

**A COMPREHENSIVE ASSESSMENT OF ILLEGAL ACTIVITIES IN FOREST  
MANAGEMENT IN MOUNT ELGON FOREST BUNGOMA COUNTY, KENYA**

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## DECLARATION AND APPROVAL

This thesis/project is my original work and has never been presented for any academic award in any institution.

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### Approval

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## DEDICATION

This work is dedicated to my wife and children for their support and encouragement during the entire period of the study.



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## ABSTRACT

The study conducted a comprehensive assessment of illegal activities in Cheptais Forest and Kaberua Forest within the larger Mount Elgon Forest in Bungoma, Kenya. The focus was on evaluating the nature of illegal activities, examining contributing factors, assessing their effects on ecological integrity and biodiversity, and identifying strategies for improved forest management practices to mitigate and prevent these activities. The study was guided by rational choice theory and ecological theories, focusing on individuals comprising forest officials, local communities residing near the forest, law enforcement agencies, conservation organizations, and other relevant actors involved in forest conservation, protection, and management. A stratified sampling approach was used to ensure representation from different stakeholders in Mount Elgon, with a sample size of 320 individuals. Data were collected using multiple research instruments, including guided questionnaires for local community members. Interviews were conducted with key informants such as law enforcement officials, environmental activists, researchers, and local authorities. Additionally, direct observations were employed to gather first-hand information on illegal activities and their impacts on forest ecosystems. Quantitative data from the questionnaires was analysed through SPSS version 26. Qualitative data from interviews and observations were analyzed thematically to identify patterns and key findings. Findings highlighted the pervasive issue of illegal activities in Mount Elgon Forest, with illegal logging identified as the most frequent and damaging activity, significantly impacting the forest's ecological integrity and the livelihoods of local communities. Key drivers of these illicit activities included socio-economic disparities, weak governance, and environmental degradation. The study suggested a comprehensive strategy for Mount Elgon Forest, emphasizing improved law enforcement, stricter penalties, enhanced surveillance, and community engagement in forest management. Capacity-building and awareness campaigns for locals on sustainable practices, policy reforms and collaboration with NGOs and government bodies would establish a supportive conservation framework.

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## LIST OF ABBREVIATIONA AND ACRONYMS

<b>INTERPOL</b>	International Criminal Police Organization
<b>KFS</b>	Kenya Forest Service
<b>KWS</b>	Kenya Wildlife Service
<b>NGOs</b>	Non-Governmental Organizations
<b>UN</b>	United Nations
<b>US</b>	United States



# CHAPTER ONE

## INTRODUCTION

### 1.1 Background to the Study

Illegal activities in forest management pose grave threats to the world's forest ecosystems, jeopardizing their health and sustainability (Cohen, Mosnier, Havlik, Obersteiner, & Schmid, 2019; Fortibuoni, Giovanardi, Pranovi, & Raicevich, 2014; Haavik, Billings, & Meeker, 2015; Caviglia-Harris, Kahn, & Green, 2017; Duffy, St. John, Büscher, & Brockington, 2013). Extensive research conducted across different regions has highlighted the widespread prevalence and devastating impacts of these illegal practices.

In the United States, challenges such as illegal logging and the illicit trade of forest products have reached alarming levels (Cohen et al., 2019; Echeverria, Gerber, & Mehta, 2016). Studies conducted in the Pacific Northwest emphasize the detrimental effects of illegal logging on forest health, biodiversity, and local economies, underscoring the urgent need for stricter regulations, enhanced enforcement measures, and public awareness campaigns (Cohen et al., 2019).

In the United Kingdom and the European Union, significant attention has been directed toward issues such as timber smuggling and the illegal trade of protected species (Interpol, 2021; Fotso, Tamfu, & Tsague, 2019). Research conducted in the UK's Forest of Dean has exposed the presence of illicit logging activities, which undermine sustainable forest management efforts (Interpol, 2021). In South America, particularly Brazil, severe challenges arise from illegal activities in forest management, including illegal logging, encroachment, and unlawful resource extraction (Schepaschenko, McCallum, & Shvidenko, 2019; Okeyo, Ndegwa, & Nyamongo, 2019). These practices lead to deforestation, habitat destruction, and contribute

significantly to global climate change. Studies in the region emphasize the urgent need for comprehensive legislation, law enforcement capacity building, and community participation to effectively address these issues (Nijman, 2018).

Across Africa, many countries are grappling with the negative effects of illegal activities in forest management. In Cameroon, extensive illegal logging has led to significant environmental degradation, biodiversity loss and economic challenges. Research indicates that illegal logging in Cameroon is influenced by factors such as weak governance, corruption and inadequate enforcement of forestry laws, resulting in the depletion of forest resources and loss of government revenues (Jones, Wambui, & Mwangi, 2020). Similarly, the Democratic Republic of Congo (DRC) faces substantial challenges related to illegal timber trade and encroachments. The DRC's vast forest cover is under threat due to illegal logging activities, which are exacerbated by governance challenges, subnational conflicts, and corruption in the timber sector (Nkemnyi, Nzoyem, & Mbani, 2020). In Nigeria, illegal logging poses a significant threat to forest ecosystems, mainly in areas like the Omo Forest Reserve. Despite its status as a conservation area for endangered species, the reserve experiences escalating illegal logging activities, attributed to lax enforcement and corruption (Areo, Omole, Amoo-Onidundu & Adejoba, 2024). The Nigerian government's efforts to combat illegal logging have been hampered by challenges such as inadequate resources, corruption, and insufficient enforcement of existing laws (UNODC, 2022).

In Kenya, forest management issues—particularly those related to illegal activities—remain a pressing concern. The Aberdare Forest, situated in central Kenya, serves as a critical watershed supplying water to Nairobi and its environs. Despite its ecological significance, the forest faces threats from illegal logging, charcoal production, and land encroachments (Okeyo, 2018). Similarly, the Mau Forest Complex in the Rift Valley region is a vital water catchment area for

numerous rivers and lakes, yet it suffers from degradation due to illegal settlements, logging, and cultivation (Gachanja, Mwangi, & Otieno, 2020). These challenges highlight broader issues in Kenya's forest management, where invaluable ecosystems are jeopardized by unlawful practices. Addressing these concerns is crucial for conserving biodiversity and natural resources, as well as ensuring the well-being and livelihoods of local communities (Mbugua, Kimani, & Njoroge, 2019).

Mount Elgon Forest in Bungoma County, Kenya, exemplifies the complex challenges faced in forest management. This ecological hotspot supports unique flora and fauna and plays a critical role in water catchment regulation and resource provision for local communities (Okeyo, 2018). However, it has been significantly affected by encroachments, illegal logging, poaching, and other illicit activities, posing a serious threat to its sustainability and, consequently, the well-being of surrounding communities (Williams, Mutunga, & Makori, 2018). This study aims to comprehensively assess the extent of illegal activities in forest management, focusing specifically on Mount Elgon Forest in Bungoma County, Kenya. The study seeks to uncover the underlying causes, drivers, and consequences of illegal practices. Additionally, it will explore existing policies, enforcement mechanisms, and institutional capacities for addressing these challenges. The findings will contribute to evidence-based strategies and interventions to combat illegal activities, promote sustainable forest management practices, and safeguard the ecological integrity of Mount Elgon Forest and similar ecosystems in Kenya and beyond.

## **1.2 Statement of the Problem**

Illegal activities, such as logging and poaching, significantly threaten the sustainable use and conservation of global forest resources. Although there are international policies and enforcement mechanisms in place, these illegal practices continue, compromising ecological integrity and impacting biodiversity, climate regulation, and the livelihoods of forest-

dependent communities. In Kenya, forests like the Aberdare Forest and Mau Forest Complex have been extensively studied, revealing their ecological value and the severe threats they face from unlawful activities (Okeyo, Ndegwa, & Nyamongo, 2018; Gachanja, Mwangi, & Otieno, 2020). These forests are crucial water catchment areas and biodiversity hotspots, and their degradation raises concerns over water security and habitat loss. However, there is a notable knowledge gap concerning Mount Elgon Forest in Bungoma County, which remains understudied despite its essential ecological and socio-economic roles. This forest grapples with unique challenges, including encroachment, illegal logging and poaching. Limited research on these dynamics hinders the development of effective strategies to address the specific threats to Mount Elgon Forest and support surrounding communities.

There is a dearth of literature on illegal activities in forest management. Okeyo et al. (2018) assessed the effects of illegal logging on the ecological integrity of Mount Elgon Forest. Findings indicated that illegal logging led to significant degradation of forest structure, loss of biodiversity and disruption of ecological functions. The study presents a conceptual gap as the dependent variable was ecological integrity. On the other hand, Mbugua et al. (2019) investigated the effects of human activities on ecological integrity of forest ecosystems in Kenya and found that activities such as agriculture, settlement expansion, and logging contributed to deforestation and habitat fragmentation. A methodological gap is evident as remote sensing data was employed in data collection. Additionally, Mwangi (2020) evaluated the relationship between poverty and poaching activities in Kenyan forests and advocated for poverty alleviation programs and alternative livelihood options to reduce reliance on poaching. The study was limited in its data collection as only interviews were conducted. Yet, Gachanja et al. (2020) examined forest degradation and its effects on water quality and quantity and found that deforestation and land encroachments adversely affected water resources. The study presents a contextual gap as it was conducted in Mau Forest Complex. This study sought to fill

these knowledge gaps as it assessed illegal activities in forest management in Mount Elgon forest Bungoma county.

### **1.3 Purpose of the Study**

The purpose of this study was to assess illegal activities in forest management in Mount Elgon forest Bungoma county, Kenya.

### **1.4 Research Objectives**

- i. To evaluate the nature of illegal activities occurring in Mount Elgon forest, Bungoma, County
- ii. To examine factors contributing to the occurrence and persistence of illegal activities in forest management in Mount Elgon forest, Bungoma, County
- iii. To assess the effects of illegal activities on the ecological integrity and biodiversity of Mount Elgon forest , Bungoma County
- iv. To identify strategies for improved forest management practices to mitigate and prevent illegal activities in Mount Elgon forest, Bungoma, County

### **1.5 Research Questions**

- i. What is the nature of illegal activities in Mount Elgon forest, Bungoma, County?
- ii. What are the factors contributing to the occurrence and persistence of illegal activities in forest management in Mount Elgon forest, Bungoma County?
- iii. What are the effects of illegal activities on the ecological integrity and biodiversity of Mount Elgon forest In Bungoma County?
- iv. What strategies can be put in place for improved forest management practices to mitigate and prevent illegal activities in Mount Elgon forest, Bungoma County?

## **1.6 Justification of the study**

Illegal logging, poaching and land encroachments in Mount Elgon Forest directly threaten the attainment of SDG 13 (Climate Action), SDG 15 (Life on Land), and SDG 1 (No Poverty). Forests aid in carbon sequestration, biodiversity preservation and sustaining the livelihoods of nearby communities. Mount Elgon, as a key water catchment area and biodiversity hotspot, is not only ecologically valuable but also an important resource for agriculture, energy and water supply in western Kenya. Yet, limited empirical research hinders targeted policy and community interventions that could help reverse its degradation. Consequently, this study aimed to fill this knowledge gap, and provided data to support sustainable forest management, conservation policy reform and community empowerment.

Moreover, the study aligns with Kenya's Vision 2030, which emphasizes environmental conservation as a pillar for achieving a globally competitive and prosperous nation. The Vision advocates for the sustainable exploitation of natural resources and enhanced forest cover to ensure water security, promote biodiversity, and support economic growth. Mount Elgon Forest, although less studied compared to forests like Aberdare and Mau, supports Kenya's socio-economic development. However, the persistent threats of illegal logging, encroachment and poaching undermine these national goals. Investigating and understanding the scope and impact of these illegal activities will help design localized, effective mitigation strategies that promote environmental integrity, safeguard livelihoods and contribute to national development targets. This study, therefore, assessed illegal activities in forest management in Mount Elgon forest Bungoma county.

## **1.7 Significance of the Study**

The study is significant in a number of ways, emphasizing its significance for different stakeholders as well as the larger conservation and sustainable development initiatives. Its

contribution to the corpus of information already available in the fields of conservation and natural resource management accounts for its scholarly value. The research contributes to the scholarly conversation on environmental governance, wildlife conservation, and sustainable forest management by carrying out a thorough examination of the scope, causes, effects, and potential remedies of illicit activities.

The study's conclusions can be a useful guide for scholars, decision-makers, and practitioners who want to comprehend the dynamics of illicit activity in forest ecosystems, create practical plans for preventing and mitigating it, and investigate methods to encourage the fusion of conservation and community development objectives. Additionally, the research technique and methodology used in this study can serve as a model for future investigations into illicit activities in other wooded areas, advancing our knowledge of this worldwide environmental issue. For the preservation of Mount Elgon Forest's forest resources, the study is essential. Through evaluating illicit activities, including poaching, encroachment, and illegal logging, the study can offer important insights into the scope and character of these activities.

This information is crucial for creating and carrying out conservation plans that preserve the forest's biodiversity, ecological integrity, and ecosystem services. The study also supports sustainable forest management techniques. The ideals of sustainability are directly challenged by illegal actions, which compromise the equitable and responsible use of forest resources. Improved forest management strategies can be developed by using the research's understanding of the elements that lead to the occurrence and persistence of these activities. This entails determining the gaps in governance, strengthening law enforcement, and encouraging community involvement in order to guarantee the sustainable use of forest.

Another noteworthy characteristic is the influence on indigenous communities. Neighboring communities depend on Mount Elgon Forest for their livelihoods, and illicit activity might negatively impact their quality of life. The results of the study can be used to inform initiatives to lessen the socioeconomic effects of unlawful activity and to increase awareness of these effects. This entails encouraging different sources of revenue, enhancing community participation in forest management, and making sure that the advantages of forest resources are distributed fairly. Additionally, the study is relevant outside of the local setting. The research results from Mount Elgon Forest can help further our understanding of the global problem of illegal forest management practices. The study's lessons gained, best practices, and policy recommendations can help guide international efforts to fight.

### **1.8 Scope of the Study**

The study assessed illegal activities in forest management in Mount Elgon forest Bungoma county. Specifically, the study examined the nature of illegal activities, factors contributing to the occurrence and persistence of illegal activities, effects of illegal activities on the ecological integrity and biodiversity and identified strategies for improved forest management practices to mitigate and prevent illegal activities in Mount Elgon forest. The study was conducted in May 2024 and June 2024.

### **1.9 Limitation of the Study**

Several inherent limitations of evaluating illicit forest management practices in Mount Elgon Forest were proactively addressed in this study. These restrictions were time restraints, a lack of financial, human, and technological resources, logistical challenges in reaching isolated locations, and possible resistance from those engaged in illicit activities. The researcher utilized a tailored strategy that was centered on particular goals in order to lessen these difficulties and guarantee objectivity. To maximize resource use, grant applications and cooperative initiatives

were sought. To guarantee thorough coverage, a variety of data collection techniques were used, and community trust was increased through moral engagement tactics. To increase the dependability of the results, rigorous data analysis methods such as data triangulation were applied. Additionally, while analyzing the findings, the researcher openly acknowledged these limitations, highlighting their importance. The study's findings are guaranteed to be legitimate and credible due to their contextual applicability to Mount Elgon Forest in Bungoma, Kenya.

### **1.10 Delimitations of the study**

This study was geographically delimited to Mount Elgon Forest in Bungoma County, Kenya, a region chosen for its ecological significance, socio-economic relevance and documented exposure to illegal forest activities such as logging, poaching and encroachment. The research did not extend to other forest ecosystems in Kenya, such as the Mau Forest Complex or Aberdare Forest, despite their environmental parallels. This enabled a focused analysis of localized threats, policies and community interactions specific to Mount Elgon. The study primarily focused on the environmental and socio-economic effects of illegal forest activities, excluding other factors that may also influence forest management. The study was limited to qualitative and quantitative data collected through interviews, surveys, field assessments and secondary data reviews.

### **1.11 Assumption of the Study**

The study assumed that illegal activities such as poaching, encroachment, illegal logging and wildlife trafficking were underway in Mount Elgon Forest and had significant negative effects on both the forest ecosystem and surrounding communities. The study further assumed that these unlawful practices contribute to environmental degradation, biodiversity loss and socio-economic hardships among local populations. It was also assumed that sustainable forest management practices are essential for reversing these trends, promoting ecological restoration

and enhancing community livelihoods. Additionally, the study assumed that local engagement, data reliability and collaborative stakeholder action were critical for achieving effective conservation outcomes.

### **1.12 Operational Definition of Key Terms**

<b>Assessment</b>	Thorough examination of the scope, character, and effects of illicit activities in relation to Mount Elgon Forest management. It entails gathering information, spotting patterns, and determining the ramifications of these actions.
<b>Biodiversity</b>	The variety and variability of life on Earth. It includes the diversity within species (genetic diversity), between species (species diversity), and of ecosystems (ecosystem diversity). Biodiversity is essential for ecosystem resilience, ecological stability, and the provision of ecosystem services that support human life, such as clean air, water, food, and climate regulation.
<b>Ecological integrity</b>	The ability of an ecosystem to support and maintain a balanced, adaptive community of organisms that has a species composition, diversity, and functional organization comparable to those of natural habitats in the region. It implies that the ecosystem is healthy, functioning naturally, and capable of sustaining its structure and processes over time, even in the face of environmental stress or human influence.
<b>Encroachment</b>	Unauthorized usage or occupation of land inside Mount Elgon Forest, especially in conservation or sustainably managed zones, is referred to

as encroachment. Illegal colonies or agricultural practices that cross legal lines may be examples of this.

**Forest Management** Forest management involves the strategies, techniques, and actions aimed at using and conserving Mount Elgon Forest's resources in a sustainable manner. It focuses on preserving ecological balance, supporting biodiversity, and addressing the socio-economic needs of the community through careful planning, implementation, and oversight.

**Illegal Activities** In this study, illegal activities are defined as actions that violate the laws, rules, and regulations set for the management of Mount Elgon Forest.

**Logging** The practice of cutting, extracting, and preparing trees from Mount Elgon Forest for use in commercial settings is known as logging. When discussing illicit actions, it refers to the unapproved removal of trees without the required permissions or sustainable logging methods.

**Poaching** The unlawful hunting, trapping, or killing of wildlife in Mount Elgon Forest is referred to as poaching. This covers things like the illegal bushmeat trade, the trafficking of endangered animals, and the illegal gathering of wildlife items.

**Sustainable Forest Management** One strategy that guarantees the long-term preservation and fair use of resources in Mount Elgon Forest is sustainable forest management. It encompasses methods that ensure the forest's regeneration and the welfare of the nearby communities while promoting the forest's ecological health, social advantages, and economic worth.

**Wildlife Trafficking** The illicit trade and transportation of live animals or parts of them from Mount Elgon Forest is known as wildlife trafficking. These practices, which frequently benefit sectors including the exotic pet trade, traditional medicine, and gourmet food markets, are illegal under both national and international wildlife protection regulations.



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The introduction to the literature review section sets the stage for a comprehensive exploration of the existing body of knowledge on the assessment of illegal activities in forest management within Mount Elgon Forest, Bungoma, Kenya. Through delving into the relevant literature, the aim is to gain a thorough understanding of the various concepts, factors, and challenges intertwined with forest management and illicit activities prevalent in the study area. This entails a systematic examination of scholarly works, reports, and articles addressing the multifaceted aspects of illegal activities, including their drivers, impacts, and mitigation strategies. Moreover, the review serves to synthesize the diverse perspectives and empirical findings dispersed across the literature landscape, facilitating a comprehension of the complex dynamics at play. Additionally, by identifying and articulating gaps in the existing literature, the review offers valuable insights into areas where further research is warranted, thus informing future scholarly endeavors and policy interventions aimed at addressing illegal activities in forest management effectively.

#### **2.2 The Nature of Illegal Activities Occurring In Forests**

Illegal activities within forest ecosystems have drawn increasing attention from researchers worldwide due to their significant impacts on biodiversity, ecosystem health, and local communities. The exploration of these activities extends beyond mere documentation to encompass understanding their drivers, consequences, and potential mitigation strategies. By examining illegal activities in various forested regions globally, researchers aim to elucidate common patterns, unique challenges, and effective interventions that can inform conservation efforts in places like Mount Elgon Forest.

### 2.2.1 Illegal Mining

Illegal mining, particularly for gold and other valuable minerals, is another widespread issue in forest areas. Often occurring in remote regions, illicit mining leads to deforestation, water contamination, and soil degradation due to the use of toxic chemicals such as mercury and cyanide. A study by Asner et al. (2013) employed a combination of field surveys, airborne mapping and high-resolution satellite imaging to monitor and quantify the expansion of mining activities from 1999 to 2012. The study revealed a dramatic 400% increase in the geographic extent of gold mining over the 13-year period. A methodological gap is evident as the proposed study used questionnaires, interview guide and observation guide in data collection. Hilson (2002) examined environmental and socio-economic impacts of small-scale gold mining in Ghana. and found that small-scale mining, often conducted illegally, led to significant environmental degradation, including deforestation, soil erosion, and water pollution due to the use of hazardous chemicals like mercury. The research presents a methodological gap as it employed a qualitative approach. Illegal mining in forests, particularly in Kenya, poses significant challenges to environmental conservation, local communities, and sustainable development. While Kenya's mining industry remains small relative to other African countries, illegal mining activities in forested areas, especially for gold and gemstones, have been increasingly reported in regions like Mt. Elgon and Kakamega Forest (Maina et al., 2020).

Illegal mining in Kenya largely involves small-scale extraction of valuable minerals such as gold and gemstones, with artisanal miners operating outside regulatory frameworks due to financial and bureaucratic barriers (Hinton et al., 2003). Artisanal miners often use rudimentary tools, which increases the environmental footprint of their activities. In places like the Kakamega Forest, unauthorized gold mining has been documented as a significant source of deforestation and soil erosion, which threatens local biodiversity and disrupts ecosystem stability (Odumo et al., 2014). Illegal mining activities lead to severe environmental

degradation, especially in forest ecosystems. For instance, the use of mercury in gold mining contaminates nearby water sources and soils, posing risks to both human health and wildlife (Ogola et al., 2002). The deforestation associated with illegal mining activities in Mt. Elgon Forest has led to habitat fragmentation, which further threatens Kenya's already vulnerable forest ecosystems (Maina et al., 2020). This activity severely impacts the health of local communities and biodiversity, often resulting in long-term ecological damage.

### **2.2.2 Illegal logging**

Illegal logging remains one of the most destructive and pervasive activities in forested areas. Defined as the unauthorized harvesting, transporting, or selling of timber, illegal logging contributes significantly to deforestation, greenhouse gas emissions, and biodiversity loss. The demand for high-value timber species, such as mahogany and teak, often drives illegal logging. Studies show that illegal logging undermines sustainable forest management practices, affects indigenous communities, and disrupts local ecosystems by reducing habitat availability for wildlife (Tacconi et al., 2007). Smith et al. (2018) shed light on the pervasive issue of illegal logging in Southeast Asia, where vast tracts of forests are exploited for commercial gain, leading to habitat loss and fragmentation. This study underscores the urgency of addressing illegal logging, not only for the sake of forest ecosystems but also for the myriad species that depend on them for survival. Illegal logging in Mt. Elgon Forest, Kenya, is a significant environmental issue, impacting local ecosystems, biodiversity, water resources, and the livelihoods of local communities. Mt. Elgon, a prominent forested area straddling the Kenya-Uganda border, is a vital watershed and biodiversity hotspot. Despite its ecological importance, this forest has faced extensive illegal logging for decades, driven by socio-economic factors, land disputes, and weak governance.

Illegal logging in Mt. Elgon Forest has caused substantial deforestation and degradation of the forest ecosystem. The forest provides critical ecological services, including soil stabilization, carbon sequestration, and water regulation. However, illegal timber harvesting disrupts these functions, leading to increased soil erosion, reduced water quality, and loss of vegetation cover. Additionally, Mwangi (2020) evaluated the relationship between poverty and poaching activities in Kenyan forests and advocated for poverty alleviation programs and alternative livelihood options to reduce reliance on poaching. The study was limited in its data collection as only interviews were conducted.. Deforestation from illegal logging also threatens biodiversity within Mt. Elgon. The forest is home to unique plant and animal species, some of which are endangered or endemic. As trees are felled and habitats are fragmented, many species lose their natural habitats, which can lead to declines in population numbers and, in extreme cases, local extinctions. Chepkwony (2020) examined the effects of illegal logging on biodiversity in Mount Elgon Forest. The research involved field surveys to document the presence and abundance of various plant and animal species, with particular attention to those that are endangered or endemic. Habitat assessments were conducted to evaluate the extent of habitat fragmentation and degradation resulting from logging activities. The study revealed that illegal logging has significantly reduced habitat availability for several key species, including the giant forest hog and the black-and-white colobus monkey. A limitation in data collection is evident as the study only used surveys in data collection.

### **2.2.3 Drug Production**

In certain regions, forested areas are used for the illicit cultivation of narcotic plants, such as coca in the Amazon and opium poppies in Southeast Asia. The impacts of drug cultivation include deforestation, soil degradation, and pollution from chemical fertilizers and pesticides. Research by McSweeney et al. (2014) shows that these activities are often tied to organized crime and exploit remote forest areas to avoid detection. Additionally, drug production in

forests can lead to violent conflicts and weaken governance, making conservation efforts challenging. McSweeney et al. (2014) study was conducted in central America, which presents a contextual gap as the political, economic and social factors in environmental issues and changes are different from Kenya's. Drug production in forests in Kenya is a complex and growing issue, primarily due to the country's strategic location, vast forested areas, and socio-economic pressures. This illicit activity, though not as widespread as illegal logging or poaching, has gradually expanded in certain forested regions, often as a hidden, underground operation in remote areas where law enforcement presence is limited. The primary drugs associated with forest production in Kenya include cannabis and the stimulant khat, though there are emerging concerns about synthetic drugs as well.

Cannabis, or "bhang" as it is locally known, is one of the most commonly cultivated drugs in Kenyan forests. Areas such as the Mau Forest, Aberdare Ranges, and parts of Mount Kenya have reported cases of illegal cannabis farms. Cultivators take advantage of the dense forest cover to conceal these activities from aerial or ground-level detection by authorities. Additionally, the fertile soil and favorable climate in these regions allow for high yields, which incentivize cultivation. The economic allure of cannabis production cannot be understated. Many local farmers, often facing poverty and limited livelihood options, view cannabis as a quick source of income, especially with the rising demand both locally and in regional markets. Cannabis farms are typically small-scale and scattered, making them difficult to detect, and often benefit from an informal network of local distributors who help in transporting the drug to urban centers like Nairobi, Mombasa, and Kisumu (Njuguna, 2021).

Khat, known locally as "miraa," is a stimulant leaf traditionally grown in specific parts of Kenya, such as Meru County. Although khat production is legal within Kenya, increased demand—especially for export to neighboring countries—has led to expanded production that

sometimes encroaches on forested areas. In particular, land pressures and the desire to cultivate more miraa have led some farmers to clear forest patches near cultivation zones.

While khat is not classified as an illegal drug within Kenya, the environmental impacts of its expansion into forested areas are concerning. The intensive farming of khat depletes water resources, as it requires significant irrigation, leading to potential conflicts with local water needs and a reduction in water tables within forest ecosystems (Wangari, 2019). The study was limited in scope as it employed questionnaire interviews and focus group discussions to collect data.

#### **2.2.4 Illegal Land Clearing For Agriculture**

Illegal land clearing for agriculture, particularly for cash crops like palm oil, soy, and cattle ranching, is a major contributor to forest degradation. Unsanctioned land clearing disrupts ecosystems, contributes to carbon emissions, and can displace indigenous populations. Geist and Lambin's (2002) work emphasizes that the underlying drivers of illegal land clearing often involve socio-economic pressures, including poverty, land tenure conflicts, and demand for agricultural commodities. The impact is particularly severe in tropical forests, where large swathes of forest are cleared for monoculture plantations, reducing biodiversity and increasing the risk of forest fires. Illegal land clearing for agriculture in Kenyan forests is a serious environmental and socio-economic issue, driven by land scarcity, population pressure, poverty, and in some cases, weak enforcement of conservation laws. Forests such as the Mau Complex, Aberdare Range, and Mt. Kenya are especially vulnerable to illegal clearing due to their fertile soils, moderate climate, and strategic locations, which attract settlers seeking productive agricultural land. Gachanja et al. (2020) examined forest degradation and its effects on water quality and quantity and found that deforestation and land encroachments adversely affected water resources. The study presents a contextual gap as it was conducted in Mau Forest Complex.

With a rapidly growing population, land scarcity has become a significant issue in Kenya. Population pressure, especially in highland areas, has led to increased demand for farmland, causing people to encroach on forested lands to cultivate crops. According to government reports, the human population around forested areas in Kenya has expanded significantly, leading to intensified agricultural activities on forest peripheries, which has in turn resulted in illegal clearing of protected areas (Njeru, 2021). Many communities living near forests face economic hardships, with limited access to viable livelihood options. For these communities, agriculture offers a stable income compared to informal employment or low-paying labor jobs. Illegal clearing of forest land allows small-scale farmers to grow staple crops like maize, potatoes, and beans for subsistence and sale. Omondi and Mwangi (2020) used satellite imagery and GIS to examine land use changes, highlighting agricultural expansion into forests. They conducted household surveys and interviews with farmers and community leaders to understand motivations for forest encroachment and local awareness of environmental impacts. Findings revealed that poverty and lack of economic alternatives drove illegal cultivation, despite awareness of deforestation's harms. The imagery analysis showed a rise in agricultural land at the cost of forest cover, emphasizing the need for sustainable economic opportunities and better forest management. An empirical gap is evident as effects of illegal activities on ecological integrity and biodiversity were not studied, a gap that this study sought to fill. . Weak enforcement of forest protection laws and corruption within government agencies have exacerbated illegal land clearing in Kenya. Though the Kenya Forest Service (KFS) is tasked with protecting forest reserves, limited resources and understaffing make it challenging for the agency to monitor all forest areas effectively. In some cases, illegal settlers have managed to bribe officials to secure unauthorized permits or continue their activities without interference, leading to a culture of impunity around forest encroachment (Mutua, 2019).

### **2.2.5 Poaching of Wildlife**

Similarly, Johnson and Brown (2019) documented the rampant poaching of wildlife in African forest reserves, revealing the devastating impact on species populations and ecological balance. Illegal wildlife trafficking within forests involves the hunting, poaching, and trading of endangered or rare species, which threatens biodiversity and disrupts ecological balance. Many species, particularly those in biodiversity-rich regions like the Amazon and Southeast Asia, are vulnerable to poaching for body parts, pets, and medicinal purposes. Johnson and Brown (2019) presents a contextual scope, as it was conducted in the Congo forest, while this study was coinducted in Mt.Elgon forest. Research indicates that illegal wildlife trade is driven by economic incentives, cultural demands, and weak law enforcement in some regions. According to Duffy et al. (2016), wildlife trafficking has significant ecological impacts and is often linked to organized crime networks that exploit forest resources across borders.

Wildlife poaching in Kenyan forests is a significant environmental and security concern, primarily driven by demand for animal products, habitat encroachment, and poverty. Despite conservation efforts, illegal hunting of species like elephants, rhinos, and bushmeat-targeted animals persists, particularly in areas like Aberdare, Mt. Kenya, and Tsavo forests, which are rich in biodiversity. Poaching endangers species, undermines ecosystems, and negatively impacts the economy, as Kenya heavily relies on tourism, which is closely tied to its wildlife conservation. Kenya's rich biodiversity includes species that are highly sought after in the illegal wildlife trade. Rhino horns and elephant ivory, for instance, are valued in international black markets, primarily for their perceived medicinal and status-symbol properties in parts of Asia. The global demand for ivory and rhino horn has led to organized poaching operations, where criminals often work with well-equipped syndicates to kill these animals, evade authorities, and smuggle products across borders (Ogada, 2019).

In many cases, poaching is driven by poverty and lack of employment opportunities. Local communities living near forests often face economic hardships and may see poaching as a quick way to earn money. A single rhino horn or elephant tusk can fetch substantial sums on the black market, making it an attractive, albeit illegal, income source. Poachers may be recruited by middlemen who offer financial incentives, sometimes providing them with weapons, equipment, and a network to access international markets (Mwangi, 2020). Human encroachment into forest habitats has increased the proximity between wildlife and human populations, leading to more frequent interactions and conflicts. When animals stray into farms or settlements in search of food, they may be killed or captured as a response to perceived threats. Habitat loss, driven by illegal land clearing and logging, has also reduced available space for wildlife, making them more vulnerable to poaching due to limited safe zones within forested areas (Karanja, 2018). These findings resonate with the challenges faced in Mount Elgon Forest, where illegal activities threaten the delicate equilibrium of its ecosystems.

Understanding the transnational nature of environmental crimes is crucial for devising effective strategies to combat them. Jones et al. (2020) highlighted the complex web of wildlife trafficking networks that operate across borders, exploiting regulatory gaps and weak enforcement mechanisms. Such insights underscore the need for international cooperation and coordinated action to disrupt these criminal networks and stem the illegal trade in wildlife products. Additionally, Lee and Carr (2017) explored the socio-economic drivers behind land encroachment and illegal land use, revealing how poverty, land tenure issues, and lack of alternative livelihood options contribute to environmental degradation. These socio-economic factors are likely to resonate with the context of Mount Elgon Forest, where similar challenges may drive individuals to engage in illegal activities for sustenance or profit. INTERPOL's report (2021) provided a comprehensive overview of the global impact of illegal wildlife trafficking, emphasizing its role in driving species extinction and undermining conservation

efforts. The report underscores the need for concerted action at the international level to disrupt trafficking networks, strengthen enforcement capacities, and address underlying demand for wildlife products. Similarly, Karsenty et al. (2018) examined the effectiveness of governance mechanisms in combating illegal logging, highlighting the importance of policy coherence, law enforcement, and stakeholder engagement. These insights offer valuable lessons for Mount Elgon Forest, where governance structures and enforcement mechanisms may require strengthening to effectively tackle illegal activities. Nasi et al. (2017) conducted a seminal study on the ecological and economic impacts of illegal logging in tropical forests, revealing the staggering costs associated with forest degradation. Beyond ecological losses, illegal logging also undermines the livelihoods of local communities dependent on forest resources, exacerbating poverty and social inequities. Williams et al. (2018) delved into the intricate web of drivers behind wildlife trafficking, uncovering the role of criminal syndicates, corruption, and consumer demand in fueling the trade. These findings underscore the interconnectedness of illegal activities and the need for holistic approaches that address underlying drivers and root causes.

Moreover, Agrawal et al. (2020) explored the potential of community-based conservation initiatives in mitigating illegal activities in forest ecosystems. By empowering local communities and fostering their stewardship of natural resources, these initiatives not only contribute to biodiversity conservation but also promote sustainable livelihoods and strengthen social cohesion. Such bottom-up approaches hold promise for Mount Elgon Forest, where the involvement of local communities in conservation and management efforts can enhance the effectiveness and sustainability of interventions. In summary, the exploration of illegal activities in forests globally offers valuable insights that can inform conservation strategies in Mount Elgon Forest and similar contexts. By examining the drivers, impacts, and potential interventions associated with these activities, researchers can develop targeted and evidence-

based approaches to address environmental crimes and promote sustainable forest management. Through international collaboration, community engagement, and policy reform, stakeholders can work together to safeguard the ecological integrity and biodiversity of Mount Elgon Forest for future generations.

### **2.3 Factors Contributing To The Occurrence And Persistence of Illegal Activities in Forest Management**

A confluence of market incentives, poor governance, and socioeconomic issues propel illegal forest management practices. The main causes of the occurrence and continuation of illicit forest management operations are shown by studies carried out in many nations. Tacconi et al. (2015) conducted a study in Indonesia that emphasizes the role that socioeconomic factors, such as poverty, a lack of other livelihood options, and income disparities—play in fueling illicit activity. Communities are pushed by these forces to resort to criminal activities in order to survive. The report highlights that lowering illicit activities in forest management requires tackling socioeconomic problems and offering alternatives for sustainable livelihood. Caviglia-Harris et al. (2017) studied the persistence of illicit activities in Brazil, namely the increase in land conversion for agriculture and deforestation. These techniques are driven by market forces and financial incentives, which keeps illicit forest management practices alive. The study highlights the necessity of implementing laws that encourage ethical and lawful forest activities as well as sustainable economic development.

According to a study done in Cameroon by Nkemnyi et al. (2020), poor governance and insufficient law enforcement tools foster an atmosphere that encourages illicit forest management practices. The report highlights how crucial it is to fortify governance frameworks, encourage openness, and improve law enforcement's ability to successfully counter illicit activity. The research was grounded in the theoretical framework of institutional

analysis, focusing on how formal and informal institutions influence forest governance outcomes, hence a theoretical gap. According to a Russian study by Schepaschenko et al. (2019), corruption and poor governance make it difficult to police forest laws, which fuels the continuation of illicit logging. The study highlights how urgently better governance frameworks, anti-corruption initiatives, and the creation of responsible and transparent forest management systems are needed.

Illegal operations in forest management also arise and persist because of the market demand for timber products and the complexity of global supply systems. In order to reduce illicit activities, Bellassen et al. (2018) conducted a global study that emphasizes the need of meeting customer demand, supporting sustainable certification programs, and guaranteeing openness across the timber supply chain. According to a study by Ojha et al. (2016), the demand for high-value timber species and international trading networks are the main drivers of illicit logging in Southeast Asia. These market dynamics lead to substantial illegal logging in countries such as Myanmar and Laos. To stop illicit activity, the report highlights the necessity of stronger rules, more surveillance of the timber trade, and regional cooperation. These variables, which have been found in research projects across the globe, offer important new information about the prevalence and sustainability of illicit forest management practices. A contextual gap is evident in Ojha et al. (2016)'s study as it was conducted in Myanmar and Laos. The local socioeconomic context, the existence of market demands and economic incentives, the efficiency of governance and law enforcement mechanisms, and the dynamics of supply chains and market demand would all be beneficial factors to take into account when evaluating illicit activities in forest management in Mount Elgon Forest, Bungoma, Kenya. Through comprehending and addressing these crucial elements, focused tactics and interventions that successfully combat illegal activities and promote sustainable forest management practices in Mount Elgon Forest and similar contexts.

## **2.4 The effects of Illegal Activities On The Ecological Integrity And Biodiversity**

Illegal activities have significant and wide-ranging effects on biodiversity and ecological balance, including logging, poaching, wildlife trafficking, and illicit fishing. Silva et al. (2018) carried out a study in Brazil that examined the destructive effects of illicit logging in the Amazon rainforest. Illegal logging has been a major contributor to rampant deforestation, which results in the loss of crucial habitats and the disruption of ecological processes that are essential for maintaining biodiversity. The study underscores the importance of stricter law enforcement and enhanced conservation efforts to protect the biodiversity of the region. Without significant intervention, the continuous illegal logging in the Amazon is likely to lead to further degradation of the environment, affecting not just the flora but also the fauna, including numerous endangered species that rely on this habitat. The research calls for the urgent need to curb illegal logging to prevent irreversible damage to one of the world's most vital ecosystems.

Nash et al. (2020) examined the problem of poaching, focusing on the ivory and horns of elephants and rhinoceroses in nations such as South Africa and Kenya. The numbers of these keystone species have significantly declined as a result of the illegal trade in these animal parts, which has an impact on the ecosystem's general health. Elephants, for instance, play a crucial role in maintaining the structure of the ecosystems they inhabit, and their decline has cascading effects on the environment, including changes in vegetation and the loss of biodiversity. Poaching disrupts entire ecosystems by removing these important species, with consequences that extend beyond just the species being targeted. Nash et al. (2020) emphasized the need for comprehensive, region-wide efforts to combat poaching, including stronger enforcement of laws, greater international cooperation, and increased resources dedicated to the protection of endangered species.

Cohen et al. (2019) studied illegal fishing in Southeast Asia, including blast fishing and the use of harmful fishing gear in nations like Indonesia and the Philippines. Coral reefs, which are vital to marine biodiversity, have suffered significant harm as a result of these practices. The use of explosives and destructive gear not only kills large numbers of fish but also devastates the delicate coral ecosystems that support a wide array of marine life. As a result, fish populations are depleted, disrupting marine food chains and threatening the livelihoods of coastal communities who rely on fishing. Cohen et al. (2019) argue that the damage caused by illegal fishing goes beyond just the immediate loss of marine species; it has long-term consequences for ecosystem stability and the economy of local communities. The study calls for stronger governance frameworks and greater international cooperation to address these issues and protect marine ecosystems. By implementing more effective regulatory measures and enhancing enforcement, it is possible to reduce the negative impacts of illegal fishing on biodiversity.

The consequences of illicit fishing practices, including overfishing and the use of forbidden fishing gear, were also examined in a related study conducted in the Mediterranean region by Fortibuoni et al. (2016). According to the study, these actions have caused fish stocks to decline, which has a significant impact on the marine food web. Overfishing has caused the decline of commercially important fish species, which in turn affects the entire marine ecosystem. The loss of these species not only impacts marine biodiversity but also affects the economy of coastal communities that depend on fisheries for their livelihood. Fortibuoni et al. (2016) advocate for better governance mechanisms, stricter regulations, and improved monitoring of fishing practices to prevent further depletion of marine resources. The study highlights the need for international collaboration to ensure that illegal fishing activities are minimized, and marine biodiversity is preserved for future generations.

A thorough investigation of wildlife trafficking, which has emerged as a major factor in the decrease of species and the loss of biodiversity on several continents, was carried out by Duffy *et al.* (2019). Primates, large cats, and pangolins are among the many species that have declined as a result of the illicit traffic in exotic pets, bushmeat, and traditional remedies. Duffy *et al.* (2019) highlighted how wildlife trafficking is not only a threat to the species directly involved but also to the ecosystems they inhabit. The illegal trade removes key species from ecosystems, leading to imbalances and a reduction in biodiversity. Furthermore, trafficking contributes to the spread of diseases and the introduction of invasive species, which further complicates efforts to conserve wildlife. The study emphasizes the need for more robust international cooperation, stricter enforcement of anti-trafficking laws, and public awareness campaigns to curb the illegal wildlife trade.

Nijman (2018) also looked at how Southeast Asian bird and reptile populations are affected by the illegal pet trade, with a particular emphasis on Thailand and Indonesia. The study found that the illegal pet trade has led to a significant decline in wild populations of these animals. Reptiles and birds are particularly vulnerable to the illegal pet trade due to their high demand in international markets. The trade not only threatens wild populations but also increases the risk of introducing non-native species into local ecosystems, further jeopardizing biodiversity. Nijman (2018) emphasized the importance of strengthening enforcement measures, promoting sustainable practices, and raising public awareness about the impacts of the illegal pet trade on both animal populations and the broader environment. Conceptual and contextual gaps are evident in the study as the focus was illegal pet trade and the study was conducted in Asia.

Okeyo *et al.* (2018) conducted a study in Kenya that concentrated on the detrimental impacts of illicit logging on the ecological integrity of Mount Elgon Forest. The study emphasized the ways in which illicit logging operations have caused habitat damage, deforestation, and a notable decline in the region's biodiversity. The removal of large, commercially valuable trees

disrupts the forest's ecological balance, reducing the availability of resources for wildlife and altering the structure of the ecosystem. Okeyo et al. (2018) emphasized that the illegal logging of trees not only affects animal populations but also disrupts important ecological processes, such as nutrient cycling and seed dispersal. These disruptions exacerbate the forest's vulnerability to degradation, making it harder for the ecosystem to recover. The study presents a conceptual gap as the dependent variable was ecological integrity.

Stricter enforcement of logging laws and enhanced monitoring systems are essential to combating the problem of illegal logging in Mount Elgon Forest, according to Okeyo et al. (2018). Without effective regulation and oversight, illegal logging will continue to threaten the ecological integrity of the forest. Additionally, the study highlights the importance of community engagement and the promotion of alternative livelihoods as a means of reducing the dependence on illegal logging. By creating sustainable income opportunities for local communities, it is possible to decrease the pressure on the forest and promote more sustainable forest management practices. Collaborative efforts among government agencies, local communities, and conservation organizations are essential for effectively protecting and restoring the Mount Elgon Forest ecosystem.

## **2.5 Strategies For Improved Forest Management Practices To Mitigate And Prevent Illegal Activities**

Improving forest management techniques is essential for reducing and stopping illicit activity, guaranteeing the preservation and sustainable use of natural resources. Effective strategies to combat illicit activities have been found in a number of studies carried out in many nations, providing information that can be used to areas such as Mount Elgon Forest in Bungoma, Kenya. Research conducted in Brazil by Mollicone et al. (2017) highlighted the significance of putting in place strong monitoring and enforcement systems to stop illicit forest management

practices. The study emphasized the use of cutting-edge remote sensing tools, like satellite photography, to track and identify changes in the forest cover.

This approach allows for the early detection of illegal practices like illegal logging, enabling timely intervention. Moreover, Mollicone et al. (2017) suggested that community engagement and participatory approaches are essential for fostering local ownership and involvement in forest management. By empowering local communities to participate in forest monitoring and decision-making processes, these strategies help build a sense of responsibility and encourage sustainable resource use. Local involvement can also make enforcement more effective, as communities become active stakeholders in protecting their environment.

Meijaard et al. (2018) studied the role of local communities in forest management in Indonesia. The significance of giving communities rights and responsibilities over forest resources was underlined by the study. The study showed how local involvement can lower illicit activities while encouraging conservation and sustainable forest use by putting community-based forest management into practice and offering sustainable livelihood possibilities. Allowing communities to manage forest resources gives them an incentive to protect these resources, as they directly benefit from their sustainable use. This approach has proven effective in reducing illegal logging and poaching activities, as communities take ownership of forest protection and sustainable management.

Fotso et al. (2019) examined the function of sustainable forest certification in Cameroon as a tactic to stop illicit activity. According to the study, certification programs such as the Forest Stewardship Council (FSC) improve forest management's accountability, openness, and governance. Certified forests are subject to rigorous standards and practices, which help prevent illegal activities. The study also showed that forest certification can improve the relationship between forest managers, local communities, and stakeholders, fostering

collaboration and promoting responsible management. As a result, certified forests are better equipped to deter illegal logging and other destructive practices, ensuring long-term sustainability.

The effectiveness of Payment for Ecosystem Services (PES) programs in lowering illicit activity and deforestation was investigated by Echeverria et al. (2016) in Costa Rica. For the protection and restoration of ecosystem services including carbon sequestration, water control, and biodiversity preservation, PES initiatives provide landowners with financial incentives. PES initiatives, according to the study, helped to improve forest management, lower rates of deforestation, and discourage illicit activity. By aligning economic incentives with environmental goals, PES programs create a win-win situation where landowners benefit financially while also contributing to the protection of forest ecosystems. This approach has been shown to be effective in reducing illegal land use and deforestation in various regions.

As an emphasis for combating illicit activities in forest management, a worldwide study by Pistorius et al. (2019) highlighted the value of cooperation and multi-stakeholder partnerships. The study became clear that in order to create and carry out successful plans, governments, local communities, civil society organizations, and the commercial sector must collaborate. These kinds of partnerships can strengthen law enforcement, advance sustainable forest management techniques, and improve governance. The study stressed that effective forest management requires a collective effort where all stakeholders have a shared responsibility for protecting forest ecosystems and ensuring their sustainable use.

Similar tactics can be used to lessen and stop illicit activity in Mount Elgon Forest in Bungoma, Kenya, using the knowledge gained from these studies. For example, implementing robust monitoring and enforcement systems using technologies like remote sensing could help detect illegal logging activities in the region. Involving local communities in decision-making

processes and adopting community-based forest management approaches can empower residents to protect the forest and use its resources sustainably. Sustainable forest certification schemes like FSC could also be explored to improve governance and accountability in forest management. Additionally, implementing PES programs in Mount Elgon could provide financial incentives to landowners, encouraging them to prioritize conservation and sustainable land-use practices. Lastly, combating illicit activities and advancing sustainable forest management in the area depend on encouraging cooperation amongst many stakeholders, including governmental organizations, local communities, non-governmental organizations, and commercial sector players. Through integration of these strategies into forest management plans and policies, Mount Elgon Forest can serve as a model for sustainable forest conservation. These approaches not only aim to reduce illegal activities but also promote the long-term health and resilience of forest ecosystems, benefiting both the environment and the local communities that rely on them.

## **2.6 Theoretical Framework**

Rational Choice Theory and Ecological Systems Theory are two theoretical frameworks that can be used to analyze illicit forest management practices in Mount Elgon Forest, Bungoma, Kenya.

### **2.6.1 Rational Choice**

In the late 18th and early 19th centuries, theorists such as Jeremy Bentham and Cesare Beccaria promoted the rational choice theory, which has its roots in classical economics and holds that people make logical decisions by weighing the advantages and disadvantages of their options. Based on utilitarian ideas, the theory contends that individuals seek to maximize their utility or self-interest. With its present version appearing in the 1970s and 1980s, Rational Choice Theory has developed and expanded its influence over time, especially in the mid-20th century in the fields of sociology and criminology.

Central to Rational Choice Theory are several key assumptions. Firstly, it presupposes that individuals are rational beings, capable of making decisions based on logical deliberation. Secondly, it asserts that individuals seek to maximize personal gains while minimizing losses, reflecting a self-interested motive. Lastly, it posits that individuals possess the capacity for conscious decision-making, implying that they can assess options and choose the one that best aligns with their preferences and values. Applied to the context of Mount Elgon Forest, Rational Choice Theory provides a lens through which to understand the motivations behind individuals' engagement in illegal activities such as logging or poaching. This theory holds that those who engage in such illegal activities make a logical decision in which the perceived advantages—like financial gains—outweigh the considered risks—like the potential for being caught and subject to legal repercussions.

In the socio-ecological context of Mount Elgon Forest, individuals may turn to illegal logging or poaching as a means of securing livelihoods or financial stability. For some, especially those facing economic hardship or limited alternative opportunities, the allure of immediate financial gain from illegal activities may overshadow the potential risks of legal repercussions or environmental degradation. Rational Choice Theory suggests that individuals weigh these factors and make calculated decisions based on their perceived benefits and costs. Moreover, the application of Rational Choice Theory can extend beyond individual decision-making to encompass broader social dynamics within communities residing near Mount Elgon Forest. Social norms, peer influences, and community dynamics may also shape individuals' rational calculations regarding engagement in illegal activities. For instance, in communities where illegal logging or poaching is normalized or tacitly accepted, individuals may perceive reduced risks or increased social acceptance, further influencing their decision-making processes.

However, Rational Choice Theory does not operate in isolation, and its application to understanding illegal activities in Mount Elgon Forest must consider the complex interplay of socio-economic, cultural, and environmental factors. The theory is applicable to this study as it aids explain illegal activities and factors contributing to the occurrence and persistence of illegal activities. Indeed, individuals make decisions by weighing costs and benefits. In illegal forest activities like logging and poaching, individuals often see immediate financial benefits as outweighing the risks of punishment and ecological damage. Weak law enforcement, low detection likelihood, corruption and limited legal economic opportunities decrease perceived costs of unlawful behavior.

### **2.6.2 Ecological Systems Theory**

Introduced by Urie Bronfenbrenner in the early 1970s, Ecological Systems Theory highlights the interdependence of multiple systems that impact ecological consequences and human behavior. The main presumptions of the theory include the identification of several levels of impact, ranging from the immediate surroundings of a person to larger social contexts, and the differentiation between proximal and distal influences on behavior. It draws attention to how people's interactions with their surroundings are dynamic and interactive, creating ongoing feedback loops. The theory also has a developmental viewpoint, taking into account how interactions with environmental systems impact human development over time.

Ecological Systems Theory offers a useful framework for comprehending the intricate relationships between ecological systems and human behavior in the context of the investigation into illicit activities in Mount Elgon Forest. The study can investigate how illicit activities affect the biodiversity and ecological integrity of the forest, as well as how they affect the interrelated ecosystems in the forest and nearby communities. This knowledge is essential for creating efficient forest management strategies that support sustainable conservation methods and consider the wider ecological effects of human activity. Critics counter that

Ecological Systems Theory may not provide exact explanations for individual behavior and that its intricacy can make its implementation difficult in some circumstances. However, it can provide a more thorough knowledge of the reasons and forces underlying illicit actions in Mount Elgon Forest when paired with other theories, such as Rational Choice Theory, directing more comprehensive and successful methods to forest management and conservation.

Ecological Systems Theory helps assess the effects of illegal activities on the ecological integrity and biodiversity and helps identify strategies for improved forest management practices to mitigate and prevent illegal activities in Mount Elgon forest. Ecological Systems Theory explains the relationship between individuals and their environmental systems. It explains how behaviors leading to forest degradation are influenced by individual choices and larger social, economic and policy factors. Applying this theory informs strategies that enhance collaboration, community empowerment, and institutional support for holistic interventions promoting ecological integrity and biodiversity conservation.

## **2.7 Conceptual Framework**

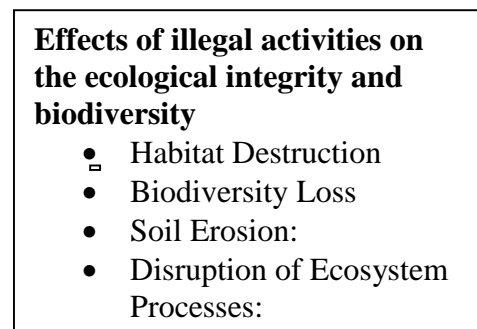
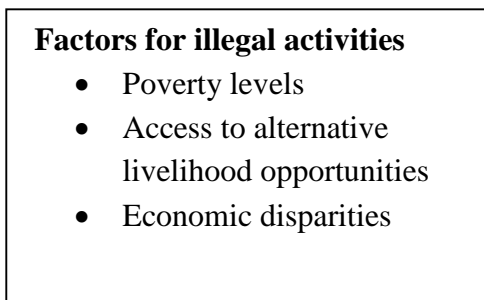
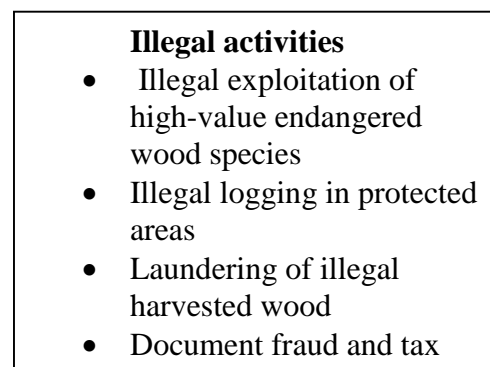
The study's conceptual framework in Figure 1 visually delineates the intricate relationships between independent variables, including poverty, income access, and economic inequality, and their effects on the dependent variable of forest management. Effective management relies on sustainable practices and proper resource use. Additionally, intervening variables illustrate the ecological consequences of illicit activities, such as habitat destruction, biodiversity loss, soil erosion and ecosystem disruption, emphasizing the interdependence of socioeconomic factors and sustainable forest management.

The dependent variable in this conceptual framework revolves around forest management, encapsulating both the effectiveness of practices and the appropriate utilization of forest resources. Forest management, in this context, signifies the implementation of strategies and

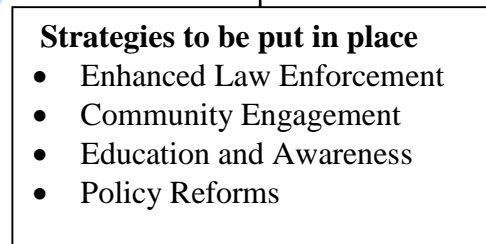
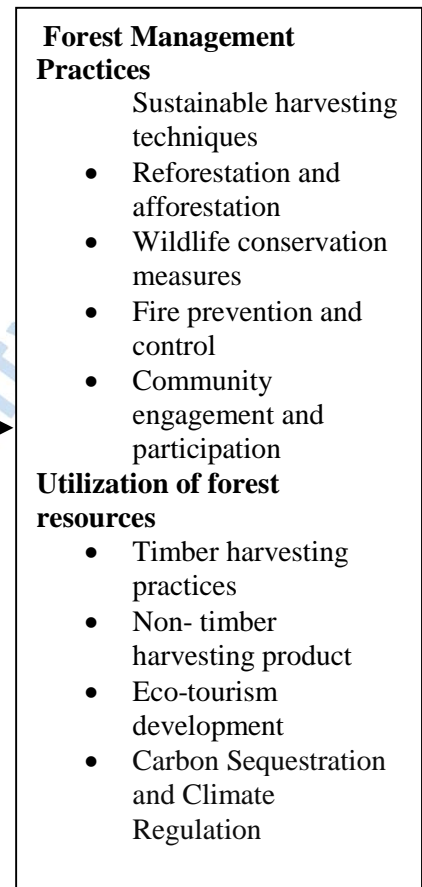
actions aimed at maintaining the health and sustainability of forest ecosystems. This encompasses a range of activities, including sustainable harvesting techniques, reforestation efforts, wildlife conservation measures, fire prevention strategies, and community engagement initiatives. Effectively measuring this dependent variable requires assessing the degree to which these practices are implemented and their outcomes in terms of maintaining forest health, biodiversity, and ecosystem services over time.



## Independent Variable



## Intervening Variables



## Dependent Variable

**Figure 1: Conceptual Framework**

Source: Researcher (2025)

## 2.8 Recap of literature review

There is limited literature on illegal activities in forest management. Okeyo et al. (2018) found that illegal logging in Mount Elgon Forest significantly degraded ecological integrity, resulting in biodiversity loss and disrupted functions. Mbugua et al. (2019) reported that human activities

like agriculture and logging exacerbated deforestation and habitat fragmentation in Kenya's forests, noting a methodological gap through remote sensing use. Mwangi (2020) linked poverty to poaching, recommending poverty alleviation but only used interviews for data. Gachanja et al. (2020) examined forest degradation's impact on water quality, revealing adverse effects due to deforestation, yet focused solely on Mau Forest Complex.

Consequently, addressing research gaps is essential for developing effective strategies against illegal activities in Mount Elgon Forest. Key areas needing further study include socio-economic factors driving these activities, such as poverty and lack of alternative livelihoods. Understanding their impact on forest ecosystems—like deforestation and biodiversity loss—is crucial for prioritizing conservation efforts. Additionally, there has been insufficient analysis of current forest management practices and policies, as well as the role of local communities in conservation. Engaging local perspectives can enhance sustainable management and combat illicit activities. This study sought to fill these knowledge gaps as it assessed illegal activities in forest management in Mount Elgon forest Bungoma county.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter encompassed a detailed exploration of the research design, target population, sampling procedures, data collection methods, data analysis techniques, ethical considerations, and research instruments. It formed the methodological foundation upon which the study on illegal activities in forest management within Mount Elgon Forest, Bungoma County, Kenya, was built. Each section contributed to the comprehensive methodology that guided the research process, facilitating an understanding of the complex dynamics that surrounded this critical environmental issue.

#### 3.2 Research Methodology

The research design adopted for this study was a mixed-methods approach, strategically incorporating both quantitative and qualitative data acquisition methodologies. This approach was chosen to comprehensively understand the spectrum of illegal activities within forest management at Mount Elgon Forest. Quantitative variables were harnessed to gauge the magnitude of unlawful logging, encroachment, and wildlife poaching. Concurrently, qualitative variables were explored to glean insights into socio-economic incentives, community perspectives, and the efficacy of forest management policies. By amalgamating quantitative and qualitative data, the research design aimed to present a holistic perspective on the underlying factors driving illicit activities within the forest. The findings were poised to offer a foundational basis for informed decision-making and the formulation of efficacious interventions aimed at combating illegal activities within Mount Elgon Forest.

### **3.3 Research Design**

This study employed an exploratory case study design, focusing on the investigation of illegal activities in forest management within Mount Elgon Forest, Bungoma, Kenya. The choice of an exploratory case study design allowed for an in-depth examination of the specific context, offering rich insights into the phenomenon of illegal activities. The study's primary objective was to comprehend the underlying causes and effects of illicit practices, including illegal logging, encroachment, and wildlife poaching. To achieve this, a mix of qualitative methods, such as semi-structured interviews with key stakeholders like local community members, forest officials, and law enforcement agencies, was utilized. Additionally, direct observations and document analysis were employed to corroborate and triangulate findings. Thematic analysis was the chosen approach for data analysis, enabling the identification of recurring patterns, motivations, and challenges related to forest management and illegal activities. This research design provided a comprehensive exploration of the complexities surrounding illicit practices in Mount Elgon Forest, contributing to a thorough understanding of the issue.

### **3.4 Location of the Study**

The study was carried out in the Cheptais and Kaberua areas of Mount Elgon Forest, which are located in Bungoma County at around latitude  $0.8756^{\circ}$  N and longitude  $34.5805^{\circ}$  E, as indicated on the map (Appendix 6) that is attached. The entire woodland terrain was affected by significant human activities in these two locations. With a staggering 4,607 hectares, Chepyuk Forest was the largest of the surrounding forests. Additionally, agro-pastoralism was practiced in the region, where communities combined herding and farming methods. A portion of the population lived in the forest, a practice that was started in the 1930s during the colonial era. Cultivation occurred both inside and outside the forest limits as a result of the growing population and individual consumption patterns. This region received an average of

1800 mm of rainfall annually, with some regions receiving as little as 400 mm. Because of their distinct geographic and socioeconomic circumstances, Cheptais and Kaberua are vital locations for researching the dynamics of illicit forest management activities. This gives researchers a solid foundation for comprehending the wider effects on the forest environment and nearby communities.

### **3.5 Target population**

The study's target population consisted of individuals from various categories, including forest officials from the Kenya Forest Service (KFS) responsible for managing Cheptais and Kaberoa Forest within Mount Elgon, local community members residing near Mount Elgon Forest, law enforcement personnel, personnel from conservation organizations operating in the area, and representatives from other relevant organizations involved in forest conservation, protection, and management as shown in Table 3.1 below. The aim of including these diverse groups was to capture a comprehensive range of insights and perspectives on forest management, illegal activities, and the sustainable use of forest resources in the study area. This diverse target population formed the basis for the subsequent stratified random sampling approach outlined in Section 3.6.

The target population for the study included people from a number of different groups, such as local residents living close to Mount Elgon Forest, law enforcement officers, representatives from conservation organizations working in the area, forest officials from the Kenya Forest Service (KFS) in charge of managing Cheptais and Kaberua Forest within Mount Elgon, and representatives from other pertinent organizations involved in forest conservation, protection, and management, as indicated in Table 3.1 below. Incorporating these varied groups was intended to capture a wide range of viewpoints and thoughts regarding unlawful activities, forest management, and the sustainable use of forest resources in the study area. The stratified

random sampling method that follows, described in Section 3.6, was developed using this heterogeneous target population as its foundation.

### **3.6 Sampling Procedures And Techniques**

The sampling procedures and techniques for this study employed a stratified sampling approach using the Mugenda and Mugenda 10% rule, ensuring representation from different stakeholder groups within Mount Elgon, Bungoma, Kenya. In this approach, the target population was divided into distinct strata based on specific stakeholder categories, such as forest officials from the Kenya Forest Service (KFS), local communities near the forests, law enforcement agencies, conservation organizations, and other relevant actors engaged in forest management. Each stratum's size was calculated according to the Mugenda and Mugenda 10% rule, where 10% of each stratum's population was included in the sample. For instance, in the case of forest officials, 10% of their population was sampled as shown in Table 3.1 below. This stratified sampling approach ensured that each subgroup was proportionally represented, ultimately creating a comprehensive understanding of the issues at hand within Mount Elgon, Bungoma, Kenya.

The sample sizes for various stakeholder groups were calculated using the stratified sampling method with a 10% rule. This approach ensured that each subgroup within the target population was proportionally represented in the final sample as shown in Table 3.1 below. The total sample size collectively contributed to 320 individuals, representing 10% of the overall target population of 3,200 as shown in Table 3.1.

**Table 3.1: Sample size**

<b>Stakeholder Group</b>	<b>Cheptais</b>	<b>Kaberua</b>	<b>Target</b>	<b>Sample</b>
	<b>Forest</b>	<b>Forest</b>	<b>Population</b>	<b>(10%)</b>
Forest Officials	200	150	350	35
Local Communities	1500	900	2400	240
Law Enforcement Agencies	100	50	150	15
Conservation Organizations	100	50	150	15
Other Relevant Actors	100	50	150	15
<b>Total</b>	<b>2000</b>	<b>1320</b>	<b>3200</b>	<b>320</b>

### 3.7 Research Instruments

Multiple research instruments were utilized to collect data from the sample population. Guided structured questionnaires were used to gather quantitative data from the members of the community on variables such as socio-economic characteristics, knowledge, and attitudes towards forest management, as well as perceptions of illegal activities from local community members and relevant stakeholders. Interviews, conducted with key informants including forest officials, community leaders, and representatives from law enforcement agencies and conservation organizations, were employed to obtain qualitative data and in-depth insights into the research topic. Additionally, direct observations were made by researchers during field visits to gather firsthand information on illegal activities and their impacts on forest ecosystems. The use of structured questionnaires, interviews, and direct observations provided a comprehensive understanding of illegal activities in forest management, enabling the researchers to explore various dimensions of the topic and triangulate the data from multiple sources.

### **3.8 Validity and Reliability of Research Instruments**

Pilot tests were carried out in Kaboiya Forest, Bungoma, within Mount Elgon Forest, during the early stages of this research to assess the validity and reliability of the research instruments. The pilot tests involved a selected group of individuals representing various stakeholder categories, including community members, forest officials, and conservation organization representatives, with approximately 10 participants participating in this phase. These participants played a crucial role in providing valuable feedback on clarity, relevance, and appropriateness of the research instruments within the specific context of Kaboiya Forest. In addition to pilot testing, several other measures were implemented to ensure the research's validity and reliability. The research instruments were developed based on validated instruments, thus establishing content validity. Furthermore, expert reviews were sought to gain insights from subject matter experts in the field. To assess reliability, the test-retest method was employed by administering the instruments to a subset of participants at two different time points, involving approximately 5 to 10 participants. This assessment focused on the level of agreement between researchers in coding and interpretation to ensure consistency and enhance the overall validity and reliability of the research findings.

Pilot tests were carried out in Kaboiyo Forest, Bungoma, within Mount Elgon Forest, during the early stages of this research to assess the validity and reliability of the research instruments. The pilot tests involved a selected group of individuals representing various stakeholder categories, including community members, forest officials, and conservation organization representatives, with approximately 10 participants participating in this phase. These participants played a crucial role in providing valuable feedback on clarity, relevance, and appropriateness of the research instruments within the specific context of Kaboiyo Forest. In addition to pilot testing, several other measures were implemented to ensure the research's

validity and reliability. The research instruments were developed based on validated instruments, thus establishing content validity. Furthermore, expert reviews were sought to gain insights from subject matter experts in the field. To assess reliability, the test-retest method was employed by administering the instruments to a subset of participants at two different time points, involving approximately 5 to 10 participants. This assessment focused on the level of agreement between researchers in coding and interpretation to ensure consistency and enhance the overall validity and reliability of the research findings.

### **3.9 Data Collection Methods And Procedures**

Data collection for this study employed a combination of quantitative and qualitative methods. To ensure ethical compliance, approvals were sought from both the Mount Kenya University Ethics Committee, Post Graduate Studies, and the National Commission for Science, Technology, and Innovation (NACOSTI) before initiating data collection. Quantitative data were gathered through guided structured questionnaires distributed in person or via online platforms to the sampled members of the community. These questionnaires were meticulously designed to extract specific information related to the study's objectives, ensuring standardized data collection for subsequent statistical analysis. Qualitative data were obtained through in-person interviews conducted with key informants, which included forest officials, community leaders, and representatives from law enforcement agencies and conservation organizations. These semi-structured interviews facilitated in-depth discussions, allowing for an exploration of perspectives. Key informants played a crucial role in providing insights into the complex dynamics and contextual factors surrounding forest management and conservation efforts. Direct observations were conducted during field visits to collect real-time data on illegal activities and their impacts on the forest ecosystem. These observations served to assess the state of the forest, identify ecological...

Data collection for this study employed a combination of quantitative and qualitative methods. To ensure ethical compliance, approvals were sought from both the Mount Kenya threats, and evaluate the effectiveness of existing management practices. Throughout the data collection process, ethical considerations were paramount. Informed consent was diligently obtained from all participants, ensuring their complete awareness of the study's purpose, their rights, and the confidentiality that would be maintained regarding their responses. Any personal information collected was treated with the utmost confidentiality, and data were anonymized during the subsequent analysis and reporting stages. The research team upheld a professional and respectful approach, respecting the privacy and dignity of all participants. The utilization of both quantitative and qualitative data collection methods provided a comprehensive understanding of the research topic. This approach allowed for the capture of the intricate complexities within forest management and conservation in Mount Elgon by triangulating data from multiple sources.

### **3.10 Data analysis Techniques And Procedures**

To comprehensively enhance and justify the data analysis techniques for this study, a detailed approach was adopted. Quantitative data collected through structured questionnaires were meticulously processed and analyzed utilizing various statistical methods. Descriptive statistics were employed to provide a succinct summary of the data distribution, including measures of central tendency (such as mean, median, and mode) and measures of dispersion (such as standard deviation and range). This detailed analysis offered insights into the characteristics and variability of the collected data, laying the groundwork for further examination.

Subsequently, inferential statistics were utilized to explore relationships between variables and uncover significant predictors of illegal activities in forested areas. Techniques such as regression analysis or analysis of variance (ANOVA) were employed to assess the impact of

socio-economic factors on the prevalence of illegal activities. By examining the strength and significance of these relationships, the study was able to discern key determinants driving illegal activities, thus enhancing the depth of understanding. Moreover, correlation analysis was conducted to elucidate the strength and direction of associations between socio-economic factors and the occurrence of illegal activities. This analysis provided valuable insights into the interplay between various variables, shedding light on potential causal mechanisms and facilitating the identification of areas for intervention.

In parallel, qualitative data obtained from interviews and direct observations underwent thematic analysis, a methodical approach aimed at identifying recurring patterns, themes, and key insights within the data. Through a detailed examination of qualitative narratives and observations, the study captured the perspectives of stakeholders involved in or impacted by illegal activities in forested regions. This qualitative exploration enriched the understanding of the socio-economic dynamics underlying illegal activities, offering contextual depth and interpretations.

### **3.11 Ethical Considerations**

The researcher adhered to ethical principles and guidelines throughout the research process. Informed consent was obtained from all participants, ensuring that they were fully aware of the study's purpose, procedures, and their rights to voluntary participation, confidentiality, and withdrawal. Confidentiality of participants' personal information was maintained, with data stored securely and anonymized to protect their identities. The researchers respected cultural norms, beliefs, and practices of the local communities, and obtained necessary permissions from relevant authorities before conducting the study. Any potential risks or harm to participants were minimized, and efforts were made to ensure that the study benefited the community and contributed to sustainable forest management. Informed consent (Appendix 1)

was a fundamental aspect of the research process, and the researcher ensured that all participants provided their consent voluntarily and with full awareness of the study's objectives, procedures, and their rights. Participants were informed that their participation was entirely voluntary, and they had the right to withdraw from the study at any point without facing any consequences. The researcher explained the purpose of the study, the data collection methods, and the potential uses of the collected information.



## CHAPTER FOUR

### RESEARCH FINDINGS AND DISCUSSIONS

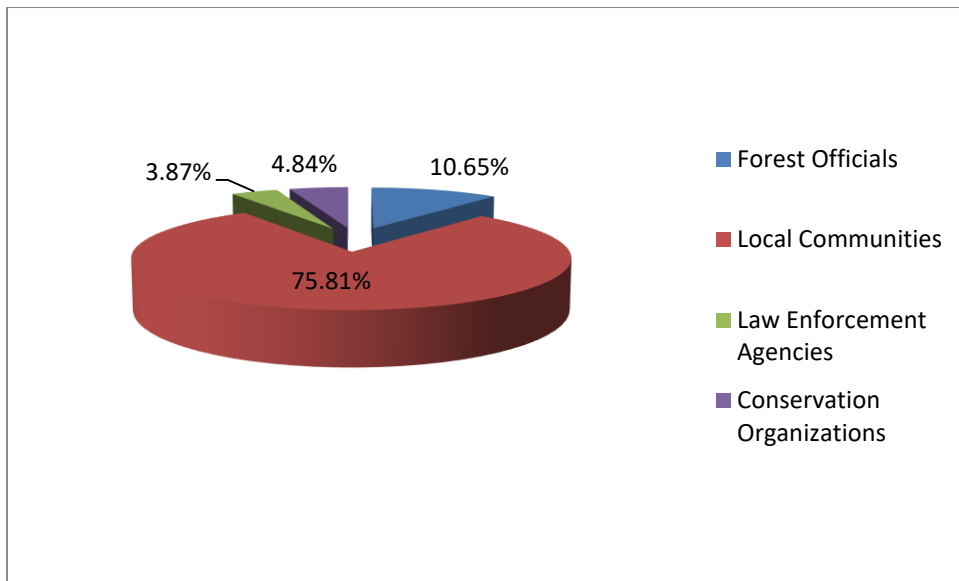
#### 4.1 Introduction

This chapter presents the analysis and interpretation of data collected in the study on the assessment of illegal activities in forest management in Mount Elgon Forest, Bungoma County, Kenya. The analysis is aligned with the research objectives, beginning with the evaluation of the nature of illegal activities occurring within the forest. Next, the chapter examines the factors contributing to the occurrence and persistence of these activities. It then assesses the effects of illegal activities on the ecological integrity and biodiversity of Mount Elgon Forest. Finally, strategies for improved forest management practices are explored to mitigate and prevent these illegal activities. The data analysis incorporates both quantitative and qualitative methods to provide a comprehensive understanding of the issues at hand.

#### 4.2 Response Rate

The response rate was a critical metric in understanding the engagement level of participants in the study. The study targeted a total of 320 individuals from various stakeholder groups involved in forest management within Mount Elgon Forest, Bungoma County, Kenya. These groups included local community members, forest officials from the Kenya Forest Service (KFS), law enforcement personnel, and conservation organizations.

Out of the 320 targeted participants, 310 individuals responded to the survey and interviews. This high level of participation resulted in a response rate of 96.88%, which was considered highly satisfactory. The response rates by stakeholder group were detailed in Figure 4.1:



*Figure 4.1: Response Rate*

To accurately assess participation rates, it was essential to compare the percentage of participation per category rather than relying solely on raw numbers, as depicted in **Figure 4.1**. This approach provided a clearer understanding of engagement levels across diverse stakeholder groups. The percentages of participation within each category, based on the target population, were as follows: Forest Officials with 82.5%, Local Communities with 90.38%, Law Enforcement Agencies with 60%, and Conservation Organizations with 75%, as shown in **Figure 4.1**. These percentages indicated high engagement across all categories, with local communities exhibiting the highest participation rate, as illustrated in **Figure 4.1**.

The study found that the high response rate could be attributed to the relevance of the study to the participants' interests, effective mobilization and engagement strategies by the research team, and the use of multiple data collection methods that catered to the preferences and availability of different stakeholders, as shown in **Figure 4.1**. The targeted approach ensured that participants felt their input was valuable and pertinent to the ongoing efforts in forest management within Mount Elgon Forest.

The findings indicated that the diverse stakeholder engagement enriched the data quality and enhanced the overall understanding of illegal activities and forest management practices in Mount Elgon Forest, as shown in **Figure 4.1**. High participation rates from various groups provided a comprehensive dataset that reflected the multifaceted nature of forest management challenges and illegal activities. This broad engagement was critical in capturing a wide array of perspectives and experiences, thereby strengthening the study's conclusions and recommendations, as shown in **Figure 4.1**.

Throughout the data collection process, qualitative insights from interviews complemented the quantitative data from questionnaires, as shown in **Figure 4.1**. Interviews with key informants, including forest officials, community leaders, law enforcement personnel, and conservation organization representatives, provided in-depth perspectives that were essential for understanding the complex dynamics of forest management and illegal activities. These qualitative insights were instrumental in contextualizing the quantitative findings, offering a richer, more detailed picture of the issues at hand, as shown in **Figure 4.1**.

In conclusion, the response rate of 96.88% indicated a robust level of engagement and provided a solid foundation for the validity and reliability of the study's findings, as shown in **Figure 4.1**. This comprehensive engagement from diverse stakeholder groups ensured that the data collected was representative and valuable for drawing meaningful conclusions about forest management practices and the prevalence of illegal activities in Mount Elgon Forest. The high response rates across all stakeholder categories underscored the community's commitment to addressing these critical issues and highlighted the importance of inclusive and participatory approaches in environmental research and policy-making, as shown in **Figure 4.1**.

### 4.3 Demographic Information of the Respondents

To evaluate the nature of illegal activities occurring in Mount Elgon Forest, Bungoma County, the study collected demographic information to understand the characteristics of the respondents. As summarized in **Table 4.1**, the data covered categories such as gender, age group, educational background, occupation, length of residence, and frequency of visiting the forest. This comprehensive demographic analysis allowed for an in-depth understanding of the diverse stakeholders involved in forest management and illegal activities.

**Table 4.1: Demographic Information of Respondents**

Demographic Category	Frequency	Percentage
<b>Gender</b>		
Male	170	54.84%
Female	140	45.16%
<b>Age Group</b>		
25-34	85	27.42%
35-44	70	22.58%
45-54	60	19.35%
18-24	45	14.52%
55 and above	40	12.90%
<b>Educational Background</b>		
Secondary education	95	30.65%
Undergraduate degree	60	19.35%
Primary education	55	17.74%
Vocational/Technical training	45	14.52%
Postgraduate degree	30	9.68%

No formal education	25	8.06%
<b>Occupation</b>		
Farmer	50	16.13%
Student	45	14.52%
Researcher/Scientist	40	12.90%
Environmentalist/Conservationist	35	11.29%
Forestry worker	30	9.68%
Unemployed	30	9.68%
Other	30	9.68%
Business owner	25	8.06%
Government official	25	8.06%
<b>Length of Residence</b>		
More than 10 years	115	37.10%
6-10 years	100	32.26%
1-5 years	80	25.81%
Less than 1 year	15	4.84%
<b>Frequency of Visiting Forest</b>		
Regularly	90	29.03%
Occasionally	80	25.81%
Frequently	70	22.58%
Rarely	50	16.13%
Never visited	20	6.45%

As shown in Table 4.1, the demographic information highlighted a gender distribution of 54.84% male and 45.16% female. This relatively balanced participation across genders

reflected the community's engagement in forest-related issues. Interviews revealed that men are often more involved in formal forest management roles, aligning with global trends where men traditionally dominate enforcement and decision-making positions (Agrawal et al., 2020). Understanding the gender dynamics is critical when examining the factors contributing to illegal activities and developing gender-sensitive strategies for improving forest management.

The age distribution provided further insights, with the majority of respondents falling within the 25-34 age group (27.42%), followed by the 35-44 age group (22.58%), as shown in Table 4.1. This range of ages allowed the study to capture diverse generational perspectives, which are essential for assessing the effects of illegal activities on the ecological integrity and biodiversity of Mount Elgon Forest. Younger participants, particularly those in the 18-24 age group, actively engaged in forest conservation activities, while older respondents contributed valuable historical insights into forest management practices (Fotso et al., 2019).

Educational background also played a significant role in shaping respondents' interaction with the forest, as shown in Table 4.1. Those with higher levels of formal education, especially younger generations, exhibited a greater awareness of modern conservation techniques, reflecting the potential for identifying strategies for improved forest management practices that incorporate both traditional knowledge and contemporary science-based approaches (Silva et al., 2018).

Key informants encompassed various stakeholders, including law enforcement officials, environmental activists, researchers, and local authorities, each bringing their unique expertise and experiences to the table. Law enforcement officials offered insights into the practical challenges and limitations encountered in enforcing forest management laws and regulations. As one officer noted, "*Our resources are stretched thin, and it's difficult to monitor all areas effectively.*" Environmental activists provided valuable perspectives on community

engagement and initiatives aimed at mitigating the impacts of illegal activities on forest ecosystems. A local activist mentioned, "*Community awareness and involvement are crucial for sustainable conservation efforts.*" Researchers contributed scholarly insights into the socio-economic and environmental factors driving illegal activities, shedding light on potential strategies for addressing these issues. One researcher observed, "*Economic hardship often pushes locals towards illegal logging as a means of survival.*" Local authorities offered on-the-ground perspectives on the socio-political dynamics and governance structures relevant to forest management in the region. A local leader stated, "Strengthening governance and community ties is essential to curb illegal activities."

Table 4.1 data reveals that the majority of respondents were farmers (16.13%) and students (14.52%), followed by researchers, environmentalists, forestry workers and government officials. There was thus a wide range of interactions with Mount Elgon forest, from direct livelihood dependence to professional and administrative involvement. Farmers and forestry workers were most familiar with forest use practices, while researchers and environmentalists provided technical information on conservation and ecology.

Most respondents had lived in the area for extended periods, with 37.10% residing for more than 10 years and 32.26% for 6–10 years. There was thus familiarity with the forest environment and any changes over time, including the rise or persistence of illegal activities. The respondents provided historical context and observations on how factors such as poverty, governance and enforcement influenced illegal practices in the forest.

The frequency of forest visits indicates a strong link between the community and the forest. A combined 51.61% of respondents reported visiting the forest regularly or frequently. This frequent access positioned them well to observe illegal activities firsthand and to suggest practical, community-driven strategies for improved forest governance. These patterns of

occupation, residence and forest interaction aided in the assessment of the nature, causes and effects of illegal activities and formulation of strategies for improved forest management practices to mitigate and prevent illegal activities in Mount Elgon forest.

#### 4.4 Nature of Illegal Activities

Participants in the study rated the frequency of various illegal activities using a Likert scale ranging from rarely to Very Frequently. The mean scores were calculated for each activity to represent the average frequency reported by participants. As shown in Table 4.2, the mean scores and percentages for each illegal activity were presented.

**Table 4.2: Frequency of Illegal Activities in Mount Elgon Forest**

<b>Illegal Activity</b>	<b>1 (Rarely)</b>	<b>2 (Occasionally)</b>	<b>3 (Sometimes)</b>	<b>4 (Frequently)</b>	<b>5 (Very Frequently)</b>
<b>Illegal logging</b>	5.2% (16)	12.3% (38)	20.1% (62)	32.5% (101)	29.9% (93)
<b>Land encroachment</b>	8.7% (27)	15.5% (48)	23.2% (72)	31.3% (97)	21.3% (66)
<b>Unlawful extraction</b>	10.6% (33)	18.1% (56)	25.2% (78)	28.9% (90)	17.2% (53)
<b>Other illegal activities</b>	9.4% (29)	16.8% (52)	22.6% (70)	30.4% (94)	20.8% (65)

This table now clearly presents the frequency of illegal activities with each activity's percentage.

#### 4.4.1 Illegal Logging

Illegal logging was found to be the most prevalent illegal activity in Mount Elgon Forest, with 29.9% (93) of respondents reporting it as occurring Very Frequently and 32.5% (101) indicating that it occurs Frequently, as shown in **Table 4.2**. This finding aligns with existing research highlighting the pervasive nature of illegal logging in forested areas worldwide (Agrawal et al., 2020; Silva et al., 2018). The frequency of illegal logging, as indicated in **Table 4.2**, underscores the urgent need for robust enforcement measures and community engagement strategies to combat this issue and promote sustainable forest management practices (Fotso et al., 2019; Okeyo et al., 2018).

The accounts shared by informants included vivid descriptions of specific incidents and instances of illegal logging, offering tangible examples to illustrate the severity and extent of the problem. One informant recounted,

*"We have seen entire sections of the forest cleared overnight, with no regard for the consequences." Another stated, "Illegal logging is rampant, driven by both local and external demands for timber."*

Moreover, the identification of primary perpetrators and beneficiaries of illegal activities by key informants added depth to the understanding of the socio-economic dynamics driving forest exploitation. By elucidating the actors involved in perpetuating illegal logging and other illicit practices, key informants shed light on the complex network of stakeholders influencing forest management in Mount Elgon. An informant highlighted,

*"The involvement of well-connected individuals and corruption within enforcement agencies makes it difficult to curb illegal logging."*

Supporting these insights with references from scholarly literature further enriches the analysis and strengthens the credibility of the findings. Research studies exploring the drivers and impacts of illegal logging in forested regions corroborate the accounts provided by key informants, reinforcing the urgency of addressing this pressing issue. By integrating these scholarly perspectives with the firsthand accounts of key informants, a more comprehensive understanding of illegal activities in Mount Elgon Forest emerges, laying the groundwork for informed policy interventions and conservation initiatives.

Illegal logging represents a significant environmental challenge in Mount Elgon Forest, with detrimental impacts on biodiversity, ecosystem health, and community well-being. The findings from our study highlight the alarming prevalence of illegal logging activities, with nearly one-third of respondents reporting its occurrence very frequently and an additional third indicating frequent instances. This high frequency raises urgent concerns about the environmental consequences of illegal logging.

The impacts of illegal logging extend beyond the immediate loss of trees; they encompass broader ecological disruptions that threaten the integrity of Mount Elgon Forest. Habitat loss from indiscriminate tree felling poses a direct threat to the survival of numerous plant and animal species endemic to the region. The fragmentation of forested areas exacerbates this threat, isolating populations and reducing genetic diversity, thereby compromising the resilience of ecosystems to environmental changes.

Moreover, illegal logging contributes to soil erosion and degradation, further exacerbating the ecological degradation of Mount Elgon Forest. The removal of trees disrupts soil structure, leading to increased erosion rates and sedimentation in nearby water bodies. This sedimentation impairs water quality and disrupts aquatic ecosystems, affecting fish populations and compromising the livelihoods of local communities that depend on freshwater resources.

The social and economic impacts of illegal logging cannot be overlooked. Forest-dependent communities rely on Mount Elgon Forest for various ecosystem services, including timber, non-timber forest products, and freshwater resources. The depletion of forest resources due to illegal logging undermines the livelihoods of these communities, exacerbating poverty and food insecurity. Additionally, the loss of biodiversity and degradation of ecosystem services diminish the long-term sustainability of local economies reliant on ecotourism and ecosystem-based livelihoods.

Addressing the issue of illegal logging in Mount Elgon Forest requires a multifaceted approach that combines robust enforcement measures with community engagement and sustainable forest management practices. Strengthening law enforcement efforts to deter illegal logging activities is essential, including increased patrols, surveillance, and penalties for offenders. Fostering community involvement in forest management through participatory approaches can empower local stakeholders to become stewards of Mount Elgon Forest, actively engaged in its conservation and sustainable use.

Promoting sustainable forest management practices is paramount to addressing the underlying drivers of illegal logging and ensuring the long-term health and resilience of Mount Elgon Forest. This includes implementing measures to enhance forest regeneration, such as reforestation and afforestation initiatives, as well as promoting agroforestry and alternative livelihood options for forest-dependent communities. By integrating ecological, social, and economic considerations into forest management strategies, stakeholders can work towards achieving a balance between conservation and human well-being in Mount Elgon Forest.

#### **4.4.2 Land Encroachment**

Land encroachment emerged as a significant concern within Mount Elgon Forest, with 31.3% (97) of respondents indicating its occurrence as "Frequent" and 21.3% (66) as "Very Frequent,"

as shown in Table 4.2. This finding underscores the substantial impact of land encroachment on the forest landscape and its surrounding communities. Consistent with existing research, this trend highlights the pervasive nature of land tenure insecurity and land-use conflicts in forested regions (Caviglia-Harris et al., 2017; Tacconi et al., 2015).

The encroachment of land into forested areas poses a dual threat to biodiversity conservation efforts and social stability. Beyond the immediate environmental implications, land encroachment exacerbates social tensions and compromises the effectiveness of protected area management strategies (Gachanja et al., 2020). Thus, addressing land encroachment demands a comprehensive approach that mitigates its environmental impacts and addresses its socio-economic drivers.

Efforts to tackle land encroachment must prioritize addressing the underlying socio-economic factors that drive this phenomenon. Research indicates that land tenure insecurity and competing land-use interests often fuel encroachment into forested areas (Smith et al., 2018). Therefore, interventions aimed at reducing land encroachment should include measures to secure land tenure rights, resolve land-use conflicts, and promote sustainable land management practices. In the same vein, Mbugua et al. (2019) investigated the effects of human activities on ecological integrity of forest ecosystems in Kenya and found that activities such as agriculture, settlement expansion, and logging contributed to deforestation and habitat fragmentation. A methodological gap is evident as remote sensing data was employed in data collection.

Moreover, community-based conservation initiatives play a crucial role in addressing land encroachment. Through engaging local communities in decision-making processes and empowering them to participate in forest management, these initiatives can foster a sense of ownership and stewardship over forest resources (Cohen et al., 2019; Okeyo et al., 2018).

Through collaborative efforts between stakeholders, including government agencies, NGOs, and local communities, it becomes possible to develop and implement effective strategies to combat land encroachment and promote sustainable forest management practices.

In summary, land encroachment represents a significant challenge within Mount Elgon Forest, with implications for both biodiversity conservation and social cohesion. Addressing this issue requires a multifaceted approach that considers the underlying socio-economic drivers while promoting community-based conservation initiatives. By adopting such an approach, stakeholders can work towards mitigating the impacts of land encroachment and fostering more sustainable land management practices within the forest landscape.

#### **4.4.3 Unlawful Extraction**

Unlawful extraction, encompassing activities such as poaching and illegal mining, represents a significant challenge within Mount Elgon Forest, with 25.2% (78) of respondents indicating its occurrence as "Sometimes" and 28.9% (90) as "Frequent," as shown in **Table 4.2**. This finding highlights the pervasive nature of illegal activities in the region and underscores their detrimental effects on both ecosystem integrity and wildlife populations. Consistent with existing literature, this trend emphasizes the multifaceted nature of environmental crimes and their far-reaching consequences for biodiversity conservation (Duffy et al., 2019; Nash et al., 2020).

Unlawful extraction poses a direct threat to biodiversity within Mount Elgon Forest, endangering the survival of numerous plant and animal species. Moreover, it undermines the livelihoods of local communities that depend on forest resources for their sustenance and economic well-being. The depletion of wildlife populations and disruption of ecosystem services resulting from unlawful extraction further exacerbate socio-economic vulnerabilities among forest-dependent communities (Pistorius et al., 2019).

Addressing unlawful extraction requires a comprehensive approach that integrates effective law enforcement with community-based conservation efforts. Strengthening law enforcement measures, including increased surveillance and stricter penalties for offenders, is essential for deterring illegal activities and enforcing compliance with conservation regulations (Nash et al., 2020). Additionally, community-based conservation initiatives play a crucial role in promoting sustainable resource use and empowering local communities to become stewards of their natural environment (Nijman, 2018; Williams et al., 2018).

#### 4.5 Factors Contributing to Illegal Activities

Participants in the study were asked to rate the contribution of various factors to illegal activities in Mount Elgon Forest using a Likert scale. The factors assessed included poverty levels, access to alternative livelihood opportunities, economic disparities, and ecological consequences of illegal activities. Mean scores were computed for each factor to determine their perceived contribution. Table 4.3 presents the mean scores for these contributing factors.

**Table 4.3: Factors Contributing to Illegal Activities**

<b>Factors</b>	<b>1 (Not at all contributing)</b>	<b>2 (Slightly contributing)</b>	<b>3 (Moderately contributing)</b>	<b>4 (Highly contributing)</b>	<b>5 (Very highly contributing)</b>
	)	)	)	)	)

			contributing )	contributing )	
<b>Poverty levels</b>	11 (3.55%)	25 (8.06%)	85 (27.42%)	94 (30.32%)	95 (30.65%)
<b>Access to alternative livelihood opportunities</b>	10 (3.23%)	17 (5.48%)	100 (32.26%)	92 (29.68%)	91 (29.35%)
<b>Economic disparities</b>	12 (3.87%)	23 (7.42%)	89 (28.71%)	96 (30.97%)	90 (29.03%)
<b>Ecological consequences of illegal activities</b>	13 (4.19%)	24 (7.74%)	98 (31.61%)	87 (28.06%)	88 (28.39%)

#### 4.5.1 Poverty Levels

The study found that poverty levels were perceived as moderately contributing to illegal activities by 27.42% of respondents and highly contributing by 30.32% of respondents, as shown in Table 4.3. This finding highlights the significant role of socio-economic factors in driving environmental degradation within forest landscapes. Previous literature supports this observation, emphasizing the interplay between poverty and forest exploitation, particularly in regions where communities heavily rely on forest resources for their livelihoods (Duffy et al., 2019; Tacconi et al., 2015).

Key informants highlighted poverty as a central driver, echoing findings from existing research that links economic deprivation to increased engagement in illegal resource extraction activities. One key informant explained,

*"Many locals depend on the forest for activities like firewood collection, charcoal burning, logging, and hunting because they have limited access to formal employment or alternative income-generating opportunities. This leads to overexploitation of forest resources, threatening both the environment and the long-term survival of those livelihoods. Without viable alternatives, communities may continue engaging in unsustainable practices out of necessity. Addressing this issue requires investment in community development, skills training, and the promotion of sustainable economic activities.."*

Moreover, corruption emerged as another critical factor, with informants citing instances of bribery and collusion that undermine law enforcement efforts and perpetuate a culture of impunity. Another informant noted,

*"Corruption undermines forest management by allowing illegal activities to continue unchecked, as offenders often pay bribes to avoid arrest or prosecution. This weakens the enforcement of environmental laws and discourages honest efforts to protect forest resources. As a result, illegal logging and other harmful practices persist, further degrading the ecosystem.."*

Weak enforcement mechanisms were identified as a significant contributing factor to the prevalence of illegal activities in Mount Elgon Forest. Key informants highlighted challenges such as limited resources, inadequate training, and ineffective coordination among law

enforcement agencies, which hamper efforts to combat forest crimes effectively. One law enforcement officer admitted,

*"Limited financial and logistical resources make it difficult to conduct regular forest patrols, maintain surveillance equipment, or support community-based conservation initiatives. Without adequate funding, forest management agencies struggle to enforce laws and respond effectively to environmental threats. Additionally, many personnel involved in forest protection lack specialized training in modern conservation techniques, law enforcement, and community engagement. This skills gap hampers their ability to detect and address illegal activities in a timely and strategic manner. The lack of continuous capacity building also reduces morale and productivity among forest workers.."*

Additionally, informants underscored the importance of community engagement in addressing illegal activities, emphasizing the role of local residents as both perpetrators and potential allies in conservation efforts. An environmental activist emphasized,

*"Engaging the community is essential; they need to see the benefits of conservation for themselves."*

The relationship between poverty and forest degradation is complex. Poverty often incentivizes illegal activities such as logging, encroachment, and extraction, as individuals in forest-dependent communities engage in these practices for survival. Studies have documented how economic hardship compels individuals to exploit natural resources beyond sustainable limits, leading to overexploitation and environmental harm (Bellassen et al., 2018; Fotso et al., 2019). Moreover, poverty exacerbates socio-economic vulnerabilities, creating a cycle of deprivation that perpetuates illegal activities and environmental degradation.

Addressing poverty-driven illegal activities requires comprehensive strategies that alleviate immediate economic hardships and empower communities to pursue environmentally sustainable alternative livelihood options. Interventions aimed at poverty reduction should prioritize investments in education, healthcare, infrastructure, and capacity-building initiatives that enhance the socio-economic resilience of forest-dependent communities (Gachanja et al., 2020; Okeyo et al., 2018). Sustainable development initiatives that promote inclusive growth, equitable resource-sharing, and community participation can help break the cycle of poverty and environmental degradation, fostering long-term resilience and sustainability (Echeverria et al., 2016; Meijaard et al., 2018).

#### **4.5.2 Access to Alternative Livelihood Opportunities**

The study found that access to alternative livelihood opportunities was perceived as highly contributing to illegal activities by 32.26% of respondents and very highly contributing by 29.68% of respondents, as shown in Table 4.3. This finding underscores the critical role of economic incentives in shaping behavior within forest-dependent communities. Research has consistently shown that poverty is a key driver of illegal forest activities, and providing alternative livelihood options is essential for breaking the cycle of dependence on unsustainable practices (Cohen et al., 2019; Meijaard et al., 2018).

Sustainable livelihood initiatives, such as eco-tourism, agroforestry, and sustainable agriculture, offer promising pathways for addressing poverty pressures and reducing incentives for engaging in illegal forest activities. These initiatives provide economic opportunities while promoting environmental conservation and community empowerment (Okeyo et al., 2018; Schepaschenko et al., 2019). By diversifying income sources and enhancing resilience to external shocks, these initiatives contribute to long-term socio-economic stability and environmental sustainability. Investing in the development of alternative livelihood

opportunities is crucial for promoting sustainable forest management and improving the well-being of forest-dependent communities.

#### **4.5.3 Economic Disparities**

The study found that economic disparities were perceived as moderately contributing to illegal activities by 28.71% of respondents and highly contributing by 30.97% of respondents (Table 4.3). This finding highlights the socio-economic complexities underlying forest exploitation and degradation. Studies have shown that unequal distribution of wealth exacerbates socio-economic inequalities, leading to marginalized communities resorting to illegal activities as a means of survival (Jones et al., 2020; Nkemnyi et al., 2020). Addressing economic disparities requires comprehensive approaches that promote inclusive development and equitable resource-sharing mechanisms. Policies aimed at reducing wealth gaps and enhancing social cohesion are essential for fostering sustainable forest management practices and reducing the drivers of illegal activities. Inclusive development strategies that prioritize marginalized communities and promote equitable access to forest resources can help alleviate socio-economic tensions and promote a more equitable distribution of benefits (Caviglia-Harris et al., 2017; Pistorius et al., 2019). By addressing the root causes of economic disparities, policymakers can create conditions conducive to sustainable development and environmental conservation.

#### **4.5.4 Ecological Consequences of Illegal Activities**

The study found that the ecological consequences of illegal activities were perceived as highly contributing by 31.61% of respondents and very highly contributing by 28.06% of respondents (Table 4.3). This finding emphasizes the profound impacts of forest degradation on both local ecosystems and global conservation efforts. Illegal logging, land encroachment, and unlawful extraction lead to the degradation of forest ecosystems, loss of biodiversity, and disruption of

ecosystem services, with far-reaching consequences for both current and future generations (Gachanja et al., 2020; Nash et al., 2020). Addressing the ecological consequences of illegal activities requires collaborative efforts to strengthen environmental governance, promote sustainable land-use practices, and enhance community-based conservation initiatives. Effective enforcement of environmental regulations, coupled with community engagement and capacity-building efforts, is essential for preventing further degradation and restoring degraded ecosystems (Echeverria et al., 2016; Mollicone et al., 2017). Investing in ecosystem restoration and conservation initiatives can mitigate the impacts of illegal activities and safeguard the ecological integrity of forest landscapes for the benefit of present and future generations.

**Table 4.4: Impact of Illegal Activities on Ecological integrity**

<b>Aspects</b>	<b>1 (No impact)</b>	<b>2 (Minimal impact)</b>	<b>3 (Moderate impact)</b>	<b>4 (Significant impact)</b>	<b>5 (Severe impact)</b>
<b>Habitat destruction</b>	12.9% (40)	18.7% (58)	23.2% (72)	29.0% (90)	16.1% (50)
<b>Biodiversity loss</b>	14.2% (44)	16.5% (51)	21.6% (67)	27.1% (84)	20.6% (64)
<b>Soil erosion</b>	11.9% (37)	17.1% (53)	25.5% (79)	28.4% (88)	17.1% (53)
<b>Ecosystem disruption</b>	13.2% (41)	20.6% (64)	24.2% (75)	26.8% (83)	15.2% (47)

#### **4.6 Impact of Illegal Activities on Ecological Aspects**

Participants in the study rated the extent of the impact of illegal activities on various ecological aspects using a Likert scale. Mean scores were calculated for each aspect to assess the perceived impact. Table 4.4 presents the mean scores for the impact on ecological aspects.

#### **4.6.2 Biodiversity Loss**

The study found that habitat destruction was perceived as having a significant to severe impact by 45.1% of respondents Table 4.4. This finding underscores the profound negative effects of illegal activities on the habitats within Mount Elgon Forest. The destruction of habitats disrupts ecological balance and threatens the survival of numerous species, highlighting the urgent need for conservation measures. Previous research has consistently emphasized the detrimental impact of habitat destruction on biodiversity and ecosystem health (Bellassen et al., 2018; Mollicone et al., 2017). Comprehensive strategies are required to mitigate habitat destruction and promote sustainable forest management practices.

#### **4.6.3 Soil Erosion**

The survey data indicated a significant threat posed by illegal activities to the biodiversity within Mount Elgon Forest, with 47.7% of respondents acknowledging a significant or severe impact (Table 4.4). This finding highlights the critical need for conservation measures to protect the rich array of species in the forest. This aligns with previous research emphasizing the detrimental consequences of biodiversity loss resulting from illegal logging, encroachment, and related activities (Bellassen et al., 2018; Mollicone et al., 2017). Protecting biodiversity requires strategies that address the underlying drivers of illegal activities, advocating for sustainable forest management while tackling socio-economic factors to ensure lasting conservation outcomes.

#### **4.6.4 Ecosystem Disruption**

The study found that ecosystem disruption had a moderate to severe impact, as rated by 52.0% of respondents (Table 4.4). This finding underscores the pervasive effects of illegal activities on critical ecological processes within Mount Elgon Forest (Jones et al., 2020; Nash et al., 2020). Disruption caused by illegal logging, mining, and hunting can lead to cascading effects

on biodiversity and ecosystem services (Schepaschenko et al., 2019; Williams et al., 2018). To restore ecosystem functions and promote ecological resilience, holistic approaches are necessary, integrating conservation efforts with sustainable development initiatives. Concerted action is required to preserve the ecological integrity of Mount Elgon Forest for future generations.

Key informants provided valuable insights into the profound impact of illegal activities on both the forest ecosystem and local communities in Mount Elgon Forest. The observed habitat destruction, biodiversity loss, and soil erosion are consistent with findings from previous research, which underscores the devastating consequences of illicit activities on forest ecosystems (Bellassen et al., 2018). Habitat destruction, resulting from practices like illegal logging and land encroachment, not only disrupts the intricate balance of forest ecosystems but also leads to the loss of critical habitats for countless plant and animal species.

*"Illegal logging is wiping out entire sections of the forest, causing irreversible damage to habitats,"* one researcher explained.

Moreover, biodiversity loss, driven by activities such as poaching and habitat degradation, threatens the resilience and stability of forest ecosystems, compromising their ability to provide essential ecosystem services (Mollicone et al., 2017). An environmental activist highlighted,

*"Poaching and habitat destruction disrupt ecosystems, leading to the loss of species that are crucial for maintaining ecological balance. As key species disappear, it disrupts the natural regulation of water cycles, affecting both the quality and availability of water resources. Additionally, the destruction of habitats compromises soil health by reducing the variety of plants and animals that contribute to nutrient*

*cycling and soil formation. This threatens the long-term sustainability of the forest and the communities that depend on it for resources.."*

The indirect effects of illegal activities on local communities further exacerbate the socio-economic challenges faced by forest-dependent populations in Mount Elgon Forest. Informants highlighted instances of displacement and loss of livelihoods resulting from forest degradation, emphasizing the intimate link between environmental health and community well-being (Nkemnyi et al., 2020). One informant noted,

*"Displacement due to land encroachment disrupts social structures and traditional livelihoods, pushing people further into poverty."*

Additionally, the loss of forest resources deprives communities of essential ecosystem services such as water provision, carbon sequestration, and non-timber forest products, further compromising their resilience to environmental changes (Caviglia-Harris et al., 2017).

*"...the community faces significant challenges in meeting basic needs such as food, fuel and construction materials. Many locals rely on the forest for daily survival and the absence of these resources forces them into poverty and vulnerability. This leads to increased pressure on the remaining forest areas .....",* a local authority stated.

In response to these challenges, key informants highlighted the importance of conservation initiatives and community-based approaches in mitigating the impacts of illegal activities. Community forestry programs, participatory resource management schemes, and sustainable livelihood initiatives were cited as effective strategies for empowering local communities and promoting sustainable resource use (Williams et al., 2018). These approaches not only foster a sense of ownership and stewardship over forest resources but also provide alternative income opportunities, reducing the reliance on illegal activities for livelihoods (Cohen et al., 2019).

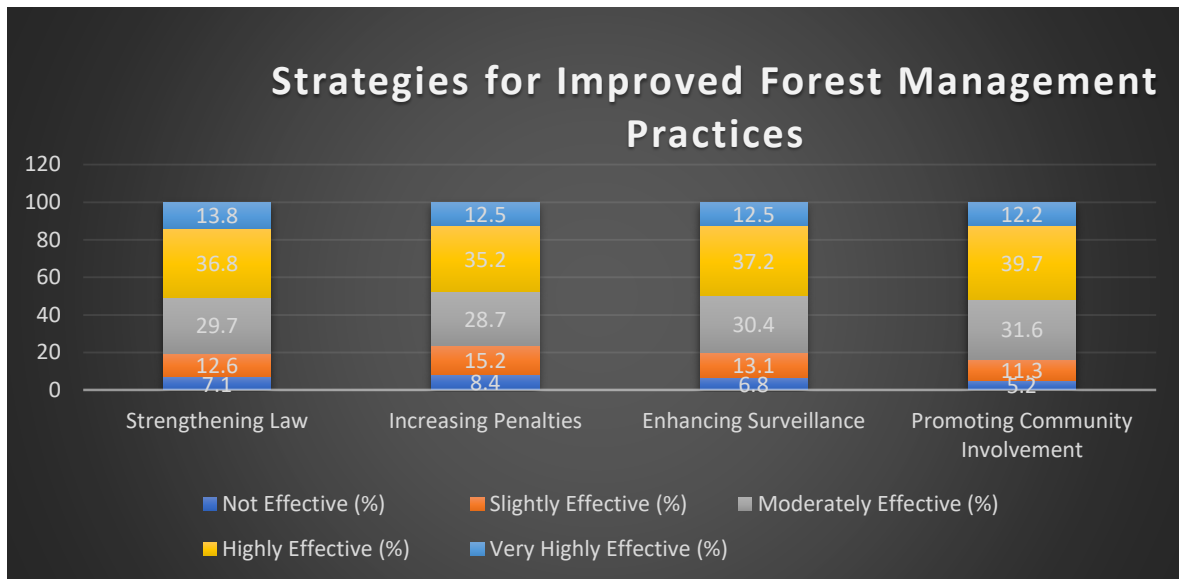
Moreover, collaborative efforts involving government agencies, NGOs, and local communities are essential for implementing integrated conservation strategies that address both environmental and socio-economic dimensions of forest degradation (Schepaschenko et al., 2019). One NGO representative emphasized

*"Collaborative efforts bring together diverse stakeholders, including government agencies, local communities, NGOs, researchers and private sector players, each contributing unique skills and resources. These stakeholders can create more inclusive, practical and effective forest management strategies. Shared goals and responsibilities encourage transparency, mutual trust and accountability in conservation efforts. Collaboration also helps align local actions with national and global sustainability objectives, such as climate change mitigation and biodiversity preservation....collective action enhances resilience and ensures that forest resources are protected for current and future generations.."*

Consequently, stakeholders can work towards achieving more resilient and sustainable forest management practices in Mount Elgon Forest.

#### **4.7 Proposed Strategies for Improved Forest Management Practices to Mitigate and Prevent Illegal Activities in Mount Elgon Forest, Bungoma, Kenya**

Participants in the study were asked to rate the effectiveness of various strategies in mitigating and preventing illegal activities in Mount Elgon Forest using a Likert scale. Mean scores were computed for each strategy to assess their perceived effectiveness and presented in figure 4.2 below:



**Figure 4.2 Strategies for improving forest management**

#### 4.7.1 Strengthening Law

Strengthening law emerged as a highly endorsed strategy, with 50.6% of respondents rating it as either highly effective or very highly effective. This indicates a widespread recognition of the pivotal role that robust legal frameworks play in deterring illegal activities and enforcing regulations within the forest. Strengthening laws related to forest protection and conservation can enhance the accountability of offenders and facilitate more effective law enforcement efforts (Cohen et al., 2019; Ojha et al., 2016). Additionally, by clarifying legal boundaries and penalties, strengthened laws can serve as a deterrent, dissuading individuals and groups from engaging in unlawful activities such as illegal logging, land encroachment, and poaching (Duffy et al., 2019; Fotso et al., 2019).

#### 4.7.2 Increasing Penalties

Increasing penalties for illegal activities garnered considerable support, with 47.7% of respondents rating it as highly effective or very highly effective. This underscores the belief among participants that imposing stricter penalties can act as a deterrent and reinforce

compliance with forest regulations. By imposing higher fines, imprisonment terms, or other punitive measures, authorities can signal the seriousness of forest-related offenses and discourage potential offenders (Bellassen et al., 2018; Mollicone et al., 2017). Moreover, increasing penalties can help offset the economic incentives associated with illegal activities, making them less attractive options for individuals seeking quick gains at the expense of forest conservation (Fortibuoni et al., 2016; Tacconi et al., 2015). However, it's important to ensure that penalties are proportionate, equitable, and enforced consistently to avoid unintended consequences and promote fairness in the legal system.

#### **4.7.3 Enhancing Surveillance**

Enhancing surveillance was perceived as an effective strategy, with 49.7% of respondents rating it as highly effective or very highly effective. This underscores the importance of leveraging technology and manpower to monitor forest areas and detect illicit activities in real-time. Surveillance mechanisms such as satellite imagery, drones, camera traps, and ranger patrols can provide valuable insights into illegal logging, land encroachment, and wildlife poaching activities (Interpol, 2021; Jones et al., 2020). By enhancing surveillance capabilities, authorities can improve their ability to detect, deter, and respond to illegal activities promptly, thereby reducing their prevalence and mitigating their environmental impacts (Schepaschenko et al., 2019; Williams et al., 2018). Moreover, effective surveillance can contribute to the collection of evidence for legal prosecution, supporting law enforcement efforts and enhancing the credibility of forest protection measures.

Key informants provided valuable insights into a diverse array of strategies for addressing and preventing illegal activities in Mount Elgon Forest. One of the key strategies identified was the strengthening of law enforcement mechanisms, which aligns with previous research emphasizing the importance of robust enforcement in deterring illicit activities (Tacconi et al.,

2015). Enhancing surveillance and increasing penalties for offenders were highlighted as essential measures to improve the effectiveness of law enforcement efforts (Echeverria et al., 2016). *"We need stricter enforcement and harsher penalties to deter illegal activities,"* one law enforcement official stated. By deterring illegal activities through stricter enforcement and imposing harsher penalties, authorities can create a deterrent effect and reduce the incentives for engaging in forest-related crimes.

Community engagement emerged as another critical strategy for addressing illegal activities, with key informants emphasizing the importance of fostering collaborative relationships between forest management authorities and local communities (Meijaard et al., 2018). Participatory approaches, such as community forestry programs and co-management initiatives, empower local communities to take an active role in forest conservation and management (Okeyo et al., 2018).

*"Involving the community in decision-making promotes ownership and responsibility on forest conservation. When local people are actively engaged, they are more likely to support and comply with sustainable forest management policies. Providing alternative livelihood opportunities, such as beekeeping, tree nurseries, or sustainable agriculture, helps reduce reliance on illegal activities like logging or charcoal burning. Empowering communities economically and socially not only strengthens forest protection but also promotes long-term environmental stewardship."*

a local leader explained. By involving communities in decision-making processes and providing them with alternative livelihood opportunities, authorities can build trust, strengthen social cohesion, and reduce the likelihood of illegal activities occurring (Cohen et al., 2019).

Promoting sustainable forest management practices was identified as a fundamental strategy for addressing the root causes of illegal activities in Mount Elgon Forest (Fortibuoni et al., 2016). Sustainable land-use practices, such as agroforestry, reforestation, and ecosystem-based approaches, not only enhance ecosystem resilience but also provide economic incentives for conservation (Pistorius et al., 2019).

*"Promoting sustainable practices, such as agroforestry and eco-tourism, creates alternative income sources for local communities, reducing their dependence on destructive forest exploitation. These practices help maintain ecological balance while supporting long-term livelihoods. Communities are more likely to protect rather than degrade forest resources."*

one informant noted. By promoting sustainable livelihood options and incentivizing responsible resource use, authorities can reduce the pressure on forest resources and mitigate the drivers of illegal activities (Schepaschenko et al., 2019).

Capacity-building programs and awareness campaigns were highlighted as essential components of any comprehensive strategy to combat illegal activities (Silva et al., 2018). By providing training and education on forest laws, conservation principles, and sustainable land management techniques, authorities can empower local communities and stakeholders to become active participants in forest protection (Nijman, 2018). Moreover, raising awareness about the negative impacts of illegal activities on the environment and local communities can foster a culture of environmental stewardship and social responsibility (Bellassen et al., 2018).

*"Education and awareness are key to fostering a culture of environmental stewardship,"* an environmental activist remarked. Through targeted outreach efforts and public education campaigns, authorities can mobilize support for conservation initiatives and garner public commitment to combating illegal activities in Mount Elgon Forest.

The role of external stakeholders, including NGOs, government agencies, and international organizations, was also recognized as crucial in supporting efforts to address illegal activities in Mount Elgon Forest (Jones et al., 2020). External stakeholders can provide technical expertise, financial resources, and logistical support to complement the efforts of local authorities and communities (Nash et al., 2020). By fostering multi-stakeholder partnerships and leveraging external resources, authorities can enhance the effectiveness and scalability of conservation interventions (Mollicone et al., 2017). One key informant noted,

*"International cooperation and collaboration are important in addressing transboundary environmental issues, such as illegal logging and wildlife trafficking, which often extend beyond national borders. Through shared expertise, funding and technology transfer, countries can strengthen forest monitoring, enforcement and conservation efforts. Collaborative frameworks also promote the harmonization of policies and practices, ensuring that forest management strategies are both sustainable and globally aligned.."*

Moreover, international cooperation and collaboration can facilitate information sharing, capacity building, and policy harmonization, contributing to more coordinated and sustainable approaches to forest management in Mount Elgon Forest and beyond.

In summary, thematic analysis of the interview and observation guides provides valuable insights into the dynamics of illegal activities in Mount Elgon Forest, highlighting the complex interplay of socio-economic, environmental, and governance factors. The perspectives and experiences shared by key informants offer a comprehensive understanding of the challenges and opportunities associated with combating illegal logging and promoting sustainable forest management in the region.

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter provides a comprehensive summary, conclusion, and recommendations based on the findings of the study on illegal activities in Mount Elgon Forest. It begins with an overview of the demographic information collected from key informants, followed by a summary of the objectives and their respective findings. The chapter then presents a conclusion that synthesizes the main insights gleaned from the study. Finally, recommendations are provided to guide future actions and initiatives aimed at addressing the challenges of illegal activities in the forest. Suggestions for further studies are also outlined to encourage continued research in this area.

#### 5.2 Summary

The demographic profile of respondents in this study provided valuable insights into the community dynamics surrounding forest management in Mount Elgon Forest, Bungoma County. The gender distribution was balanced, with men more frequently occupying formal forest management roles, while women engaged in informal conservation efforts. Respondents ranged widely in age, with younger individuals often involved in direct forest activities, while older participants contributed historical knowledge. Education levels varied, and those with higher education were more aware of legal frameworks and conservation practices. Farmers, being the most prevalent occupational group, were directly affected by forest management policies, while environmentalists actively advocated for sustainable forest practices. Long-term residents, due to their extended connection with the forest, offered crucial ecological and historical insights, and regular forest visitors provided detailed observations of forest conditions and illegal activities.

### **5.2.1 Nature of Illegal Activities in Mount Elgon Forest**

The study's findings highlight the extensive illegal activities within Mount Elgon Forest, where illegal logging, land encroachment, and resource extraction activities such as poaching and illegal mining pose significant threats to the forest's ecological and socio-economic stability. Respondents frequently reported these activities, indicating that they are not isolated incidents but rather widespread practices impacting the forest at multiple levels.

Illegal logging emerged as a particularly concerning activity, severely impacting the forest's biodiversity and ecosystem balance. This practice involves the unauthorized cutting and removal of timber, often targeting high-value tree species. As the forest canopy is disrupted, habitats for various species are lost, which can lead to declines in biodiversity. The reduced tree cover also impacts soil stability, leading to erosion and decreased water retention, which negatively affects water sources that both wildlife and local communities depend upon. Additionally, illegal logging contributes to carbon emissions, undermining the forest's role as a carbon sink essential for mitigating climate change effects.

Land encroachment in Mount Elgon Forest often involves the clearing of forest areas for agriculture, settlements, or other unauthorized uses. This practice has intensified due to population pressures and demand for agricultural land, leading individuals and communities to encroach on forest areas illegally. The loss of forested land results in habitat fragmentation, isolating wildlife populations and reducing genetic diversity, which weakens the resilience of species to environmental changes. Land encroachment also disrupts natural processes like nutrient cycling and hydrological patterns, which are essential for maintaining the overall health of the forest ecosystem. This ecological instability can reduce the forest's long-term sustainability, impacting local livelihoods reliant on forest resources for agriculture and other needs.

Poaching and illegal mining represent further unsanctioned extraction activities that degrade the forest ecosystem. Poaching disrupts animal populations, particularly targeting high-value or endangered species, which leads to cascading ecological effects. For example, the loss of keystone species through poaching can disrupt food chains and ecosystem dynamics, which would otherwise support a balanced environment. Illegal mining, on the other hand, often involves destructive practices that lead to soil erosion, water contamination and landscape alteration. Mining operations can release toxic substances that leach into water sources, adversely affecting both wildlife and the health of nearby human populations. The unsustainable extraction methods used in illegal mining exacerbate deforestation and pollution, rendering the forest less hospitable for its flora and fauna.

The study's findings underline not only the environmental but also the socio-economic impacts of these illegal activities. Mount Elgon Forest plays a crucial role in supporting local economies, providing resources such as water, medicinal plants, and tourism opportunities. As these illegal practices escalate, the forest's ability to sustain these services diminishes, adversely affecting communities that depend on the forest for their livelihoods. Reduced forest health also limits eco-tourism potential, diminishing opportunities for sustainable economic development in the area.

The illegal activities identified in Mount Elgon Forest pose profound ecological and socio-economic challenges. Illegal logging, land encroachment, and unlawful resource extraction disrupt biodiversity, compromise ecosystem stability, and threaten the local economies that depend on the forest. Addressing these issues requires an integrated approach, involving stricter enforcement of conservation laws, community education, and sustainable development initiatives that provide alternatives to forest exploitation. Through such measures, there is

potential to curb these activities, preserve Mount Elgon's ecological integrity and support the long-term well-being of local communities.

### **5.2.2 Factors contributing to the Occurrence and Persistence of Illegal Activities**

The study underscores that poverty and socio-economic disparities are not merely background factors but primary drivers of illegal activities in Mount Elgon Forest. Economic hardship is deeply intertwined with the forest's challenges, especially for forest-dependent communities with limited livelihood options. This situation fosters a reliance on unsustainable forest practices as an immediate means of survival, creating a cycle of degradation and vulnerability that is difficult to break. The following analysis explores how poverty and economic inequality contribute to illegal activities like logging, land encroachment, and resource extraction, and how these practices ultimately reinforce socio-economic and environmental instability.

Mount Elgon Forest communities often rely on the forest for their basic needs, including food, fuel, water, and medicinal plants. Economic hardship in these areas leaves few viable alternatives for income, compelling community members to turn to the forest's resources, often through illegal means, as a readily available source of survival. For instance, individuals who struggle to make ends meet may resort to illegal logging as a source of firewood or for timber to sell. Without external income opportunities, such as jobs or government support, this dependency reinforces unsustainable practices that further degrade the forest's resources over time. As the forest diminishes, community members are forced to exploit remaining resources more intensively, perpetuating a downward spiral of forest degradation and deepening poverty.

Economic inequality exacerbates forest exploitation as it limits the resources available to marginalized groups, often excluding them from access to sustainable livelihoods or conservation initiatives. Those on the economic margins—often small-scale farmers or unemployed youth—are more likely to engage in illegal activities, including land

encroachment and poaching, as a last resort to meet basic needs. This disparity creates a dynamic where wealthier individuals or entities might access sustainable livelihoods or legal forest products, while the poorest segments of society are left with few options but illegal activities, perpetuating a cycle of environmental degradation. The forest thus becomes a battleground of economic survival, with those at the lowest income levels forced to make choices that, although necessary in the short term, worsen their long-term prospects by depleting the resources they rely on.

The absence of diverse income opportunities is a significant factor that deepens community reliance on forest resources. In Mount Elgon, limited access to education, training, and employment hinders the development of sustainable alternatives to forest exploitation. Without adequate skills or capital, community members find it challenging to transition to livelihoods that do not depend on forest resources. Investment in sustainable agriculture, eco-tourism, and small-scale businesses could reduce pressure on the forest, yet these opportunities are sparse. This lack of economic diversification not only drives individuals toward illegal activities but also diminishes the community's resilience against economic shocks, such as crop failure or loss of income, making illegal resource extraction a fallback option during times of financial strain.

As poverty drives forest degradation, the resulting environmental damage further entrenches communities in a cycle of socio-economic vulnerability. Deforestation and biodiversity loss reduce the availability of essential resources, such as clean water, fertile soil, and medicinal plants. This environmental degradation has a direct impact on the health and economic productivity of local populations, reinforcing economic hardship and prompting even greater dependence on illegal activities. Additionally, as forest resources dwindle, competition for

these resources can lead to social conflicts, further destabilizing the community and undermining collaborative efforts for sustainable solutions.

Addressing the root causes of illegal activities in Mount Elgon Forest requires comprehensive strategies that integrate both poverty alleviation and conservation efforts. Solutions may include: empowering local communities to participate in and benefit from forest conservation efforts can shift incentives away from illegal activities. Through allowing community members to manage forest resources sustainably and providing economic returns through eco-tourism or sustainable harvesting, these initiatives can generate income and encourage preservation. Creating job opportunities and providing training in skills such as sustainable agriculture, agroforestry, or craft production can offer income sources that do not rely on forest exploitation. Furthermore, initiatives that support access to capital and markets for locally produced goods can enhance the economic resilience of forest communities. Investment in education, healthcare, and infrastructure (e.g., roads and water access) can indirectly reduce illegal activities by improving overall quality of life and enabling community members to pursue stable, non-forest-based livelihoods. While enforcement is critical, it must be paired with programs that support alternative incomes, so individuals do not return to illegal practices out of necessity. Education campaigns on the long-term benefits of conservation can also foster community buy-in and reduce reliance on illicit practices.

Poverty and socio-economic disparities are central to the challenges facing Mount Elgon Forest, compelling marginalized communities into unsustainable practices for survival. By recognizing the link between economic hardship and environmental degradation, efforts to combat illegal activities can take a more holistic approach that not only conserves the forest but also uplifts the communities dependent on it. Such an integrated approach is essential for

breaking the cycle of poverty-driven exploitation and fostering a future where both Mount Elgon and its people can thrive.

### **5.2.3 Effects of Illegal Activities on the Ecological Integrity and Biodiversity of Mount Elgon Forest**

Illegal activities in Mount Elgon Forest have far-reaching ecological implications, directly disrupting its biodiversity and destabilizing its critical ecosystem functions. These impacts are not only immediate but have long-term consequences for the health and resilience of the forest, impacting the broader environment and surrounding communities that depend on it for essential resources and ecosystem services. By examining the specific effects of illegal logging, land encroachment, and resource extraction, a clearer picture emerges of the ongoing degradation and the potential risks that Mount Elgon Forest faces.

Illegal logging and land encroachment have led to substantial habitat destruction within Mount Elgon Forest, particularly affecting diverse flora and fauna. Many species within the forest are highly specialized, relying on specific conditions to survive, such as tree cover, humidity, and food sources unique to the ecosystem. When logging and clearing activities reduce tree density, entire habitats are destroyed, resulting in the loss of food, shelter, and breeding sites for wildlife. This forces many species to migrate, while others that cannot adapt or relocate face the threat of local extinction. This loss of biodiversity is more than a numbers game, it weakens the forest's resilience to environmental stressors, such as disease outbreaks or climate change, and disrupts food chains that maintain ecological balance. Consequently, the decline in biodiversity reduces the forest's overall capacity to recover from further disturbances, setting off a domino effect that compromises ecosystem stability.

Soil erosion is a particularly severe consequence of deforestation, illegal logging, and land encroachment in Mount Elgon Forest. Tree roots play a crucial role in anchoring soil,

preventing it from washing away during heavy rains. With the removal of trees and vegetation, soil is left exposed and vulnerable to erosion. This erosion not only depletes the topsoil, which is rich in nutrients essential for plant growth, but also destabilizes slopes, increasing the risk of landslides. As fertile soil is lost, the forest floor becomes less productive, diminishing its ability to support a diverse range of plant species. In turn, this limits food availability for herbivores, disrupting the food web and further reducing biodiversity. Moreover, nutrient-depleted soils negatively impact water quality as eroded sediments enter rivers and streams, affecting aquatic ecosystems downstream and potentially harming human populations who rely on these water sources.

The illegal extraction of forest resources disrupts essential ecosystem functions, including carbon sequestration, water regulation, and nutrient cycling. Forests act as natural carbon sinks, absorbing and storing carbon dioxide from the atmosphere. When trees are illegally logged, this carbon is released back into the atmosphere, contributing to climate change. Similarly, the forest's ability to regulate water is impaired as tree removal reduces canopy cover, which would otherwise intercept rainfall, slow water runoff, and promote groundwater recharge. Without these natural buffers, water flows become more erratic, increasing the likelihood of floods during rainy seasons and droughts during dry periods. This altered water cycle has repercussions for both the forest ecosystem and nearby communities that depend on consistent water availability for drinking, agriculture, and sanitation. The disruption of nutrient cycling is another significant impact, as plants and animals play a role in decomposing organic matter and recycling nutrients back into the soil. When plant and animal populations decline, the natural decomposition process slows, depleting soil fertility and diminishing the forest's productivity. Over time, this lack of nutrient recycling reduces the forest's ability to support diverse plant species, which further reduces biodiversity and resilience to environmental changes.

The degradation of ecosystem services in Mount Elgon Forest has profound implications not only for wildlife but also for human populations that rely on these services for their survival. Ecosystem services like water regulation, soil fertility, pollination, and air purification provide foundational support to local agriculture, water supply, and community health. As illegal activities reduce forest cover and deplete resources, the forest's ability to perform these services weakens. For instance, water regulation is impaired, leading to irregular water supply and quality, which affects crop yields and increases the risk of waterborne diseases. Similarly, reduced soil fertility makes agricultural lands less productive, which directly impacts food security for forest-dependent communities. This decline in ecosystem services perpetuates a vicious cycle, as local communities may become increasingly dependent on the forest to meet immediate needs, despite the ongoing degradation.

The ecological degradation in Mount Elgon Forest leaves it highly vulnerable to future exploitation and environmental challenges. With reduced biodiversity, weakened ecosystem functions, and diminished resilience, the forest is less capable of withstanding disturbances such as invasive species, extreme weather events, or pest outbreaks. Climate change further exacerbates these risks, as warming temperatures and altered precipitation patterns place additional stress on already fragile ecosystems. This vulnerability not only endangers the forest but also poses long-term risks for the surrounding communities, who face increased exposure to floods, landslides, and loss of agricultural productivity. Moreover, as illegal activities persist and intensify, they accelerate these vulnerabilities, making it ever more challenging to restore the forest's health and maintain its ecological integrity.

The illegal activities in Mount Elgon Forest are a stark reminder of the complex and interconnected challenges facing conservation efforts in economically vulnerable regions. The ecological impacts of illegal logging, land encroachment, and resource extraction extend

beyond immediate resource loss to disrupt biodiversity, ecosystem functions, and essential services that both wildlife and humans depend on. Addressing these impacts requires urgent action, not only to enforce conservation laws but also to provide sustainable alternatives for communities that depend on the forest. Through a combination of poverty alleviation, environmental education, and sustainable development initiatives, there is a potential pathway to preserve Mount Elgon Forest's ecological health and safeguard its vital role in regional environmental stability.

#### **5.2.4 Strategies for Improved Forest Management Practices to Mitigate and Prevent Illegal Activities**

The study emphasizes that mitigating illegal activities in Mount Elgon Forest requires a multi-faceted approach, combining law enforcement with community involvement and sustainable livelihood options. The insights from respondents underscore a comprehensive strategy involving stricter enforcement measures, community-based conservation, and economic incentives designed to encourage long-term sustainable practices. By addressing both the root causes of illegal activities and the means for local communities to transition away from these activities, these strategies offer a pathway to conserving the forest while improving the livelihoods of those who depend on it.

Respondents indicated that a primary step in addressing illegal activities is the enhancement of law enforcement measures and the implementation of stricter penalties. Currently, illegal logging, land encroachment, and resource extraction are difficult to control due to limited resources for surveillance and enforcement. Many offenders operate with minimal risk, undermining conservation efforts and setting a precedent of impunity. Strengthening law enforcement in Mount Elgon Forest can deter illegal activities by increasing the risks and consequences for offenders. This approach requires investment in advanced surveillance

technologies, such as drones or satellite monitoring, can significantly improve the ability to detect and respond to illegal activities in remote or hard-to-access areas of the forest. Additionally, deploying more forest rangers and patrol teams would enhance on-the-ground monitoring, enabling quicker responses to infractions. Instituting heavier fines and longer sentences for illegal logging, poaching and resource extraction can serve as a strong deterrent. Stricter penalties would signal that illegal exploitation of the forest will not be tolerated, providing a legal framework that prioritizes environmental preservation and ecological integrity. Illegal activities in Mount Elgon Forest are often interconnected, requiring coordination between various governmental and non-governmental bodies, such as forest services, wildlife agencies, and local authorities. By fostering collaboration between these agencies, enforcement efforts can become more effective and holistic, addressing not only immediate violations but also larger patterns of environmental crime.

The study found that fostering community-based conservation initiatives is essential for sustainable forest management. Engaging local communities in conservation efforts can reduce illegal activities by creating a sense of ownership and shared responsibility for the forest's well-being. This strategy emphasizes collaboration between conservation authorities and local residents, recognizing the critical role that communities play as stewards of their environment. Community-based conservation can be promoted through empowering communities to have a say in forest management decisions fosters a sense of accountability and shared interest in sustainable practices. When locals participate in conservation planning and implementation, they are more likely to support and uphold conservation efforts. This participatory approach builds trust and aligns conservation goals with community needs, reducing friction and fostering collaborative solutions. Training and awareness campaigns on the importance of forest conservation can encourage community members to adopt sustainable practices. By highlighting the long-term benefits of conservation—such as improved soil health, water

availability, and biodiversity—communities are better informed and motivated to protect forest resources. Education on the ecological and economic risks of illegal activities can also shift attitudes, helping locals understand the value of preserving the forest.

Respondents stressed the importance of providing alternative, sustainable livelihoods as a way to reduce dependency on illegal forest activities. Economic hardship is a major factor driving illegal logging, poaching, and land encroachment, as communities turn to forest resources out of necessity. Offering viable income sources that do not harm the environment can empower locals to become active contributors to conservation. Key initiatives in this area include: *d*developing eco-tourism opportunities within Mount Elgon Forest can generate income for the community while promoting conservation. Eco-tourism allows visitors to experience the forest's unique biodiversity and cultural heritage, creating economic value without depleting resources. By involving locals as tour guides, operators, or hospitality providers, eco-tourism can foster economic growth, employment, and environmental education. Agroforestry combines agriculture with sustainable forest management, enabling communities to derive income from farming while preserving tree cover and soil health. This practice not only diversifies income sources but also enhances ecological resilience by reducing soil erosion, improving water retention, and promoting biodiversity. Similarly, sustainable agriculture practices can reduce the need for land encroachment, as they focus on soil conservation, crop rotation, and organic fertilizers, increasing yields without expanding into forested areas. Providing training and support for small-scale, forest-friendly enterprises—such as beekeeping, handicrafts, or non-timber forest products (e.g., medicinal plants, mushrooms, and honey)—allows locals to earn a livelihood while protecting the forest. These enterprises have low environmental impact but high market potential, giving communities a sustainable alternative to illegal activities.

Empowering communities to take an active role in managing Mount Elgon Forest is key to fostering long-term ecological sustainability. When communities see themselves as co-managers of the forest, they are more likely to take measures to prevent illegal activities and advocate for conservation practices. This sense of ownership can be cultivated by establishing local councils or committees dedicated to forest management allows communities to organize, monitor, and enforce conservation regulations. Such councils can serve as intermediaries between the community and government authorities, ensuring that local voices are represented in conservation policies and that concerns are addressed in ways that support sustainable outcomes. Programs that recognize and reward community conservation efforts can incentivize local residents to continue their stewardship of the forest. For example, conservation incentive programs that offer small grants, subsidies, or tax breaks to communities for adopting sustainable practices can make conservation an economically attractive option. Reward systems can also foster healthy competition and collaboration, where communities take pride in their efforts to protect and restore the forest.

By strengthening the economic resilience of communities, they are less likely to resort to illegal activities in times of financial hardship. This can be achieved through programs that provide financial literacy training, microfinance options, and social safety nets, ensuring that families have alternative support during difficult times, reducing their dependence on forest resources. The study highlights that the future of Mount Elgon Forest depends on a balanced approach that incorporates robust law enforcement, community-based conservation, and the promotion of sustainable livelihoods. Strengthening these areas can help alleviate the pressure on the forest, reduce illegal activities, and build a foundation for long-term ecological health. By fostering collaboration with local communities, providing alternative income opportunities, and enhancing enforcement mechanisms, Mount Elgon can be preserved not only as a vital ecological resource but also as a sustainable economic asset for current and future generations.

This integrated strategy aims to shift the forest's role from a contested resource to a shared heritage that both conserves biodiversity and supports resilient, empowered communities.

### **5.3 Conclusion**

In conclusion, the study revealed that illegal logging, land encroachment, poaching, and illegal mining are the predominant illegal activities within Mount Elgon Forest. These activities, reported with regularity by respondents, threaten the forest's ecological stability by disrupting biodiversity and deteriorating essential resources. Illegal logging and land encroachment, in particular, stand out as the most frequent threats, destabilizing the ecosystem and weakening forest resources crucial for both human and ecological sustainability. This frequency and scale of unlawful activities underscore the need for urgent interventions to safeguard Mount Elgon Forest's ecological integrity.

Socio-economic factors, especially poverty and economic disparities within forest-dependent communities, play a major role in perpetuating these illegal activities. Economic hardships have pushed marginalized communities into unsustainable practices such as illegal logging and resource extraction, which are often the only available means of subsistence. The lack of alternative livelihoods further compounds the problem, creating a cycle where communities are forced to exploit forest resources for survival, thereby reinforcing a cycle of environmental degradation and socio-economic vulnerability. Addressing these underlying economic issues is essential to curbing illegal activities and promoting sustainable forest practices.

The ecological impact of these illegal activities on Mount Elgon Forest is profound, with substantial consequences for both biodiversity and the forest's ecosystem functions. The destruction of habitats, loss of wildlife, and soil erosion have disrupted natural ecosystems and endangered numerous plant and animal species. These practices have also depleted the forest's ecosystem services, including water regulation and soil fertility, which are vital for both

environmental stability and local livelihoods. The degradation of these ecosystem services further increases the forest's vulnerability, highlighting the urgency for conservation measures to preserve its ecological integrity for future generations.

To address these challenges, the study identifies a combination of law enforcement, community engagement, and sustainable livelihood initiatives as essential strategies for forest management. Enhanced law enforcement measures, stricter penalties, and advanced surveillance systems are crucial to deter illegal activities. Equally important is the empowerment of local communities through community-based conservation efforts, engaging them in decision-making, and promoting sustainable alternatives like eco-tourism, agroforestry, and sustainable agriculture. Empowering communities to actively participate in forest management not only addresses immediate illegal activities but also fosters a culture of conservation, ensuring that Mount Elgon Forest remains resilient and sustainable in the long term.

#### **5.4 Recommendations**

The study provides the following recommendations:

- To address the nature of illegal activities, the study recommends strengthening law enforcement efforts to combat illegal activities, including increased patrols and monitoring of forest areas. For instance, there is need to strengthen local law enforcement agencies, forest rangers, and governmental bodies responsible for forest protection.
- Additionally, in addressing the factors that contribute to illegal activities the study recommends enhancing penalties for offenders to effectively deter future illegal activities.

- In addressing the effects of illegal activities on ecological integrity, the study recommends improving surveillance capabilities through the use of technology such as drones and satellite imagery.
- To address strategies for improved forest management the study recommends fostering greater community involvement in forest management decision-making processes and conservation initiatives.

### **5.5 Suggestions for Further Studies**

The study recommends further studies to conduct longitudinal research aimed at assessing the long-term impacts of illegal activities on forest ecosystems and local communities. Further studies should investigate the role of corruption and political factors in facilitating illegal activities in forested areas, in order to understand the systemic enablers of forest-related crimes. The study recommends further studies to explore the potential of community-based forest management approaches in promoting sustainable resource use and enhancing conservation efforts. Further studies should assess the effectiveness of existing policy interventions and legal frameworks in addressing illegal logging and other forest-related crimes, with the aim of identifying gaps and improving enforcement strategies.

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## **APPENDICES**

### **Appendix I: Informed Consent Form**

**TITLE OF STUDY: ASSESSMENT OF THE ILLEGAL ACTIVITIES IN FOREST MANAGEMENT IN MOUNT ELGON FOREST; BUNGOMA: KENYA**

**PRINCIPAL INVESTIGATOR: EZRA KORIR BARCHOK**

You are invited to participate in a research study conducted by Ezra K. Barchok from Mount Kenya University. The purpose of this study is to investigate and analyze illegal activities in

forest management in Mount Elgon Forest, Bungoma, Kenya. Your participation in this study is entirely voluntary, and you have the right to decline or withdraw at any time without facing any negative consequences.

Your involvement will require [duration of participation, e.g., filling out a questionnaire, participating in an interview, or taking part in direct observations]. During this process, we may ask questions about your knowledge, perceptions, and experiences related to forest management and conservation. All data collected will be kept confidential, and your personal information will be anonymized to ensure your identity remains protected.

By giving your informed consent, you acknowledge that you have been properly informed about the purpose of the study, the data collection procedures, and your rights as a participant. Your participation will be respected, and we will follow ethical guidelines to ensure your well-being throughout the study.

Please sign below to indicate your informed consent to participate in this research study.

Participant's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Researcher's Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Appendix II: Guided Questionnaire For Local Community Members**

Dear Participant,

We would like to extend our warmest greetings to you as we embark on an important study titled "Assessment of Illegal Activities in Forest Management in Cheptais Forest and Kaberua Forest of Mount Elgon Forest, Bungoma, Kenya." This research aims to comprehensively evaluate the extent and nature of illegal activities occurring in Mount Elgon forest, identify key factors contributing to their occurrence and persistence, assess their impacts on the ecological

integrity and biodiversity of the forest, and propose strategies and recommendations for improved forest management practices to mitigate and prevent such activities.

Your valuable insights and experiences are vital in achieving our study objectives. We specifically invite Forest Officials, Local Communities, Law Enforcement Agencies, Conservation Organizations, and Other Relevant Actors to participate in this questionnaire. Your input will contribute to the development of effective solutions for sustainable forest management in Mount Elgon forest.

Thank you for your cooperation and dedication to this important cause.

Sincerely,

**EZRA KORIR BARCHOK**



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**DEMOGRAPHIC INFORMATION:**

**Gender**

Male ( )

Female ( )

**Age**

18-24 ( )

25-34 ( )

35-44 ( )

45-54 ( )

55 and above ( )

**Educational Background:**

No formal education ( )

Primary education ( )

Secondary education ( )

Vocational/Technical training ( )

Undergraduate degree ( )

Postgraduate degree ( )

**1. Occupation:**

Farmer ( )

Forestry worker ( )

Environmentalist/Conservationist ( )

Government official ( )

Researcher/Scientist ( )

Student ( )

Business owner ( )

Unemployed ( )

Other (please specify) \_\_\_\_\_

Length of Residence in the Mount Elgon Forest area:

Less than 1 year ( )

1-5 years ( )



Mount Kenya University

6-10 years ( )

More than 10 years ( )

**Frequency of Visiting Cheptais Forest and Kaberua Forest:**

Never visited ( )

Rarely (once or twice a year) ( )

Occasionally (a few times per year) ( )

Regularly (monthly) ( )

Frequently (weekly or more) ( )

**OBJECTIVE 1: EVALUATE THE NATURE OF ILLEGAL ACTIVITIES OCCURRING IN MOUNT ELGON FOREST; BUNGOMA: KENYA.**

Participants should rate the frequency of each illegal activity using the provided scale

(Rarely, Occasionally, Sometimes, Frequently and Very frequently).

<b>Illegal Activity</b>	<b>1 (Rarely)</b>	<b>2 (Occasionally)</b>	<b>3 (Sometimes)</b>	<b>4 (Frequently)</b>	<b>5 (Very Frequently)</b>
Illegal logging					
Land encroachment					
Unlawful extraction					
Other illegal activities					

**OBJECTIVE 2: THE FACTORS CONTRIBUTING TO THE OCCURRENCE AND PERSISTENCE OF ILLEGAL ACTIVITIES IN FOREST MANAGEMENT**

**Q2: Please rate the following factors based on their contribution to illegal activities in Mount Elgon forest:**

Participants should rate the contribution of each factor using the provided scale (Not at all contributing, slightly contributing, Moderately contributing, Highly contributing, Very highly contributing).

<b>Factors</b>	<b>1 (Not at all contributing)</b>	<b>2 (Slightly contributing)</b>	<b>3 (Moderately contributing)</b>	<b>4 (Highly contributing)</b>	<b>5 (Very highly contributing)</b>
Poverty levels					
Access to alternative livelihood opportunities					
Economic disparities					
Ecological consequences of illegal activities					

**OBJECTIVE 3: ASSESS THE EFFECTS OF ILLEGAL ACTIVITIES ON THE ECOLOGICAL INTEGRITY AND BIODIVERSITY OF MOUNT ELGON FOREST**

**Q3: Please rate the extent of impact of illegal activities on the following aspects in Mount Elgon forest:**

Participants should rate the impact of illegal activities on each aspect using the provided scale (No impact, Minimal impact, Moderate impact, Significant impact, Severe impact).

Aspects	1 (No impact)	2 (Minimal impact)	3 (Moderate impact)	4 (Significant impact)	5 (Severe impact)
Habitat destruction					
Biodiversity loss					
Soil erosion					
Ecosystem disruption					

**OBJECTIVE 4: PROPOSED STRATEGIES FOR IMPROVED FOREST**

**MANAGEMENT PRACTICES TO MITIGATE AND PREVENT ILLEGAL**

**ACTIVITIES IN MOUNT ELGON FOREST, BUNGOMA, KENYA**

Q4: Please rate the effectiveness of the following strategies in mitigating and preventing illegal activities in Mount Elgon forest:

Participants should rate the effectiveness of each strategy using the provided scale (Not effective, Slightly effective, Moderately effective, Highly effective, Very highly effective).

Strategies	1 (Not effective)	2 (Slightly effective)	3 (Moderately effective)	4 (Highly effective)	5 (Very highly effective)
Strengthening law					
Increasing penalties					
Enhancing surveillance					

Promoting community involvement					
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**Assessment of Forest Management Practices and Utilization of Resources in Mount Elgon Forest, Bungoma, Kenya"**

Please rate the extent to which the following forest management practices and utilization of forest resources are implemented in Mount Elgon Forest, Bungoma, Kenya, using the scale provided below:

<b>Practices/Utilization of Resources</b>	<b>1 (Rarely)</b>	<b>2 (Occasionally)</b>	<b>3 (Sometimes)</b>	<b>4 (Frequently)</b>	<b>5 (Very Frequently)</b>
Sustainable Harvesting Techniques					
Reforestation and Afforestation Efforts					
Wildlife Conservation Measures					
Fire Prevention and Control Strategies					
Community Engagement and Participation					
Timber Harvesting Practices					

Non-Timber Forest Product (NTFP)					
Harvesting					
Ecotourism Development					
Carbon Sequestration and Climate Regulation					

**Appendix III: Interview Guide For Key Informants For Law Enforcement Officials, Environmental Activists, Researchers, And Local Authorities**

**Background Information:**

1. Can you please provide some background information about yourself? (Role, experience, affiliation with forest management, etc.)
2. How familiar are you with the Cheptais Forest and Kaberua Forest of Mount Elgon Forest in Bungoma, Kenya?
3. How long have you been involved in forest management activities in these areas?
4. In your opinion, what are the primary challenges or issues related to illegal activities in forest management in these specific forests?

**II. Understanding Illegal Activities:**

5. What types of illegal activities have you observed or encountered in Cheptais Forest and Kaberua Forest?
6. Can you describe any notable instances or incidents of illegal activities that you have come across in these forests? (If comfortable sharing specific examples, please do so.)
7. Who do you believe are the primary perpetrators or beneficiaries of these illegal activities? Are they individuals, organized groups, or specific industries?

**III. Factors Contributing to Illegal Activities: 8. What factors or circumstances do you think contribute to the prevalence of illegal activities in these forests? (E.g., poverty, lack of enforcement, corruption, community engagement, etc.)**

8. Have you noticed any particular socio-economic or political factors that may drive people to engage in illegal activities within the forests?

9. Are there any specific challenges or limitations in enforcing forest management laws and regulations in these areas? If yes, could you please elaborate on them?

**IV. Impact on Forest Ecosystem and Local Communities: 11. In your opinion, what are the environmental consequences of illegal activities in Cheptais Forest and Kaberua Forest? How do these activities affect the forest ecosystem, biodiversity, and local communities?**

10. Have you observed any indirect effects of illegal activities on the local communities, such as displacement, loss of livelihoods, or conflicts?

11. Are there any efforts or initiatives in place to mitigate the impacts of illegal activities on the forest ecosystem and local communities? If yes, could you please provide some examples?

**V. Strategies for Addressing Illegal Activities: 14. What measures, in your opinion, should be taken to address and prevent illegal activities in these forests? Are there any existing strategies or initiatives that have shown positive results?**

12. How can forest management authorities improve community engagement and participation in the conservation and protection of these forests?

13. Do you believe there is a need for capacity-building programs or awareness campaigns to educate local communities about the importance of sustainable forest management and the negative impacts of illegal activities?

14. Are there any specific policy or legislative changes that you think would be beneficial in curbing illegal activities in these forests?

15. What role do you believe external stakeholders, such as NGOs, government agencies, or international organizations, can play in addressing illegal activities in these forests?

16. Is there anything else you would like to add or emphasize regarding illegal activities in Cheptais Forest and Kaberua Forest?

17. Can you share your observations on the forest management practices and resource utilization in Mount Elgon Forest?

18. Specifically, what sustainable practices have you noticed, such as reforestation or wildlife conservation?

19. Also, how prevalent are activities like timber harvesting, non-timber forest product collection, and ecotourism development?"



Conclusion:

Thank the interviewee for their time and valuable insights.

#### Appendix IV: Observation Guide

Observation Guide for Illegal Logging Activities in Mount Elgon Forest

Objective: To observe and document illegal logging activities in Mount Elgon Forest.

1. Location and Date:	Specify the exact location within Mount Elgon Forest and the date and time of the observation.
2. Observers:	List the names and roles of the individuals responsible for conducting the observations.
3. Equipment:	Describe the equipment and tools needed, such as cameras, GPS devices, notebooks, etc.
4. Data Collection:	
- Note any signs of illegal logging activities, such as felled trees, logging equipment, or fresh tree stumps.	

- Document the GPS coordinates of observed sites.	
- Take photographs or videos to provide visual evidence.	
- Record any relevant details, such as the type of trees affected and the extent of the damage.	

5. Safety Precautions:	Provide instructions for the safety of observers, including how to interact with potential violators, if necessary.
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6. Data Recording:	Outline the format and structure for recording the collected data and observations.
--------------------	---

7. Reporting:	Specify the process for submitting observation reports and data to the research team.
---------------	---

8. Data Analysis:	Describe how the collected data will be analyzed and integrated into your research findings.
9. Assessment of Forest Management Practices and Utilization of Resources in Mount Elgon Forest, Bungoma, Kenya"	<p>Look for signs of sustainable harvesting techniques, such as selective logging or tree planting initiatives.</p> <p>Note any reforestation or afforestation efforts, including newly planted trees or areas undergoing restoration.</p> <p>Observe wildlife conservation measures, such as protected areas or habitat restoration projects.</p>

	<p>Pay attention to any fire prevention and control strategies in place, such as firebreaks or firefighting equipment.</p> <p>Assess community engagement and participation in forest management activities, including involvement in decision-making processes or community-led conservation projects.</p> <p>Record instances of timber harvesting practices, such as logging activities or timber extraction sites.</p> <p>Document any non-timber forest product (NTFP) harvesting, such as collection of medicinal plants or fruits.</p> <p>Take note of ecotourism development initiatives, including visitor facilities or guided tours.</p> <p>Evaluate the presence of carbon sequestration and climate regulation measures, such as carbon offset projects or monitoring efforts.</p>
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## Appendix V: Introduction Letter



### DIRECTORATE OF GRADUATE STUDIES

MASSC/2019/41569

15<sup>th</sup> April, 2024

National Commission for Science Technology & Innovation (NACOSTI)  
Off Waiyaki Way, Upper Kabete,  
P.O Box 30623- 00100  
NAIROBI, KENYA

Dear Sir/Madam,

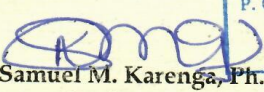
**RE: EZRA KORIR BARCHOK - REGISTRATION NO. MASSC/2019/41569**

The purpose of this letter is to introduce the above named student who is pursuing **Master of Arts in Security Studies and Criminology** in the **Institute of Security Studies, Justice and Ethics** in the school of **Social Sciences**.

The title of the research is " **A comprehensive Assessment of Illegal Activities County, Kenya.**" It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **April 2024, and June 2024.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

  
Dr. Samuel M. Karenga, Ph.D  
Director, Graduate Studies  
Enc.


Mount Kenya University  
P. O. Box 342 - 01000, THIKA  
Office of the Director,  
Graduate Studies

Appendix VI : NACOSTI Research License

Republic of Kenya  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 500077

**RESEARCH LICENSE**




**This is to Certify that Mr. EZRA KORIR KORIR of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Bungoma on the topic: A COMPREHENSIVE ASSESSMENT OF ILLEGAL ACTIVITIES IN FOREST MANAGEMENT IN MOUNT ELGON FOREST BUNGOMA COUNTY:- KENYA for the period ending : 19/April/2025.**

License No: NACOSTUP/24/34916

Applicant Identification Number: 500077

Director General  
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

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See overleaf for conditions

## Appendix VII: Research Authorization Letters

REPUBLIC OF KENYA



THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telephone: 055-30326.

Fax: 055-30326.

E-mail: [ccbungoma@yahoo.com](mailto:ccbungoma@yahoo.com)

When replying please quote

Office of the County Commissioner

P.O. Box 550-50200

**BUNGOMA.**

REF:ADM.15/13/VOL.V/109

Date: 22<sup>nd</sup> April, 2024

Deputy County Commissioner

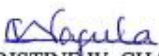
1. Mt. Elgon Sub-county
2. Kopsiro Sub-county
3. Cheptais Sub-county

**RE: RESEARCH AUTHORIZATION – EZRA KORIR BARCHOK.**

Reference is here made on the research license letter Ref: 500077 dated 19<sup>th</sup> April 2024 License No. NACOSTI/P/24/34916 signed by Director General, National Commission for Science, Technology and innovation.

The student is hereby granted authority to conduct research in the above listed Sub-Counties within Bungoma County on the topic **“A Comprehensive Assessment of illegal Activities in Forest Management in Mount Elgon Forest, Bungoma County: for the period between April 2024 and June.**

Kindly support him accordingly.

  
CHRISTINE W. CHACHA,  
FOR: COUNTY COMMISSIONER  
**BUNGOMA COUNTY**



Email: [zmbungoma@kenyaforestservice.org](mailto:zmbungoma@kenyaforestservice.org)  
When replying please quote,



ECOSYSTEM CONSERVATOR  
BUNGOMA COUNTY  
P.O BOX 506 – 50200  
BUNGOMA  
Date: 23<sup>rd</sup> April, 2024

REF.NO. KFS/BGM/ST/3/2/45

**Forest Station Managers**

- Kaberwa
- Kaboywa
- Cheptais

**RE: RESEARCH AUTHORIZATION-EZRA KORIR BARCHOK**

Reference is made to your letter dated 22<sup>nd</sup> April,2024 and research licence letter Ref;500077 dated 19<sup>th</sup> April 2024 No.NACOSTI/P/24/34916 on the above subject matter.

The student is hereby granted authority to conduct research in the three mentioned forest stations within Bungoma County on the topic A comprehensive Assessment of illegal activities in Forest Management in Mount Elgon Forest,for the period between April and June 2024.

Kindly support him accordingly



**ERIC ABUNGU  
COUNTY FOREST CONSERVATOR  
BUNGOMA COUNTY**

Mount Ke

## Appendix VIII: Turnitin Report

### A COMPREHENSIVE ASSESSMENT OF ILLEGAL ACTIVITIES IN FOREST MANAGEMENT IN MOUNT ELGON FOREST BUNGOMA COUNTY-: KENYA

#### ORIGINALITY REPORT

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<b>6</b>	"Tropical Forestry Handbook", Springer Nature, 2016 Publication	<b>&lt;1</b> %
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90	DeFries, R.. "Earth observations for estimating greenhouse gas emissions from deforestation in developing countries", <i>Environmental Science and Policy</i> , 200706 Publication	<1 %

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Appendix IX: Map of Mount Elgon Forest In Bungoma County Where Cheptais And Kaberua Forest Lies

