

**LIVELIHOODS AND SUSTAINABLE CONSERVATION
NEXUS AMONGST THE OGIEK COMMUNITY LIVING IN
MAU FOREST, NAKURU COUNTY, KENYA**

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DECLARATION

Declaration by Candidate

This Research Thesis is my original work and has not been presented for the award of a degree in any other University.

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List of Abbreviations and Acronyms

Community-Based Organizations (CBO)

Community-Based Natural Resources Management (CBNRM)

Community Forest Association (CFA)

County Integrated Development Plan (CIDP)

Centre on Housing Rights and Evictions (COHRE)

Ecosystem-based adaptation (EBA)

Faith-Based Organization (FBO)

Forest Action Network (FAN)

Food and Agriculture Organization (FAO)

Gross Domestic Product (GDP)

Human Rights Organization (HRO)

Sustainable Development Goals (SDG)

Sustainable Forest Management (SFM)

Participatory Forest Management (PFM)

Protected Area (PA)

Tiger Task Force Report (TTFR)

Internally Displaced Persons (IDPs)

Integrated Regional Information Networks (IRIN)

Kenya Forest Service (KFS)

Kenya Wildlife Service (KWS)

Mau Community Forest Association (MACOFA)

Mau Forest Complex (MFC)

Ministry of Environment and Natural Resources (MENR)

Non-Timber Forest Products (NTFPs)

Non-Governmental Organizations (NGOs)

United Nations (UN)

United Nations Development Programme (UNDP)

United Nations Environment Programme (UNEP)

United Nations Conference on Environment and Development (UNCED)

Definition of Operational Terms

Poverty: Denial of comfort about the absence of material revenue or utilization, low standard of health and education, and minimal opportunity for expression (Saunders, P.2004; Khatun, 2024).

Forest Conservation: Protection, improvement, or successful creation of forests (Essama-Nssah et al., 2002).

Socio-economic: Economic activity affects and is shaped by social processes. Analysis of societal progress, stagnation, or regression about the local, regional, or global economy (Cinner J., 2000).

Livelihood: A means of securing the necessities of life (Chambers & Conway, 1992, p. 6).

Sustainability: that which satisfies current needs while safeguarding the capacity of future generations to fulfil their objectives. (United Nations, 1987).

Abstract

Forests play a crucial role in alleviating poverty among rural, forest-dependent communities. However, a dilemma arises as these communities strive to sustain their livelihoods while governmental bodies and stakeholders for conservation endeavor to safeguard and preserve forests. Balancing the dual objectives of livelihood sustainability and conservation presents a challenge for all parties involved. This study assessed the link between livelihoods, sustainable conservation, and the Ogiek indigenous community of Molo Sub-County. The three main objectives of the study are: (1) to analyze the Ogiek community's challenges in accessing forest resources. (2) to assess conservation efforts for the sustainable use of Mau Forest resources supporting the livelihoods of the Ogiek community. (3) to examine the challenges of collaboration between the Ogiek community and other stakeholders in fostering sustainable livelihoods while safeguarding Mau Forest. Applying a landscape approach framework, the study incorporated strategies that intersect and harmonize to facilitate the integration of agricultural and forestry issues. The study's target population consisted of 300 Ogiek community households and 12 representatives from Chiefs, HRG, CFA, and KFS. Purposive and stratified random sampling techniques were employed. The primary survey tool for data collection was questionnaires. The study gathered information through Focus Group Discussions and in-depth interviews with key informants. For data analysis, the study utilized descriptive statistics, explicitly focusing on frequencies and percentages, using SPSS version 22. My results indicate that the Ogiek community relies almost entirely on the forest for its livelihood. The Ogiek community, however, faces significant challenges in forest resource access and conservation participation due to limited engagement with CFAs and ongoing socio-political tensions. Their dependence on forest products for livelihood highlights the urgent need for inclusive policy reforms prioritizing their input while fostering sustainable practices and alternative economic opportunities. Policymakers should engage them in collaborative dialogue to incorporate their needs into forest management. Inclusive reforms that recognize their rights, alongside initiatives for sustainable practices and alternative economic opportunities, will enhance their livelihoods and improve forest conservation.

1.0 INTRODUCTION

1.1 Background to Study

Forests are vital for human well-being, providing essential goods and services globally (Miller & Hijjar, 2019). They contribute over US\$250 billion annually to developing economies (Ferraro et al., 2011; Agrawal et al., 2013) and support many rural residents below the poverty line in low- and middle-income countries (Babulo et al., 2008; Mamo et al., 2007; Nguyen et al., 2015). About 1.6 billion people live near forests (Carr et al., 2021), with over one billion relying on them for their livelihoods (Chao, 2012; FAO, 2015; Angelsen et al., 2014; Belcher & Dewi, 2015; Dokken & Angelsen, 2015). Around one million rural residents and 25% of the global population depend on 3,999 million hectares of forest (FAO, 2015).

Approximately one billion people derive significant income from forest extraction (FAO, 2015), including industrial raw materials, fuel wood, and medicinal plants (Saha & Sundriya, 2012; Langat et al., 2016; Mamo et al., 2007) as well as wild foods like bush meat and fruits (Pingali, 2015; Hickey et al., 2016; Ickowitz et al., 2014; Powell et al., 2013; Arnold et al., 2011). About 80% of the population in developing nations relies on forest resources (FAO & UNEP, 2020). Non-timber forest products (NTFPs) are used for direct consumption or income (Delgado et al., 2023) by billions globally (Shackleton et al., 2024), fulfilling livelihood needs (Martins & Shackleton, 2022). Additionally, forests help purify the environment and maintain ecosystem stability (Bisui et al., 2023).

Household socio-economic factors influence forest product use (Angelsen et al., 2011; Senganimalunje et al., 2016). Resource access depends on income, education, and land size (Coulibaly-Lingani et al., 2009). Community involvement and resource proximity affect accessibility (Senganimalunje et al., 2016), boosting extraction when markets exist (Mamo et al., 2007) and limiting participation when distance is a factor (Gutierrez Rodriguez et al., 2009). Forest-dependent communities enhance access rights through community engagement

(Kabubo-Mariara, 2008). Seasonal changes affect resource collection due to labor availability (Senganimalunje et al., 2016).

Africa is home to 25% of the world's remaining rainforest (Nchanjia et al., 2023) and has 582 million hectares of forests in sub-Saharan Africa, which support diverse ecosystems (Katerere et al., 2009). Due to limited options, many impoverished households depend on environmental resources, relying more on forest services than wealthier counterparts (Angelsen et al., 2011; Vedeld & Sjaastad, 2013). Over 70% of the sub-Saharan population depends on forests for income and sustenance (Nchanjia et al., 2023), with nearly 300 million people living in forests, including 60 million indigenous individuals (Jiwot et al., 2021). Forests serve as safety nets for rural livelihoods during crises (Babigumira et al., 2014) and provide essential food and medicine (Duguma et al., 2019).

Kenyan forests offer vital economic, environmental, social, and cultural benefits. The sector directly employs about 50,000 people and indirectly supports 300,000, with over 530,000 households near forest reserves relying on them for livelihoods (KFS, 2017). The Mau Forest Complex (MFC) is Kenya's key 'water tower,' supplying water to rivers flowing into Lake Victoria, Natron, and Turkana, and benefits six million people (Olang, 2011). MFC is crucial for rural rain-fed farming (Wolff, 2011) and is a major honey-producing area (Olang, 2011).

The Ogiek community, among Kenya's last hunter-gatherers, lives in MFC, and its cultural beliefs are tied to the forest. However, deforestation and degradation are pressing issues (Chrisphine et al., 2016; Jacobs et al., 2017; Miller et al., 2021), driven by logging for the past century (Were et al., 2013). Between 1973 and 2013, a quarter of the forest cover was lost (Swart, 2016), and from 2010 to 2016, 42.4% of the Western Mau Forest was disrupted (Brandt et al., 2018). In 40 years, 850 km², or 43.5%, of the eastern part has degraded (Kweyu et al., 2020).

Recently, stakeholders, including the government and communities, have initiated efforts to halt MFC deforestation (Miller et al., 2021). Initiatives like AFR100, INDCs, and the REDD+ program have been

implemented, along with the Voluntary Partnership Agreement (VPA) (Jebiwott et al., 2021). However, limited research connects forests and livelihoods to support sustainable conservation. This study analyzes the link between the forest-dependent Ogiek community's livelihoods and sustainable conservation in East Mau, Kenya.

1.2 Statement of the Problem

The Ogiek community's livelihood is fundamentally linked to forest resources. While these forests present development opportunities, they also challenge meeting conservation objectives (Timko et al., 2010). Previous conservation efforts within Mau Forest have centered on the involvement of Ogiek community members, primarily focusing on enhancing natural capital. However, there has been insufficient consideration of how these natural resources can sustain or improve the community's livelihoods when integrated with other assets.

This oversight has resulted in a lack of recognition for the significant role that forest products play in fostering sustainable livelihoods. Furthermore, awareness of forests' contribution to achieving sustainable living and alleviating poverty and the implications of conservation efforts remains limited. Inadequate advocacy, insufficient data, and valuation of forest resources compound the challenges. Addressing these gaps is essential for promoting a sustainable future for the Ogiek community.

Since immemorial, the Ogiek community has coexisted with the MFC and relied entirely on the forest for their means of living. The community's traditional lifestyle has been threatened over time. In recent times, the government of Kenya has claimed that the community is a threat to MFC's conservation and thus forcefully evicted them. These evictions have led to devastating negative impacts on the social and economic aspects of Ogiek's livelihood. The Ogiek have, however, actively opposed the evictions and filed numerous claims against the government. The resistance has caused severe conflict between Ogiek and the government, worsening the delicate situation.

In this regard, there is an urgent need to acknowledge the significance and potential of the forest sector in promoting sustainable livelihoods. Although there has been a growing interest in linking forest-dependent communities to forest conservation in recent years, limited attempts to systematically assess the linkage are available. The dilemma has been achieving forest conservation goals while simultaneously securing forest livelihoods. The research, therefore, assessed the link between livelihoods, sustainable conservation, and the Ogiek Indigenous community of Molo Sub-County.

1.3 Objective of the Study

The study's primary objective is to assess the link between livelihoods, sustainable conservation, and the Ogiek Indigenous community of Molo Sub-County, Nakuru, Kenya. The following specific objectives guided the study.

- i. To analyze the Ogiek community's challenges in accessing forest resources in Mau Forest, located in Molo Sub-County
- ii. To assess conservation efforts for the sustainable use of Mau Forest resources supporting the livelihoods of the Ogiek community in Molo Sub County.
- iii. To assess collaboration challenges between the Ogiek community and other stakeholders in promoting sustainable livelihood and conservation of Mau Forest in Molo Sub-County.

1.4 Research Questions

- i) What challenges does the Ogiek community face in accessing Mau Forest resources in Molo Sub-County?
- ii) What conservation efforts support the sustainable use of Mau Forest resources and the Ogiek community's livelihoods?

- iii) Do the Ogiek Community households experience challenges in collaborating with the Government and Civil Society Organizations on sustainable livelihood and forest conservation?

1.5. Rationale of the Study

The research focuses on the livelihood strategies and economic activities of the Ogiek community, highlighting how the availability and accessibility of forest resources influence their choices. It also examines whether alternative revenue-generating activities have been adopted. A critical aspect of the study is assessing the relationship between livelihoods and sustainable conservation, which is vital for creating effective conservation strategies that meet the Ogiek community's needs (Khalid, 2020).

Additionally, the study analyses the impact of conservation efforts on the Ogiek's livelihoods and explores pathways for sustainable forest conservation practices that can benefit the community. The Ogiek have historically faced marginalization and challenges in defending their land and resource rights (Ngoya, 2019). By linking livelihoods with sustainable conservation, the research enhances understanding of how conservation practices can align with the rights and aspirations of Indigenous communities. The findings provide detailed insights for stakeholders, including policymakers, conservation practitioners, and local communities, about the interplay between livelihoods, sustainable conservation, and Indigenous rights (Adams & Hutton, 2007).

This research contributes significantly to the global agenda for sustainable development, particularly through frameworks such as the UN Agenda 21 (United Nations, 1992), the World Summit on Sustainable Development (United Nations, 2002), and the Sustainable Development Goals (SDGs), especially SDG 1, which targets the end of poverty in all its forms and promotes life on land (United Nations, 2015). Moreover, it aligns with Kenya's constitutional goal of achieving 10% forest cover by 2030 and contributes to the County Integrated

Development Plan (CIDP) and strategic plans (Government of Kenya, 2018).

Ultimately, the study enriches existing knowledge by addressing gaps and offering perspectives on integrating sustainable forest-based livelihoods with policy structures. It is a vital intersection between sustainable livelihoods dependent on forests and conservation efforts (Berkes, 2012). By exploring these connections, the research provides valuable insights that can help address conservation challenges, promote social justice, and improve the well-being of the Ogiek community and their ecosystem (Khan et al., 2021).

1.6 Conceptual Framework

This section briefly explains two conceptual frameworks: the forests as pathways to prosperity framework and the sustainable livelihood approach (SLA). Furthermore, we give a detailed description of Carl Troll's (1939,1971) landscape approach, which this study adopts.

A conceptual framework for analyzing forests as pathways to prosperity, adapted from typologies (Angelsen et al., 2014; McKinnon et al., 2016), argues for an expanded conceptual framework that directs attention to a more comprehensive range of dimensions of human well-being. It facilitates analysis of whether and how forest conservation, management, and use provide a pathway out of poverty. However, the framework focuses more on livelihood improvement than forest resource sustainability.

The sustainable livelihood approach (SLA) developed by Chambers and Conway (1992) defines sustainable livelihood as (...) A livelihood comprises the capabilities and assets encompassing both physical and social assets alongside the necessary actions for sustaining existence. Sustainability in livelihood is demonstrated when it can endure, rebound from pressures and unexpected events, and continuously strengthen its abilities and resources while not undermining the natural

resource base (...) (Ashley & Carney, 1999). Environmental and social aspects encompass SLA. Drawing ideas from Chambers (1992), human well-being and capabilities are the significant aspects of the framework. The primary challenge of this framework is measuring and comparing capital assets, which include human, social, physical, financial, and natural resources.

Considering the challenges of the forests as pathways to prosperity framework and SLA, this study adopts Carl Troll's landscape approach because it integrates both agricultural and forestry issues and recognizes the interconnection between land use and different stakeholders (GLF,2015). In this study, the framework is seen as the forest land management by dependent communities for sustainable forest resources and non-forest-based livelihoods.

The dependent variables in this study encompass several critical aspects related to the Mau Forest and the Ogiek community. Firstly, the conservation status of the Mau Forest can be evaluated through various indicators, including changes in forest cover, diversity of tree species, density per hectare, and knowledge of sustainable forest management. Secondly, the livelihoods of the Ogiek community can be assessed by measuring increases in household income and the number of income-generating activities, such as beekeeping, herbal harvesting, and ecotourism initiatives associated with the Mau Forest. Finally, the effectiveness of collaborative efforts can be determined by the frequency of multistakeholder meetings conducted annually, biannually, or monthly, the engagement of Ogiek households in decision-making forums, their level of participation in project co-management and conflict resolution processes, as well as the outcomes of relevant cases. (A) Multifunctional landscapes are the independent variable. The study assumes that habitat productiveness and regulatory, social, and economic objectives are supported by multifunctional landscapes (Mander et al., 2007), including fuel wood, private farms, smallholder agriculture, cash crops (tea), communal forestry, and watershed functions. Time frames can differ in the products and

services, benefiting various stakeholders with differing rights, access, resource management, and power over decisions. By integrating approaches, managing multifunctional land use systems can promote livelihood, conservation, and sustainability (Mbow et al., 2014).

This study identified intervening variables, including **(B)** a sustainable livelihoods framework. Resource-based integrity is paramount for a livelihood to be sustainable, as it must withstand and recover from stress and shocks while continuously enhancing its capabilities and assets without compromising the present or future. For successful forest conservation, recognizing all stakeholders and fully involving them in all phases of project management is key.

(C) Supporting Principles: The principles of the landscape approach are integral and function collaboratively. This study emphasizes the importance of promoting resilient actions to effectively address threats and facilitate recovery in the face of challenges. The sustainability of processes and benefits relies on the continual maintenance and strengthening of resilience, which can be achieved by enhancing the capacity of stakeholders.

Furthermore, ongoing learning from the outcomes plays a critical role in the effective management of landscapes. It is essential to continually adjust to learning from and revise strategies, allowing for the integration of new knowledge from diverse sources. Importantly, the inclusion of Indigenous knowledge is vital to advancing conservation efforts. Ecosystem-based approaches (EBA) should promote integrated land management for equitable, sustainable forest conservation. It recognizes humans as essential to ecosystems and establishes successful stakeholder collaborations. **(E)** A combination of the intervening variables will lead to successful collaboration that will aid in the livelihood of the Ogiek community and successful forest conservation. A framework was developed from the above conceptual and theoretical approaches. See Figure 1.

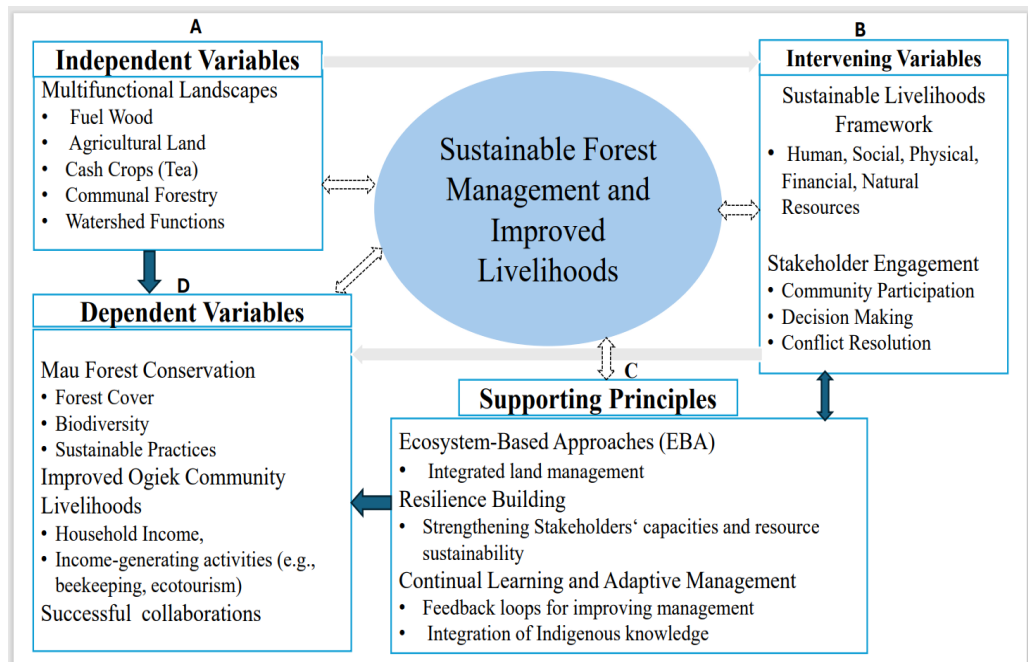


Figure 1: Conceptual Framework: A Landscape Approach for Analyzing Household Livelihood Strategies and Forest Conservation
Source: Author,2022.

The conceptual framework aided the study in data collection by combining traits of landscape styles used to identify the research area. Further, it identified and analyzed the presence of legitimate coalitions or networks of stakeholders governing MFC to achieve impact by shaping actors' outcomes.

Additionally, in seeking financial assets and a spatial inventory of natural, physical, social, and human assets at KFS. Finally, the framework aided in developing a metric useful for measuring the effectiveness of the landscape approach linked with livelihood improvement for the study area.

2.0 LITERATURE REVIEW

2.1 Introduction

Literature related to this study has been reviewed thematically and guided by the specific objectives. Identification of existing knowledge gaps regarding the link between livelihood and conservation, as per the study goal, was filled. This section is divided into four parts: (i) Forest Resource Access Challenges for Dependent Communities, (ii) Conservation Efforts for the Sustainable Use of Forest Resources, (iii) Collaboration Challenges for Local Communities, (iv) Literature and Identification of Research Gaps.

2.2 Forest Resource Access Challenges for Dependent Communities

Governments and international communities have used protected areas (PAs) to halt biodiversity loss and ecosystem degradation and achieve global climate and development priorities. According to Tauli-Corpuz (2020), the creation of fortress conservation through investment in PAs negatively affects land and the rights of communities to access the forest. At the regional level, countries experience mixed impacts of PAs on the poverty index differently (Ferraro & Hanauer, 2011; Pfaf et al., 2014; Canavire-Bacarreza & Hanauer, 2013; Clements et al., 2014).

Creating protected areas can limit local communities' access to traditional resources, driving them towards unsustainable alternative practices (Gallo et al., 2021). Pils (2016) details reasons why forced evictions undermine the elimination of poverty. Household characteristics, such as socio-economic status, significantly impact community engagement and management effectiveness in PAs, affecting biodiversity conservation and socio-economic benefits (Bennett & De Marco, 2019; Roe & Elliott, 2020). Environmental economists and policy makers have raised further concerns about whether the establishment of PAs negatively affects people's livelihoods by limiting forest resources or positively by creating ecotourism activities. (Pullin et al., 2013; Baylis et al., 2016).

Establishing national parks in the United States has often resulted in the displacement of Indigenous communities, highlighting the ongoing struggle for Indigenous rights and recognition in conservation efforts (Cunneen, 2022; Smith & Adkins, 2023). Islam & Mungai (2016) conclude by indicating that forced evictions adopt different approaches and differ depending on the circumstances.

In Africa, while the causes of eviction may be historical through either colonialism (Evers & Kooy, 2011) or development (Baker, 2022), three case studies show a tendency towards the eviction of indigenous groups due to nature conservation (Maravanyika, 2012). In their study, Baird et al. (2013) explain that eviction is a disruptive force or unexpected event influencing the development of diversification strategies in emerging economies. The research also suggests that the potential for adverse impacts from eviction-induced shocks can be particularly concerning in regions where residents live near subsistence levels, as even a slight decrease in household income could have catastrophic consequences.

Cavanagh (2012) and Kyere-Boateng et al. (2021a & b) argue that encroachment of protected areas for agriculture and livestock is a challenge for nature conservation in developing countries. This issue is exacerbated by population pressure around the parks and increased poverty levels. Additionally, Bhushal et al. (2024) emphasize the significance of equitable resource access in reducing human-wildlife conflict, which parallels Cavanagh's assertion about restricted access to formerly available resources.

In conclusion, Cavanagh (2012) indicates that people encroach because they have limited access to resources they used to access freely before their rights were curtailed. Several studies further validate this, finding that community-based resource management could help mitigate the pressures on protected areas by empowering local populations (Bennett et al., 2020; Katikiro et al., 2024; Kachali et al., 2024)

2.3 Conservation Efforts for the Sustainable Use of Forest Resources

Traditionally, the main objectives of forest management have been to enhance wood production and economic profitability. However, over the past decade, focus has been shifted significantly from sustained yield management to sustainable forest management (SFM). This change has emerged from the necessity to consider additional goals (Hahn & Knoke, 2010). SFM has become a prevailing paradigm in forest management (MacDicken et al., 2015).

SFM aims to balance forests' socio-cultural, ecological, and economic roles. This approach aligns with the principles set forth during the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, 1992 (Hahn & Knoke, 2010).

Ecosystem services recognize the dependence of human welfare on various environmental benefits and their connection to sustainable forest management (SFM) (Quine et al., 2013). Numerous studies indicate that ecosystem services (ES) are increasingly being planned, priced, and marketed (Schomers & Matzdorf, 2013; Wangai et al., 2016; Hansen & Malmaeus, 2016; Englund et al., 2017; Costanza et al., 2017, 2018). Multiple ecosystems across landscapes should be managed and balanced (Triviño et al., 2015; Nelson et al., 2009; de Groot et al., 2010). Deal et al. (2012) conclude that SFM closely aligns with the preservation of forest ecosystem services, and the potential of SFM can be enhanced through the valuation and marketing of ES. Additionally, Biber et al. (2015) contend that forest ES is somewhat sensitive to trade-offs and requires management and collaboration between wood production and ES. Nordström (2010) advocates a multi-stakeholder approach to forest ecosystem services across landscapes.

Successful natural resource management recognizes governance as essential (Potts, 2019). Various groups and governments have adopted collaborative, participatory, and polycentric governance structures (Yeboah et al., 2017; Bixler, 2014). Many authors argue that significant experimentation has contributed to this transformative shift in

governance, including innovative decision-making approaches that have produced varying levels of success and impact on outcomes within social-ecological systems (Potts et al., 2016; McFadgen & Huitema, 2017). However, further studies indicate that, in practice, achieving these principles presents a challenge for the successful management of natural resources, as well as for the planning and implementation of activities (Waylen et al., 2018; Petursson & Vedeld, 2017; Dale et al., 2016; Potts et al., 2015; Kuzdas et al., 2015).

In this regard, the Kenyan government has placed high importance on the forest conservation agenda, which is evident in its policies and legislation. The Forest Act of 2016 is one of the primary policies concerning forest conservation. Additionally, there are other laws related to land restoration and associated ecosystems. These include the 2010 Constitution, which mandates maintaining and restoring a tree cover of at least 10% of the country (GoK, 2010c). By 2030, the National Climate Change Response Strategy aims to grow approximately eight billion trees across 4.1 million hectares of land (GoK, 2010b).

Programs aimed at conserving indigenous forests in Kenya's water towers are being implemented through Kenya's Vision 2030 (GoK, 2007). One billion trees have been planted to enhance forest growth and create job opportunities for youth (GoK, 2007). Additionally, preparations for reducing emissions from deforestation and forest degradation (REDD+) are ongoing to increase forest carbon stocks. The Kenya Forest Service (KFS), established under the Forest Act of 2016, is primarily responsible for conserving, managing, and utilizing forests and their associated products (MENR 2016).

The Act establishes Participatory Forest Management (PFM) to engage forest-dependent local communities in collaboration with the government for forest management (Kimutai & Watanabe, 2016), leading to the formation of Community Forest Associations (CFAs) (Kairu et al., 2018). To achieve the 10% forest cover target, KFS aimed to increase forest area by 670,000 hectares by 2020, partially through partnerships with the CFAs (KFS, 2017). Over the past decade,

enhancing forest management has been a key objective in amendments to the forestry sector (MENR, 2016). Furthermore, due to devolution, county governments must develop spatial plans and forest conservation strategies (GoK, 2014). The Kenyan Constitution 2010 reinforces the Forests Act of 2005 (KFS, 2010).

2.4 Collaboration Challenges for Local Communities

PFM positively impacts forest conservation (Takahashi & Todo, 2012). However, understanding the welfare implications of household participation in PFM remains limited. Additionally, PFM has not fulfilled its promise to fairly distribute economic and social benefits to those living near forests (Persha & Meshack, 2016; Green & Lund, 2015). PFM has introduced new rules and regulations restricting livelihood options connected to forests (Larson et al., 2013), decreasing forest-based income.

Similarly, global forest governance has experienced increased market-oriented approaches (Scheba, 2017; Andersson et al., 2018). Several studies promote the use of market strategies to tackle the challenges of PFM, along with conservation and sustainable use trade-offs (Burgess et al., 2010; Blomley et al., 2017). As a result, solutions to combat deforestation and forest degradation have been implemented through frameworks like REDD+ (Bhagwat et al., 2017). However, the groundwork for implementing market-based approaches (MBA) such as REDD+ has depended on existing forest governance methods, including PFM (Khatun et al., 2015; Blomley et al., 2017). These methods have resulted in problems, such as the violent eviction of communities residing near forests (Chomba et al., 2016). The reliability of MBAs in being environmentally effective or cost-efficient is insufficient (Muradian et al., 2013). Their implementation becomes complicated when forests depend on informal, legally customary use rights.

There is a weak legal basis for compensating individuals for the non-use of resources that are not officially theirs (M. Veronesi et al., 2015). Furthermore, several authors argue that the complexity of MBA design

and weak property rights can lead to counterproductivity, and trade-offs between environmental objectives and poverty alleviation may be involved (Corbera et al., 2007; Engel et al., 2013). In addition, groups such as local communities typically possess customary rights, which raises issues related to a common-pool dilemma (Dawson et al., 2021).

Internalizing externalities is a concept embraced by most MBAs (Engel et al., 2008). However, the authors argue that this approach suggests that individuals neither purchase nor sell ecosystem services (Schomers & Matzdorf, 2013).

2.5 Summary of Literature Review and Gaps

The preceding review has demonstrated the presence of relevant literature for this study. Over the last decade, there has been an increased acknowledgement of the impact of forest resources on the livelihoods of communities residing near forests. However, challenges remain in making effective comparisons between human dependence on forests, conservation of environmental resources, and fostering successful collaborations among stakeholders. The prioritization of the daily needs of forest-dependent populations within forest contexts is still inadequate.

Furthermore, neighbouring forest communities are unaware of the values associated with ecosystem services, resulting in poorly documented sustainable forest management practices. Despite collaborations between forest-dependent communities and other stakeholders, the sustainability issue in forest conservation continues. Conflicts arise between forest conservation efforts, communities' livelihoods, and active involvement in these initiatives. Insufficient attention is given to the root causes of existing conflicts. This study aims to fill these gaps by assessing the link between livelihoods, sustainable conservation, and the Ogiek Indigenous community of Molo Sub-County, Nakuru, Kenya.

3.0 RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the methodology and procedures used in this study, which are considered in attaining the set research objectives and goals according to the study requirements. The research design and methodology outline the framework for collecting and analysing relevant data. Turato (2000) defines methodology as a systematic study of methods used within a discipline. This chapter, therefore, presents a detailed discussion of the research design, its nature and sources of data, sampling, data collection, data analysis methods, and presentation in investigating the study problem.

3.2 Study Area

The study took place in Mariashoni ward of Molo sub-county, Nakuru county. It covers an area of about 250 Km² in the north-eastern part of the Mau Forest complex.

The area has 12,000 people, including Nandi, Kikuyu, and Kipsigis; 4,000 are Ogiek. There are 3,250 households (KNBS REPORT 2019). Its area is 167 square kilometers, with 389 people per square kilometre. In the Eastern Mau Forest region, Mariashoni (S 0° 22' 06" E 35° 49' 28") is a critical trading and business centre. Cash crop farming for potatoes, peas, and maize contributes to the area's economy. In addition, livestock rearing of cattle, sheep, and goats, as well as subsistence farming, is practiced. The small villages for the Ogiek are far from the forest, often in the middle and lower altitudes (Zocchi et al., 2020). As shown in Figure 27 in the Annex section.

3.2 .1 Climate

3.2.1.1 Rainfall

The climate is influenced by the modification of the North-South movement of the Intertropical Convergence Zone (ITCZ) due to local orographic effects. May and June typically encounter the long rainy season, while a shorter rainy period occurs from September to November. The annual rainfall average is about 1300 mm in normal

years, bereft of extreme weather like El Niño. The mean monthly rainfall ranges between 30 and 120 mm (Kundu, 2007; Smith et al., 2023) (Figure 2).

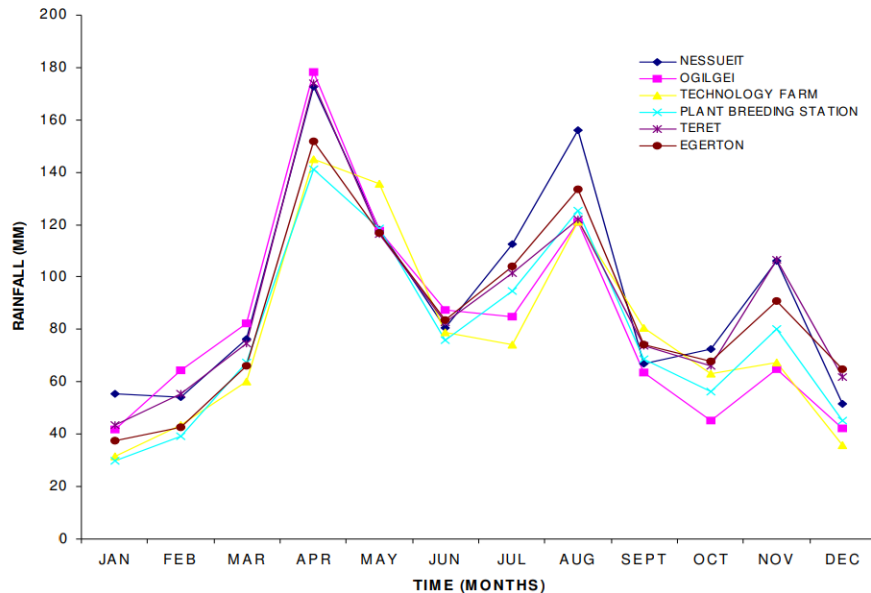


Figure 2 Distribution of Monthly rainfall from six weather stations in MFA Source: Kundu (2007)

3.2.1.2 Temperature and Evapotranspiration

According to classification by moisture indices, average evapotranspiration, and annual rainfall amounts, the North-eastern MFC falls into agro-climatic zones I, II, and III. Its various topographies complicate yearly estimations of actual mean air temperature. Annual average evapotranspiration estimates range from 1.3 mm/day to 4.2 mm/day, with an average of approximately 3.85 mm/day. Additionally, the temperature is cold, with a mean ranging from 10 to 15°C. The North-eastern Mau is the primary upper catchment of the Njoro, Naishi Makalia, and Nderit rivers, flowing into Lake Nakuru.

3.1.3 Vegetation and land cover

Montane forests cover the high-altitude area, giving way to mixed grassland and African bamboo forests. Near the escarpments, montane

sclerophyllous forest exists (Birdlife International, 2013). Logging has been rampant in recent years, leading to the colonization of pioneer tree species such as *Conopharyngia stapfiana* Stapf in the area. Various tree species, such as *Olea europaea* L. subsp., Wall. ex G. Don Cif, *Prunus Africana*, and *Podocarpus latifolius*, among others, can be found (Birdlife International, 2013). Large parts of the high *Juniperus virginiana* L. have been deforested (Birdlife International, 2013), and some areas have been cultivated. Maize, Irish potatoes, wheat, peas, and more grow in this region, while cattle graze the fields.

3.3 Study Design

This study employed a descriptive survey to examine and report how things are, detailing values, characteristics, and behaviour (Creswell & Creswell, 2018). According to Huyler & McGill (2019), descriptive research involves gathering data to examine hypotheses or address inquiries about the significance of the subjects under study. Therefore, this design is suitable as it focuses on the link between ongoing forest conservation initiatives and the sustenance of livelihoods within the forest-dependent community. Questionnaires were used as the research instrument. The data collected contributed to formulating recommendations for this study.

3.4 Sample Size and Sampling Procedures

3.4.1 Sampling Location

The research study was carried out within Mariashoni ward, situated in Molo Sub-County, adjacent to the border of Mau Forest. The ward has a mixed settlement of different communities with a population of 3,332 in 2019 (Kenya National Bureau of Statistics, 2019). The selection of this area was deliberate, primarily due to its proximity to the forest, which experiences significant encroachment and degradation. Moreover, numerous rural households rely on forest resources for their livelihoods within this region. Additionally, many

development civil society organizations have projects in this area. The research occurred in two of the six villages, Kapcholola and Kitiro.

The two villages were selected for their ability to represent Mariashoni ward within the time and budget limitations. Although collecting data from all villages would yield a more thorough understanding, focusing on these two still offers valuable insights. These villages were chosen because they share community characteristics and challenges concerning forest resources. This focus allows the study to emphasize significant issues like forest encroachment, degradation, and access, which may be prevalent throughout the ward. Nevertheless, it is essential to recognize that this choice may not encompass the complete variety of experiences found in other villages, highlighting the need for further research to incorporate a broader range of perspectives in subsequent studies.

3.4.2. Sampling of Households

Purposive sampling was utilized to select households from the Ogiek community within a mixed settlement context. The study aimed to target a sample of 300 households across two villages. The selection of a sample size of 300 households from a population of 3,332 is based on several key methodological considerations.

This sample size is statistically sufficient to ensure representativeness, enabling reliable generalizations about the broader population and capturing diverse community experiences. Additionally, increasing sample size yields diminishing returns in precision and reliability beyond a certain threshold, making 300 households an optimal choice for the desired confidence level. Focusing on the villages of Kapcholola and Kitiro allowed for examining local variations in forest resource utilization, providing valuable insights into the impacts of encroachment and degradation. Thus, this sample size effectively balanced rigorous research objectives with practical implementation considerations.

Employing a stratified sampling approach, I categorized these households according to the population distribution within each village.

The preliminary analysis revealed that Kapcholola village comprised 60% of the total households, whereas Kitiro village constituted 40%. Therefore, I allocated 180 households to Kiptunga and 120 to Kitiro. Subsequently, purposive sampling was employed to identify specific households near the forest in both villages, incorporating a random selection process to minimize potential bias. Furthermore, I ensured that the selected households accurately reflected the demographic characteristics of the overall population in each village, which enhanced the validity of the study's findings.

Respondents were chosen from households located within a five-kilometre radius. The selection of a five-kilometre radius from the forest was based on the understanding that proximity to the forest significantly affects the community's interaction and dependence on its resources. According to Meffe and Carroll (1994), the community's influence and engagement with the forest diminish as the distance from the forest increases. Therefore, selecting households within this radius ensured respondents had a direct relationship with the forest, providing more relevant and accurate insights into their interactions, perceptions, and behaviours related to the forest ecosystem. This approach also helped focus on the most affected population, enhancing the study's relevance and findings.

$$n = \frac{\frac{Z^2 * p(1 - p)}{e^2}}{1 + \left(\frac{Z^2 * p(1 - p)}{e^2 N}\right)}$$

Where: n = Sample size (**300**) | N = Population Size (**300**) e = Margin of error (**0.0124**) | Z = Z-score at 95% confidence level (**1.96**)

Cochran's Sample Size Formula

3.4.2 Key Informants

The study involved key informants from the Mau Forest leadership team within the Kenya Forest Service (KFS), which included a conservator and a forester. Moreover, two representatives from the

Ogiek Peoples Development Program, a human rights organisation, four Community Forest Association (CFA) members, two local chiefs, and two village elders participated. Twelve informants were chosen based on their expertise and engagement with relevant issues, as outlined in Table 1. The deliberate selection was aimed at facilitating a comprehensive understanding of the complexities inherent in the study

Table 1 Key informants

Stakeholders	Sample population
Government Agencies (KFS)	2
Ogiek Peoples Development Program (HRG)	2
Representatives from CFA	4
Chiefs	2
Village Elders	2
TOTAL	12

Source; Author

The respondents were stratified into Ogiek community households and key informants. Those interviewed using the questionnaire were sampled using the purposive method, which enabled me to interview several respondents in the two villages. Drawing a population sample ensures that each member has an equal probability of selection (Kerlinger, 1964). Purpose and snowball sampling techniques were employed to identify key informants for this study, facilitating in-depth interviews and Focused Group Discussions (FGDs).

Personal judgment is essential in selecting participants for the research to align with the study's objectives (Frankel & Wallen, 2000). To incorporate a variety of perspectives and minimize potential bias, I considered factors such as gender, availability, willingness to participate, and expertise in the research topic. I also factored in

logistical aspects like accessibility to ensure effective participation, which ultimately contributed to a participant pool that improved the quality and integrity of the research.

3.5. Instruments

Individual interview questionnaires and FGD guides were chosen as the primary tools for data collection due to their effectiveness in gathering information from a large sample size, making it both time-efficient and cost-effective (Kombo & Tromp, 2006). This method was especially beneficial for obtaining quantitative data essential for generalization and statistical analysis.

The questionnaire was designed to enhance the effectiveness of data collection and includes several key components. These consist of an introductory section that outlines the study's objectives and offers clear instructions for respondents. A demographic section was added to gather basic participant information, followed by primary thematic sections focusing on specific research areas.

The instrument utilized a mix of closed-ended and open-ended questions to facilitate a thorough analysis, enabling quantitative and qualitative data collection. Moreover, follow-up questions were included to draw out more profound insights. The question design also aimed to assess the level of collaboration and the impact of local factors within decision-making processes, thereby enriching the depth of responses.

This approach allowed for understanding respondents' sentiments, lifestyles, interests, and decision-making processes. Responses were measured using a Likert scale ranging from 1 (extremely poor) to 5 (excellent), thus permitting the assessment of attitudes and feelings related to the research topics.

The concluding section expressed gratitude to the respondents and highlighted the study's importance, along with a consent area to uphold ethical standards. This organized format aids in gathering thorough and comparable data. The questionnaires were systematically distributed to

households within the Ogiek community, ensuring a broad representation of perspectives and experiences. By utilizing a standardized format, the questionnaires enabled the comparison of responses across different households within the Ogiek community, thereby enhancing the reliability of the findings.

Additionally, two focus group discussions (FGDs) were conducted with representatives from the Ogiek Peoples Development Program, a human rights organization, Community Forest Association (CFA) members, local chiefs, and village elders. The FGDs were structured to facilitate collective interaction and gather qualitative insights. As a facilitator, I moderated the discussion, establishing ground rules and guiding participants through open-ended questions to encourage dialogue on the key research themes. The discussion phase allowed the participants to express their views and build on each other's contributions. The session concluded with a summary of key points and an opportunity for additional insights. The discussions were documented and later analysed, identifying recurring themes relevant to the research objectives.

Moreover, in-depth interview schedules were implemented for government agencies, specifically the Kenya Forest Service (KFS), to obtain qualitative data that delved into the intricate relationship between conservation efforts and the livelihoods of the Ogiek people. I designed a set of open-ended questions to explore participants' experiences, perceptions, and opinions in detail, allowing for flexibility in responses and prompting follow-up questions to gain deeper insights into specific topics of interest. This also allowed discussing issues not considered in the questionnaire to provide a unique understanding of the study. This qualitative approach was essential, as it uncovered the complexities and subtleties of policy impacts that were not captured through quantitative measures alone.

Throughout the data collection process, efforts were made to engage respondents meaningfully. Building rapport with participants was crucial in establishing trust, which led to more honest and open responses. Explaining the study's objectives helped demystify the

research process and addressed any uncertainties participants may have had regarding the questionnaire or interview topics. This step is fundamental in qualitative research as it encourages participant buy-in and improves the quality of the data collected.

3.6 Data Collection Procedure

3.6.1 Piloting Study

A limited number of respondents from Ndosua, an adjacent village to the study area, were chosen to pre-test data collection instruments. This was conducted to assess their accuracy and validate their relevance and suitability for the upcoming data collection process. The pre-testing, conducted two months before the field research, aimed to ensure the accuracy and relevance of data collection instruments. Familiarity with the respondents was established through socialization (Kvale & Brinkmann, 2009) and active participation in locally organized activities, including chief barazas.

The pilot study's findings significantly contributed to identifying gaps and field challenges, addressing inconsistencies, and restructuring the survey instruments before the main data collection. Subsequently, the instruments were validated by experts within the study area, aligning with Mugenda and Mugenda's (2003) argument that a panel of professionals and experts in the same field provides a more robust validity assessment.

3.6.2 Validity of Research Instruments

The validity of the research instruments was ensured through several methodological strategies that align with best practices in social research. The questionnaires were carefully designed to address the three core research objectives, ensuring that each question was directly relevant to the study's aims. This careful construction was underpinned by an extensive literature review that informed the thematic focus of the questions and grounded them in existing research, thereby enhancing the content validity. Content validity refers to the extent to which the instrument measures the intended construct, and in this case, it was crucial for capturing the respondents' experiences and insights accurately.

To enhance clarity and accessibility, the questionnaires were written in simple English to facilitate understanding among respondents with varying literacy levels. In addition, a local research assistant was deployed to provide translations for those who found English challenging, thus mitigating potential biases that could arise from language barriers. Beyond the questionnaire design, standardized interview protocols were followed to ensure systematic data collection and minimize interviewer bias. This approach is vital as it establishes reliability in the responses, which complements the validity of the findings.

Furthermore, pilot testing of the questionnaire could have been used to identify any ambiguities or issues, ensuring refinement before the actual data collection. By incorporating these strategies, the researchers aimed to enhance the accuracy and significance of their findings and contribute meaningful insights to the broader discourse in the field.

3.6.3 Reliability of Research Instruments

According to Mugenda (2003), reliability denotes the extent to which a research tool consistently produces dependable outcomes over multiple iterations. Reliability is affected by random errors, and as their occurrence rises, reliability diminishes. Moreover, it represents the deviation from an accurate measurement due to factors not thoroughly examined by a researcher. The split-half technique was used to evaluate the reliability of the questionnaires, which scored a reliability of 0.82. This score indicated a strong level of consistency in the questionnaires, suggesting that the instrument is reliable for accurately measuring the constructs it aims to assess. I distributed the questionnaires to the sampled groups, after which the scored items were randomly divided into three groups. The total scores from each subject across the three sets of items were calculated, followed by a correlation analysis of the scores.

3.6.4 Data Collection Technique

Participatory data collection methods, such as questionnaires, focus group discussions (FGDs), and a structured interview schedule, were employed to obtain precise information from respondents regarding the relationship between forest-based livelihoods and forest conservation. Refer to Table 2 for additional details.

Participants were selected using a purposive and snowball sampling technique, ensuring that individuals directly connected to forest-based livelihoods and conservation were included. This approach helped in obtaining informed perspectives that were crucial for the study. Key criteria for selection included factors such as involvement in sustainable forestry practices, experience in local conservation efforts, and socioeconomic status affecting their interactions with forest resources. Moreover, a field research guide conversant with the community's complexity helped translate the questionnaires into Kiswahili and the local language.

Photos were taken during field observation to help cross-check forest conservation measures and the socio-economic activities undertaken in the area, as shown in Annex III. The field observation checklist entailed writing the two villages' socio-economic, environmental, and livelihood activities around Mau Forest. Additionally, secondary data was gathered through a desk review to obtain information on documented case studies regarding the connection between livelihoods and conservation. Relevant reports from peer-reviewed journals provided insights into the effects of climate change on livelihoods. Publications from government agencies outlined policies, strategies, and statistics pertinent to natural resource management and rural development, including the Kenya Forest Act of 2005. Grey literature from media reporting, for example, newspapers, was also examined.

Due to logistical constraints and research requirements, considering the mixed methodology, the research lasted for twenty-five consecutive days. I reached my research areas using public transport, matatu, motorcycle (boda-boda), and on foot.

Table 2 List of Interviewees

Respondent's Name	Sample Size	Affiliation	Sampling Method	Data Collection Method
Respondent	2	Chief	Purposive/Snowball	FGD
Respondent	2	Village elders	Purposive/Snowball	FGD
Respondent	2	KFS	Purposive/Snowball	KII
Respondent	2	Human Rights Group	Purposive/snowball	FGD
Respondent	4	CFA	Purposive/snowball	FGD
Respondent	300	Ogiek Households	Purposive	Questionnaires

Source; Author

3.7 Data Analysis

The collected data encompassed quantitative and qualitative. The quantitative data underwent a cleaning process involving editing, coding, and tabulation. This was conducted to identify and address any anomalies in the responses, assigning specific numerical values to facilitate further analysis. After coding and assigning variables, I imported data into SPSS (Statistical Package for the Social Sciences), followed by a thorough cross-validation process and analysis.

Subsequently, qualitative data gathered through focus group discussions and key informant interviews were recorded and transcribed using audio devices. The collected and transcribed data were then labelled with anchor codes based on the research questions. I then coded relevant statements from participants, and using the end note function, the data were then organized under respective anchor codes. The initial codes were compiled into lists and grouped under their respective anchor codes, with frequencies tallied.

The data was then categorized and organized into a thematic framework based on main themes, concepts, and categories. These included Socio-economic and environmental challenges facing the Ogiek community, sustainable conservation of the Mau Forest, and collaborations between the Ogiek community and other stakeholders.

For analysis, a framework-based approach was employed, as recommended by Ritchie et al. (2003). This framework aided in the comprehensive examination of issues raised by key informants, ensuring a thorough analysis and providing flexibility in identifying and characterizing emerging data issues (Ritchie & Spencer, 1994). The data was then entered into SPSS for further analysis.

The data analysis utilized a combination of descriptive and inferential statistics to ensure a comprehensive understanding of the dataset. Descriptive statistics helped organize and summarize extensive datasets, improving the clarity of specific observations throughout the study. Summary statistics, including means, standard deviations, and percentages, were calculated to provide an overview of central tendency and variability.

Simultaneously, inferential statistics, particularly linear regression analysis, were performed to examine the relationships between various dependent and independent variables. This analysis identified significant correlations and made predictions based on the established model. Key assumptions of linear regression, such as linearity, independence, homoscedasticity, and the normality of residuals, were carefully tested to validate the findings.

Data visualization was a crucial aspect of the analysis, with results presented through various graphs, figures, and tables to enhance interpretability and facilitate effective communication of results. Scatter plots illustrated the relationships among continuous variables, while bar graphs and pie charts depicted categorical distributions. This comprehensive analytical framework allowed for a robust examination of underlying patterns and trends within the dataset, thereby contributing to the study's conclusions.

3.8 Ethical Consideration

Ethical endorsements from the Graduate School at Kenyatta University and the Nakuru County Department for Water, Energy, Environment, Natural Resources, and Climate Change were approved

before commencement of the research. Additional ethical considerations upheld throughout the study encompassed ensuring the confidentiality of participating respondents. This practice safeguarded their privacy and fostered trust and rapport, maintaining ethical standards and research integrity. Participation in the entire process was voluntary, with no coercion of respondents, and the collected data was solely utilized for research purposes. The selection of respondents was carried out randomly to alleviate bias.

4.0 RESULTS AND DISCUSSION

4.1 Introduction

This chapter details the outcomes of the research findings and the analysis of the collected data, considering the stated hypotheses and aligned with the conceptual framework. The data analysis was presented under different headings grouped in line with the research objective.

This is followed by an assessment of Mau Forest's contribution to the Ogiek community's poverty alleviation, the Sustainability of the primary forest resources, and the Socio-economic and environmental impact of conservation on Ogiek's livelihood. Furthermore, I present results from legislation and institutional framework amendments for KFS. Finally, I present results on the Ogiek community's forest eviction compensation.

4.2 Response Rate

Ogiek community member households were issued a total of 300 questionnaires. The complete questionnaires were edited for completeness and consistency. Out of the 300 questionnaires that had been issued, 295 were fully completed. 5 questionnaires had missing data and were therefore not used for analysis. This represented a response rate of 96 %, which was adopted by the study as adequate for analysis. According to Mugenda and Mugenda (2003), a response rate exceeding 60% is deemed sufficient for data analysis. Further, the study conducted an interview schedule with twelve key informants to get their responses on the four study objectives. This survey was conducted in the Kitiro and Kapcholola villages of the Mariashoni ward.

4.3 Socio-Demographic Characteristics of Participants

The demographic information considered in this study for the respondents included the gender, level of education, the respondent's capacity to answer the questionnaire, and the number of people in a household.

4.3.1 Gender of the Respondent

The sampled population comprised both male and female respondents. As listed in Table 3, out of 295 participants, male respondents comprised 57.6% of the total respondents compared to 42.4% of female respondents. Data collection occurred during the day when most women were busy with their daily chores. Additionally, men in the study area are more involved in community projects than women. This might be the reason why a larger number of respondents were of the male gender.

The chi-square test revealed a p-value below the significance threshold of 0.05, allowing us to reject the null hypothesis. This shows a statistically significant relationship between gender and participation rates among respondents, with males more likely to participate due to societal norms. This analysis highlights quantitative findings and prompts discussions about societal structures affecting gender participation rates. Addressing these disparities is essential for balanced representation in future community projects and studies.

Furthermore, these results are consistent with Watkins, Zimmermann, and Poling's (2014) findings, which concluded that men are more willing to engage in community-based studies due to their traditional roles, where they often serve as family heads.

Table 3 Gender Distribution

Gender	Frequency (<i>f</i>)	Percentage (%)
Female	124	42.4
Male	171	57.6
Total	295	100

Source: Field Data (2022)

4.3.2 Occupational Roles of Respondents

I aimed to analyze the roles assumed by respondents in both occupational and domestic contexts. Analysis of role distribution among the 295 participants reveals a marked dominance of traditional household structures, with 67.2% of respondents identifying as heads

of households. This statistic suggests a strong influence of gender norms on the allocation of roles within the community. They are the primary income earner or decision-maker, while the spouse might have different responsibilities or roles.

The substantial representation of male respondents in leadership positions likely indicates that opportunities may be disproportionately limited for women in this context. A comparison of the proportions of male and female respondents assuming the role of household head could provide insight into potential barriers women face. Additionally, 25.6% of respondents identified as spouses, while 7.5% classified themselves under other categories (see Table 4).

Table 4 Respondents' Roles

Position Held	Frequency (<i>f</i>)	Percentage (%)
Household Head	197	67.2
Spouse	76	25.6
Other	22	7.5
Total	295	100

Source: Field Data (2022)

Eight percent of the participants reported having no formal education, indicating they had never attended school. In contrast, 47.2% completed primary education, 24.8% attained secondary education, and 20% received vocational training, earning diplomas and certificates. These figures suggest a significant level of literacy among the participants.

Results from the chi-square test indicated a significance level, demonstrating a statistically significant association between participants' educational attainment and their involvement in forest conservation programs. The data imply that individuals with higher levels of education are more inclined to participate in conservation efforts than those with lower educational backgrounds. This finding emphasizes the critical role of education in promoting active engagement in community initiatives focused on environmental conservation, thereby highlighting the necessity for ongoing

educational programs to improve literacy and environmental awareness within the community.

The participants demonstrated an ability to comprehend and engage in forest conservation programs. The observed increase in literacy rates may be associated with experiences such as forest evictions and land resettlement, which introduced the community to various educational opportunities. Additionally, interactions with non-indigenous migrant populations may have positively influenced their school attendance. Engagement with international and local NGOs operating in the region likely enhanced educational access (Ilaria, 2016). This data is summarized in Table 5 below.

Table 5 Educational Level of Participants

Education Level	Frequency		Percentage
	(<i>f</i>)	(%)	
None	24		8
Primary/Middle	139		47.2
Secondary	73		24.8
Vocational/Technical	59		20
Total	295		100

Source: Field Data (2022)

4.3.3 Household Population

In the study population, 7.2% of participants reported household sizes exceeding 12 individuals, while 52.8% indicated having between 2 and 5 members. Furthermore, 24% of respondents reported households comprising 6 to 8 individuals, and 16% had between 9 and 11 members, as illustrated in Figure 3. These findings suggest that the predominant household size falls within the range of 2 to 5 members. Comparative analysis with county and national demographics reveals that this distribution is consistent with broader trends. This pattern may be associated with increased individuals attaining basic education and accessing modern family planning resources. The study underscores a noteworthy correlation between educational attainment and the availability of family planning services, indicating that smaller

household sizes are more common among individuals with higher educational levels.

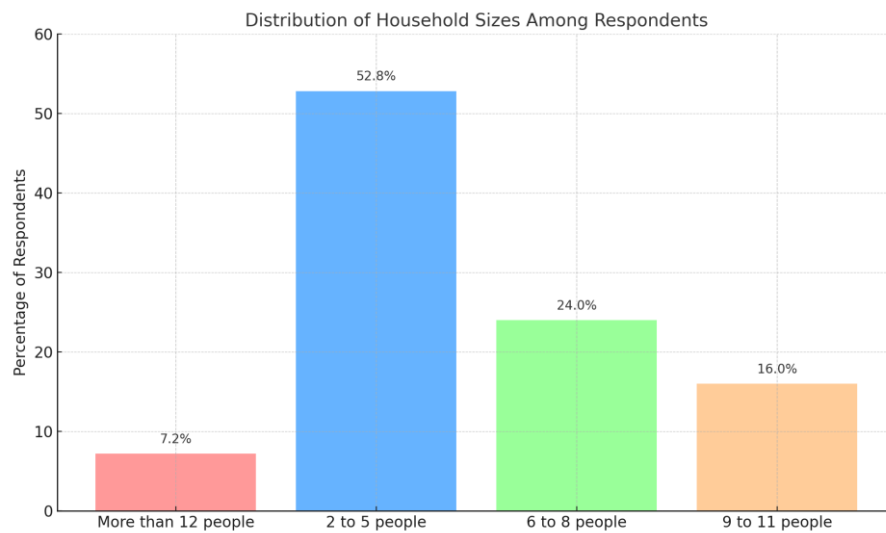


Figure 3 Household Population
Source: Field Data (2022)

4.4 Forest Resource Access Challenges for Dependent Communities

4.4.1 Access to Mau Forest and Utilization of its Products and Services

Most (92%) respondents indicated prior access to and utilization of forest resources and associated products and services. In comparison, only a minority (8%) reported an absence of such access, as depicted in Figure 4. This data highlights the significant reliance of the Ogiek community on forest resources. Conversely, this dependence may contribute to the observed increase in deforestation within the Mau Forest. These findings align with the research conducted by Kibria et al. (2018), which emphasizes that the well-being of communities reliant on ecosystem services is intricately linked to their access to forests and the benefits derived from these ecosystems.

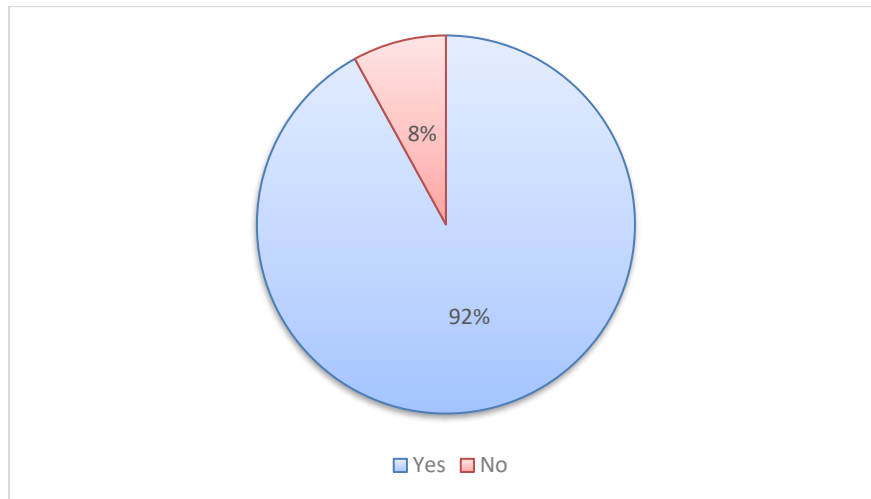


Figure 4 Access to and Utilization of Forest Resources
Source: Field Data (2022)

4.4.1.1 Firewood

This study investigated the prevalence of firewood collection from Mau Forest among the participants. A significant 94% reported using fuelwood sourced from the forest for cooking. Conversely, 6% indicated that they did not depend on firewood from the forest, as illustrated in Figure 5. This finding aligns with the known practices of the Ogiek community, the majority of whom depend on the forest for fuelwood (Miller et al., 2021).

The results indicate that the Ogiek community depends on the forest for its firewood supply. Respondents who reported not using firewood from the forest cited alternative cooking methods, including kerosene stoves and charcoal cookers commonly called "Jikos." These results are consistent with the findings of Senganimalunje et al. (2015), which highlighted that firewood collection constitutes a primary source of livelihood for the local community, primarily utilized for cooking and heating purposes.

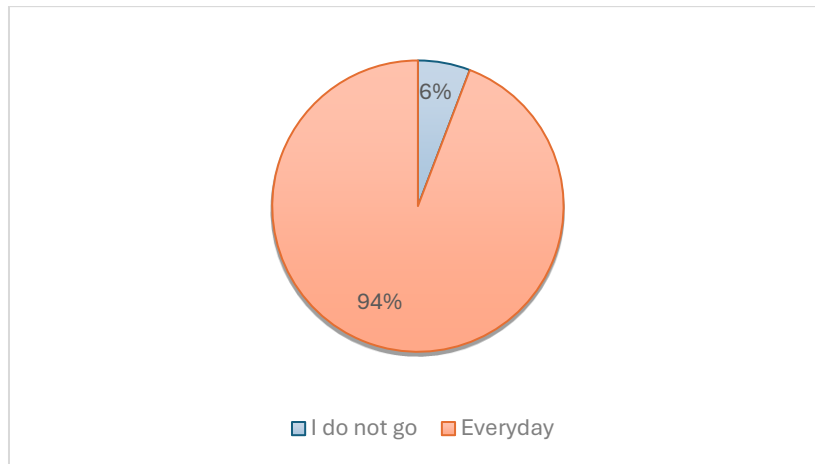


Figure 5 Forest Access to and Utilization for Firewood
Source: Field Data (2022)

4.4.1.2 Tree Seedlings

The findings reveal that a significant proportion (65.6%) of respondents within the Ogiek community previously obtained tree seedlings from forested areas for agricultural cultivation. Conversely, 34.4% of respondents do not utilize the forest for seedling procurement (see Figure 6). However, they did not mention where and if they source their tree seedlings. This observation underscores a notable inclination towards environmental conservation initiatives. Inferential statistical analyses indicate that this behaviour may be influenced by the respondents' understanding of suitable tree species for cultivation in homesteads and agricultural environments, reflecting the community's dedication to sustainable practices.

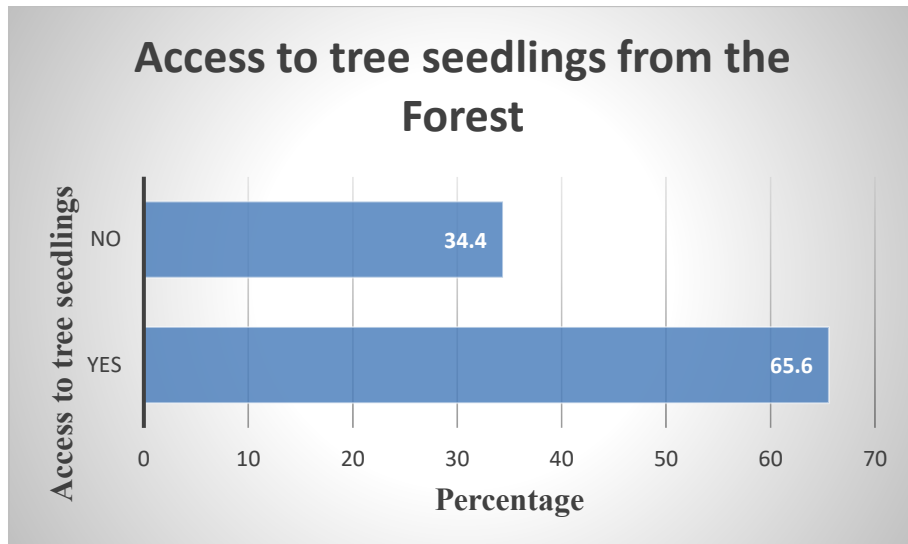


Figure: 6 Forest Access and Utilization of Tree Seedlings
Source: Field Data (2022)

4.4.1.3 Honey

The study investigated the accessibility of honey from the Mau Forest among participants. Results indicated 87.2% of respondents sourced honey from the forest, while 12.8% did not, as illustrated in Figure 7. These findings reinforce that the Ogiek community historically engaged in hunting and gathering practices. Despite shifts in lifestyle and economic activities, the Ogiek continue participating in beekeeping and harvesting honey from forest resources (Dave et al., 2017; Ingram et al., 2017).

The data demonstrate a correlation between community identity and economic status through the ownership and management of beehives. A greater number of beehives is associated with an increased honey yield, thereby enhancing income through trade with neighbouring communities. Honey is also a critical food source and an ingredient in local beer production. There exists a significant dependency on forest resources for various beekeeping activities, including the construction of beehives and honey extraction. Essential materials, such as tree trunks, bark, and leaves, are predominantly sourced from the forest.

Traditional beekeeping practices are still observed among the Ogiek, who utilize hollow logs as beehives placed high in trees. Males in the community typically position these beehives at elevated locations.

Through established community leadership, designated sites for beekeeping have been allocated to Ogiek households, which are respected and adhered to by the community members. Beekeeping practices heavily rely on indigenous tree species due to their suitability for hive establishment.

Among the 12.8% of community members who do not source honey from the forest are those who have received government training in modern beekeeping techniques and have been provided with contemporary beehives. Consequently, these individuals engage in beekeeping practices at their homesteads.

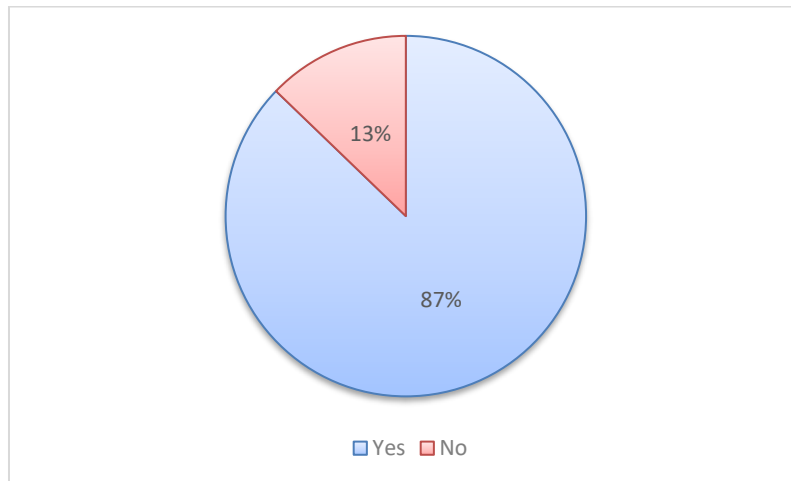


Figure: 7 Honey Access and Utilization from the Forest
Source: Field Data (2022)

One respondent from the community gave his views on the beekeeping practice. He said:

“(…) Well, Ogiek and honey cannot be separated, because beekeeping has been preserved through generations. Other traditions we used to conduct, such as hunting, are getting lost. I had hoped my children would follow all our traditions, but no. The world has changed, right? I am, however, happy my children can keep bees. I have ten beehives in the forest, and that makes me incredibly happy (…)” (Ogiek community member)

4.4.1.4 Charcoal

The study aimed to investigate the participants' utilization of charcoal from the forest. Remarkably, 100% of the respondents reported not using charcoal as a fuel source. This finding is attributed to the Kenyan government's enforcement of a charcoal production ban, which is part of its commitment to the conservation of Mau Forest. Nevertheless, these results appear inconsistent with observations made during the data collection phase, where charcoal was visibly available for sale at various market centres within the local community.

Respondents were discreet in disclosing the source of the charcoal, citing concerns that doing so could lead to repercussions from local authorities if the information became public. This reluctance to share highlights the sensitive nature of the issue.

Moreover, the findings align with the data regarding firewood utilization from the forest, where only 8% of participants reported using firewood sourced from the forest. This inconsistency raises critical questions regarding the origin of the charcoal. If the charcoal is indeed sourced from Mau Forest, it becomes imperative to explore how the local community can be engaged in sustainable charcoal production practices. Further research is recommended to address these questions, as the current study could not definitively ascertain the source of the charcoal.

4.4.1.5 Grass for Thatching Houses

Traditionally, the Ogiek live in thatched houses. The study assesses whether the respondents collect grass from the forest to thatch their houses. Of those surveyed, 62.4% collect grass from the forest for their house roofs, while 37.6% do not use grass for thatching, as indicated in Table 6. The findings suggest that most members of the Ogiek community rely on the forest for construction materials (Mamo et al., 2007; Senganimalunje et al., 2016; Kabubo-Mariara, 2013).

The Ogiek house, known as a kog, is constructed with bark materials and roofed with covers from bamboo trees, referred to as teleg. The finishing touches involve placing thatching grass on top.

The responses correlated with the number of people who access the forest for their daily livelihood and their level of education. Those with education and financial means tend to use modern materials like iron sheets to roof their houses.

Table 6 Access to Grass for Thatching

	Frequency (<i>f</i>)	Percentage (%)
Yes	183	62.4
No	112	37.6
Total	295	100

Source: Field Data (2022)

4.4.1.6 Medicinal Herbs

21.6% of respondents reported they do not utilize medicinal herbs sourced from the forest, while 78.4% indicated using these herbal resources, as illustrated in Figure 8. This data aligns with the existing literature, which suggests that the Ogiek community possesses significant Indigenous knowledge about medicinal plants. Historically, these plants have been a primary resource for treating various ailments (Kiragu, 2006). However, there is growing concern regarding the loss of vital medicinal plant resources, partly attributed to inadequate documentation, as the Ogiek undergo rapid changes in their traditional lifestyle (Ngari et al., 2010).

These findings correlate with the number of individuals accessing forest resources, suggesting that the Ogiek community continues to engage in traditional practices and relies on the forest for personal medicinal needs and economic activities, including trade with neighbouring communities. Furthermore, the results suggest a relationship between the utilization of forest resources and the educational attainment of individuals, indicating that those with basic education may increasingly seek medical treatment from healthcare facilities.

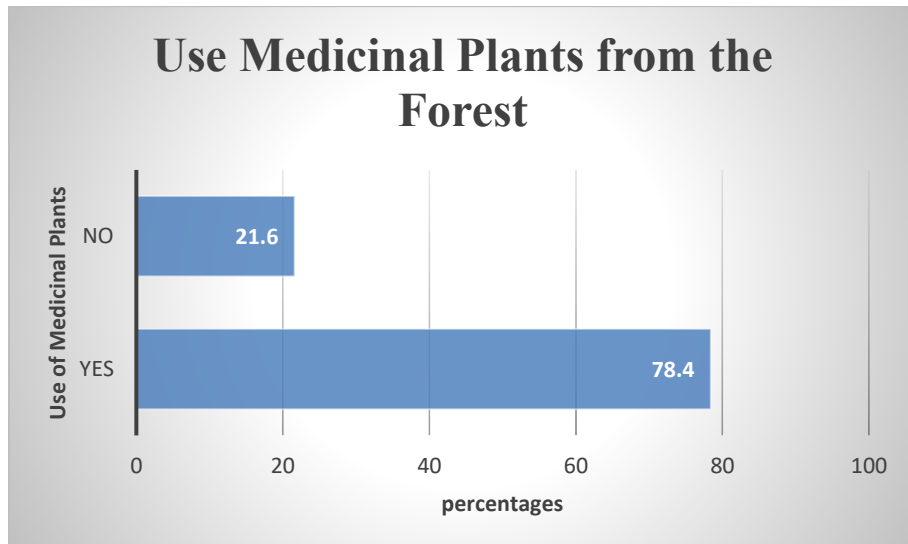


Figure: 8 Use of Medicinal Plants
Source: Field Data (2022)

4.4.1.7 Wild Game Meat

In this study, 70.4% of participants reported having previously consumed wild meat sourced from the forest, while 29.6% indicated they did not partake in this practice, as illustrated in Figure 9. This predominant trend among the respondents reinforces existing literature, highlighting that hunting has been an integral aspect of the Ogiek community's economic livelihood. Notably, the Ogiek are committed to sustainable hunting practices, focusing on species that maintain healthy population levels (Rambaldi et al., 2007).

However, it is crucial to note that the traditional hunting lifestyle faces challenges due to land resettlement and forest evictions, which could significantly impact the community's long-standing practices. The data further suggest that a substantial portion of the Ogiek population relies on wild game meat as a dietary staple, underscoring the resilience of traditional practices in modernization.

Additionally, while the majority still adhere to these customs, modernization and changing lifestyles may have influenced the dietary habits of some community members, potentially leading to a shift in consumption patterns over time. Future research employing inferential statistics could explore correlations between demographic variables (such as age, education, and economic status) and wild meat

consumption, thereby providing deeper insights into the evolving dietary practices within the Ogiek community.

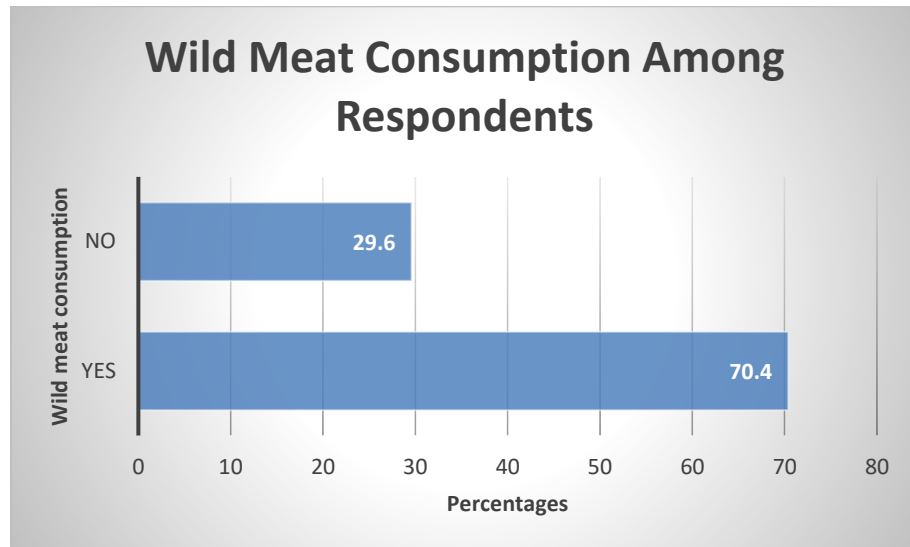


Figure: 9 Wild Game Meat Consumption
Source: Field Data (2022)

4.4.1.8 Timber Wood

The research analysed the utilization of timber sourced from forests within the Ogiek community, revealing a significant reliance on forest resources among most households. With 86.4% of participants indicating prior use of timber for home construction compared to 13.6% who did not, the data suggests a statistically significant association between reliance and utilization of forest resources by local communities. This reliance may impact these households' environmental sustainability and long-term economic stability. (Senganimalunje et al., 2016). Additionally, governmental restrictions on access to forest resources may explain the 13.6% of Ogiek community members who do not utilize timber from the forest for residential construction. See Figure 10.

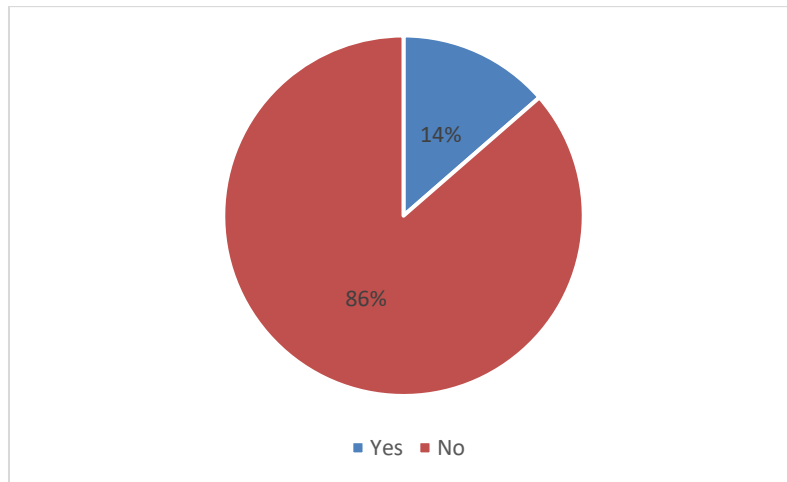


Figure:10 Utilization of Forest for Timberwood
Source: Field Data (2022)

4.4.1.9 Wild Fruit

The forest serves as a vital food source for local communities that rely on it. This is reflected in my results: 24% of respondents reported not consuming wild fruit from the forest, while 76% acknowledged eating wild fruits as a food source, as illustrated in Figure 11. This finding relates to the number of people accessing the forest for daily sustenance. Additionally, it indicates that members of the Ogiek community remain dependent on the forest for wild fruits as a part of their diet. My findings align with several authors, including Shackleton et al. (2024), Ickowitz et al. (2015), Pingali (2015), and Rasmussen et al. (2017), who emphasize the importance of wild fruits to local communities. However, 24% of the Ogiek community does not gather wild fruits from the forest. This may be due to recent government initiatives promoting new agricultural practices, including fruit cultivation. Alternatively, they may obtain fruits from other communities that have migrated to Mau Forest or buy them from the local market.

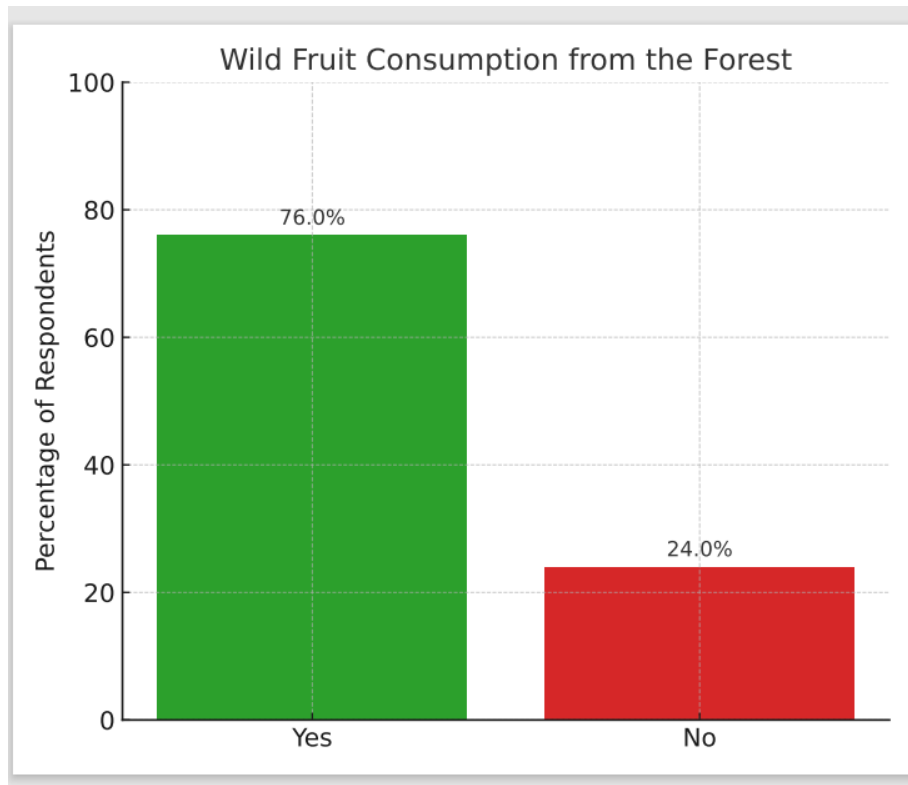


Figure: 11 Wild Fruits Consumption
Source: Field Data (2022)

Examining the Ogiek community's previous dependence on forest products provides valuable insights into their livelihood requirements. Utilizing inferential statistics, we can analyze the patterns of reliance on various forest resources among community members.

The chi-square test assessed whether significant differences exist in access to different forest products. The data indicates that firewood has the highest access rate at 92%, followed closely by honey at 87.2% and timber wood at 86.4%. These consistently elevated percentages reflect a strong dependence on these resources for daily sustenance. Conversely, charcoal is reported to have an access rate of 0%, suggesting it is absent from the community's usage, potentially due to ecological, economic, and policy factors affecting its availability and desirability.

Additionally, the access rates for medicinal herbs (78.4%), wild fruits (76%), and wild meat (70.4%) illustrate the community's reliance on these resources for nutritional and health benefits. The lower accessibility rates for tree seedlings (65.6%) and thatching grass

(62.4%) indicate that while these resources are beneficial, they are not as critical for daily survival as the primary resources previously mentioned, as shown in Figure 12.

Calculating the mean access percentage for all products reveals an average reliance on forest resources of approximately 68%, highlighting the community's substantial dependence on the forest for its livelihoods. This high dependence on forest products suggests that many households within the Ogiek community likely face economic constraints, rendering the forest essential for meeting basic needs and improving their economic standing.

In summary, this analysis emphasizes the vital role that forest resources play in the Ogiek community, with implications that any alterations in forest resource availability and access could profoundly affect their livelihoods. Future research could investigate the correlations between economic status and specific resource dependencies to enhance understanding of their needs and priorities.

My findings align with multiple studies concluding that communal forests, e.g., in South Africa, provide wild herbs and fruits (Rasmussen et al., 2017), while the Congo Basin yields five to six million tons of bushmeat annually (Nasi et al., 2011). Environmental resource revenue supports rural households in Burkina Faso (Pouliot, 2012), Ethiopia (Mamo et al., 2007), and Zambia (Kalaba et al., 2013), with significant contributions also in Malawi, Mozambique, and Uganda, and agro-pastoral communities in Tanzania (Lambi et al., 2012; Mfunda & Røskaft, 2010; Knapp, 2012).

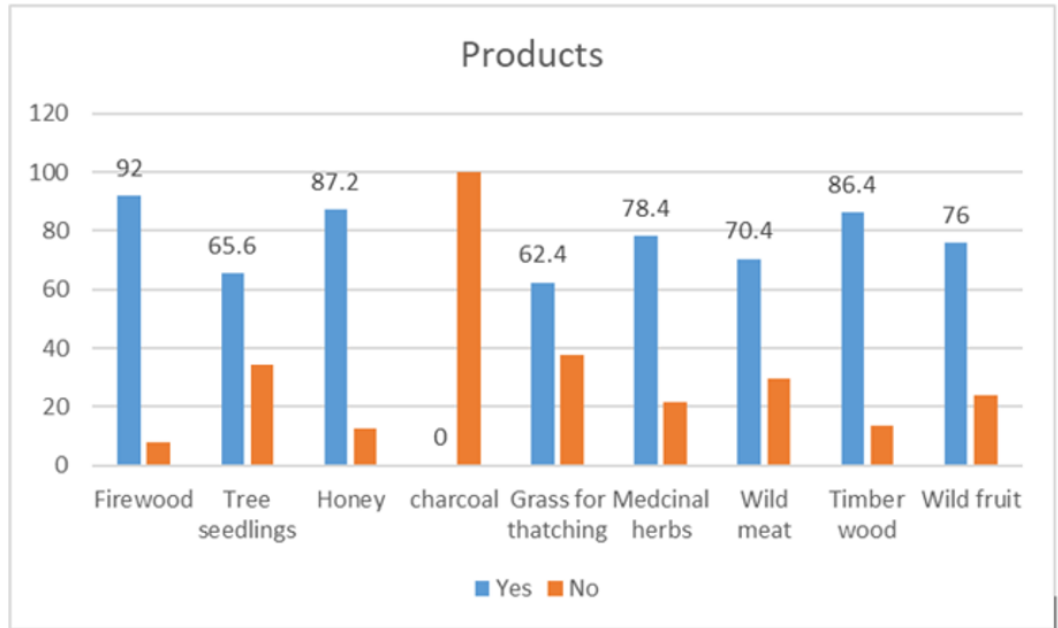


Figure: 12 Comparison of Forest Products Utilization Rates
Source: Field Data (2022)

4.4.2 Forest Access Frequency

Based on the findings, it can be inferred that most respondents, specifically 52%, previously engaged with the forest daily. This suggests a strong reliance on forest resources, which aligns with the cultural and economic practices of the Ogiek community. In contrast, a small segment (3.2%) did not utilize the forest, highlighting a potential demographic shift. The findings indicate that 38.4% of participants visited the forest weekly, while a smaller portion, 6.4%, did so monthly. (See Table 7). This pattern underscores the forest's critical role in meeting the livelihood needs of most community members.

Furthermore, the lower percentage of households that do not access the forest reflects a correlation between educational attainment and resource reliance. It indicates that those less connected to the forest may have diversified their income sources, potentially due to higher levels of education. This dynamic may signal an emerging trend within the community, in which education plays a pivotal role in altering traditional livelihood practices.

Table 7 Frequency of Participants' Forest Access

Time Frame	Frequency		Percentage
	(f)	(%)	
I do not go	9	3.2	
Everyday	153	52	
Once a week	114	38.4	
Once a month	19	6.4	
Total	295	100	

Source: Field Data (2022)

4.4.3 Main Occupation of the Ogiek community

The data show that most (87.2%) of Ogiek community respondents primarily engage in farming. This high percentage suggests a significant shift from traditional practices, likely influenced by restricted access to forest resources. The decline in their traditional hunting and gathering lifestyle appears to have prompted a necessity for adaptation, leading to the adoption of agricultural practices.

In contrast, a smaller segment of the community engages in a mixture of activities, specifically, 9.6% partake in animal husbandry and crop cultivation. In comparison, only 3.2% are involved in trading, as shown in Figure 13. The diversity within these mixed activities may reflect the influence of neighbouring migrant communities, such as the Kikuyu, who have settled in the Mau Forest area, potentially introducing new economic practices.

The inferential statistics analysis revealed significant associations between the demographic factors of the Ogiek respondents, specifically education level and past occupations, and their current farming practices. The Chi-squared test indicated that as educational attainment increased, there was a notable shift towards modern farming practices, suggesting that higher education may enable individuals to adopt more effective agricultural techniques. Additionally, those with a background in traditional occupations were more likely to retain traditional farming methods.

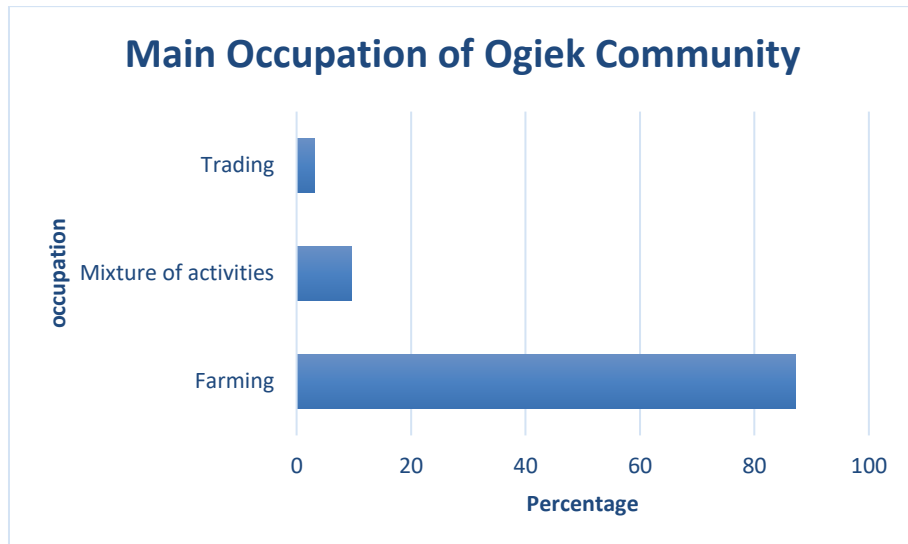


Figure:13 Occupation of the Ogiek Community
Source: Field Data (2022)

4.4.4 Limitations Towards the Ogiek Community’s Livelihood

The study's findings indicate significant correlations between government restrictions and the livelihoods of the respondents, particularly within the Ogiek community. According to the data, 52.8% of the respondents reported that the government's restrictions on access to forest resources have severely limited their livelihoods. This suggests this population's strong dependency on forest resources for daily sustenance and economic activities.

In comparison, 27.2% of respondents highlighted evictions from their homes as a significant limitation to their livelihood. This substantially impacts personal security and stability, further exacerbating the challenges of maintaining economic resilience in such displacement. Additionally, 13.6% of the respondents indicated that a combination of restrictions, including limited forest access, evictions, and the negative impacts of deforestation, contributes to their overall hardships.

Furthermore, 6.4% of respondents attributed their livelihood impacts to reduced forest cover, underscoring the multifaceted effects of environmental degradation on community well-being, as shown in Table 8. These percentages reveal that most respondents are experiencing negative consequences from government interventions,

highlighting a critical area of concern for policymakers and community advocates.

The chi-square test showed significant associations between government restriction and its negative reported impacts on livelihood, supporting the theory that closer ties to forest resources correlate with heightened vulnerability to policy changes.

My findings agree with other research about the enduring debate on whether conservation interventions, such as protected areas, contribute to or perpetuate poverty traps. This dilemma arises from concerns about restricting forest product use, displacing communities and livelihoods, and neglecting to manage ecosystem services. Alternatively, it questions whether these interventions provide avenues to enhance the livelihoods of rural populations (Rasmussen et al., 2017).

Table 8 Sources of Limitations to Ogiek’s Livelihood

Limitation	Frequency (<i>f</i>)	Percentage (%)
Restrictions on forest resources by the government	156	52.8
Eviction from your homes by the government	80	27.2
Reduction in the size of the forest cover	19	6.4
All of the Above	40	13.6
Total	295	100

Source: Field Data (2022)

4.4.5 Challenges and Divergences in Forest Livelihoods and Conservation

The results of the examination of conflicts between the government and the Ogiek community indicate that a substantial majority of respondents (69%) suggested the existence of significant conflicts that negatively impact access to and use of forest resources. Conversely, 27.8% of participants reported that these conflicts are minimal and rarely disrupt resource usage, while 2.4% were unsure about the existence or impact of such conflicts (see Table 9). These findings suggest that perceptions of conflict intensity vary considerably among

individuals, likely influenced by personal experiences related to access and use of forest resources.

Additionally, conflicts have been identified between the Ogiek community and neighbouring communities, such as the Kipsigis, Maasai, and Kikuyu, with 70.6% of respondents acknowledging significant disputes. However, it is noteworthy that these conflicts reportedly do not interfere with forest management or utilization. In contrast, 23% of respondents indicated that there were no significant conflicts impacting resource use, while 5.6% expressed uncertainty. The primary source of conflict seems to arise from migrant communities that have settled in the Mau Forest for various reasons, with community members unanimously expressing a desire for their removal.

The study also explored the persistence of conflicts over forest resources, revealing that 50% of respondents believe such conflicts tend to last indefinitely. Only 11.1% reported prompt and effective resolutions to conflicts. A considerable portion (37.3%) felt that while conflicts may be resolved, others persist over long durations. These results are corroborated by qualitative data from key informant interviews, which indicated that major conflicts have been escalated to the legal system due to issues concerning land tenure clarity; however, resolution has remained elusive, often extending over many years. Lower-level conflicts are typically communicated to local area chiefs, with some successfully addressed, while more complex intercommunal disputes are resolved through community elder groups.

The results indicate a marked inclination among community members regarding conflict resolution preferences for formal methods. A significant 57.1% of respondents preferred formal court proceedings to address conflicts, as opposed to 37.3% favoring informal resolutions. Only 4.8% expressed uncertainty regarding their preferences. The inclination towards formal resolution mechanisms may be attributed to a pervasive distrust in local leadership, often perceived as susceptible to corruption and bias, thus undermining the credibility of informal conflict resolution processes.

Table 9 Existence of Conflict, Resolution Process, and its Impact on Forest Resource Use and Management

State of Conflict	Responses
Conflicts between the state and the community are not serious and rarely interfere with forest use	35
No idea	3
Serious conflicts interfere with their forest resource access and use	87
Conflict between Ogiek and neighbouring communities	
There are serious conflicts with the neighbouring communities, but they do not interfere with forest management or use,	89
There are no serious conflicts between the neighbouring communities	29
I have no idea	7
Conflict Persistence	
Conflicts tend to persist indefinitely	63
Conflicts tend to be resolved indefinitely	14
Some conflicts are resolved efficiently while others persist	47
I have no idea	1
Preference on conflict resolution	
Both formal and informal	47
Formal ways e.g., courts are used	72
I have no idea	6

Source: Field Data (2022)

4.4.6 Respondent's Recommendation on Conflict Resolution

Simultaneously, the respondents proposed that the best way to end the conflict and bring peace to the communities in Mau Forest is to evict all the immigrant communities from Mau Forest. Furthermore, they indicated that they had coexisted peacefully before the migrants' arrival. Moreover, they requested that the courts conclude their pending cases because the outcomes will determine how they will use forest resources.

Concerning the compromised village elders, the community must convene a meeting to conduct elections for new leaders, expecting the corrupt individuals to step aside from their roles. This process should fully engage all community members in decision-making and amend local rules and regulations. Finally, the community should elect a conflict mitigation team to address the diverse conflicts that may arise effectively.

4.5 Conservation Efforts for the Sustainable Use of Forest Resources

4.5.1 Link Between Forest Cover Decrease and the Community's Daily Actions

The results indicate that 8% of the respondents did not know if their activities had contributed to decreased forest cover, and 52% disagreed that their activities may have contributed to the reduction of the forest size. In comparison, 40% of the respondents agreed that their daily actions have contributed to the decrease of the forest, as shown in Figure 14. This finding correlates with further information that the community provided regarding receiving training on sustainable agriculture by the Ewaso Nyiro Development Agency. The training and implementation focused on agroforestry and growing nitrogen-fixing tree species. This program is part of the Plantation Establishment and Livelihood Improvement Scheme.

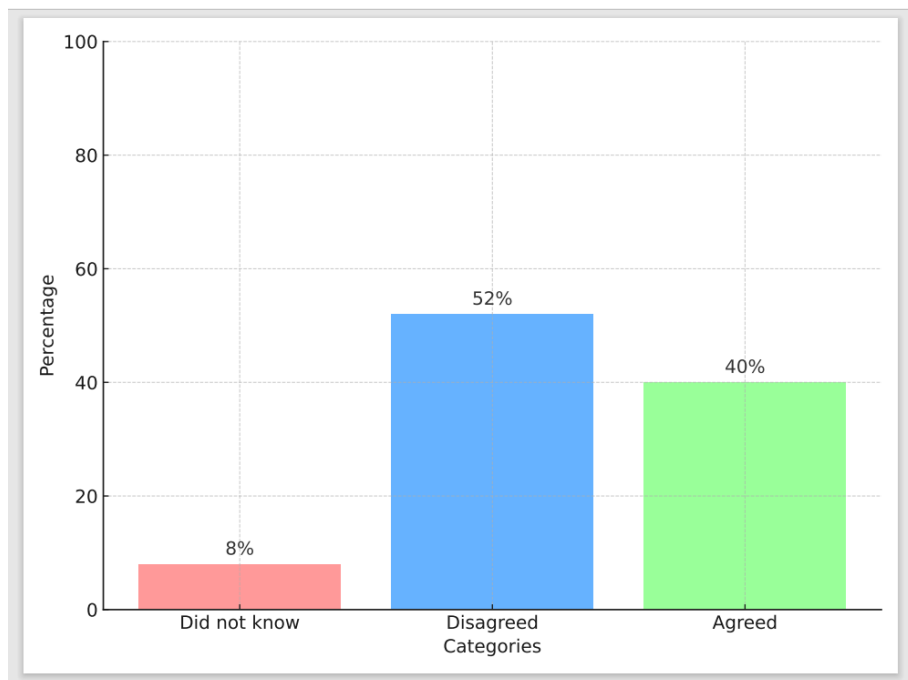


Figure 14 Ogiek's Contribution to Forest Destruction
Source: Field Data (2022)

4.5.2 Access and Source to Reliable Forest Conservation Information

The study revealed that 51.2% of respondents could not access reliable information regarding forest conservation, while 41.6% reported having access to such information. Additionally, 7.2% of participants indicated they were uncertain about their access to forest conservation information, as illustrated in Figure 15. The pronounced lack of reliable information correlates with the findings from the Ogiek community, where a significant proportion of members acknowledged that their daily activities did not negatively impact forest cover. These results align with Azeez (2008), who posits that inadequate dissemination of environmental conservation information to local communities dependent on forests contributes significantly to the heightened deforestation rates observed across the African continent.

Further support for these findings was provided by officials from KFS, who noted that their department relies heavily on donor funding to develop programs to raise awareness of conservation measures. The lack of sufficient financial resources hampers the implementation of extensive programs.

The study also found that 60% of respondents accessed conservation information primarily through local meetings, while 20.8% indicated that their primary source was the KFS. Radio and television served as the second source of information for 17.6% of respondents, whereas only 0.8% relied on social media, as shown in Figure 16. These findings underscore the significance of local gatherings as effective channels for information dissemination, historically a crucial mode of communication within the Ogiek community. These meetings typically draw strong attendance, and the community values and actively engages with the information shared during these events.

In this context, the gatherings can be viewed as a form of social capital that fosters social relationships. Such connections can enhance information flow and facilitate collective action (McDougall & Banjade, 2015), which is essential for adaptive collaborative

approaches, including community-based natural resource management initiatives that are vital for conservation efforts (Bodin, 2008).

Moreover, while participants also relied on information from the KFS, officials from the KFS cited limitations in funding capacity-building programs. This finding correlates with the significant number of individuals who believe their daily actions do not contribute to forest degradation. Additionally, these results are consistent with the observed correlation between lower educational levels among respondents and limited access to forest conservation information from alternative sources such as non-governmental organizations or other relevant government departments. The shift in lifestyle is reflected in the number of individuals obtaining conservation information from radio broadcasts and social media platforms.

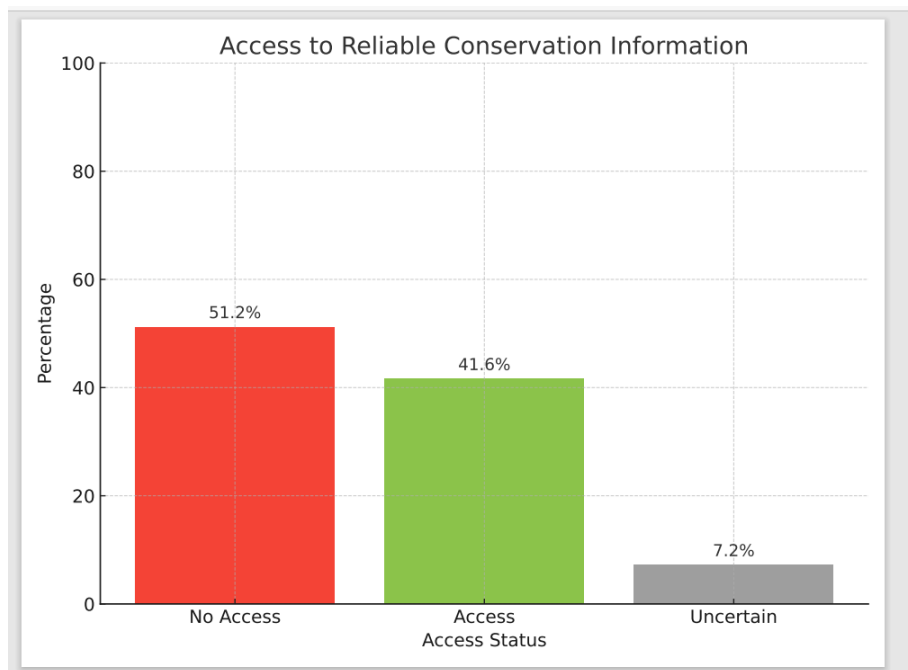


Figure 15 Frequency of Accessing Reliable Forest Conservation Information

Source: Field Data (2022)

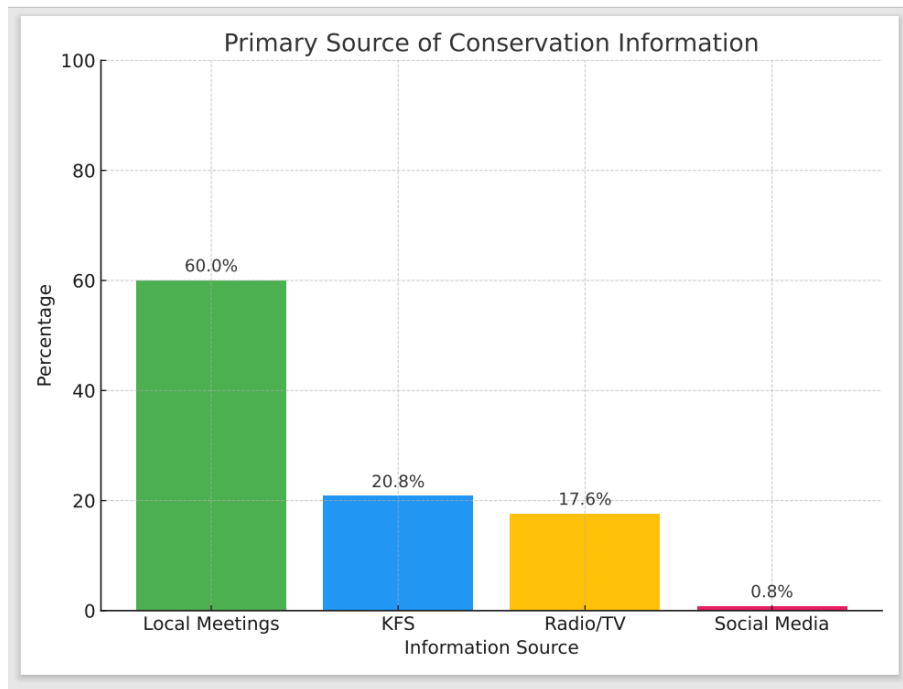


Figure 16 Sources of Conservation Information
Source: Field Data (2022)

4.5.3 Sustainable Forest Conservation Knowledge

Findings from the research indicated that 48.8% of respondents had never heard of sustainable forest management, and 15.2% had no knowledge of it. In comparison, 36% of respondents were aware of it, as shown in Figure 17. These results correspond to the higher number of participants who could not access reliable information on forest conservation. Furthermore, there is a correlation with information from KFS about insufficient funding for community capacity-building programs in the Mau Forest related to sustainable forest conservation and other topics. The lack of adequate knowledge regarding sustainable forest conservation may contribute to the ongoing degradation of the Mau Forest. My results align with several studies arguing that empowering local communities to manage their affairs, particularly in conservation, is a matter of moral rights (Carson et al., 2018). While there is international consensus on the importance of involving indigenous groups in forest management, particularly through capacity development, implementing these practices varies in effectiveness, interpretation, scope, and decision-making processes (Sterling et al., 2017). Consequently, there is a noticeable decline in the ability of local communities to engage in sustainable forest management policies, resulting in their

marginalization, dismissal, and neglect (Awuh, 2016). This is evident in my case study involving the Ogiek community in conservation measures.

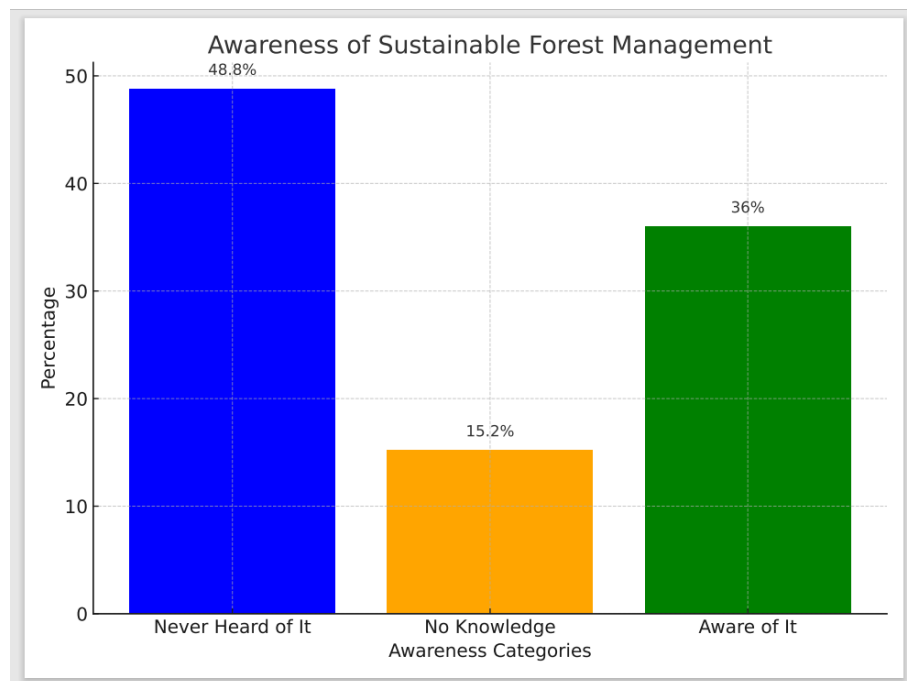


Figure 17 Sustainable Forest Conservation Knowledge
Source: Field Data (2022)

4.5.4 Management of Community Forests for the Protection of Forest Resources

Even though community members have limited access to conservation information, 73.6% agreed that community participation in managing forest resources will safeguard the forest resources. 12% of the respondents had no idea, while 14.4% did not agree with this statement, as shown in Figure 18. The high number of community participants in forest conservation correlates with the high number of Ogiek community members who access the forest for resources. Due to their dependence on the forest, they are willing to contribute to conserving the Mau Forest sustainably. In this sense, their daily livelihood will be restored.

These findings could be because, in the wake of substantial failures in centralized systems, numerous developing countries have explored various models of decentralized forest governance (Lund et al., 2018). However, research indicates that participation of local communities in

conservation remains low across developing nations (Mbeche et al., 2021). This is evident in the Ogiek community (Chomba et al., 2015) despite their willingness to participate in conservation measures. Furthermore, Ogiek are eager to participate in conservation as they are a source of local indigenous knowledge that can influence forest conservation and sustainability (Brugnach et al., 2017).

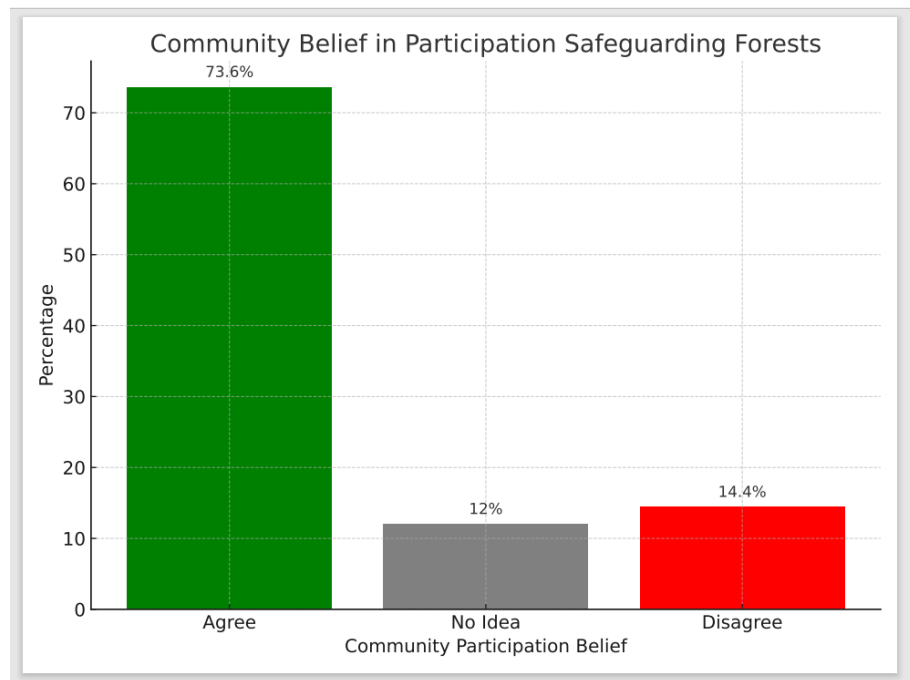


Figure 18 Community Participation in Forest Conservation
Source: Field Data (2022)

4.5.5 Ogiek’s Involvement in Mau Forest Conservation in the Last Decade

The study established that 77.6% of the respondents stated that they had not had much involvement in the conservation of Mau Forest. 20% said their involvement was good, and 2.4 % indicated it was excellent, as shown in Figure 19. These findings relate to the higher number of respondents who said they do not get information on forest conservation. Additionally, there is correspondence with more Ogiek community members wanting to be involved in forest conservation. There was a general feeling among the respondents of exclusion from the conservation process of the Mau Forest (Mbeche et al., 2021).

My findings are consistent with those of Waruingi et al. (2021) and Kwayu et al. (2014), who examined the extent and factors influencing household participation in Payment for Ecosystem Services (PES) programs in Kenya. They concluded that the involvement of local people is insignificant. Furthermore, my study agrees with recent calls to enhance indigenous participation in forest management, equitable engagement of stakeholders, and recognition of community priorities (van Kerkhoff & Pilbeam, 2017). Furthermore, I argue that households should voluntarily participate in conservation programs (Jones et al., 2020). However, some conservation schemes do not enforce the voluntary principle (Mullan & Kontoleon, 2012), and administrative selection can influence who is involved and who is not.

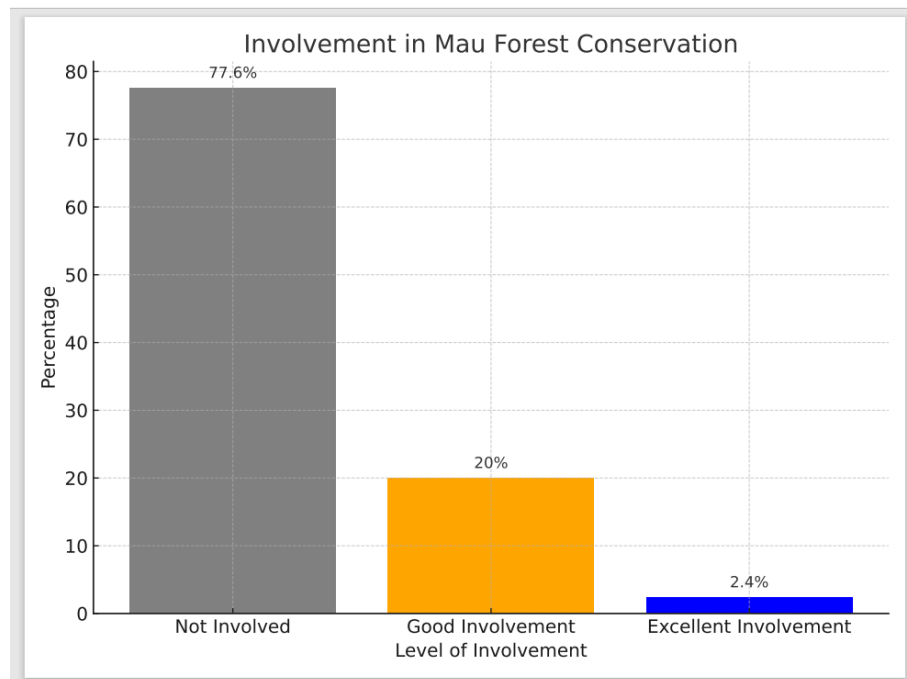


Figure 19 Extent of Participation in Conservation Programs in the Last Decade

Source: Field Data (2022)

4.5.6 Sensitizations on Sustainable Forest Management

To analyze the data gathered from 295 participants regarding their exposure to sustainable forest management education by Kenya Forest Service (KFS) officers and non-governmental organizations (NGOs), I

computed the proportions of respondents in each category of sensitization.

32% of respondents reported never being sensitized about sustainable forest management, suggesting a significant gap in outreach efforts. In contrast, 11.2% indicated they received sensitization annually, indicating limited engagement in regular educational initiatives. Additionally, 14.4% of the respondents received information quarterly, and 28.8% received information biannually, emphasizing varying frequency levels in disseminating information (see Figure 20)

To further analyze the implications of the findings, a chi-square test was used to examine the relationship between the level of sensitization and the participants' perceptions of their impact on deforestation and forest degradation. Given the high number of respondents believing that their daily actions do not contribute to environmental issues, it is plausible that insufficient sensitization has led to a disconnect between understanding sustainable practices and individual behaviours.

Moreover, the limited sensitization opportunities may be partially attributable to inadequate funding for KFS programs, which could restrict the capacity for frequent outreach and education efforts by both KFS and NGOs. The correlation between insufficient funding and limited engagement suggests a need for increased investment in sustainable education initiatives.

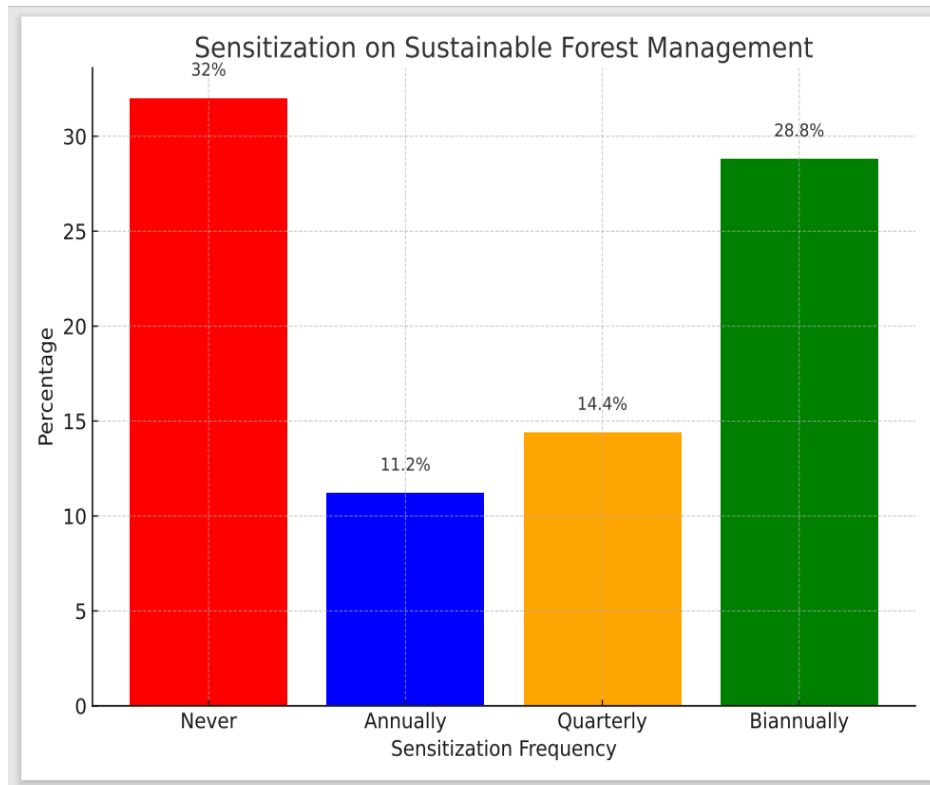


Figure 20 Frequency of sensitization on sustainable forest management

Source: Field Data (2022)

4.5.7 Interactions Between Ogiek Community, KFS, and NGOs

Out of 295 participants, 45.6% reported that interactions regarding forest conservation primarily occur through local barazas, typically coordinated by the local chief with assistance from national government agencies. Conversely, 49.6% of respondents were uncertain about the format of these interactions. A smaller fraction, specifically 4%, indicated that the interactions take the form of workshops, while only 0.8% identified pilot projects as the medium of engagement, as illustrated in Figure 21.

The substantial percentage of respondents who are unsure about the nature of these interactions may suggest a deficiency in the dissemination of information. This uncertainty may also be attributed to a prevailing mistrust between the respondents and the organizers of these meetings. This mistrust likely stems from a broader sentiment among respondents regarding their exclusion from decision-making processes related to the conservation of Mau Forest. Additionally, the

respondents' eviction from their residences within the forest could contribute to a perceived lack of relevance regarding the interaction modalities between the Kenya Forest Service (KFS) and non-governmental organizations (NGOs) focused on sustainable forest management.

These findings underscore the critical role of local social gatherings in facilitating communication and information flow related to forest conservation initiatives. The results align with prior research by McDougall & Banjade (2015), which emphasizes the importance of local networks in disseminating knowledge pertinent to environmental stewardship.

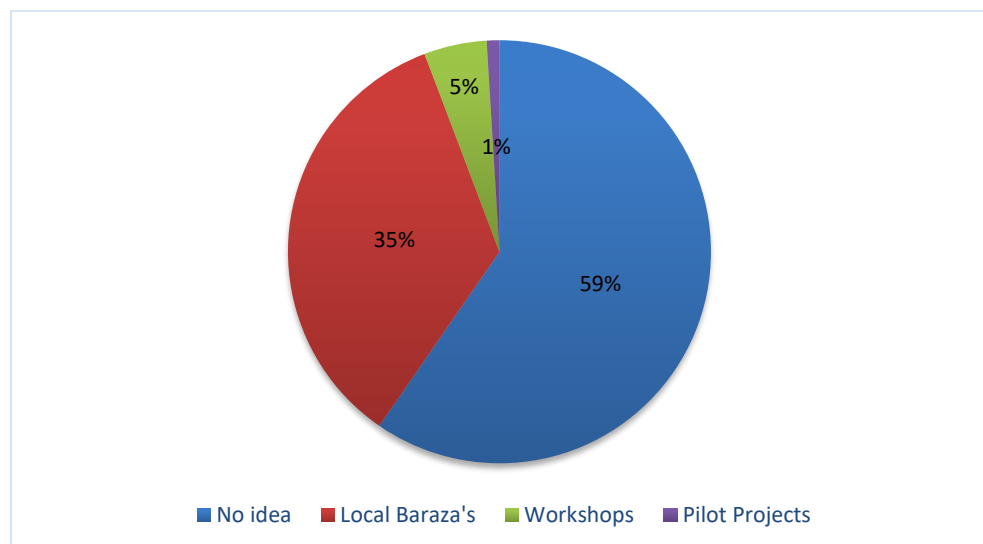


Figure 21 Interaction Medium Between Ogiek, KFS, and NGOs
Source: Field Data (2022)

4.5.8 Household Participation in Conservation Programmes

The findings reveal that, among 295 participants, 86.5% reported that their household members engaged in conservation activities between 0 and 3 times over the past five years. In contrast, 11.1% of respondents indicated participation between 4 and 7 times, while only 2.4% had engaged more than 7 times, as illustrated in Figure 22. These results indicate a remarkably low level of participation in sustainable forest conservation activities within the Ogiek community households.

The observed low participation rates may stem from respondents' limited understanding of sustainable forest management. This conclusion is consistent with the findings of Melnykovich et al. (2018), who highlighted the importance of enhancing local community capacity through knowledge exchange and environmental education to foster greater involvement in forest conservation efforts. Additionally, Carson et al. (2018) noted that the Ogiek's participation in forest policy has been hindered by a lack of comprehension regarding their local livelihoods among policymakers, pervasive discriminatory cultural practices, and a complex social history.

Moreover, all participants reported being excluded from formulating conservation projects, with their involvement restricted to implementation and monitoring roles. Data collected during the study indicated that many active projects had been initiated in the past decade. The absence of respondents in project formulation may significantly contribute to the low levels of engagement in conservation activities observed among the participants and their household members.

Furthermore, there appears to be a notable lack of individual or communal ownership of ongoing projects, as highlighted during the household survey. One participant explicitly noted this sentiment:

(...) I was only involved in the tree planting exercise last year. This project and the trees planted belong to KFS" (...), (Community member)

A deficiency in local communities' project ownership can contribute to the unsustainability of conservation initiatives. Furthermore, the respondents' foundational levels of education may lead project proponents to exclude the community from the formulation process. Supporting this perspective, Soe and Yeo-Chang (2019) suggest that a critical determinant for community participation in forest conservation is the assurance of benefits from their involvement.

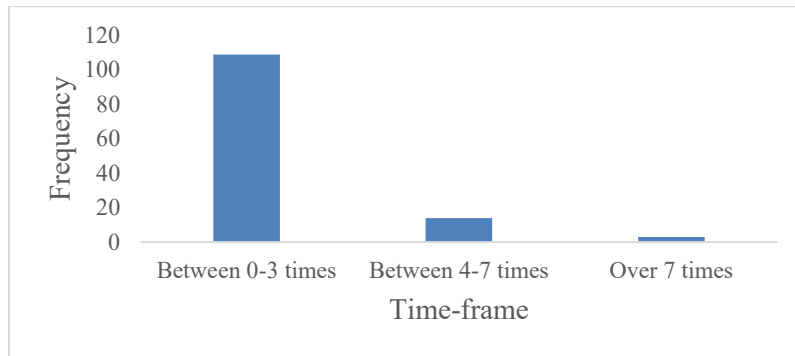


Figure 22 Timeframe of Household Participation in Conservation Projects

Source: Field Data (2022)

4.5.9 Household's Community Forest Association (CFA) Membership

The study found that 77% of respondents indicated that none of their household members were affiliated with a Community Forest Association (CFA). Conversely, 5 % were unaware of the existence of CFAs, while 18 % confirmed that members of their household were involved in a CFA, as illustrated in Figure 23. The significant proportion of non-involvement and lack of awareness regarding CFAs appears to correlate with the elevated number of household members not participating in forest conservation activities. This trend may be attributed to low levels of education, which could lead to a lack of confidence in engaging with CFA initiatives. Alternatively, inadequate information regarding sustainable forest management may contribute to this phenomenon. Nonetheless, a small subset of households actively participates in CFA activities, likely comprising individuals with higher educational attainment who possess a greater understanding of forest conservation principles. Additionally, the limited budget available to the Kenya Forest Service (KFS) and its consequent engagement with fewer households in conservation programs may explain the overall low levels of household participation in these initiatives.

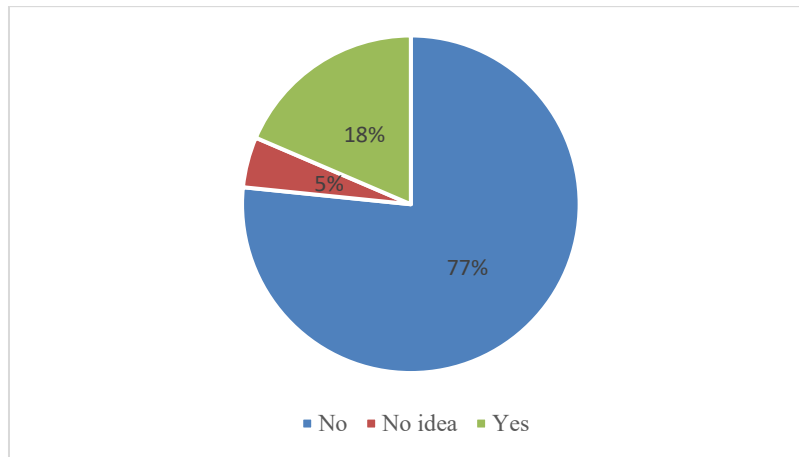


Figure 23 Household Involvement in CFA Implementation
Source: Field Data (2022)

4.5.10 Recommendations by Respondents on Sustainable Forest Conservation

The respondents provided valuable insights into governmental actions necessary for the sustainable conservation of the Mau Forest. The first major recommendation centres on the implementation of reforestation programs utilizing indigenous tree species. Respondents highlighted that their extensive interactions with the forest have equipped them with critical knowledge about native species suitable for replanting. A collaborative approach was suggested; local communities could work alongside the government to provide expertise in indigenous tree cultivation. Emphasis was placed on the importance of native species due to their resilience to climate fluctuations, contrasting with the downsides of exotic species, which have been linked to the growth of the timber trade and subsequent illegal logging activities.

Additionally, the necessity of incorporating indigenous knowledge into sustainable forest conservation strategies was underscored. Participants asserted that the government needs to engage all community segments in conservation initiatives, with one participant emphasizing the importance of inclusivity: “The government should not be selective when choosing the participants.” This sentiment arose from concerns regarding the current practice of the Kenya Forestry

Service, which predominantly involves youth in conservation efforts, potentially alienating other stakeholders.

4.6 Collaboration Challenges for Ogiek Communities

4.6.1 Involvement of Household Members in Collaborations

The results indicated a significant disparity in perceptions regarding collaboration between the local community and various stakeholders. Specifically, 23% of respondents reported a lack of collaboration, while 77% acknowledged cooperative efforts involving CFAs, KFS, and non-governmental organizations (NGOs) (see Figure 24). This aligns with key informant interviews from KFS, which indicated a partnership with the Ogiek community through the Ogiek Peoples Development Program to reclaim the Mau Forest. This program encompasses reforestation initiatives and the promotion of land rights awareness.

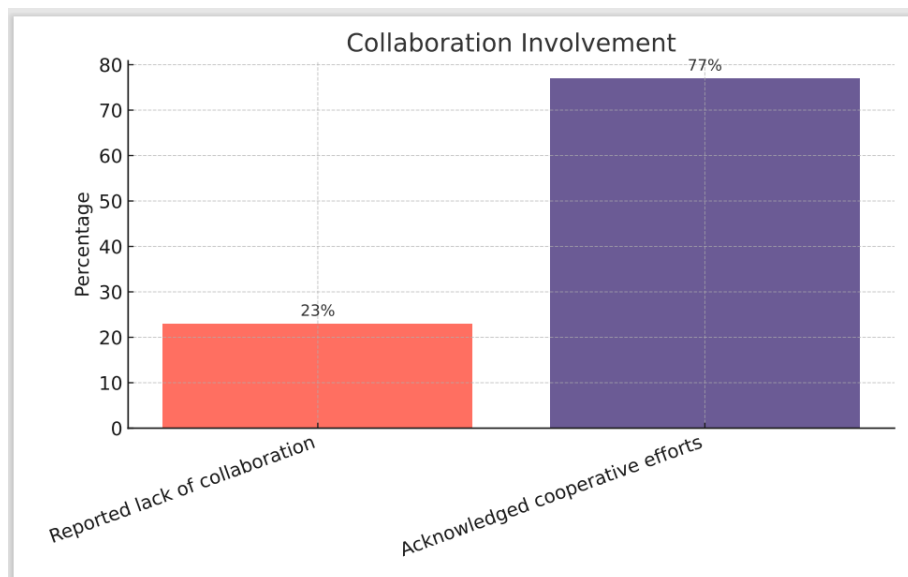


Figure 24 Collaboration Involvement
Source: Field Data (2022)

The collaboration allows Ogiek community members to cultivate crops for staple foods during the initial phases of forest restoration in previously degraded areas. The overarching goal is to benefit vulnerable groups by enhancing forest preservation efforts and improving food security among the Ogiek population. Additionally, the

initiative aims to increase household incomes, leading to financial benefits for the government through land rental proceeds.

However, despite being aware of them, 60% of community members reported non-involvement in these collaborative efforts at the individual and household levels. Only 38% either participated directly or knew someone involved, while a minimal 2% had no connection to the collaborations, as illustrated in Figure 25. This low participation rate correlates with ineffective communication and information dissemination regarding sustainable forest management practices. Furthermore, the collaboration efforts within the Mau Forest receive substantial financial backing from NGOs, directly or through KFS. Nonetheless, a notable decline in funding support has hindered the establishment of new CFAs, raising concerns about the sustainability of existing associations due to inadequate financial resources.

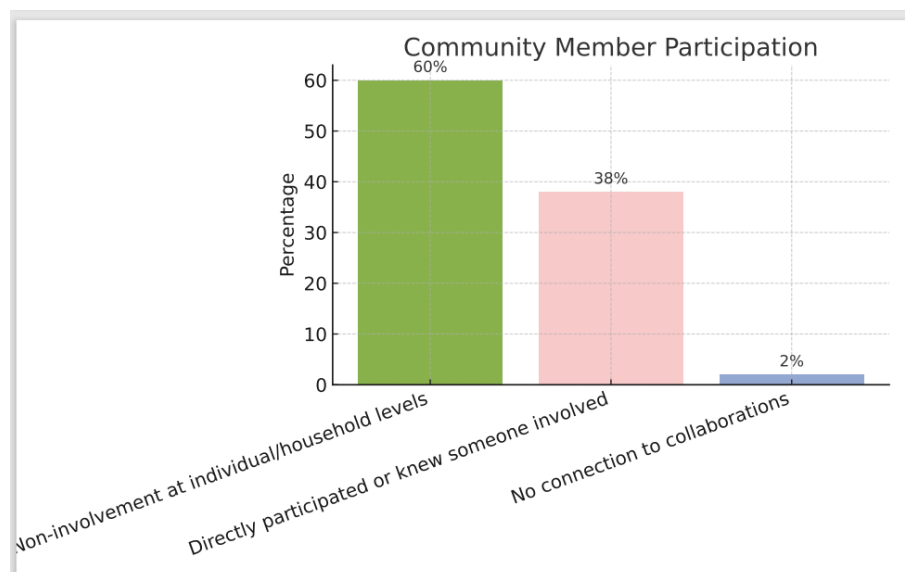


Figure 25 Involvement of Household Members in Collaborations
Source: Field Data (2022)

In evaluating perceptions of collaboration success, 63.5% of respondents were uncertain about its efficacy, while 29.4% viewed the collaborations as successful, and 7.1% believed they were not successful (see Figure 26). A substantial percentage of respondents expressed uncertainty, which can be linked to the minimal community involvement in collaborative initiatives.

Critically, those who perceived the collaborations as failures cited two primary reasons. Firstly, they noted that these initiatives predominantly cater to the elite, thus excluding many Ogiek households, which often have limited formal education. This finding corroborates the conclusions of Waruingi et al. (2021), which revealed that wealthier households participate more in the Plantation Establishment and Livelihood Improvement Scheme (PELIS) because they can afford the associated costs. Conversely, poorer households often lack necessary financial resources, access to information, and technical expertise, diminishing their participation rates.

Secondly, participants expressed concerns that projects targeted primarily the youth, who are perceived as less engaged in forest conservation efforts. They also reported being excluded from project development and planning phases and only participating during implementation. This lack of engagement ultimately led to unaddressed socioeconomic and environmental needs within the community, resulting in diminished project ownership and perceived failures.

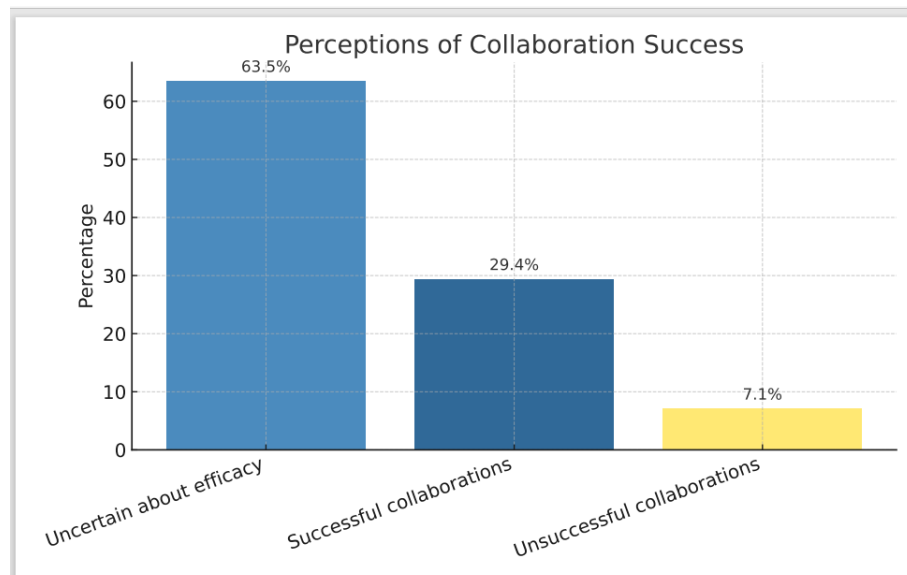


Figure 26 Perception of the Failures or Success of Collaborations
Source: Field Data (2022)

4.7 Mandate of KFS in Mau Forest Conservation

4.7.1 Legislation and Institutional Framework Amendments for KFS

The KFS department reported that improving forest management has been a key objective in forestry sector amendments over the past decade. Due to devolution, county governments must develop spatial plans and forest conservation strategies. The department has therefore made efforts to amend the Kenya Forest Act of 2016 through an act of parliament, with the most recent amendment occurring in 2022. The Forest Conservation and Management (Amendment) Bill of 2021 aims to remove clause 34(2) from the 2016 Act, which mandates authorities to vet anyone attempting to alter forest boundaries.

The broader implication of removing clause 34(2) from the Forest Conservation and Management (Amendment) Bill of 2021 could be significant for forest conservation efforts. This clause plays a crucial role in regulating modifications to forest boundaries by requiring authorities to vet any proposed changes. Eliminating this requirement poses a risk of unrestricted alterations to forest areas, potentially resulting in deforestation and habitat loss. This could harm biodiversity, ecosystems, and the environment's overall health.

Moreover, without strict oversight, logging, agricultural expansion, and urban development may encroach upon forested areas, undermining conservation goals. This could also exacerbate climate change impacts, as forests are vital in carbon sequestration. At a community level, diminished protections might affect local populations relying on forests for their livelihoods, leading to increased land use and resource management conflicts. Removing such a regulatory measure could pose serious challenges to sustainable forest management and conservation efforts.

This clause protects forests from actions that may threaten rare, endangered, or vulnerable species. This Forest Policy establishes a framework for improved forest governance, resource allocation,

partnerships, and collaboration between the National and County governments, the private sector, and non-state actors. It also outlines monitoring and evaluation measures to enable the sector to contribute to achieving the country's growth and poverty alleviation goals within a sustainable environment. Furthermore, the department is working on the Grazing Act, which examines forest zoning.

4.7.2 Involvement of Ogiek in Sustainable Management and Utilization of Forest Resources

KFS, through several initiatives, has considered the needs of the communities. The Forest Act of 2016 allows Participatory Forest Management (PFM) to engage forest-dependent local communities with the government in forest management, creating Community Forest Associations (CFAs). To meet the global recommendation of 10%, KFS planned to increase forest cover by 670,000 hectares by 2020, partly through engagement with the CFAs.

The department established the Plantation Establishment and Livelihood Improvement Scheme (PELIS) through the national government. The program aims to benefit marginalized forest-dependent community members, such as women and poor community members.

PELIS has successfully restored approximately 5,000 hectares of land through its initiatives. The program allows communities near forests to grow local staple crops during the early stages of restoring degraded areas. Through Community Forest Associations (CFAs), the program has engaged around 2,000 members, providing opportunities for cultivation within forest regions, reinforcing the importance of community involvement in environmental restoration efforts. The initiative showcases how collaborative efforts between the government and local communities can bring significant ecological and economic benefits.

Furthermore, the department has collaborated with the Ewaso Nyiro North Development Authority to provide tree seedlings to community

members. Similarly, they provide the local community with modern beehives to enhance honeybee production.

According to the department, Ogiek community members have displayed a cheerful outlook toward the policy development process because they depend on the forest for their livelihood and are ready to be part of sustainable management and conservation. Moreover, the planning practices within KFS have integrated the social and economic values of the forest. Acknowledging the Ogiek as an Indigenous community, the department permits them to initiate communal activities within the forest. During this period, they safeguarded the forest and assisted the department by reporting illicit activities. Additionally, Ogiek 's cultural festivities are celebrated through tree planting activities in collaboration with the department.

To strengthen the Ogiek's economic knowledge, the department has funded training sessions and allocated resources for livelihood improvement projects. A segment of the Ogiek community underwent training on preparing compost manure, enabling them to utilize organic manure on their farms. Furthermore, the department provided sensitization on economically sustainable and climate-resilient crops, including Irish potatoes, beans, cabbage, and cowpeas. Additionally, many community members received modern beehives for beekeeping on their land.

Previously, the Ogiek community utilized honey for domestic purposes and exchange trading; however, it currently serves as a source of income for families. In collaboration with multiple stakeholders, including KFS, the Mariashoni Community Development Community-Based Organization (MACODEV CBO) was established in 2012 by local beekeeper groups and serves as a community-based organization. Its goal is to empower and guide communities, promoting sustainable development and enhancing livelihoods through beekeeping and eco-farming. Three hundred fifty beekeepers organized into twelve self-help groups are part of MACODEV in Mariashoni. Furthermore, MACODEV adds value to the honey by purchasing, refining, and packaging from its members.

Even though MACODEV exists, I noted three distinct value chains in the honey-selling process for non-members. Initially, sales may occur locally for smaller quantities of honey. The harvested honey is transported to nearby towns and sold to intermediaries, who convey it to major cities like Nakuru and Nairobi for resale. Consequently, prices vary at various levels, with the lowest prices observed at the local level and the highest prices in larger cities. As a result, intermediaries tend to generate higher profits than Ogiek farmers.

In addition to the previously mentioned activities, MACODEV CBO actively participates in ecotourism endeavours, having established a community guest house. This initiative creates employment opportunities and generates revenue for several community members. Furthermore, the CBO conducts community training and awareness programs, emphasizing the value chain in honey production and promoting soil conservation through organic farming, agroforestry, and crop rotation practices. Adding to their diverse initiatives, MACODEV CBO operates a radio station, "SoGoot," to disseminate essential information to the local community. Collectively, these practices contribute positively to the livelihoods of the Ogiek.

Collaborations between the department and the Ogiek community have been established, integrating Indigenous knowledge with modern-day science. Drought prediction has been conducted through the inspection of sheep intestines. Furthermore, community members are sensitized to fire outbreaks and water rationing. Similarly, fifteen scouts from the community have been employed to serve as forest guards and report illegal activities. They are also tasked with managing tree nurseries. For communication purposes, the scouts have been equipped with mobile phones.

Conflict between the Ogiek community, the government, and other migrant communities has been prevalent over the past few years. The department has involved national government administration officers and village elders in the conflict resolution process.

Moreover, the department undertakes forest valuation against mature trees, not considering the forest's total value. Research institutions have

partnered with KFS to conduct the valuation exercises. The department also advocates for the utilization and sustainable stewardship of non-timber forest resources like gum arabica and aloe vera, which are abundant in the Mau Forest. Due to budgetary restraints, KFS is currently not implementing forest conservation programs. The officer in charge emphasized the collaborative activities and conservation measures that have been put in place. He stated:

(...) “As you can see, we have worked hand in hand with the Ogiek community for a long time to ensure that we conserve Mau. I agree we have problems with certain community members that are encroaching on the forest, but we are committed to finding long-lasting solutions to the problems and amicably addressing the encroachment issues”
(Forester, Mr. Oletapi)

Finally, I noted that the department advises against the Ogiek raising goats due to their detrimental impact on forest trees. Adapting to this aspect proves challenging for the Ogiek community and creates conflict. Goats are among the Ogiek’s preferred domestic animals. This preference is partly because goats require less intensive management and provide a vital source of meat and milk.

4.8 Compensation for the Forest Eviction of the Ogiek Community

According to the human rights groups interviewed, the Ogiek People's Development Program, in 2009, a 21-day eviction notice was served by the Kenya Forest Service. This threatened to cause harm to the community. The Ogiek People's Development Programme (OPDP) petitioned the African Commission. OPDP's complaints led the Commission to conclude that mass rights violations occurred. In March 2012, the Commission referred the case to the African Court for adjudication. It started documenting offenses committed as evidence to support their case with the African Union Commission and the African

Court. Permissive laws continued to allow industrial agriculture to advance into Ogiek territory.

In May 2017, the Ogiek people succeeded in getting their rights recognised. The African court found the Kenyan government guilty of violating the Ogiek's right to property, natural resources, culture, and religion and recognised them as an Indigenous community. Now, the Ogiek are asking for the full implementation of the court's ruling, including compensation and reparations.

5.0 SUMMARY OF MAIN FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the main findings, conclusions and recommendations from the study guided by the specific objectives. The chapter consists of three main parts. Firstly, a summary of the main findings is provided, organized according to the objectives of this study. This underlines how forests contribute to alleviating poverty, the socio-economic livelihood options of Ogiek households, and the socio-economic and environmental impacts on the Ogiek. Secondly, the conclusions of the study and thirdly are the main recommendations on enhancing the Ogiek's participation in the Mau Forest conservation. Lastly, there is the suggestion of areas that require further research.

The conceptual framework supported the study in data analysis and presentation of findings by assessing the landscape demands of Mau Forest, focusing on the Ogiek's lifestyle and the livelihood resources they obtain from the forest. Additionally, collaborations exist to assess the stakeholders involved in Mau Forest conservation. Similarly, the involvement of the Ogiek community in forest conservation, capacity building regarding sustainable forest management, access to forest conservation information, and existing conflicts between stakeholders are considered. Finally, we will evaluate the impact of Mau Forest conservation on the Ogiek's livelihood and sustainable forest conservation.

5.2 Summary of the Findings by the Objectives

5.2.1 Forest Resource Access Challenges for Dependent Communities

The findings suggest that socio-economic and environmental factors have significantly influenced the decision-making processes within the Ogiek community. The community's livelihoods are predominantly

dependent on the Mau Forest. However, the government categorizes the Ogiek people as illegal encroachers, accusing them of engaging in illicit forest activities and exhibiting unsustainable practices that contribute to environmental degradation. This classification has culminated in the eviction of the Ogiek from the Mau Forest, an event characterized by instances of violence and human rights abuses during the eviction process. Despite the detrimental effects of these evictions on the Ogiek's livelihood, the government has failed to offer compensation for the losses incurred, including property, land, and injuries sustained during the forced removals.

In addition, governmental restrictions have curtailed the Ogiek community's household rights to access forest resources. The KFS has enacted measures to arrest and prosecute individuals who violate these regulations. Consequently, these restrictions have severely limited the Ogiek's access to and utilization of forest resources. The community relies on non-timber forest products (NTFPs), such as medicinal plants, fuelwood, fruits, and vegetables, for subsistence and income generation. The imposed limitations have led to adverse effects on the Ogiek's livelihoods, exacerbating poverty and vulnerability within the community. Furthermore, these restrictions have been resisted, as the Ogiek perceives them to be unjustified.

The ongoing constraints have induced heightened tensions between the Ogiek community and government officials. This discord has precipitated significant conflicts between the Ogiek, the government, and neighbouring communities, adversely impacting Mau Forest conservation efforts. The absence of sustainable forest management practices has had a direct adverse effect on the livelihoods of the Ogiek, given their reliance on the forest's resources. Additionally, the conflict with neighbouring communities has fostered mistrust, undermined trade relations, and influenced Ogiek's income from commerce.

Moreover, the evictions have contributed to the erosion of trust and social cohesion within the Ogiek community. The detrimental effects have particularly impacted the most disadvantaged members, who have

historically depended on traditional institutions for guidance, support, information, and assistance, and have benefited from the cultivation of social capital.

5.2.2 Conservation Efforts for the Sustainable Use of Forest Resources

Research findings indicate that the recognition of the Ogiek community as essential stakeholders, along with their full participation in the conservation of the Mau Forest, is critical for achieving sustainability. Interviews with conservation stakeholders reveal a shared commitment to involving the Ogiek community in forest conservation efforts; however, the Department of Forest in Molo Sub County has only partially engaged the community. A significant portion of the Ogiek population reports feelings of exclusion from the decision-making processes, resulting in a growing disconnection from governmental initiatives.

Pilot programs, such as the Kenya Climate Smart Agriculture initiative funded by the World Bank, have been implemented to collaborate with organized community groups to enhance forest conservation through livelihood interventions to strengthen community capacity. Nevertheless, the sustainability of these programs is undermined by a pervasive lack of trust between local communities and governmental authorities.

Moreover, community involvement appears to be limited to the implementation phase of specific conservation projects. The shortcomings of existing forest conservation programs can be attributed to the insufficient consideration of the Ogiek's Indigenous knowledge and perspectives regarding forest conservation during the design and execution phases. Additionally, the KFS and other relevant conservation stakeholders in the region have not prioritized promoting forest conservation and sustainability awareness within the Ogiek community.

A substantial proportion of respondents indicated that they are not members of CFAs, leading to limited participation in activities

conducted by these associations. This high rate of non-involvement in CFAs correlates with many households not engaging in forest conservation activities. Furthermore, the Ogiek community has not participated in local meetings concerning forest conservation policy development. The absence of adequate consultation and ineffective communication within the policy development process has resulted in an information vacuum, which a select group of local elites has exploited to influence policy outcomes.

5.2.3 Collaboration Challenges Between the Ogiek Community and Other Stakeholders

Forest conservation represents a collaborative effort between local communities and various stakeholders, including governmental and developmental organizations, to promote sustainable livelihoods while safeguarding natural resources. The Ewaso Nyiro Development Authority has partnered with the Ogiek community to facilitate beekeeping and honey production initiatives. This project seeks to enhance the economic well-being of the Ogiek people while simultaneously fostering their motivation to preserve forest ecosystems.

Additionally, the KFS has engaged 15 scouts tasked with monitoring forest areas and gathering intelligence on illegal activities within the Mau Forest. These scouts also play a crucial role in supporting the propagation of tree seedlings for reforestation efforts. However, several challenges impede the success of these interventions. The initiatives tend to benefit a small elite community segment, limiting overall impact. Furthermore, the short-term nature of these programs hinders the attainment of sustainable, long-term outcomes in forest conservation.

Inter-community conflicts between the Ogiek and immigrant populations compound these difficulties, undermining efforts to establish a unified approach to sustainable livelihoods. Local cultural practices further complicate collaboration: specifically, women in the Ogiek community traditionally lack land ownership rights, restricting

their participation in decision-making processes and limiting their access to benefits derived from forest conservation initiatives.

Legal disputes arising from forced evictions have also compelled the Ogiek community to act against the government, with ongoing court proceedings prolonging resolution and exacerbating divisions within the forest stakeholder community. Despite these significant obstacles, the Ogiek community is strongly committed to engaging in conservation initiatives to restore the Mau Forest. They are eager to leverage their indigenous knowledge and contribute as equal partners in conservation endeavours.

5.3 Conclusion

5.3.1 Forest Resource Access Challenges for Dependent Communities

The Ogiek community relies heavily on forest products for their daily livelihood, with essential resources like firewood, honey, and timber being vital for survival. Their use of medicinal herbs, wild fruits, and wild meat underscores the importance of these resources for nutrition and health. My findings align with many studies, eg, Forest products are crucial in rural economies, contributing over 60% of household revenue in the Peruvian Amazon (L'Roe & Naughton-Treves, 2014) and 40-60% of total income in India (Kumar et al., 2010). In Nepal and Myanmar, forests are vital for livelihoods and food security, with around 80% of rural Nepalis relying on fuelwood (Meilby et al., 2014), while in Bangladesh, communities near protected areas utilize various forest resources for subsistence (Mukul et al., 2016). Approximately ninety to one hundred wild plant food species are utilized in Asia and Africa (Bharucha & Pretty, 2010). In Indonesia, wild meat accounts for 51% of food (Rasmussen et al., 2017), while Amazonian rural meals contain 11% bush meat (Van Vliet et al., 2014b). However, restricted access reveals challenges in resource management, with an average access rate of about 68%. Recognizing

the link between forest resources and community welfare is essential, as changes in resource availability could significantly impact their lives.

In this context, the study reveals the Ogiek community's unstable circumstances, primarily due to their dependence on forests for sustenance. Government regulations and subsequent evictions exacerbate these challenges, jeopardizing their economic stability. There is an urgent need for policy reform that includes input from the Ogiek populace and prioritizes alternative livelihoods, ensuring the preservation of their cultural identity while promoting environmental stewardship.

Recent trends indicated a significant shift in the primary livelihoods of the Ogiek community towards agriculture. This transition underscores a substantial change influenced by reduced access to traditional resources and the incorporation of novel economic activities, potentially driven by interactions with neighbouring communities. Data suggest a clear relationship between higher educational attainment and the adoption of modern agricultural practices, indicating that education is a crucial factor in enhancing agricultural productivity and innovation within the community.

Despite this transition, the community relies strongly on forest resources, with a considerable portion of the population engaging regularly with the forest. This dependence indicates the forest's importance for livelihoods and its integral role in the community's cultural identity. However, the small percentage of participants who do not utilize forest resources may reflect shifting trends, possibly linked to increased educational levels and income diversification. This evolving dynamic may signify broader socioeconomic changes that could alter traditional practices and affect community interactions over time.

Finally, the analysis of conflicts between the government and the Ogiek community reveals a complex environment of perceptions and experiences related to access to forest resources. The conflicts are multifaceted, involving historical grievances over land ownership, competition for dwindling resources, and the effects of state-led

conservation efforts. Most respondents report experiencing considerable conflict, highlighting the acute awareness of these tensions within the community. The intersection of these disputes with neighbouring communities, along with ongoing challenges presented by migrant groups in the Mau Forest, underscores the urgent necessity for effective dialogue and resolution strategies. The persistence of disputes, especially regarding land tenure, highlights the need for effective conflict resolution strategies. The community's preference for formal resolution avenues indicates a significant lack of trust in traditional leadership structures. This suggests that conflict resolution methodologies, transparency, and accountability reforms are essential for fostering equitable resource management and community relations.

5.3.2 Conservation Efforts for the Sustainable Use of Forest Resources

The research highlights a substantial disparity in access to reliable information regarding forest conservation among the Ogiek community, with over 50% of respondents indicating difficulties in this domain. The community's reliance on local meetings as its principal source of information underscores the critical importance of community engagement in fostering environmental awareness. However, the findings also reveal shortcomings in the Kenya Forest Service (KFS) 's funding and capacity-building efforts, which may impede larger conservation initiatives.

Furthermore, the results indicate a significant lack of understanding of sustainable forest management among local populations, evidenced by a high percentage of respondents who are either unfamiliar with the concept or lack adequate comprehension. This knowledge deficit is closely associated with the ongoing degradation of the Mau Forest, underscoring the urgent necessity for accessible and reliable information on forest conservation. The correlation with inadequate funding for community capacity-building programs from KFS further emphasizes the pressing need for investment in educational and

empowerment initiatives. The active engagement of local communities, particularly indigenous groups, is essential for effective forest management. Multiple studies suggest that implementing collaborative approaches frequently suffers from inconsistencies and ineffective execution.

Further, the findings demonstrate a crucial need for enhanced community engagement in forest conservation initiatives, specifically for the Ogiek community, which expresses a willingness to participate but encounters barriers such as limited information and funding challenges. The gap between knowledge and action highlights the necessity for ongoing sensitization regarding sustainable practices to empower community members and improve their involvement in managing and conserving forest resources.

Data indicates a significant lack of awareness about the mechanisms for participation in forest conservation among local communities, exacerbated by feelings of exclusion and distrust. To facilitate improved engagement and foster mutual trust, it is vital to enhance both the transparency and accessibility of information related to conservation efforts and to actively involve community members in the decision-making processes affecting their environments.

The study also reveals alarmingly low levels of participation in conservation activities within the Ogiek community. This trend illustrates that those barriers, including a lack of understanding of sustainable forest management, exclusion from project formulation, and insufficient community ownership, significantly impede participation. The limited involvement in Community Forest Associations is further corroborated by the 77% of respondents reporting no affiliation with such organizations. These challenges underscore the need for a more inclusive conservation strategy that acknowledges and values the experiences and knowledge of community members.

Finally, the study underscores the urgent requirement for governmental prioritization of reforestation utilizing indigenous species and incorporating community members into conservation

practices. Such actions would enhance ecological integrity and recognize and leverage local communities' historical and cultural knowledge, promoting a more sustainable and pragmatic approach to forest conservation.

5.3.3 Collaboration Challenges Between the Ogiek Community and Other Stakeholders

The collaboration challenges the Ogiek communities face underscore the complexities of integrating diverse cultural, social, and environmental perspectives in collective endeavors. Issues such as historical marginalization, land rights conflicts, and inadequate representation in decision-making processes hinder effective collaboration. These challenges affect the Ogiek's ability to participate fully in regional development initiatives and impede the preservation of their unique cultural heritage and traditional ecological knowledge. Addressing these barriers is essential for fostering inclusive and sustainable collaboration that respects the rights and needs of Ogiek communities.

5.3.4 Mandate of KFS in Mau Forest Conservation

In conclusion, the involvement of the Kenya Forest Service (KFS) in the conservation and management of Mau Forest highlights the critical intersection of legislation, community engagement, and sustainable practices. Recent amendments to the Kenya Forest Act, particularly the proposed removal of clause 34(2), raise concerns about potential risks to forest integrity and biodiversity. However, KFS's initiatives, such as promoting Participatory Forest Management (PFM) and establishing Community Forest Associations (CFAs), emphasize the importance of local community involvement, especially that of the Ogiek. By fostering collaboration between the government and local stakeholders, KFS aims to enhance forest cover, restore degraded lands, and ensure that the socio-economic needs of marginalized communities

are met. The successful implementation of programs like PELIS underscores the positive impact of community-driven efforts in achieving ecological restoration and sustainability. As KFS continues to navigate the complexities of forest management, integrating environmental, social, and economic values remains vital for the long-term health and resilience of forest ecosystems and the communities that depend on them.

5.3.5 Compensation for the Forest Eviction of the Ogiek Community

The Ogiek community's struggle for recognition and justice highlights the importance of safeguarding Indigenous rights and addressing historical injustices. The African Court's ruling in 2017 marked a significant victory for the Ogiek people, affirming their rights to property, natural resources, culture, and religion. However, the ongoing quest for the full implementation of the court's decision, including compensation and reparations, underscores the need for accountability and commitment from the Kenyan government. Moving forward, measures must be taken to prevent further encroachment on Ogiek territory and to support the community's restoration and development in alignment with their rights and traditions.

5.4 Recommendations

5.4.1 Forest Resource Access Challenges for Dependent Communities

To establish a sustainable future for the Ogiek community, it is crucial to implement conservation policies that safeguard forest resources and ensure sustainable access. This includes initiatives focused on reforestation and the protection of vital habitats, which will play a key role in preserving the ecosystem on which the community relies. Encouraging the community to pursue alternative income sources is essential. By promoting activities and economic opportunities that align with traditional Ogiek practices, such as eco-

tourism, handicrafts and sustainable agriculture, the Ogiek community can reduce their dependence on forest products. This shift not only enhances their economic stability but also upholds cultural values and contributes to forest conservation efforts by lessening the pressure on natural resources.

Offering training and resources for better forest management is crucial. Educating the Ogiek community on sustainable harvesting of valuable products like medicinal herbs and wild fruits can yield long-term benefits for both the community and the environment. Additionally, implementing educational programs on modern farming practices and hosting workshops on sustainable agriculture can provide the community with practical tools to boost productivity while protecting their environment.

Furthermore, conducting focused research that examines the relationship between economic conditions and resource dependence will yield valuable insights. Understanding these dynamics will help inform and shape more effective policy responses to address the community's specific needs. It is also important to engage with policymakers to ensure that the rights and needs of the Ogiek community are included in broader environmental and economic strategies. By emphasizing their essential access to forest resources for sustenance, we can advocate for policies that support their livelihoods and empowerment.

Finally, decisive actions must be taken to address the current conflicts faced by the Ogiek community. This can be achieved by engaging neutral external stakeholders to facilitate dialogue among community members, government representatives, and conflicting parties. Strengthening the Ogiek's social capital through the promotion of their cultural identity and fostering unity will enhance collaboration and resilience. Establishing a framework for collective decision-making will further empower the community, ensuring their voices are heard in critical governance issues

5.4.2 Conservation Efforts for the Sustainable Use of Forest Resources

The Kenyan government is urged to enhance the legal frameworks governing land rights and cultural heritage to provide robust protection for the Ogiek community. This enhancement should involve the development and enforcement of legislation aimed at preventing encroachment upon Indigenous territories, as well as ensuring compliance with the 2017 ruling by the African Court. Immediate and full implementation of this ruling is critical, including the provision of timely compensation and reparations to the Ogiek people, thereby addressing historical injustices and reinforcing state accountability concerning Indigenous rights.

To ensure that the rights and perspectives of the Ogiek community are acknowledged, it is essential to establish participatory mechanisms that facilitate their active involvement in decisions regarding land and resource management. A participatory approach should be adopted for land-use planning, resource management, and development initiatives. Moreover, prioritizing programs aimed at preserving Ogiek culture, language, and traditions is vital; educational initiatives and community events focused on cultural heritage would promote pride and enhance the intergenerational transmission of knowledge.

Raising public awareness regarding the rights and challenges faced by the Ogiek community is also essential. Public awareness campaigns can generate solidarity and mobilize support for justice and recognition of Indigenous rights. Furthermore, fostering collaborations between local, national, and international organizations focused on Indigenous rights can amplify the voices of the Ogiek community and enhance advocacy efforts.

Investing in research to clarify the socio-economic dynamics of the Ogiek community is imperative. Data collection efforts should concentrate on aspects such as livelihoods, dependence on forest resources, and the impact of policies on community well-being, thus providing a scientific basis for informed decision-making. Furthermore,

incorporating traditional Ogiek knowledge into forest management strategies can enhance biodiversity conservation and promote sustainable resource utilization, yielding benefits for both the community and the broader ecosystem.

Additionally, the government, through the Kenya Forest Service and other agencies involved in Mau conservation, should revise its communication strategies to effectively engage with the community, utilizing appropriate channels such as community forums, celebrations, and the involvement of traditional leaders to disseminate important information. A comprehensive framework for monitoring and evaluating policies that support the Ogiek community should be established to ensure that adjustments can be made to adequately address the community's evolving needs. Addressing the historical injustices experienced by the Ogiek community necessitates a coordinated, multifaceted approach that respects their rights, supports their development, and strengthens their cultural identity. The implementation of these recommendations will contribute to the long-term sustainability and empowerment of the Ogiek people, paving the way toward justice and recognition.

5.4.3 Collaboration Challenges Between the Ogiek Community and Other Stakeholders

Inclusion of Ogiek representatives in decision-making at all levels is crucial. This can be achieved through legal frameworks that ensure their participation in policies impacting their communities, empowering them to influence decisions affecting their lives and environment. To enhance the negotiation, advocacy, and collaborative management skills of Ogiek community members, targeted training and resources must be provided. By empowering these communities, their capacity to engage effectively with external stakeholders will be significantly improved, leading to more successful partnerships and initiatives.

Another critical aspect is fostering an understanding of Ogiek cultural values among external partners. This can be achieved through

workshops and awareness programs aimed at bridging the gaps between various stakeholders. By establishing these educational programs, collaborative efforts can be built on a foundation of mutual respect and understanding, which is vital for successful engagement and cooperation. Advocacy for the recognition of land rights and the protection of cultural heritage within existing legal and policy frameworks is necessary. Supporting initiatives that secure land tenure for the Ogiek people will facilitate their active involvement in collaborative environmental management systems, ultimately benefiting both the community and the ecosystem.

Lastly, the implementation of robust monitoring systems is crucial for assessing the effectiveness of collaborative efforts. Engaging the Ogiek communities in the evaluative process will provide valuable feedback, ensuring that their perspectives and needs are adequately integrated into ongoing projects and initiatives. This participatory approach is fundamental for achieving sustainable outcomes.

5.4.4 Mandate of KFS in Mau Forest Conservation

Strengthening the legislative framework surrounding forest protection is essential for enhancing the conservation and management of Mau Forest. The evaluation of amendments to the Kenya Forest Act, particularly the proposed removal of clause 34(2), is necessary to assess their potential impacts on forest integrity and biodiversity.

Engaging with the Ogiek community is vital, as understanding their traditions and customs can facilitate the integration of these values into formal legal frameworks, thereby enhancing governance and cultural preservation. Effective forest management relies on community engagement, especially for marginalized groups like the Ogiek. Increasing local participation in forest management decisions, combined with the incorporation of traditional ecological knowledge, can foster greater stewardship and responsibility for forest resources.

Scaling up Participatory Forest Management (PFM) across various regions and providing training and resources to Community Forest Associations (CFAs) will empower these groups to manage and protect forest resources effectively, resulting in improved ecological outcomes. Moreover, education and awareness campaigns play a vital role in promoting sustainable forest management practices, instilling a culture of stewardship among local communities, and encouraging active investment in forest health.

Establishing robust monitoring and evaluation systems will enable stakeholders to assess the effectiveness of forest management strategies, focusing on ecological outcomes and community livelihoods. These evaluations will guide future policies and practices, promoting adaptive management.

Facilitating access to funding for community-led conservation initiatives can significantly enhance local livelihoods. Collaborations with NGOs and international organizations will provide resources to support sustainable practices, boosting the resilience of forest ecosystems. Moreover, incorporating traditional ecological knowledge into conservation frameworks is essential, as it often yields valuable insights for sustainable resource management.

Promoting sustainable economic practices is necessary to align community livelihoods with conservation objectives. Supporting the development of alternative livelihoods can yield economic benefits while preserving forest ecosystems, creating mutually beneficial scenarios for local communities and the environment. A collaborative approach involving government agencies, NGOs, and community groups is crucial for achieving comprehensive forest management outcomes.

Finally, investing in research and innovation will enhance sustainable forestry management practices with a focus on climate adaptability and ecosystem resilience. By implementing these recommendations, stakeholders can work towards a more effective, inclusive, and sustainable approach to forest conservation and management in Mau Forest and beyond.

5.4.5 Compensation for the Forest Eviction of the Ogiek Community

To strengthen protections for Indigenous rights, the Kenyan government should enhance legal frameworks that safeguard the land and rights of the Ogiek community. This includes ensuring that existing laws are effectively enforced to prevent further encroachment on their territory. Furthermore, the government must prioritize fully implementing the African Court's 2017 ruling, including timely compensation and reparations to the Ogiek people. The government can help rebuild trust and integrity within these communities by demonstrating accountability for historical injustices.

Active engagement of the Ogiek community in decision-making processes is critical for achieving equitable outcomes. Establishing mechanisms that allow their voices to be heard, especially regarding land use and resource management, can ensure their rights and needs are respected. In addition, the promotion and preservation of Ogiek culture, language, and traditions should be prioritized to maintain their unique heritage and identity.

Moreover, implementing regular monitoring and evaluation of policies designed to support the Ogiek community will ensure accountability and transparency in the process, allowing for adjustments and improvements where necessary. Lastly, raising public awareness about the rights and struggles of the Ogiek community is crucial in garnering broader support for their cause. Launching awareness campaigns can educate the public on Indigenous issues, fostering solidarity and commitment to justice. These comprehensive recommendations aim to create a pathway for the Ogiek community to restore and develop in alignment with their rights and traditions.

The analysis of conflicts and conservation efforts involving the Ogiek community highlights the urgent need for effective collaboration and implementation of recommendations aimed at improving resource management and community relations. Key organizations that should

be involved include the KFS, which is critical for enhancing funding and capacity-building initiatives, as well as local government authorities to ensure transparency and accountability. NGOs and CBOs are essential for mobilizing community participation, raising awareness, and advocating for indigenous rights. Additionally, academic institutions can provide valuable research to inform policy, while international organizations can offer technical support and funding for conservation efforts.

Moreover, engaging the private sector in sustainable practices can further benefit both the Ogiek community and the environment. By fostering collaboration among these diverse stakeholders, a more inclusive and effective approach to forest management that not only addresses the historical grievances and current challenges faced by the Ogiek community but also empowers them to play a pivotal role in conserving their natural resources and cultural heritage can be created.

5.5 Suggestions for Further Study

Subsequent studies should prioritize exploration into the following areas:

- (i) Further research is necessary to assess the impact of migration on deforestation. Limited research exists exploring the extent to which migration poses a threat to Mau Forest conservation. Therefore, future studies should focus on examining the recent patterns of immigration to the Mau Forest to better understand the potential implications for deforestation and conservation.
- (ii) Additional research should focus on the multifaceted dynamics of deforestation, particularly the role of the political system as a fundamental factor. It is necessary to expound on how political forces influence deforestation drivers. Furthermore, research should explore the complex interplay between political factors and deforestation dynamics, focusing on the complexities of

resource governance and the implications for forest conservation efforts.

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ANNEXES

Annex 1: Study Area

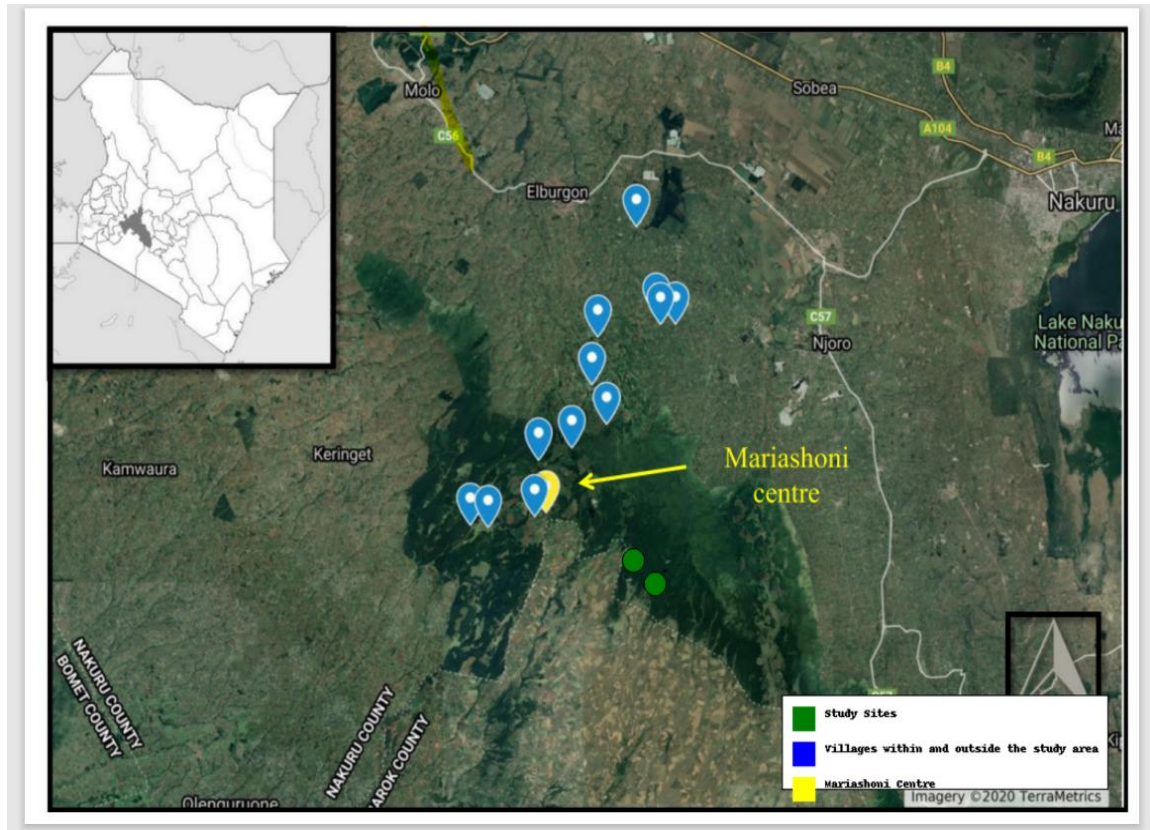


Figure 27 Study Area
Source: Author

Annex II: List of Oral Informants who Did not Seek Anonymity

Name	Title	Date of interview	Location
Alexon Oletapi	Forester Mariashoni	05/01/2022	Mariashoni
Daniel Ngurule	Chief Mariashoni	07/01/2022	Mariashoni
Joseph Towett	Chair Ogiek, council of elders	06/01/2022	Nakuru
John Omam	Njoro Conservator	07/01/2022	Njoro
George Njoro	Mau Conservator	07/01/2022	Njoro

Annex III: Plates (Photos) Taken During Field Work



Plate 1 KII interview with the Forester Mr. Oletapi in Mariashoni forest station
Source; Author



Plate 2 Implementation of the PELIS farming program.
Source; Author



Plate 3 CFA members and scouts tending to tree seedlings in their nursery
 Source; Author



Plate 4 The beekeeping initiative for Ogiek households, and value-added honey
 Source: Author (Beehives), MACODEV (Packaged Honey)

Annex IV: Research License

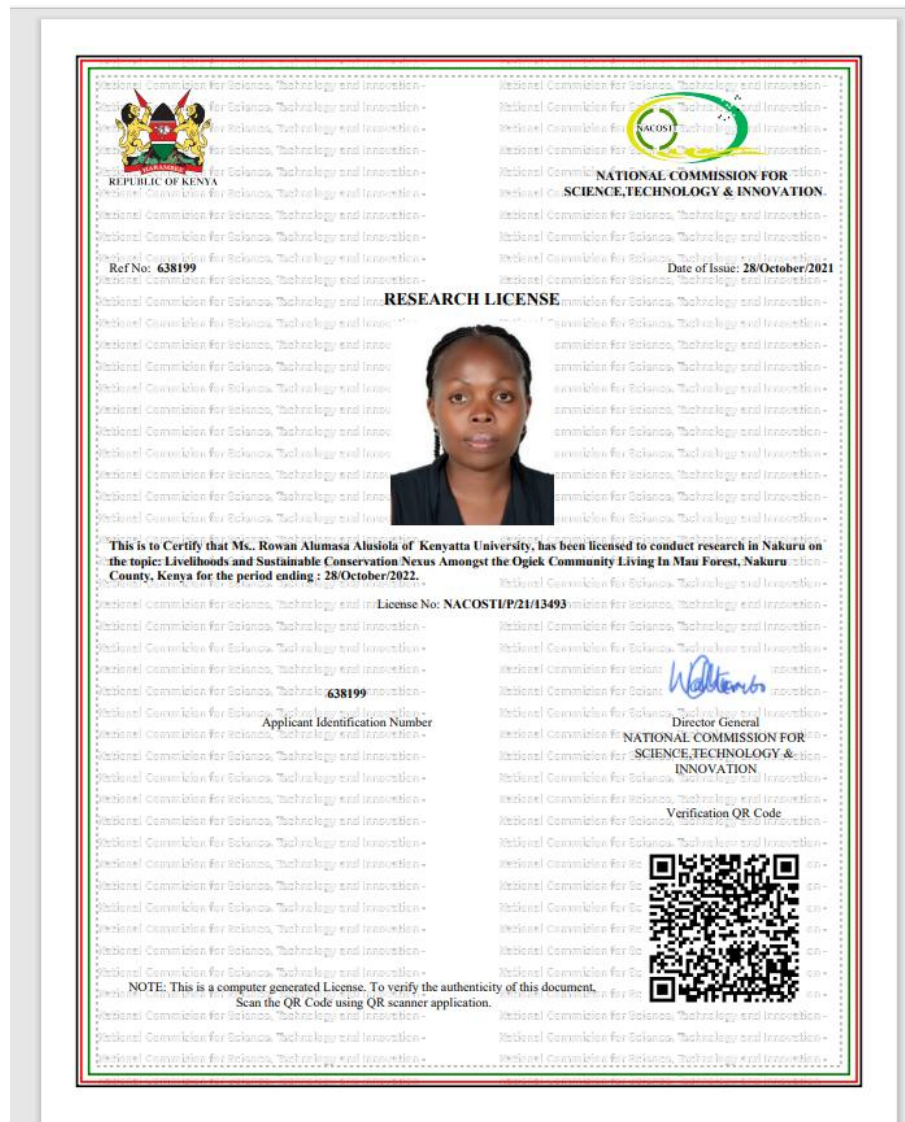


Figure 28 NACOSTI Research License

APPENDIXES

Appendix I: Letter of Introduction

Rowan Alumasa Alusiola
P.O.Box66827
Nairobi, Kenya

Dear Respondent,

My name is Rowan Alusiola. I am currently pursuing a master's degree at Kenyatta University, conducting a research project titled "*livelihoods and sustainable conservation nexus with special reference to the Ogiek community within Mau Forest, Nakuru County, Kenya*" being a partial fulfilment of the master's degree in environmental studies (Community Development).

I kindly request you to be part of my research by filling in this questionnaire. Please answer all the questions with your true agreement to each. This will help me in developing relevant recommendations aimed at informing future conservation efforts, as well as policymakers, on the involvement of the community in conservation. The information and data obtained will be confidential and solely used for academic purposes. Your sincere feedback would be greatly valued. Thank you in advance. Best regards

Rowan Alumasa Alusiola

Reg.No: N50/CTY/PT/ 23016/2011

Appendix II: Questionnaire

Please give your honest and accurate answers/opinions to the questions below. All the information you give is going to be highly confidential. Please refrain from writing your name on this questionnaire.

Section A: Questionnaire Logbook

1. Questionnaire Identification Number
2. Date of Interview
3. Village Name.....

Section B: Background Information of the Respondent

4. What is your capacity when answering this questionnaire?
 - a. Chief/Assistant Chief
 - b. Head of Household
 - c. Spouse
 - d. d. Other
5. Gender of the respondent
 - a. Female
 - b. Male
6. Do you have a formal education?
 - a. Yes
 - b. No
7. If yes above, at what level?
 - a. Primary
 - b. Secondary
 - c. Collage/Technical
 - d. University
8. What is the number of people in this household?
 - a. Between 3-5
 - b. Between 3-8

- c. Between 3-15
- d. Over 15

Activities in the household

9. What is the distance between your home and the forest?

- a. less than 800M
- b. 800M-5 KM
- c. 5-15KM
- d. Over 15 km

10. Do you access the forest?

- a. Yes
- b. No

11. If yes above, which forest products do you or any of your household members have access to? (Tick all that are appropriate)

Products	Tick
Firewood	
Tree Seedlings	
Honey	
Charcoal	
Fodder for animals	
Grass for thatching houses	
Medicinal Herbs	
Wild Meat	
Timber/Wood	
Wild Fruit	

12. How often do you access the forest for its services?

- a. Daily
- b. Thrice a week
- c. Twice a month
- d. I do not access the forest.

13. What is the main livelihood activity for this community?

- a. Lumbering
- b. Farming
- c. Trading

d. All the above

Other (Please mention here)

.....

14. If your response above is (a) lumbering, please mention the way it takes.

- a. Commercial logging
- b. Logging by chainsaw
- c. Fuelwood & Charcoal

Section C. Sustainable Forest Management

15. What are some of the main limitations to your livelihood activities?

- a. Restrictions on accessing forest resources by the project proponents and the government.
- b. Forest cover reduction in size
- c. Eviction from your homes by the government
- d. Loss of biodiversity
- e. All the above

16. Do you think your daily actions may have contributed to the decrease in size of forest cover in one way or the other?

- a. Yes
- b. No
- c. I do not know

17. Have you been able to gain access to information on forest conservation?

- a. Yes
- b. No
- c. I do not know

If yes, what are the sources of the forest conservation information?

- a. Kenya Forest Service
- b. NGO Officers
- c. Radio
- d. Television
- e. Social Media
- f. SMS
- d. other sources

Mention them.....

18. Do you have any knowledge about sustainable forest management?

- a. Yes
- b. No
- c. I do not know.

19. How often have you been involved in sustainable forest conservation activities over the past five years?

- a. Not often
- b. Often
- c. Very Often

20. How often do Kenya forestry service officers and NGOs talk to you about sustainable forest management?

- a. Yearly
- b. Every 6 months
- c. Every 3 months
- d. Monthly
- e. Weekly
- f. Never

21. In which form have they interacted with you?

- a. workshops
- b. Local baraza
- c. Projects

22. How many times have you or any member of your household taken part in the events above over the last five years?

- a. Between 1-5 times
- b. Between 5-10 times
- c. Between 10-15 times
- d. Over 15 times
- e. Never

23. Has any of your household members been involved in the design of a project in the last five years?

- a. Yes

b. No

If yes, please mention which one it was.

.....

24. Please list some projects that you and your household have worked on over the past five years.

.....

25. Are you or anyone in your household a member of the Community Forest Association (CFA)?

a. Yes

b. No

c. I do not know.

If yes, what activities do they engage in?

.....

26. In your opinion, please mention some of the things that the government and project proponents/implementors should implement to ensure that the Mau Forest is sustainably conserved.

.....

Section D: Stakeholder Collaborations

27. Are there any collaborations between the local community, CFA, KFS and NGOs?

a. Yes

b. No

c. I do not know.

28. Have you personally or a member of your household been involved in the collaborations?

a. Yes

b. No

c. I do not know.

If yes, do you feel that the collaborations were/are successful?

a. Yes

b. No

c. I do not know.

If no, please mention some of the challenges that you have experienced.

.....

If yes, please mention some of the things that made it successful.

.....

29. Do you agree that collaboration between the community and other stakeholders in the conservation and management of forest resources contributes to its sustainability?

a. Yes

b. No

c. I do not know.

If yes, please give a reason.

.....

30. In your opinion, what are some measures that should be followed to ensure successful collaborations?

.....

Section E: Disagreements/Conflicts between forest livelihoods and Conservation

31. Has forest conservation and use been affected by any conflicts between your community, the government and project proponents? (Tick one)

i.	Forest use and conservation id rarely interfered with conflicts between the government, project proponents and the community because they are not serious	
ii.	Conflicts have occurred between the community, the project proponent and the government, and they have interfered with forest conservation and use	
iii.	I have no idea	

32. Are there conflicts between your community/village and another neighbouring one due to the use and access? (Tick one)

i.	Conflicts have not been experienced between our community/village and any other	
ii.	Conflicts have occurred, but they do not disrupt access to or utilization of forest resources.	

iii. Conflicts have occurred, and they have interfered with forest resources access and utilization	
iv. I have no idea	

33. Have conflicts regarding the use and management of forest resources persisted or have they been adequately resolved? (Please indicate with a tick)

i. Conflicts are swiftly and effectively resolved	
ii. Some conflicts are resolved efficiently while others persist	
iii. Conflicts tend to persist indefinitely.	
iv. I have no idea	

34. How are conflicts resolved? (Tick one)

I. Informally	
ii. Formally e.g., going to court	
iii. Both formally and informally	
iv. I have no idea	

35. In your opinion, what do you think should be done to resolve the existing conflicts?

.....

APPENDIX III: Interview Guide for Key Informants

Please give your honest and accurate answers/opinions to the questions below. All the information you give is going to be highly confidential. Please refrain from writing your name on this questionnaire.

Section A: Questionnaire Logbook

- 1. Questionnaire Identification
Number.....
- 2. Position/Responsibility.....
- 3. Organization Name.....
- 4. Department/Section.....
- 5. Date and Place of Interview
.....

- 6. Has your department/ organization over the last 10 years developed and implemented new laws/bills/development plans to endorse sustainable management and use of forest resources?
 - a. Yes
 - b. No
 - c. Not applicable

If yes, please in brief provide us with an outline and/or attach any documents.
.....

- 7. Does the department/ organization consider future generations' needs whilst making plans for the sustainable management and use of forest resources?
 - a. Yes.
 - b. No
 - c. Not applicable

If yes, please in brief provide us with an outline and/or attach any documents.
.....

8. Has the department/Organization implemented any programmes to promote sustainable forest management and use?

- a. Yes
- b. No
- c. Not applicable

If yes, please in brief provide us with an outline and/or attach any documents.

.....

9. Did the department/organization fully involve the Ogiek community in the development process of the policies and or programmes?

- a. Yes
- b. No
- c. Not applicable

If yes, how, and what was their attitude towards the process? Did they actively participate? Please briefly explain.

.....

Have social, economic, and environmental values been incorporated in the planning procedures for the sustainable use of forest resources by your department /organization.

- a. Yes
- b. No
- c. Not applicable

If 'Yes,' please briefly mention them below.

i) Environmental Values

.....

ii) Economic Values

.....

iii) Social Values

.....

Involvement of the Ogiek Community

10. Do the programmes developed (above) address the specific needs of the Ogiek community, including supporting activities that mainstream Indigenous Knowledge into the management of forests sustainably?

a. Yes

b. No

c. Not application

If yes, briefly summarize your responses below.

a) Social Needs

.....

b) Economic Needs

.....

11. Has your organization/department developed any conflict resolution mechanisms that have been used during the eruption of conflicts in Mau Forest?

a. Yes

b. No

c. Not application

If 'Yes,' briefly describe the mechanism in place.

.....

12. Does your organization/department support any collaborations with the Ogiek community or any conservation groups within the community?

a. Yes

b. No

c. No application

If 'Yes,' briefly mention existing collaborations, or attach any details.

.....

13. Are there any measures that your organization/department has set across to ensure that the collaborations (above) are successful?

a. Yes

b. No

- c. Not application

If 'Yes,' briefly summarize them or attach any details.

.....

Forest Valuation

14. Environmental, Social and Economic values of forest resources and services are key to conservation. Has the department/organization evaluated these values?

- a. Yes
- b. No
- c. Not application

If 'Yes', briefly summarise the findings or, attach any details

.....
.....

15. Does your department/organization promote modelling tools for sustainable forest management?

- a. Yes
- b. No
- c. Not application

If 'Yes,' please briefly outline below.

.....

Monitoring sustainable forest use is key to successful forest conservation. Does the department/organization have any indicators to evaluate improvement in implementing the policies?

- a. Yes
- b. No
- c. Not application

If 'Yes,' briefly explain or attach any details.

.....

Does your organization/department endorse the sustainable stewardship and utilization of Non-Timber Forest Resources?

If 'Yes,' mention below how it was conducted or attach any details.

.....

16. How does your organization/department monitor unsustainable uses of forest resources? Briefly summarise the methodology, criteria or tools and reporting process.

.....

17. Are there any plans for innovative programs that are going to increase sustainable forest management and reduce conflicts with the indigenous community in Mau Forest? If yes, briefly outline them.

.....

Appendix IV Timelines

Activity	Duration
Creation of Questionnaires	Two weeks
Interviews and visits to the relevant county offices	seven Weeks
Actual Data Collection	Completed in 45 days of initial contact with participants
Compiling the results, data analysis, and report development	30 days after the workshop
Submission to the supervisor and editing for any corrections	10 days after finishing developing the report
Presentation of the final dissertation to the department	Will take 1 day as scheduled by the panellists

Appendix V: Budget

No	Activity	Budget (KES)
1.	Initial Planning	25,000
2.	Pilot study	30,000
3.	Travelling and accommodation	40,000
4.	Research tools and equipment	25,000
5.	Data collection	150,000
6.	Data Analysis	15,000
7.	Report development	10,000
	Total	295,000