agreement on the lack of alternative income sources and the frequency of observing poaching for financial reasons highlights the central role of economic deprivation in driving bushmeat poaching in Chyulu Hills. This finding aligns with Cheloti and Mulu (2023) and Karanja (2019), who identify poverty and income scarcity as critical motivators behind illegal hunting. The near-universal agreement among respondents who strongly linked income hardship to frequent sightings of poaching underscores the community's recognition of financial necessity as a primary impetus for this activity. Fa *et al.* (2016) emphasize that economic constraints often leave rural populations with few viable livelihood options, compelling reliance on natural

resources, including bushmeat, to meet subsistence needs. Similarly, Milner-Gulland and Bennett (2003) argue that without addressing these underlying socioeconomic drivers, enforcement efforts alone are unlikely to achieve sustainable reductions in wildlife exploitation. This perspective is supported by the broader literature, which advocates for integrated conservation strategies combining poverty alleviation, community development, and enhanced law enforcement to tackle bushmeat poaching effectively (Travers *et al*., 2019; Lindsey *et al*., 2013; Cooney *et al*., 2017). Together, these insights demonstrate the importance of economic empowerment alongside regulatory measures to mitigate poaching pressures sustainably.

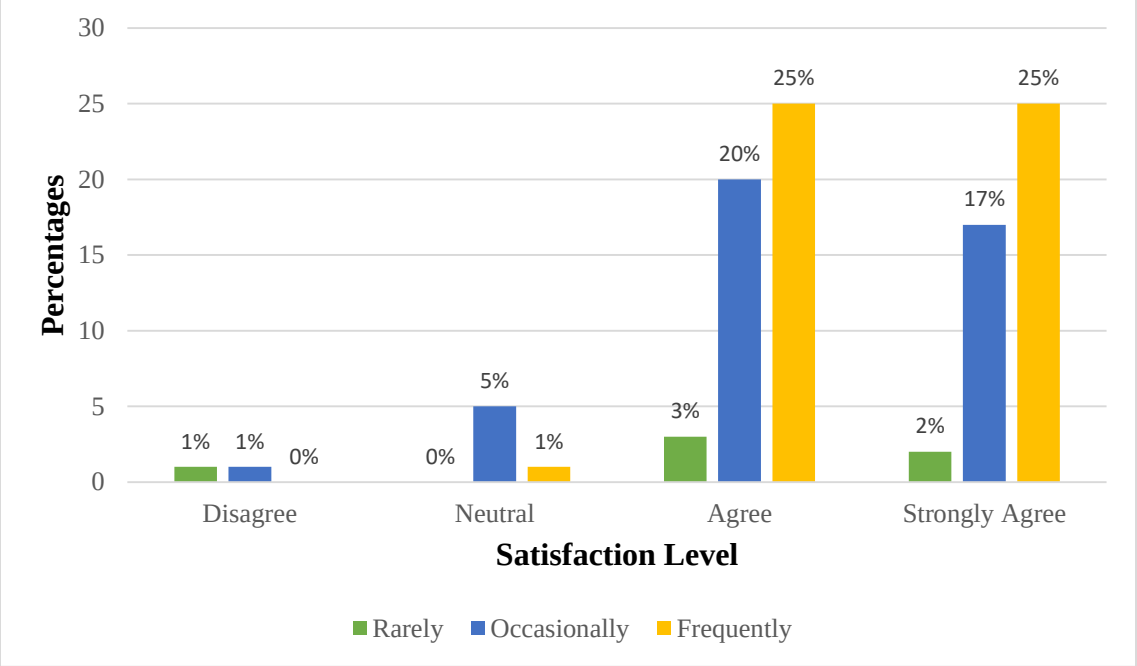

Figure 4.15: Poaching for Financial reasons

4.5.3 Reasons for Illegal Bushmeat Hunting

The most frequently cited reason for bushmeat poaching as shown in figure 4.17 below was poverty/lack of income, selected by 100% of respondents. This was closely followed by the lack of alternative sources of income (97%), availability of snares (96%) and limited law enforcement (92%). High demand for bushmeat was mentioned by 82%**,** while traditional or cultural practices were cited by 69% of respondents.

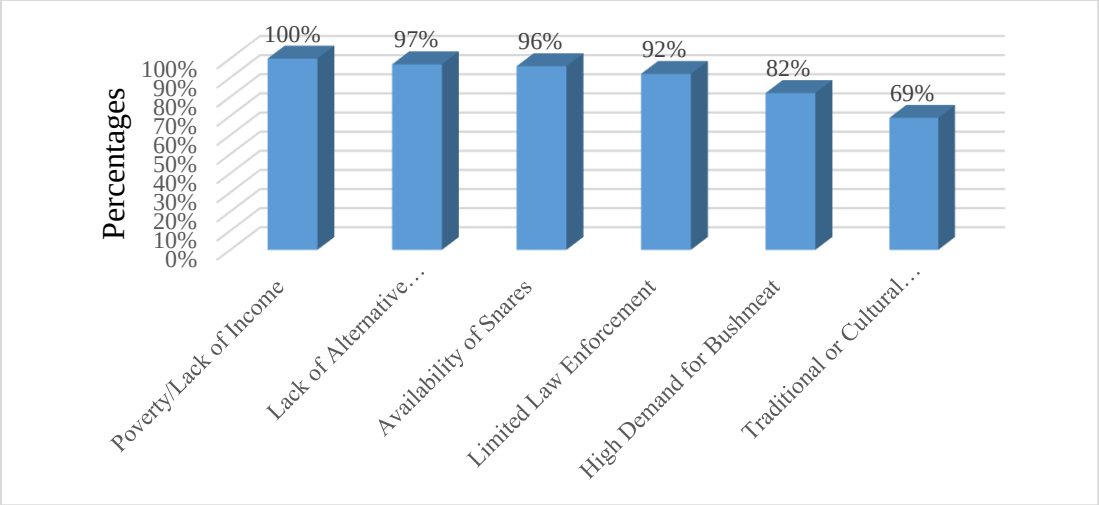

Figure 4.16: Reasons for Illegal Bushmeat Hunting

As shown in Plate 4.2 and Plate 4.4 below, illegal hunters have ready access to wire snares and other poaching equipment, exacerbating the poaching problem.

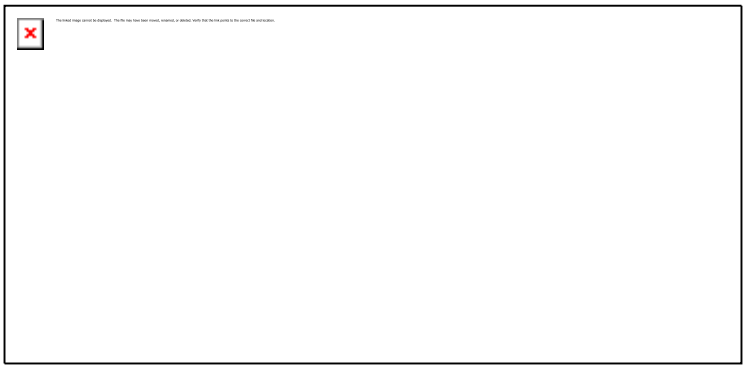

Plate 4.4: Poaching Snares

These results indicate that bushmeat poaching in the Chyulu Hills area is influenced by a combination of economic hardship, accessibility of hunting tools, weak enforcement, and socio-cultural factors, with poverty remaining the central driver.

Thematic analysis (see Table 4.21 and 4.24) reveals that a vast majority of respondents (98%) cited poverty and unemployment as the primary motivators, 89% cited lack of alternative livelihoods and 97% cited low education levels. The availability of snares (86%) and market demand for bushmeat (85%) make poaching both accessible and profitable.

Moreover, 77% of the respondents mentioned that weak law enforcement and corruption enable illegal activity to persist, and 88% of the respondents cited cultural factors reflecting the normalization of bushmeat consumption in some communities.

Table 4.21: Causes of illegal bushmeat hunting

Theme	Classified reasons for Poaching
Poverty & Unemployment	Lack of jobs; poaching as income-generating activity
Lack of Alternative Livelihoods	No other legal means of income; lack of community-based projects
Low Education Levels	Illiteracy; lack of awareness on laws and conservation
Availability of Snares	Easily accessible poaching tools
Market Demand for Bushmeat	High demand and profit margins drive continued poaching
Weak Enforcement/Corruption	Bribes to evade arrests; weak monitoring
Cultural Factors	Hunting as tradition; meat as dietary staple

Logical regression revealed that individuals citing poverty as a reason for poaching were 2.8 times more likely to support or engage in bushmeat poaching ($p < 0.01$). Those whose primary income was farming or livestock were also more likely to view poaching as necessary for survival ($p < 0.05$). Conversely, belief in education as a solution significantly reduced the likelihood of poaching support ($OR = 0.4$, $p < 0.01$).

The widespread availability of snares and weak enforcement mechanisms further reduces the perceived risk of poaching, echoing Karanja (2019), who found that limited ranger presence and light penalties embolden would-be offenders. Additionally, socio-cultural elements such as traditional hunting norms and persistent demand for bushmeat contribute to the normalization of this illegal activity, a theme also identified by Cooney *et al*. (2017) and Kahler and Gore (2015), who underscore the role of embedded social values in perpetuating unsustainable practices. Robinson and Bennett (2000) similarly highlight how economic dependence on bushmeat and cultural traditions sustain hunting pressures in rural communities, complicating enforcement efforts. Logistic regression results in this study align with these perspectives, demonstrating a statistically significant relationship between poverty and support for poaching, while also showing that higher education levels are

inversely associated with pro-poaching attitudes. This reflects findings by Lindsey *et al*. (2013), who argue that educational attainment equips individuals with broader perspectives on conservation and long-term sustainability. Wilkie *et al*. (2016) further emphasize that effective reduction of bushmeat poaching requires integrated approaches combining strengthened law enforcement, education, and viable alternative livelihoods. These insights collectively underscore the necessity of integrated strategies that combine poverty alleviation, stronger enforcement, and investment in education to sustainably reduce bushmeat poaching in the region (Travers *et al*., 2019; Cheloti & Mulu, 2023).

4.5.4 Education and Illegal Bushmeat Hunting

Finally, the results reveal that an overwhelming majority of respondents (97%) agree that access to education and awareness programs can help reduce bushmeat poaching in their community. This strong consensus is further supported by the low standard deviation (0.171), indicating minimal variation in responses and highlighting the perceived importance of educational initiatives in curbing poaching activities. These results were also confirmed by key informant explanations, as shown below,

"*When people understand the long-term damage poaching causes to wildlife and the benefits of conservation, they're more likely to change their ways. Education opens their eyes to other possibilities."* Director

The strong agreement on the role of education and awareness programs in addressing bushmeat poaching in Chyulu Hills reflects a widely held belief in the transformative power of knowledge. This is consistent with Cheloti and Mulu (2023), who observed that communities often identify awareness initiatives as foundational to shifting attitudes toward conservation. The low variation in responses points to a shared community understanding that poaching is not just a legal issue, but also one rooted in perception and socio-economic context, a perspective echoed by Kiumbuku (2022), who found that community education can foster stewardship and responsibility. Moreover, interview insights align with Cooney *et al*. (2017), who emphasize that awareness campaigns, when combined with tangible alternatives, can open pathways to sustainable livelihoods and reduce dependence on illegal hunting. These findings further support Biggs *et al*. (2017),

who argue that behavioral change is more likely when conservation messaging is localized, sustained, and linked to opportunities for community benefit. As such, educational interventions in Chyulu Hills should not be viewed as supplementary but rather as integral to long-term conservation outcomes, especially when embedded within broader community engagement strategies (Kahler & Gore, 2015; Travers *et al*., 2019).

4.6: The Effectiveness of Existing Regulations Governing Poaching in Chyulu Hills National Park

4.6.1: Anti-poaching Law Awareness and Effectiveness

The results indicate a high level of awareness (99%) among respondents regarding laws or regulations against bushmeat poaching in Chyulu Hills National Park, with only 1% expressing uncertainty. The mean score of 1.02 and a low standard deviation of 0.200 reflect strong agreement to the awareness of the available antipoaching laws and minimal variability in responses. This suggests that conservation awareness initiatives in the region have been effective.

The results reveal that a majority (57%) of respondents believe the current laws and penalties are "not very effective" in preventing bushmeat poaching, with an additional 4% viewing them as "not effective at all." Only 29% consider them "somewhat effective," while 10% remain neutral (see Figure 4.18). The mean score of 3.32 and standard deviation of 1.024 indicate a general leaning toward ineffectiveness, with moderate variability in opinions. A community respondent said,

"*The laws are there, yes, but they don't scare anyone. Poachers know they won't face serious consequences, so they keep doing it. Unless the government strengthens enforcement and makes the penalties tougher, nothing will change."*Forester

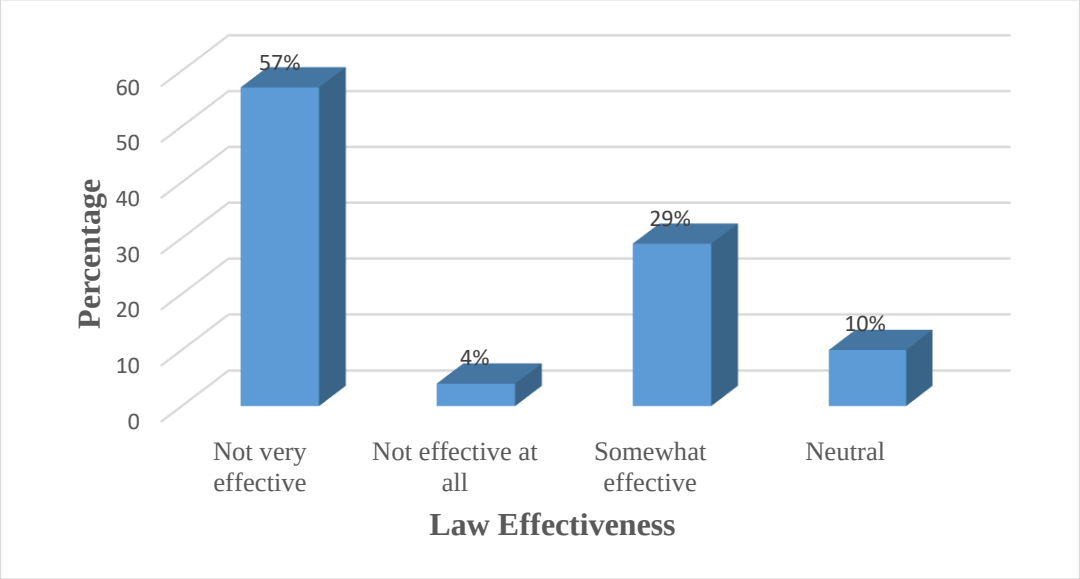

Figure 4.17: Perceived Effectiveness of Laws on Bushmeat Poaching

These results suggest that while awareness of laws is high, their perceived impact on deterring poaching remains low, highlighting a need for stronger enforcement or policy review. There is a statistically non-significant association at a 5% confidence level between awareness and perceived effectiveness of the laws (p-0.059). The results further reveal that although 99% of respondents are aware of laws against bushmeat poaching in Chyulu Hills National Park, the majority still perceive these laws as ineffective, with 57 out of 99 rating them as "not very effective."

The above results reveal a striking paradox in the bushmeat poaching context of Chyulu Hills National Park. Although awareness of poaching laws is exceptionally high (99%), this has not translated into confidence in the laws' effectiveness. This aligns with Cheloti and Mulu (2023), who argue that conservation education has made legal frameworks more visible, yet enforcement remains weak and inconsistent. The majority of respondents in this study rated the laws as “not very effective” or worse, echoing findings by Karanja (2019) and Ngetich (2016), who reported that weak penalties and corruption have eroded the deterrent effect of wildlife legislation in Kenya. The statistically non-significant relationship between awareness of laws and perceived effectiveness ($p = 0.059$) in this study mirrors observations by Becker (1968), whose economic theory of crime suggests that deterrence relies not only on knowledge of the law but also on the certainty and severity of punishment. Qualitative feedback further reinforces this disconnect, citing minimal penalties and lack of follow-through in prosecutions—patterns consistent with the institutional weaknesses highlighted by Lindsey *et al*. (2013). Moreover, Cooney *et al*. (2017) and Biggs *et al*. (2017) emphasize that without visible enforcement and community engagement in monitoring, laws lose their legitimacy. As such, high awareness alone is insufficient; enforcement must be backed by credible mechanisms, transparency, and community inclusion if legal frameworks are to function as effective deterrents in conservation contexts (Kahler & Gore, 2015; Travers *et al*., 2019).

4.6.2: Law Enforcement Challenges

The majority (61%) of respondents believe law enforcement officers rarely patrol areas prone to poaching in Chyulu Hills National Park, while 38% think patrols occur often, and only 1% reported that patrols never happen (see figure 4.19). With a mean score of 1.63 and a standard deviation of 0.506, the responses are moderately concentrated around "rarely," suggesting a general perception of insufficient patrol frequency.

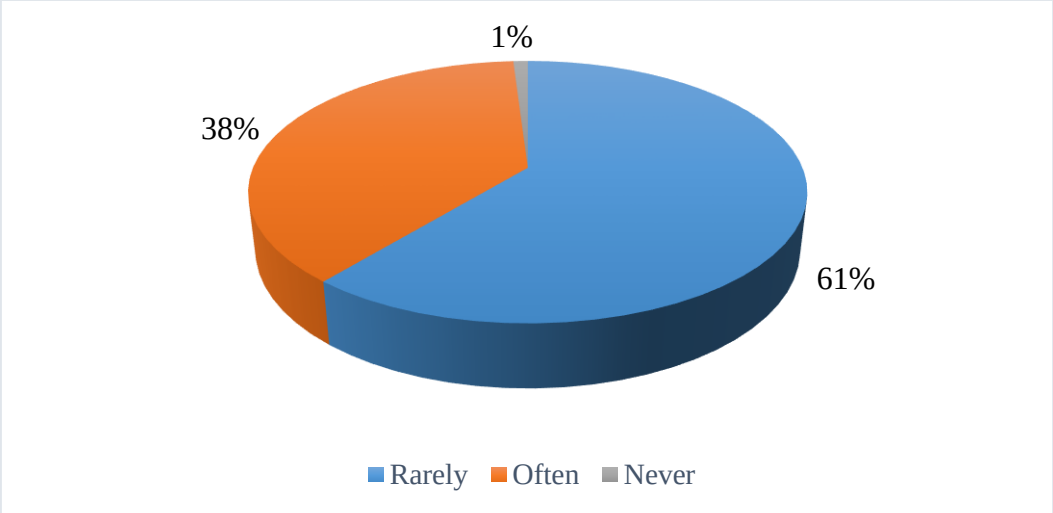

Figure 4.18: Perceived Frequency of Patrols in Chyulu Hills National Park

The majority (96%) of the respondents who agreed that patrols occur often asserted that when such patrols occur, many illegal hunters must be arrested, as shown in Plate 4.5 below.

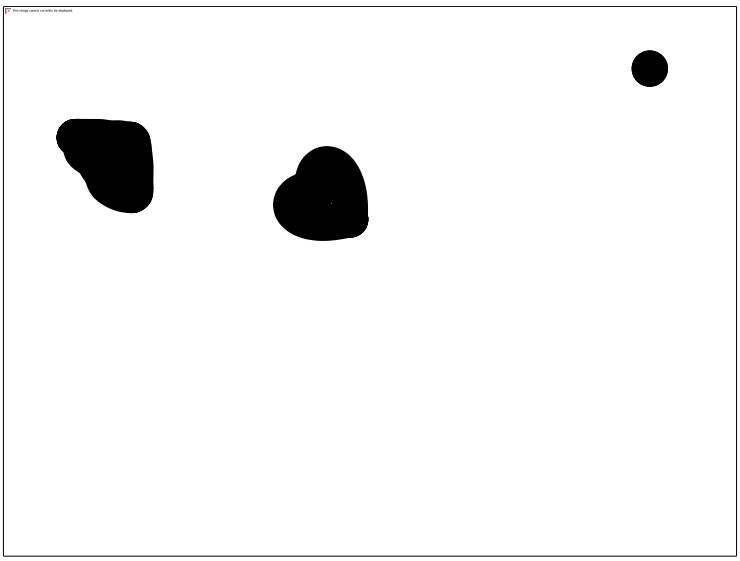

Plate 4.5: Offenders arrested by a patrol officer in Mnara area

The majority of the respondents agree that weak law enforcement encourages bushmeat poaching in Chyulu Hills National Park, with 52% agreeing and 47% strongly agreeing with the statement. The high mean score of 4.46 and a low standard deviation of 0.521

reflect a strong consensus on the issue with minimal variation in opinion. These results can be supported by the following key informant response:

"*People are not afraid of getting caught because even if they are, the chances of facing real punishment are low. The rangers are too few, and the patrols are not consistent, so poachers take the risk knowing enforcement is weak." Community Youth*

These results underscore the perceived direct link between ineffective enforcement and increased poaching activity, suggesting that strengthening law enforcement presence and actions could be a crucial step in addressing the bushmeat poaching challenge in the park.

Table 4.22: Perceived Law Effectiveness vs. Agreement on Weak Enforcement and Poaching

Count		To what extent do you agree with the statement: "Weak law enforcement encourages bushmeat poaching in Chyulu Hills National Park"?			Total
		neutral	agree	strongly agree	
How effective do you think the current laws and penalties are in preventing bushmeat poaching?	Very effective	0	2	2	4
	Somewhat effective	0	8	17	25
	neutral	0	7	3	10
	Not very effective	1	33	23	57
	Not effective at all	0	2	2	4
Total		1	52	47	100

There is a strong and statistically significant relationship at the 5% confidence level between perceptions of law effectiveness and agreement that weak law enforcement encourages bushmeat poaching in Chyulu Hills National Park, as shown in Table 4.33 above and Figure 4.20 below. For instance, 98.2% of respondents who view the laws as "not very effective" (56 out of 57) either agree (33) or strongly agree (23) with the

statement. Similarly, 100% of those who consider the laws "not effective at all" (4 out of 4) agree (2) or strongly agree (2). Among respondents who perceive the laws as "somewhat effective," 32% agree (8 out of 25) while 68% strongly agree (17 out of 25), indicating a more distributed view, though still clearly leaning toward agreement. The p-value of .000 confirms a highly significant association between the two variables, suggesting that weaker perceptions of law effectiveness are strongly linked to the agreement that weak enforcement encourages poaching.

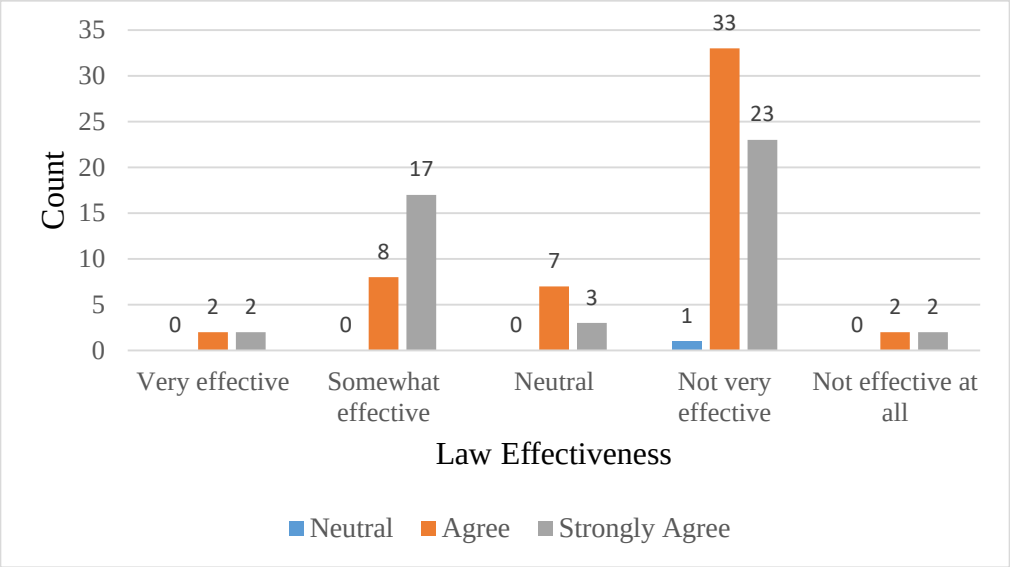

Figure 4.19: Perceived Law Effectiveness vs. Agreement on Weak Enforcement Encouraging Poaching

The strong perception among respondents that existing laws are ineffective in addressing bushmeat poaching in Chyulu Hills highlights a critical disconnect between legal frameworks and their enforcement, a concern echoed by Cheloti and Mulu (2023), who observed that enforcement inconsistency undermines conservation objectives. This view is reinforced by Ngetich (2016), who noted that systemic weaknesses in Kenya's judiciary and law enforcement contribute to diminished deterrence. The resulting erosion of institutional credibility emboldens illegal activity, particularly when offenders perceive that the likelihood of punishment is low, consistent with findings by Lindsey *et al*. (2013) and Karanja (2019). The need for visible and credible enforcement, including increased patrols and transparent prosecution processes, is supported by Cooney *et al*. (2017), who stress that the legitimacy of enforcement improves when communities are actively

engaged. Similarly, Biggs *et al*. (2017) argue that involving local populations in monitoring and reporting builds trust and fosters collective responsibility for conservation. Studies by Kahler and Gore (2015) and Travers *et al*. (2019) further emphasize that collaborative approaches not only enhance the flow of intelligence but also contribute to stronger social buy-in and compliance. Without restoring faith in the rule of law through these integrative strategies, raising awareness alone will not suffice to curb illegal hunting, a concept long acknowledged in deterrence theory (Becker, 1968) and confirmed by recent research in Kenya (Otianga-Owiti *et al*., 2021).

4.6.3 Challenges Faced by Law Enforcement

Further, respondents identified multiple overlapping challenges faced by law enforcement in controlling bushmeat poaching in Chyulu Hills National Park. Corruption among officials was the most frequently cited issue, mentioned by 88% of respondents, followed closely by inadequate penalties for offenders (87%), and both insufficient funding/resources and lack of community cooperation (each at 84%) (see figure 4.21). These high percentages across all listed challenges indicate that law enforcement efforts are hindered by a complex combination of systemic, institutional, and social factors.

"*Corruption is everywhere. Even some people who are supposed to stop poaching are involved in it. The poaching penalties are too weak to scare anyone, and the officers don't have enough equipment or support for antipoaching efforts. Plus, many locals don't cooperate because they feel left out or benefit from poaching.* Community youth.

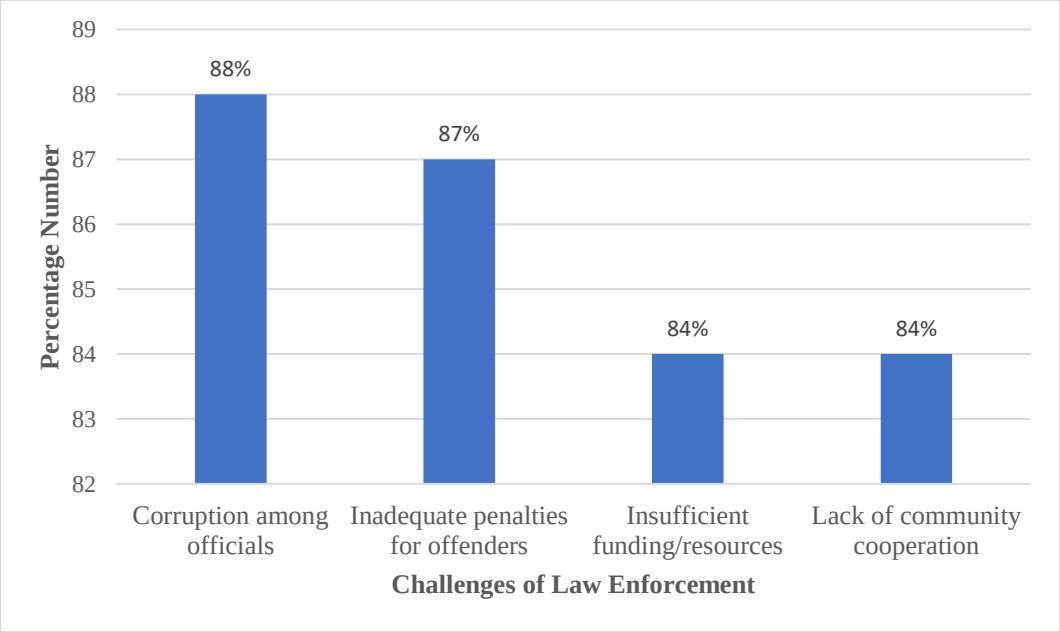

Figure 4.20: Challenges Faced by Law Enforcement

The findings point to a deeply entrenched set of challenges facing law enforcement in the fight against bushmeat poaching in Chyulu Hills National Park, with corruption emerging as the most dominant obstacle. This study's findings align with Cheloti and Mulu (2023), who found that enforcement efforts are often undermined by internal complicity and lack of accountability, and with Ngetich (2016), who identified governance weaknesses as a major impediment to effective wildlife protection in Kenya. The concern over weak legal penalties resonates with Karanja (2019), who argues that current sanctions are insufficient to deter persistent offenders. The situation is further compounded by inadequate funding and logistical support, which mirrors observations by Lindsey *et al*. (2013) on the resource constraints faced by conservation agencies in sub-Saharan Africa. Additionally, the low levels of community cooperation highlight the social dimension of the problem, as noted by Biggs *et al*. (2017), who emphasize that trust and inclusivity are essential for fostering long-term compliance. The disengagement seen in Chyulu Hills may reflect what Kiumbuku (2022) describes as silent complicity in areas where conservation does not yield visible local benefits. Addressing these interconnected barriers requires a multi-pronged approach. As Becker (1968) and Cooney *et al*. (2017) suggest, corruption can only be curbed through credible oversight mechanisms that restore trust. Furthermore, Brashares

et al. (2004) advocate for strengthening operational capacity and legal deterrents, while Kahler and Gore (2015) emphasize the importance of community involvement and benefit-sharing as pathways to build legitimacy and support. Without such integrated reforms, as Travers *et al*. (2019) warn, enforcement efforts will remain reactive and largely ineffective against the entrenched threat of illegal exploitation.

The following is a thematic analysis for the measures respondents suggested to improve the enforcement of anti-poaching regulations in Chyulu Hills National Park;

Table 4.23: Thematic Analysis

Theme	Representative ideas	Percentage
Socio-Economic Factors Influencing Bushmeat Poaching	Poverty & Unemployment	98%
	Lack of Alternative Livelihoods	89%
	Low Education Levels	97%
	Availability of snares	86%
	Market Demand for Bushmeat	85%
	Weak Enforcement/Corruption	77%
	Cultural Factors	88%
How These Factors Influence Bushmeat Poaching	Drives Need for Income	95%
	Easy Money & High Demand	85%
	Poor Awareness of Laws	93%
	Limited Opportunities for Youth	90%
	Bribery Encourages Repeat Offenders	98%
Measures to Improve Enforcement of Anti-Poaching Regulations	Stricter Laws & Penalties	94%
	Use of Technology	88%
	Increase Personnel & Resources	84%

	Tackle Corruption	95%
	Community-Based Scouting	78%
	Awareness Campaigns	76%
Improving Collaboration Between Communities and Park Authorities	Employing Local Youth	91%
	Sensitization Forums	88%
	Joint Decision Making	84%
	Share Conservation Benefits	96%
	Establish Informant Networks	90%

Thematic analysis (see Table 4.24) reveals that a majority of respondents (94%) emphasized the need for stricter laws and harsher penalties, such as heavier fines and longer jail terms, to effectively deter poaching. A significant portion (88%) highlighted the importance of technological interventions, including drones, GPS, and camera traps—to enhance surveillance and real-time monitoring. Additionally, 86% called for increased personnel and logistical resources like patrol vehicles and fuel to improve enforcement coverage. Tackling corruption was viewed as essential by 82%, with suggestions to remove corrupt officers and introduce oversight mechanisms to ensure accountability. Community involvement also emerged as a strong theme, with 89% recommending the recruitment of local scouts and informants to foster trust and intelligence-sharing, while 87% supported awareness campaigns to educate the public on the importance of wildlife conservation and the consequences of poaching. These responses, as shown in Table 4.25 below, collectively indicate a strong preference for an integrated approach combining legal, technological, community-based, and institutional strategies to strengthen wildlife protection efforts.

Table 4.24: Wildlife Protection Strategies

Theme	**Representative Ideas**
Stricter Laws & Penalties	Heavier fines, longer jail terms
Use of Technology	Use of drones, GPS, camera traps, surveillance systems
Increase Personnel & Resources	More rangers, fuel for patrol vehicles, and better logistics
Tackle Corruption	Remove corrupt officers; introduce oversight mechanisms
Community-Based Scouting	Employ locals to act as scouts and informants
Awareness Campaigns	Educating the public on the consequences and importance of wildlife

These results were further supported by a key informant who said;

"*To improve enforcement of anti-poaching regulations here at Chyulu Hills, I would suggest a few key measures. First, we need stricter laws with real consequences; current penalties are too lenient and don't deter repeat offenders. Second, we need better equipment and logistics support. Sometimes our rangers go on patrols without basic gear like radios or even enough fuel for vehicles. Strong oversight and accountability systems are necessary. Finally, we must involve the local community more deeply and give them a stake in conservation. When people feel included and benefit from protecting wildlife, they become our strongest allies."* Director.

The results showcase that strengthening anti-poaching enforcement at Chyulu Hills requires stricter legal penalties, improved technological and logistical support for rangers, and robust oversight to combat corruption. These recommendations align with Cheloti and Mulu (2023), who emphasize that inadequate prosecution and limited ranger capacity undermine conservation gains. Similarly, Brashares *et al*. (2011) highlights the role of economic and institutional constraints in weakening wildlife protection efforts. The need for robust oversight is reinforced by Ngetich (2016), who found that corruption and delays in legal follow-through often allow poachers to escape punishment. Engaging local

communities as active partners in conservation is essential, as their inclusion fosters trust and enhances the effectiveness of wildlife protection efforts (Biggs *et al*., 2017; Cooney *et al*., 2017). This community-centered approach not only improves detection and deterrence but also strengthens the legitimacy of conservation interventions in areas adjacent to protected zones.

4.6.4 Witnessed Prosecution

The results show that a large majority of respondents (86%) have witnessed or heard of arrests or prosecutions related to bushmeat poaching in or around Chyulu Hills National Park. This indicates a relatively high level of awareness regarding law enforcement activities in the area. In contrast, 12% reported no awareness of such legal actions, while 2% were uncertain.

A resident at the CHNP community said the following concerning prosecution at the park;

"I have heard of several arrests related to bushmeat poaching in and around Chyulu Hills. Usually, when poachers are caught with snares or illegal meat, the rangers detain them and hand them over to the authorities. However, prosecutions are less common, as cases sometimes get delayed or dropped due to lack of evidence or corruption. Still, these arrests do send a message, though we need stronger follow-through to ensure poachers face real consequences." Community Resident.

There is a strong and statistically significant relationship at the 5% confidence level (*p*-value of 0.025) between witnessing or reporting bushmeat poaching and awareness of arrests or prosecutions in or around Chyulu Hills National Park. Among the 99 respondents who had observed or reported poaching incidents in the past year, 86 (approximately 87%) also reported being aware of arrests or prosecutions, while only 11 were not aware and 2 were unsure. In contrast, the single respondent who had not witnessed or reported poaching was unaware of any arrests (figure 4.22). As shown in Plate 4.3, plate 4.4 and plate 4.5 , arrests usually occur when the offenders are caught with the bushmeat and hunting equipment. This suggests that individuals with direct exposure to poaching incidents are more likely to be informed about related law enforcement actions, reinforcing the

connection between firsthand experience and perceptions of legal accountability in the Chyulu Hills area.

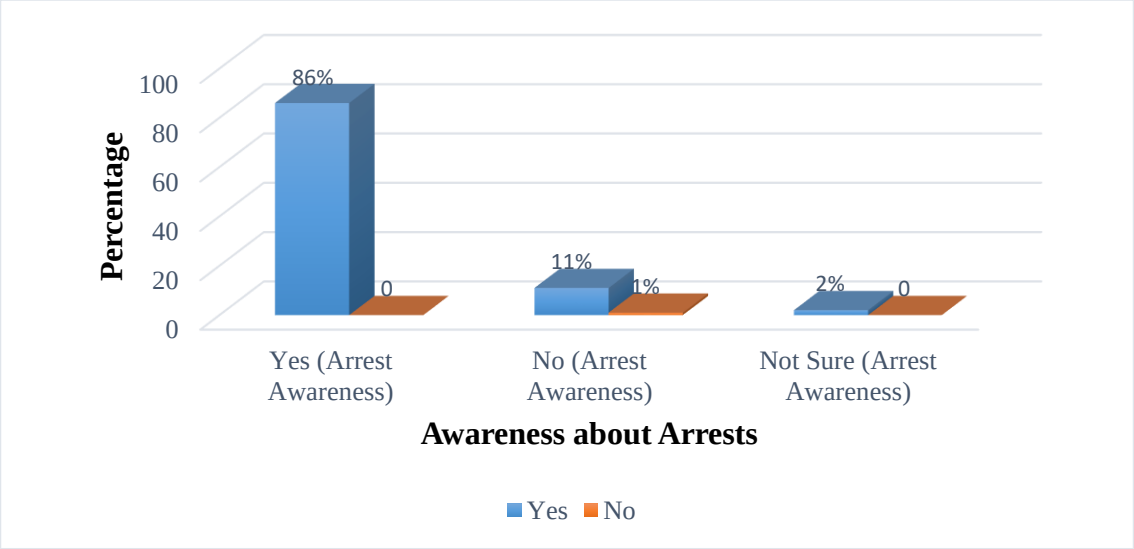

Figure 4.21: Poaching Observations vs. Awareness of Arrests in Chyulu Hills National Park

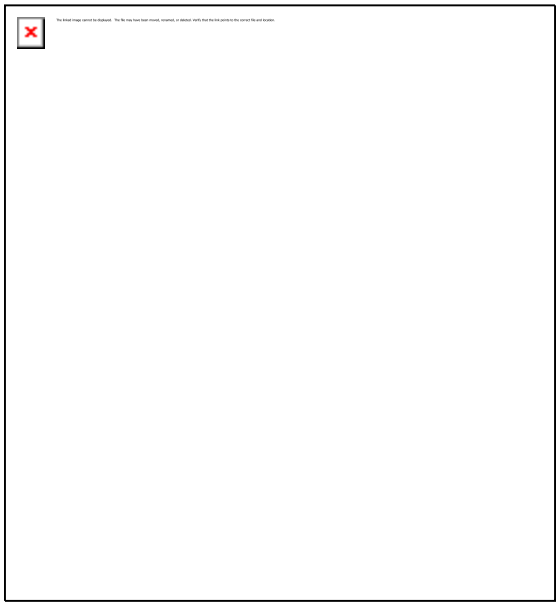

Plate 4.6: Arrested offenders

The thematic analysis (see Table 4.26) of responses from individuals who had witnessed or heard of arrests or prosecutions related to bushmeat poaching in Chyulu Hills National Park reveals four key themes. Visibility of law enforcement was the most prominent theme,

cited by 46% of respondents who noted occurrences such as arrests during market days or when individuals were caught with bushmeat. Community awareness accounted for 28%, as many interviewees stated that news of arrests spreads quickly through the village. Reactive enforcement was noted by 14%, highlighting concerns that arrests only occur when poaching is reported. Lastly, 12% of respondents acknowledged hearing about arrests but lacked specific details, pointing to limited firsthand knowledge or vague reports.

Table 4.25: Thematic Analysis of Responses on Arrests Related to Bushmeat Poaching

Theme	**Representative Ideas**	**% of Respondents (Yes)**
Visibility of Law Enforcement	Rangers come during market days; People get arrested when caught with meat	46%
Community Awareness	Everyone in the village hears when someone is arrested; It spreads fast	28%
Reactive Enforcement	They only act when someone reports; Arrests happen after the damage is done	14%
Lack of Detail or Specific Cases	Don't know the details; Just heard stories	12%

The high level of community awareness regarding arrests and prosecutions for bushmeat poaching in Chyulu Hills suggests visible law enforcement presence, which is consistent with findings by Cheloti and Mulu (2023), who noted that enforcement actions are often known at the community level. However, the perception that enforcement is largely reactive aligns with Biggs *et al*. (2017), who argue that without strong community partnerships and proactive engagement, enforcement alone may have limited deterrent effect. The observed gap between arrests and successful prosecutions due to delays or corruption echoes findings by Ngetich (2016), who identified weaknesses in Kenya's legal

processes that undermine wildlife protection efforts. Moreover, the spread of information about arrests through informal channels highlights the role of community dynamics in shaping conservation outcomes, as emphasized by Cooney *et al*. (2017), who stress the importance of building trust and transparency to strengthen compliance. These insights collectively underscore the need to enhance both legal follow-through and community collaboration in conservation enforcement strategies.

4.6.5: Community Collaboration

Finally, the majority of the respondents (see Table 4.27) mentioned that improving collaboration is a sustainable solution to illegal bushmeat poaching. Hiring locals, especially the youth, was the top suggestion (91%) to create economic benefits while involving the community in conservation. Sensitization forums (88%) and joint decision making (84%) were viewed as key to strengthening relationships and trust. An overwhelming 96% supported sharing conservation benefits, such as investing in community infrastructure, as a way to demonstrate the tangible value of wildlife protection. Establishing informant networks (90%) was also considered an effective way to improve intelligence gathering and early intervention. Table 4.27 summarizes responses given.

Table 4.26: Community-Based Conservation Strategies

Theme	**Representative Ideas**
Employing Local Youth	Hire them as scouts/rangers
Sensitization Forums	Educate the community regularly on conservation laws and benefits
Joint Decision Making	Involving locals in planning and enforcement
Share Conservation Benefits	Provide community services (schools, clinics) from conservation revenues
Establish Informant Networks	Engage trusted locals to provide intelligence

The responses summarized in Table 4.27 reveal that community collaboration is seen as central to sustainable anti-poaching efforts.

CHAPTER FIVE: SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter synthesizes the key findings of the study, discusses their implications, and provides recommendations for policy and practice. The study sought to assess the extent of bushmeat poaching in Chyulu Hills National Park (CHNP), examine socio-economic factors influencing poaching, and evaluate the effectiveness of existing anti-poaching regulations. The findings reveal critical insights into the drivers of bushmeat poaching, its ecological and economic impacts, and potential strategies for mitigation.

5.2 Summary of Findings

5.2.1 Extent of Bushmeat Poaching in Chyulu Hills National Park

This study shows that bushmeat poaching has become rampant in Chyulu Hills National Park, with community members accepting its occurrence as visible or normalized activity supporting the findings by Cheloti & Mulu (2023). Its prevalence is further confirmed by the frequency of encounters which indicate that poaching is no longer clandestine but is institutionalized within local practices. However, dealing with such deeply entrenched behaviors poses big challenges to conservation, as there is an urgent need to tackle economic drivers as well as cultural perceptions of wildlife use (Biggs *et al*., 2017; Travers *et al*., 2019). The data highlights the necessity for interventions that deal with these complex social dimensions and are coupled with effective anti-poaching measures.

According to the study, large and medium mammals are the main targets of poachers in Chyulu Hills, preferring to take species with higher meat yields and market value, as shown in the findings by Nasi *et al*. (2011) & Ripple *et al*. (2016). The selective hunting pattern has a dual threat of driving keystone ecologically vital species to extinction and disrupting broader ecosystem dynamics (Wilkie *et al*., 2016). Large mammals may be disproportionately pressured leading to trophic cascades and destabilization of vegetation dynamics and biodiversity of the park (Brashares *et al*., 2004). The targeted removal of ecologically significant species that could have far reaching consequences for CHNP's long term ecological integrity and resilience.

The rise in bushmeat poaching in Chyulu Hills National Park highlights that conservation problems are becoming more serious due to several factors working together. More snares and animal carcasses have been found according to local reports which reflect 92% of people who observed that poaching is rising. Many respondents suggested this rise is due to population increase, economic troubles and weak law enforcement. As neighboring populations grow, more people are turning to bushmeat for both their meals and for profit (Ripple *et al*., 2016). At the same time, many people are unemployed and have few ways to earn money, so they turn to poaching (Wilkie *et al*., 2016). Not having enough funding and resources, along with corruption, leads to worsen la enforcement (Lindsey *et al*., 2013; Biggs *et al*., 2017). If these systemic problems are not fixed, the loss of wildlife in CHNP might not be stopped and could negatively impact the environment and the lives of local communities.

People living in the Chyulu Hills are aware that bushmeat poaching has both negative ecological and economic effects. Many respondents mentioned that poaching is related to drops in wildlife, damage to habitats and poor ecosystem health which is consistent with the main findings of conservation literature (Cheloti & Mulu, 2023; Cooney *et al*., 2017). Excessive hunting upsets the balance between predators and prey, changes plant growth and lessens the benefits the ecosystem provides (Ripple *et al*., 2016; Wilkie *et al*., 2016). People in the community mentioned that poaching could be bad for tourism which makes it harder for conservation organizations and the community to make money (Lindsey *et al*., 2013). Therefore, it is clear that integrated methods should focus on conserving biodiversity and proving non-poaching economic solutions (Biggs *et al*., 2017; Travers *et al*., 2019).

The results of the study are in line with what is known as the “empty forest syndrome” in Africa forests may look healthy, but overhunting has caused their ecological lack (Redford, 1992). As a result of this, the environment of CHNP gets less valuable and its appeal for eco-tourism decreases, leading to a cycle: less wildlife means less money from tourism which could weaken conservation efforts and encourage more poaching (Cheloti & Mulu, 2023; Nasi *et al*., 2011). To solve this loop, it is necessary to actively include the

community, improve governance and ensure both environments and jobs will be sustainable in the future (Brashares *et al*., 2004; Cooney *et al*., 2017).

5.2.2 Socio-Economic Factors Influencing Bushmeat Poaching

Many respondents admitted that hunting animals is their main source of income, but this percentage is likely lower than the actual rate because poaching is illegal. The research confirms that those living in poverty are more likely to turn to wildlife poaching for their food and income. Despite the fact that livestock keeping and small-scale trade provide legal options, their unpredictability along with drought, sudden changes in prices and lack of capital encourage some in the community to choose illegal bushmeat hunting. Cheloti & Mulu (2023) point out that proper conservation efforts should focus on poverty and inequality at their core to truly lessen poaching activities. The results agree with what Milner-Gulland and Bennett (2003) previously found, pointing out that having limited education and few economic prospects makes conservation more difficult.

The study has revealed that poverty is the main factor leading to bushmeat poaching and the lack of other job opportunities is what pushes many people into it. This is also evident in different areas, where people turn to wildlife hunting as a means to support themselves when times are tough (Milner-Gulland & Bennett, 2003). Since many communities are economically fragile, they turn to poaching which ultimately decreases the natural resources they could rely on for their livelihoods (Cooney *et al*., 2017; Wilkie *et al*., 2016). Addressing the cycle means tackling the underlying social and economic problems and providing attractive and achievable alternatives to trading bushmeat.

Besides poverty, the report points out three main reasons that continue the practice of bushmeat poaching in the Chyulu Hills area. The fact that snares can be acquired easily makes poaching available to most people, unlike in the past when it took special skills. In addition, when law enforcement is ineffective, poachers are hardly discouraged by the risk of being caught (Cheloti & Mulu, 2023). In addition, cultural practices ensure that bushmeat is still needed, since it is a common food and part of tradition. When these three factors interact, they make it easier for illegal hunting to continue and have a negative effect

on the environment (Cooney *et al*., 2017; Fa *et al*., 2016). Therefore, we should use enforcement, educate people in the community and create sustainable job opportunities to address this issue.

5.2.3 Effectiveness of Existing Anti-Poaching Regulations

Many people in the Chyulu Hills National Park know about anti-poaching laws, demonstrating that conservation education has worked well. Nevertheless, people are not confident that these laws are working well. The majority of people think the regulations are not strong enough since the penalties are not severe and enforcement varies. Many qualitative comments pointed out that poachers are not deterred by the risks involved. Becker's (1968) deterrence theory explains that certain and severe consequences are needed to prevent crime. Karatani (2019), Cheloti and Mulu (2023) and Ngetich (2016) also argue that the effect of wildlife laws in Kenya is limited by poor enforcement and corruption.

Most people believe that law enforcement is inconsistent, with patrols only occurring when needed. The majority of those who responded believe that poor law enforcement makes bushmeat poaching more likely. A large number of respondents pointed out that not only are patrols understaffed and poorly supplied, but very few offenders are ever prosecuted. This confirms what Lindsey *et al*. (2013) and Cooney *et al*. (2017) pointed out: that enforcement should be open to the public and involve the community to be effective and seen as legitimate. This research supports the idea that people who believe laws are ineffective often link that to the idea that weak enforcement causes illegal poaching (Cheloti & Mulu, 2023; Ngetich, 2016).

Major difficulties to antipoaching law enforcement are corruption, weak penalties, not providing enough resources and the lack of community support. It was noted by some that certain officers participate in poaching, strict regulations do not stop offenders and rangers face difficulties in their work. A lack of community involvement can lessen the impact of conservation. The results are also consistent with what Cheloti and Mulu (2023), Lindsey *et al*. (2013) and Karanja (2019) reported about governance and resource allocation in

earlier studies. According to Biggs *et al*. (2017) and Kahler and Gore (2015), encouraging trust and inclusivity plays a key role in how well law enforcement performs.

For illegal bushmeat hunting challenge to be solved, most respondents suggested that penalties should be stricter, there should be more advanced surveillance, more rangers employed and efforts to fight corruption. Community-based activities and spreading awareness were also pointed out. A ranger pointed out that the situation could improve if there were better laws, better support and more local participation. It is clear from these articles that using all types of strategies such as legal, technological, institutional and grassroots, works best (Cheloti & Mulu, 2023; Brashares *et al*., 2011; Biggs *et al*., 2017; Cooney *et al*., 2017).

For conservation to endure, it was important to get local communities engaged. Trust was seen to be built by hiring local youth, holding awareness forums and involving everyone in making decisions. The importance of sharing the benefits of conservation such as building infrastructure, was underlined to encourage the community. Having informant networks was also thought to work. They are consistent with Biggs *et al*. (2017), Cooney *et al*. (2017) and Travers *et al*. (2019), who claim that involving communities helps conservation by supporting better intelligence and encourages people to obey the rules.

5.3 Conclusions

According to this study, poaching for bushmeat in the Chyulu Hills National Park is a common and established problem, and it is now accepted by many local people. Poachers hunt mainly large and medium-sized mammals, which endanger the ecology and biodiversity of the park. The continuous activity of poaching not only affects important wildlife but also weakens the park's ecosystems. Moreover, the fact that poaching is so commonly seen suggests that the challenge is connected to the local population's way of life and culture. If these complicated issues are not handled, it will be difficult to protect the park's wildlife and ecology for a long time.

It is also clear from the research that social and economic factors play a major role in encouraging people to poach bushmeat. For several people living near Chyulu Hills,

poaching is the main way to make money, as other sources of income are either absent or unreliable. The combination of tough financial situations, low levels of education, and prevailing acceptance of bushmeat leads to the ongoing problem of illegal hunting. Because hunting tools are easy to get and people do not have another way to earn money, poaching is still an appealing choice for many. It explains why it is important to include poverty alleviation, education, and community development in conservation efforts. In order for change to last, local people need to have economic opportunities that help them depend less on wildlife.

Lastly, existing ways of stopping poaching are not as effective as they could be due to a number of challenges. Even though most people are familiar with these laws, the fact that enforcement is not strong, penalties are often inconsistent, corruption exists, and there aren't enough resources make these laws less effective. Because the rules are not faithfully followed, poachers can avoid punishment, which makes the laws fail to stop illegal hunting. Based on the evidence, the conclusion is that countries should use various approaches: strengthen their police, deal with the weaknesses in their institutions, and engage their communities in conservation. Building trust and long-term success in the park will depend on teamwork, new technology, and including all in the benefits.

5.4 Recommendations

5.4.1 Community Engagement and Cultural Integration

To effectively combat the entrenched and normalized practice of bushmeat poaching, conservation strategies must prioritize community engagement that addresses cultural norms and local perceptions. This involves partnering with community leaders, cultural influencers, and educators to develop awareness programs that highlight the ecological importance of wildlife and foster a collective sense of responsibility. By embedding conservation values within the community's social fabric and education systems, the behavior and attitudes toward poaching can gradually shift, promoting long-term ecological stewardship.

5.4.2 Livelihood Diversification and Economic Empowerment

Addressing the socio-economic root causes of poaching requires the creation of sustainable livelihood alternatives for communities surrounding Chyulu Hills. Programs focused on vocational training, support for agriculture, small business development, and ecotourism can provide practical income sources that reduce reliance on illegal wildlife exploitation. Enhancing access to education, financial services, and markets will empower individuals economically, helping to break the cycle of poverty and poaching. Integrating development efforts with conservation objectives is essential for fostering durable behavioral change.

5.4.3 Strengthening Enforcement and Governance

To improve the effectiveness of anti-poaching regulations, it is critical to enhance law enforcement capacity through increased funding, better training, and improved logistical support. Implementing transparent accountability measures will help curb corruption and build public trust. Moreover, involving local communities in co-management roles and decision-making can enhance surveillance and compliance while fostering a sense of ownership. The adoption of modern surveillance technologies combined with community-based monitoring will increase enforcement visibility and deterrence. A collaborative governance framework that includes government agencies, local communities, and conservation partners is vital for sustaining these efforts. Mainstreaming anti-poaching into county plans ensures consistent funding and political support. KWS-NGO-community partnerships improve intelligence-sharing and grassroots enforcement, creating a unified front against wildlife crime.

5.5 Areas for Further Research

1. **Longitudinal Studies on Poaching Dynamics**: Future research could focus on long-term monitoring of bushmeat poaching trends to better understand how socio-economic and environmental changes influence poaching activities over time. Such studies would provide valuable insights into the effectiveness of conservation interventions and allow for adaptive management strategies.
2. **Community Perceptions and Behavior Change Mechanisms**: Further exploration of community attitudes, beliefs, and knowledge regarding wildlife conservation could inform

the design of culturally sensitive education and engagement programs. Understanding the social drivers behind poaching behavior will help tailor interventions that promote long-lasting behavioral change.

3. **Role of Technology in Anti-Poaching Enforcement**: Research could examine the deployment and impact of emerging technologies such as drones, camera traps, and real-time surveillance systems in enhancing enforcement capacity. Assessing cost-effectiveness, community acceptance, and integration with existing patrol efforts would be valuable.

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APPENDICES

Appendix 1: Questionnaire

QUESTIONNAIRE

KENYATTA UNIVERSITY

DEPARTMENT OF ENVIRONMENTAL STUDIES AND COMMUNITY DEVELOPMENT

REG NO. N50/CE/26128/2014

Introduction

My name is James Mbuthia, a postgraduate student undertaking a Master's program in Environmental Studies (Community Development) in the School of Agriculture and Environmental Sciences of Kenyatta University. I am researching on the Community Factors Influencing Bush Meat Poaching in Chyulu Hills National Park, Makueni County, Kenya. This questionnaire is being used to collect data on the extent of bushmeat poaching, socio-economic factors influencing bushmeat poaching, and the effectiveness of existing regulations governing poaching in Chyulu Hills National Park. The information provided will be utilized with utmost confidentiality for academic purposes only.

Instructions: Please **tick** the appropriate bracket or **write the answer** as required.

SECTION A: DEMOGRAPHIC INFORMATION

1. **Age**

- ☐ Below 18 years
- ☐ 18–25 years
- ☐ 26–35 years
- ☐ 36–45 years
- ☐ 46–55 years

- ☐ Above 55 years

2. **Gender**

   - ☐ Male
   - ☐ Female

3. **What is your highest level of education?**

   - ☐ No formal education
   - ☐ Primary education
   - ☐ Secondary education
   - ☐ College/University

4. **How long have you lived in this community?**

   - ☐ Less than 5 years
   - ☐ 5–10 years
   - ☐ 11–20 years
   - ☐ More than 20 years

5. **How far is your home from Chyulu Hills National Park?**

   - ☐ Less than 1 km
   - ☐ 1–5 km
   - ☐ 6–10 km
   - ☐ More than 10 km

SECTION B: OBJECTIVES

Objective 1: The Extent of Bushmeat Poaching in Chyulu Hills National Park

1. **Have you ever heard of bushmeat poaching in Chyulu Hills National Park**?

   ☐ Yes

   ☐ No

   ☐ Not sure

2. **How frequently do you hear about bushmeat poaching in your community?**

   ☐ Very frequently

   ☐ Occasionally

   ☐ Rarely

   ☐ Never

3. **What types of animals are commonly targeted for bushmeat in Chyulu Hills National Park? (Select all that apply)**

   ☐ Small mammals

   ☐ Medium-sized mammals

   ☐ Large mammals

   ☐ Birds

   ☐ Reptiles

   ☐ Other (Please specify) _____

4. **Has the level of bushmeat poaching in Chyulu Hills National Park increased, decreased, or remained the same in the past five years?**

- ☐ Increased significantly
- ☐ Increased slightly
- ☐ Remained the same
- ☐ Decreased slightly
- ☐ Decreased significantly

5. **Using a Likert scale where 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree, to what extent do you agree with the following statements about the impact of bushmeat poaching in Chyulu Hills National Park?**

Statement	1	2	3	4	5
Bushmeat poaching has led to a decline in wildlife populations in Chyulu Hills.					
Bushmeat poaching has contributed to habitat destruction and environmental degradation in the park.					
The loss of wildlife due to poaching affects the overall health of the park's ecosystem.					
Bushmeat poaching has contributed to increased human-wildlife conflicts in the area.					
If poaching continues, the park's wildlife tourism potential will significantly decline.					

6. **What are the main reasons why people engage in bushmeat poaching in Chyulu Hills National Park? (Select all that apply)**

☐ Lack of alternative livelihoods

☐ Cultural or traditional practices

☐ Demand for bushmeat in local markets

☐ Lack of enforcement and patrols

☐ Poverty and food insecurity

☐ Other (Please specify) _____

7. **In your opinion, which areas within or around Chyulu Hills National Park are most affected by bushmeat poaching?**

8. **Have you observed or reported any incidents of bushmeat poaching in or around Chyulu Hills National Park in the past year?**
   ☐ Yes
   ☐ No
   ☐ Prefer not to say

<u>Objective 2: The Socio-Economic Factors Influencing Bushmeat Poaching In Chyulu Hills National Park,</u>

1. **What is your primary source of income?**

   ☐ Farming

   ☐ Livestock keeping

   ☐ Formal employment

   ☐ Small business/trade

   ☐ Poaching or bushmeat trade

☐ Other (Please specify) _____

2. **To what extent do you agree with the statement: "Lack of alternative income sources drives people to engage in bushmeat poaching"?**

   ☐ Strongly Disagree

   ☐ Disagree

   ☐ Neutral

   ☐ Agree

   ☐ Strongly Agree

3. **How often do you observe or hear about people engaging in bushmeat poaching for financial reasons?**

   ☐ Never

   ☐ Rarely

   ☐ Occasionally

   ☐ Frequently

4. **What are the main reasons people in this community engage in bushmeat poaching?** (Select all that apply)

   ☐ Poverty/lack of income

   ☐ High demand for bushmeat

   ☐ Limited law enforcement

   ☐ Traditional or cultural practices

   ☐ Availability of snares

   ☐ Other (please specify)

5. **What are some of the socio-economic factors influencing bushmeat poaching in Chyulu Hills National Park?**

6. **How do these factors influence bushmeat poaching in Chyulu Hills National Park?**

7. **Do you think access to education and awareness programs can reduce bushmeat poaching in your community?**
   ☐ Yes
   ☐ No
   ☐ Not sure
   (*If yes, please explain how:*) _____

8. In your opinion, would providing alternative livelihood programs (e.g., eco-tourism, sustainable farming, youth employment) reduce reliance on bushmeat poaching?
☐ **Strongly Disagree**
☐ Disagree
☐ Neutral
☐ Agree
☐ Strongly Agree

9. Have you or someone you know ever received any support (financial, training, or employment) intended to reduce poaching-related activities in this area?
☐ Yes
☐ No
☐ Not sure
(*If yes, please describe the support received:*) _____

<u>Objective 3: The Effectiveness of Existing Regulations Governing Poaching in Chyulu Hills National Park</u>

1. **Are you aware of any laws or regulations against bushmeat poaching in Chyulu Hills National Park?**

☐ Yes

☐ No

☐ Not sure

2. **How effective do you think the current laws and penalties are in preventing bushmeat poaching?**

☐ Very effective

☐ Somewhat effective

☐ Neutral

☐ Not very effective

☐ Not effective at all

3. **How frequently do law enforcement officers patrol areas prone to poaching in Chyulu Hills National Park?**

☐ Often

☐ Rarely

☐ Never

4. **To what extent do you agree with the statement: "Weak law enforcement encourages bushmeat poaching in Chyulu Hills National Park"?**

☐ Strongly disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly agree

5. **What challenges do you think law enforcement faces in controlling bushmeat poaching?** (Select all that apply)

☐ Insufficient funding and resources

☐ Corruption among officials

☐ Lack of community cooperation

☐ Inadequate penalties for offenders

☐ Other (Please specify) _____

6. **What measures would you suggest to improve the enforcement of anti-poaching regulations in Chyulu Hills National Park?**

7. Have you ever witnessed or heard of any arrests or prosecutions related to bushmeat poaching in or around Chyulu Hills National Park?

☐ Yes

☐ No

☐ Not sure

(*If yes, please provide more details if possible:*) _____

8. In your opinion, how can the collaboration between local communities and park authorities be improved to strengthen anti-poaching efforts?

THANK YOU

Appendix 2: Interview Guide

Community Factors Influencing Bush Meat Poaching in Chyulu Hills National Park, Makueni County

Introduction to the Interview

Thank you for agreeing to participate in this interview. My Name is James Mbuthia, I am conducting a study on the community factors influencing bushmeat poaching in Chyulu Hills National Park. I appreciate your insights into seeking to understand the context of the study and the possible solutions. Your response will be confidential and will only be used for academic purposes.

Interview Questions

1. What changes have you observed in the types of animals being targeted by bushmeat hunters in the park?

2. Can you describe any trends or changes in poaching activities you have observed in this area?

3. What are the main reasons why people engage in bushmeat poaching around Chyulu Hills National Park?

4. How do you think education and awareness programs influence bushmeat poaching in this community?

5. What is your view on the effectiveness of current laws and penalties in deterring bushmeat poaching?

6. How do you perceive the enforcement of anti-poaching laws and the presence of park rangers in Chyulu Hills National Park?

7. What challenges do you think hinder effective anti-poaching efforts in Chyulu Hills National Park?

8. Have you witnessed or heard of any arrests related to bushmeat poaching in Chyulu Hills, and how effective do you think these arrests are in deterring future poaching?

9. What measures would you recommend to improve the enforcement of anti-poaching regulations in Chyulu Hills National Park?

Thank you

Appendix 3: Graduate School Approval Letter