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# **It's not a competition.** How combining traditional and modern methods can contribute to more sustainable conservation practices in Western Kenya





#### Keywords:

Cherangani forest conservation indigenous knowledge Kakamega sustainability

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There are no conflicts of interest to declare for this study.

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#### Abbreviations and acronyms

- QCA qualitative comparative analysis
- CFA Community Forest Associations
- Pelis Plantations Establishment and Livelihood Improvement Scheme
- NTFP Non-timber forest products
- KEEP Kakamega Environmental Education Programme
- KFHF Kakamega Forest Heritage Foundation

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# **Executive summary**

This Groundwork investigates the sustainable practices and conservation efforts of forest-dwelling communities in Kenya's Cherangani and Kakamega forests, emphasizing the complex and often conflicting dynamics that shape their relationship with the environment. Deeply rooted in traditional ecological knowledge, these communities are under growing pressure to balance their cultural heritage with modern conservation strategies imposed by external stakeholders. Tensions arise as they attempt to sustain their livelihoods relying on forest resources for food, medicine, and income—while facing challenges such as land tenure insecurity, restrictive government policies, and the encroachment of commercial interests.

At the core of these tensions is the trade-off between immediate survival needs and long-term ecological sustainability, with conservation measures sometimes marginalizing local groups or conflicting with indigenous knowledge systems. External economic pressures, including agricultural expansion, logging, and market demands, further exacerbate these challenges, leaving communities caught between preserving their ecosystems and responding to external forces threatening their environment andway of life.

Our findings underscore the importance of integrating traditional knowledge into modern conservation policies to ensure the sustainability of forest ecosystems and the well-being of the communities that depend on them.



#### **Key Findings:**

In Cherangani, the Sengwer people practice traditional foraging, medicinal plant use, and honey collection, while facing land tenure insecurity. In Kakamega, communities utilize the Pelis/Shamba system, integrating agriculture with forest regeneration. They also engage in sustainable mushroom foraging and are supported by strong Community Forest Associations.

Both forests face significant threats from deforestation due to agricultural expansion, and commercialization pressures brought about by population growth. Nutritional challenges persist, with the Sengwer relying on diverse wild foods and cultivated crops, while Kakamega shows improvements in child nutrition but struggles with dietary diversity.

#### We recommend:

Promoting sustainable agriculture and forest conservation

- Develop sustainable livelihoods directly linked to forest conservation, ensuring that forest-dependent communities can maintain their wellbeing while preserving their environment.
- Strengthen Community Forest Associations (CFAs) to improve local governance and sustainable resource management and foster a collaborative approach to forest conservation.

#### Enhancing land tenure systems and community rights

• Secure land tenure rights for indigenous and forest-adjacent communities, empowering them to take ownership of forest

management and reduce the likelihood of unsustainable exploitation.

• Introduce policy reforms to incentivize forest conservation, such as economic incentives for communities to protect forest resources rather than exploit them for short-term gain.

#### Supporting reforestation and agroforestry initiatives

- Encourage reforestation efforts by integrating traditional agricultural practices, such as the Shamba system, with modern reforestation techniques. This will help restore degraded areas while maintaining agricultural productivity.
- Promote agroforestry systems that blend tree planting with sustainable agriculture, balancing food production and forest regeneration.



# Introduction

Cherangani and Kakamega forests represent two ecologically and socioeconomically distinct regions in Kenya. Cherangani, located in the western highlands, is primarily composed of montane forest (forests found at high altitudes, but not high enough for growth to be so limited that trees can't take root there) and is an important water catchment area. In contrast, Kakamega, Kenya's only tropical rainforest, is part of the Guineo-Congolian forest belt; and is known for its high biodiversity, including endemic species. The ecological makeup of these forests significantly differs, with Cherangani being more temperate, while Kakamega sustains a dense, humid, and biologically rich environment.

The challenges faced by these two forests also vary. Cherangani is highly vulnerable to deforestation due to agricultural expansion, notably the spread of monocultures like maize, which places immense pressure on the forest's water resources. The local communities in Cherangani also face land tenure insecurity and the depletion of water sources crucial for farming and regional ecosystems.

On the other hand, Kakamega faces its distinct challenges. Despite improvements in biodiversity conservation, Kakamega's proximity to rapidly growing urban centers and intense human settlement has led to encroachment, illegal logging, and biodiversity loss. The forest is also under threat from shifting agricultural practices. However, the high level of biodiversity in Kakamega has spurred conservation initiatives focused on ecological preservation and sustainable livelihoods for surrounding communities.

While deforestation driven by socio-economic pressures threatens both forests, the differences in their ecosystems and the specific nature of the threats they face highlight the need for tailored conservation strategies. More in-depth studies and comparisons from secondary sources indicate that Cherangani's deforestation is driven mainly by small-scale agriculture. At the same time, Kakamega's pressures are more complex, involving biodiversity loss from agricultural expansion and urban encroachment.

The forest-dwelling communities in these regions rely heavily on forest resources for their livelihoods, including food, medicine, and fuel. However, rapid population growth intensifies the demand for new land, particularly for cultivation. Young people, often with the approval of tribal elders, are increasingly claiming forested areas for agricultural use. This expansion into the forests places immense pressure on both the forest ecosystems and the traditional practices of these communities. As more land is cleared for farming, land tenure becomes increasingly insecure, with legal protections often lagging behind these informal claims. External economic pressures, such as commercial logging and agricultural expansion, further exacerbate the situation, threatening the sustainability of both the forests and the communities' traditional practices.

### Research objectives

Our research aimed to explore the intricate relationships between forest communities and their environment, focusing on their knowledge of forest products, foraging behaviors, and conservation attitudes.



Specifically, we were looking to:

- Investigate the specific knowledge and practices related to forest products among local communities in Kenya.
- Assess how these communities perceive their role in forest conservation and identify cultural or historical factors influencing this perception.
- Analyze the influence of land tenure security and agricultural productivity on land-use decisions, particularly concerning forest encroachment.
- Identify the main economic and social drivers behind farmers' decisions to lay private claim to forest lands.
- Explore policy interventions or incentives that balance agricultural productivity with forest conservation, such as payments for ecosystem services (PES), financial support for agroforestry, land tenure reforms granting secure rights for sustainable practices, and subsidies or market access for sustainably produced crops.

We selected the Cherangani and Kakamega forests due to their unique ecological characteristics and the distinct communities that inhabit these regions. Both forests provide rich biodiversity and significant environmental and socio-economic importance, making them ideal for a comparative analysis.





### Key areas of inquiry

This study focused on four critical research themes to understand the interactions between forest communities and their environments:

#### **1.** Foraging behaviors of forest resources

Examining the traditional and contemporary practices of foraging in Cherangani and Kakamega forests. Understanding the types of resources gathered, the methods used, and the seasonal variations in foraging activities.

#### 2. Indigenous knowledge of food and medicine

Investigating the extent and nature of indigenous knowledge of forest resources used for food and medicine. This theme includes identifying specific plants and their uses, knowledge transmission methods, and the role of this knowledge in community health and well-being.



#### 3. Land tenure

Analyzing the impact of land tenure systems on forest conservation and community livelihoods. This theme examines different tenure arrangements, historical development, and influence on land-use decisions and forest encroachment.

### 4. Nutrition and health

Assessing the nutritional status and health outcomes of forest-adjacent communities. This theme includes analyzing dietary patterns, the prevalence of malnutrition or specific health conditions, and the role of forest resources in meeting nutritional needs.

### Methodology

We employed a qualitative comparative analysis (QCA) with two case studies, focusing on the Cherangani and Kakamega forests. QCA is suitable for identifying patterns and causal mechanisms across different contexts; and allows us to draw meaningful comparisons between these distinct forest communities.

Given the limited knowledge of the topic, a qualitative approach allowed for in-depth exploration of complex relationships and behaviors. Furthermore, qualitative methods provided detailed insights into community practices, perceptions, and the socio-cultural context, which were crucial for understanding the nuances of forest management and conservation.

#### Table 1. Data collection methods

Data Collection Methods				
In-Depth Interviews (IDIs)	Focus Group Discussions (FGDs)	Key Informant Interviews (KIIs)		
Purpose: To gather detailed personal insights and experiences from community members. Total conducted: 15 IDIs. Justification: IDIs effectively elicit in- depth information	<ul> <li>Purpose: To capture diverse perspectives and facilitate cross-validation of information obtained through individual interviews.</li> <li>Total conducted: 2 FGDs (1 per location).</li> <li>Justification: FGDs</li> </ul>	<ul> <li>Purpose: To gain expert insights and provide a comprehensive understanding of specific issues.</li> <li>Total conducted: 4 Klls.</li> <li>Pre-Field Klls: Conducted before field data collection to refine research tools and validate initial assumptions.</li> <li>Justification: Klls are valuable</li> </ul>		
on individual experiences, beliefs, and practices. This method helps capture personal narratives essential for understanding the community's interaction with forest resources.	encourage richer discussion and allow community members to express their views collectively, providing a broader understanding of community norms and collective behaviors.	for obtaining information from individuals with specialized knowledge or unique insights, such as local leaders, traditional healers, and forest rangers. Pre-field KIIs helped in develop and refine research tools and ensured the study was grounded in existing knowledge and practices.		

We conducted a literature review to to understand the context and background; and inform the research tools. This identifiedgaps in existing knowledge and ensured the study addressed relevant issues. We also interviewed key informants to provide contextually appropriate guides



Key stakeholders included local community members, forest management authorities, non-governmental organizations (NGOs) involved in conservation and community development, and local government officials. Special attention was given to including diverse voices within the community such as elders, women, and youth. This diversity ensured a comprehensive understanding of community dynamics and the various perspectives on forest management and conservation.

The community entry process involved critical ethical considerations, primarily in building trust and ensuring cooperation through initial meetings with community leaders to explain the study's purpose and seek support. Respecting local customs and protocols, highlighted in early interactions, was crucial for fostering ethical engagement with the community. Establishing rapport with key figures such as elders and leaders facilitated smoother data collection and ensured respectful access to community knowledge and practices.

#### Limitations of the study

Data collection faced several challenges that influenced the comprehensiveness of the study. Limited access to certain areas in Cherangani and Kakamega forests; due to conservation regulations or private land ownership (particularly in the buffer zone tea areas), restricted our ability to survey all relevant sites. We adopted a more targeted approach by identifying and engaging key informants to address this limitation. These informants are people with specific knowledge or expertise on local practices and resource use. This allowed us to gather critical insights that would otherwise have been missed, ensuring that our survey captured the essential information needed for a more robust understanding of foraging behaviors and conservation practices, even though some areas remained inaccessible. Cultural sensitivities around discussing certain traditional practices, particularly those involving rituals and sacred sites, led to some community members hesitating to share detailed information. We addressed this by speaking to knowledgeable individuals but slightly removed from these holy practices such as elders, who were more comfortable discussing traditions in a general sense. This effort helped us fill in some gaps while respecting the community's privacy and cultural boundaries.

Language barriers also presented challenges, as specific nuances in traditional practices and cultural concepts were difficult to convey. We countered this by working closely with local translators with deep cultural understanding, allowing us to capture the essence of responses more accurately. Despite these efforts, some details may still have been lost in translation. Therefore, these findings should be interpreted cautiously and viewed within a broader research framework that acknowledges limitations while aiming for more inclusive methods in future studies.



# Community profiles - Sengwer community

History, culture, and lifestyle of the Sengwer people and other forest-dwelling communities

The Sengwer is an indigenous community traditionally inhabiting the Cherangani Hills. They have a deep historical connection to the forest, which has been central to their cultural and spiritual practices for generations. Their resilience and adaptability mark their history facing external pressures, including colonial and post-colonial land policies that threatened their traditional way of life.

The culture of the Sengwer people is deeply intertwined with the forest. Their traditional practices include hunting, gathering, and the use of herbal medicine. The Sengwer possesses a rich repository of indigenous knowledge about the forest's flora and fauna, which is passed down through generations. Their cultural practices also involve spiritual rituals and ceremonies that honor the forest as a sacred entity. The forest is a source of material sustenance and a cornerstone of their cultural identity.

The Sengwer led a semi-nomadic lifestyle, with their movements dictated by the availability of forest resources. They practice sustainable foraging and small-scale agriculture, vital for their subsistence. The community's diet primarily consists of wild fruits, roots, vegetables, and occasionally meat, supplemented by cultivated crops. Housing structures are traditionally made from locally sourced materials, reflecting their harmonious relationship with the forest environment.



**Figure 1:** Indigenous living: a Sengwer homestead in Cherangani (Image credit: Mugambi Murithi)

The forest is the center of the economic activities of the Sengwer community. They collect and sell forest products such as honey, medicinal plants, and firewood. Livestock rearing is another important economic activity, providing a source of income and food security. However, recently, the Sengwer have increasingly turned to maize cultivation as a primary income-generating activity. They grow maize on acres of land, which has become the mainstay of their livelihood. In addition to maize, they produce and sell other vegetables and roots, but maize remains the principal crop for making ends meet.

## Challenges faced by the Sengwer people

The Sengwer's traditional lands have been subject to legal disputes and evictions, particularly during government initiatives to gazette forest areas as protected zones. These disputes have led to conflicts and a sense of marginalization.





Commercial logging, agricultural expansion, and infrastructure development pose significant threats to the forest ecosystem and the Sengwer's way of life. These activities have led to deforestation and environmental degradation, impacting the availability of forest resources.

The Sengwer often face socio-economic marginalization, with limited access to education, healthcare, and economic opportunities. This marginalization exacerbates their vulnerability and undermines their capacity to advocate for their rights.

Despite these challenges, the Sengwer have demonstrated remarkable resilience. They have adapted to changing circumstances by diversifying their livelihoods, advocating for land rights, and participating in community conservation initiatives. The Sengwer's deep knowledge of the forest and sustainable practices positions them as vital stewards of the Cherangani Hills ecosystem.

### Leadership and governance

The Sengwer community has a well-defined leadership structure that includes village elders and a council of elders. These leaders manage community affairs and make crucial decisions regarding their social, economic, and cultural life. Despite this structured leadership, a notable disconnect exists between the community's traditional practices and government policies, particularly regarding the Community Forest Association (CFA) and land ownership rights.

An elder articulated the community's stance:

"The big reason why people are rejecting the CFA is because they have not been given the title deed of the other side of the land." - **Elder from the Sengwer community** 

By "the other side," the elder refers to land areas the community historically occupied but designated as protected forests. The community perceives CFAs as restrictive because they do not grant full ownership rights, making members reluctant to engage in conservation efforts without secure tenure over these ancestral lands. This statement highlights the community's urgent need for formal recognition and support from the government to reconcile traditional practices with modern governance frameworks

### Personal histories and stories

Barnaba (name changed for privacy), a village elder, plays a significant leadership role within the community. He has a large family with ten children and places a high value on education, despite facing economic barriers preventing him from continuing his schooling. Barnaba emphasized the importance of clear land ownership and government support, stating:

"The government must settle the land ownership issue by giving them title deeds."

William (name changed for privacy), born in 1943, has a profound connection to the forest where he learned traditional skills such as honey harvesting and animal trapping from his father. He shared his personal history, including his educational journey, which was cut short due to the long distance to





school. William married in 1970 and has four children, living a life rooted in traditional practices.

Juma Cheriyot (name changed for privacy) is another key figure in the community who highlighted the importance of land rights and the fear of losing land without proper documentation. He expressed concerns about economic hardships that might force community members to cultivate land in the forest, despite conservation efforts. Juma stressed:

"My great fear is losing my land and that is why I do not follow the CFA because they have not addressed any of our concerns."

# Community profiles - Kakamega community

The Kakamega Forest region is predominantly inhabited by the Luhya people, encompassing sub-groups such as the Isukha, Idakho, and Kabras. These communities have resided in the area for generations, fostering a profound connection with the forest. Their cultural practices are deeply intertwined with the forest ecosystem, relying on it for traditional ceremonies, medicinal plants, and the crafting of cultural artifacts.<sup>1</sup>

Economically, the communities are primarily agricultural, cultivating crops like maize, tea, and sugarcane. The fertile soils surrounding the forest support these farming activities. In addition to agriculture, they engage in foraging for wild fruits, vegetables, and mushrooms, which supplements their diet and income. The forest also provides essential resources such as firewood, building materials, and medicinal plants, emphasizing its significance in their daily lives.<sup>2</sup>

Despite their rich cultural heritage and reliance on the forest, these communities face challenges like land tenure insecurity and external pressures from commercial interests. Deforestation, driven by agricultural expansion and illegal logging, threatens the forest's biodiversity and the livelihoods dependent on it. Nevertheless, the communities exhibit resilience through strong communal ties and adaptive strategies. Initiatives such



<sup>1</sup> Why Kakamega Forest Matters

<sup>2</sup> THE SOCIO-ECONOMIC BENEFITS OF KAKAMEGA FOREST TO THE RESIDENT COMMUNITIES



as the Kakamega Environmental Education Programme (KEEP) and the Kakamega Forest Heritage Foundation (KFHF) empower locals to participate in conservation efforts, blending traditional knowledge with sustainable practices.<sup>3</sup>

This intricate relationship between the Kakamega communities and the forests highlights the importance of integrating cultural practices into conservation strategies to ensure the sustainability of both the forest ecosystem and the livelihoods it supports.

<sup>3 &</sup>lt;u>5 Critical Things to know about Saving The Kakamega Forest</u>

# Looking at the two forests side by side

While it may be tempting to imagine that a similar approach to finding a sustainable balance would work on both forests, a careful analysis shows key differences between the two. In this section, we examine the two forests alongside each other, outlining similarities and differences in both.

# a. Commercialization, topography and accessibility

Cherangani is characterized by a high-altitude montane forest ecosystem with a calm, moist climate supporting diverse flora and fauna. Its rugged terrain and underdeveloped infrastructure limit accessibility and commercialization. As a result, the primary economic activities in Cherangani include small-scale farming, livestock rearing, and collecting forest products. The Sengwer people who inhabit this region rely heavily on traditional practices and maintain a deep cultural connection to the forest. These challenges in accessibility and commercialization have helped preserve many conventional practices and the forest's biodiversity.

Kakamega Forest, Kenya's only tropical rainforest, benefits from a warm and humid climate, fostering a lush, dense forest environment. Better infrastructure and proximity to urban centers make Kakamega more accessible, leading to higher levels of commercialization and extensive agricultural activities. The community in Kakamega relies heavily on farming, with maize and sugarcane being the dominant crops. The improved infrastructure supports





market access, enabling better economic opportunities and posing forest threats through increased agricultural expansion and resource extraction. Despite these pressures, efforts are being made to balance conservation with economic activities.

### b. Community nutrition

The Cherangani and Kakamega communities demonstrate distinct differences in lifestyle, dietary patterns, and nutritional challenges. The Sengwer people in Cherangani lead a semi-nomadic lifestyle, with a diet that includes wild fruits, roots, vegetables, and cultivated crops like maize. While nutritional issues are present, they are less documented than in Kakamega.

Kakamega county is home to various ethnic groups who primarily engage in agriculture with maize as the staple crop. Shinyalu constituency is the home to the Kakamega forest, communities around the forest are predominantly Luhya. Nutritional issues are a significant concern, particularly among children under five. According to the Nutritional Director from Kakamega, the region has seen improvements in some areas, but challenges remain. Nationally, stunting affects 18% of children under five, but Kakamega has reduced this rate from 22% to 12%, indicating effective interventions. The prevalence of underweight children stands at 10% nationally, with Kakamega showing a lower rate of 6.4%. Wasting is at a national rate of 5%, but Kakamega reports a significantly lower rate of 1.5%, suggesting that localized efforts to address malnutrition are effective.<sup>4</sup>

<sup>4</sup> USAID Kakamega County, Demonstrating the Value of Multi-Sectoral Nutrition Investments in Kakamega. County

The diet of the Sengwer people in Cherangani is diverse but highly dependent on the seasonal availability of wild foods. The reliance on traditional foods is crucial for nutritional intake, although modern pressures have started influencing dietary habits. In Kakamega, despite agricultural productivity, many households struggle with dietary diversity. Approximately 60% of households do not meet the minimum dietary diversity, often consuming the same foods repeatedly. Efforts to promote nutrient-dense foods, such as indigenous vegetables and high-iron beans, are ongoing to address these challenges.

# c. Traditional foraging practices and their regulation

Foraging is vital to Cherangani's and Kakamega's lifestyles, but it manifests differently and faces unique challenges in each region. In Cherangani, the Sengwer people rely on foraging for essential food, medicinal plants, and income. Men typically venture deep into the forest to gather resources such as wild fruits, roots, and vegetables, which are crucial for the community's nutrition. Medicinal plants, like the *deworming tree* and *cheptenrepe*, treat ailments such as malaria and high blood pressure. Additionally, honey collection is a significant source of income. However, increasing population pressures have strained these traditional practices, leading to overharvesting and resource competition.

In Kakamega, traditional foraging also plays a significant role in community nutrition and health. The community relies on indigenous vegetables such as amaranth and spider plants, which are often cultivated rather than foraged, and are rich in essential nutrients, helping to supplement diets. The knowledge of foraging for other wild resources, such as honey and mushrooms, is





passed down through generations, ensuring continued benefits from these natural resources. Individuals like Peter Noka Mukalani (*name changed for privacy*), known as the "mushroom man," collect various types of mushrooms from the forest, including ear and termite-cultivated mushrooms, which have medicinal and nutritional benefits. However, the increase in population has impacted foraging, leading to overexploitation and reduced availability of forest resources.



Figure 2: This is a picture of cheptenrepe an indigenous plant used to cure various diseases (Image credit: Mugambi Murithi)

In both regions, regulatory restrictions aimed at forest conservation have significantly impacted traditional foraging practices. In Cherangani, these regulations protect the forest from over-exploitation and environmental degradation but often limit the Sengwer people's access to necessary resources. Environmental degradation and deforestation have made it increasingly challenging to find medicinal plants, and population growth has intensified pressure on forest resources. The restrictions have also limited honey collection, reducing a vital income source for many families.

Similarly, in Kakamega, conservation policies restrict access to forest resources, impacting those who depend on foraging for their livelihoods. Regulatory measures can create barriers to accessing medicinal plants essential for traditional medicine. Deforestation and environmental changes further exacerbate these challenges by reducing the availability of these plants. Population growth has added pressure, making sustainable foraging more difficult. Initiatives are needed to promote sustainable harvesting practices and educate the community about indigenous foods' nutritional and medicinal benefits. Traditional practitioners, like the herbalist and the mushroom man, are essential in these educational efforts, particularly in teaching sustainable foraging techniques and preserving indigenous knowledge of the forest's resources, ensuring these practices are passed down without compromising the forest ecosystem.

## d. Indigenous knowledge of food and medicine

In Cherangani, the Sengwer people have extensive knowledge of forest resources, using various plants for both nutrition and medicine. This knowledge, passed down through generations, includes practices for treating ailments such as malaria and high blood pressure. Using plants like the *deworming* tree and *cheptenrepe* showcases the community's deep understanding of their natural environment and its benefits. Honey is another vital resource, both as a nutritious food and for its economic value. The collection of honey, using traditional methods, is a well-established practice that provides both nutrition and a significant source of income for the community.





Similarly, in Kakamega, traditional medicine remains integral to healthcare. The community often prefers traditional remedies, particularly when modern healthcare fails to address their needs adequately. The use of medicinal plants is widespread, addressing physical, mental, and social health issues. Environmental degradation and regulatory restrictions pose challenges to sourcing these plants, but traditional practices remain critical in health management. The reliance on conventional medicine is evident in the community's preference for herbal treatments for various conditions. For example, the herbalist in Kakamega treats a range of ailments, from physical health issues like recurrent miscarriages to mental health conditions such as spirit possession. The herbalist's practice reflects the community's trust in traditional medicine and its holistic approach to health.

Traditional medicine plays a crucial role in healthcare in both Cherangani and Kakamega. It demonstrates a deep cultural connection to their natural environments and the benefits derived from them. Despite the challenges posed by environmental degradation and regulatory restrictions, these practices continue to be vital for community health and well-being.

### e. Women's health and reproductive issues

Women in the Sengwer (Cherangani) community face several health and reproductive challenges, often relying on traditional medicine to address issues such as recurrent miscarriages and other reproductive health problems. The traditional herbalist plays a crucial role in treating these conditions, providing remedies trusted by the community. There is a strong belief that traditional remedies are more effective than modern medicine, as they are perceived to have fewer side effects and are considered healthier and more natural. This belief is passed down through generations, reinforcing the community's reliance on traditional practices. Additionally, the nutritional status in Cherangani is relatively better, with fewer reported cases of malnutrition and other non-communicable diseases, attributed to the community's dietary practices and reliance on natural, foraged foods.

Similar challenges exist in Kakamega where women often turn to traditional medicine for reproductive health issues. The herbalist in Kakamega treats many conditions, including those related to women's health. The reliance on traditional remedies highlights the community's trust in these practices. Further research could explore how modern healthcare services complement these conventional practices to improve health outcomes.

## f. The emphasis on maize, grain, and starch

The Sengwer people have a rich tradition of cultivating staple crops like millet and sorghum. These crops hold significant cultural importance and are integral to the community's traditional agricultural practices. Millet and sorghum are used in various cultural ceremonies and rituals, such as circumcision ceremonies and the preparation of traditional brews. These grains are preferred for their nutritional benefits and growing ability in the region's climate.

Millet and sorghum are labor-intensive to cultivate, requiring precise planting techniques and manual weeding. These grains are often used to make traditional foods and beverages. For instance, millet is used to prepare traditional brews consumed during critical cultural events and is considered a sign of respect when offered to visitors. The preparation methods preserve the nutritional content, providing essential nutrients to the community. Additionally, the community deeply loves millet ugali, which they consider



more nutritious and flavorful than maize-based ugali. This preference highlights the cultural and nutritional significance of millet in their diet.

Despite their cultural significance, millet and sorghum cultivation has declined due to several challenges. These crops require more labor and are susceptible to pests and diseases, making them less attractive to younger generations who prefer less labor-intensive farming methods. Additionally, the market demand for millet and sorghum is limited, making maize more economically viable.

The community has increasingly turned to maize cultivation as a primary income-generating activity. Maize has become the staple crop due to its quick growth cycle, ease of cultivation, and higher market demand. Maize farming requires less manual labor compared to millet and sorghum, as chemical weed control can be used, reducing the effort involved. One kilogram of maize sells for approximately 40 Kenyan shillings whilst a kilogram of sorghum sells at 150 Kenyan shillings, providing a steady income for farmers.

Maize is now grown on over 5,000 acres of land in Cherangani, making it the principal crop for sustaining livelihoods. This shift reflects the community's adaptation to modern agricultural practices, and intersects with land ownership issues. While some of the land is communally owned, others have started claiming individual plots, which creates tensions within the community regarding the use of forested areas for agriculture. These land ownership dynamics affect how the community engages in traditional practices, including foraging and small-scale agriculture.

Although the community continues to grow and sell other vegetables and roots, maize remains the dominant crop due to its economic stability. While

crops like sorghum could offer higher income, the lower demand for these crops makes maize more rewarding in the current market. However, this focus on maize has mixed implications for nutrition. While it improves food security and provides economic stability for the Sengwer people, focusing on maize reduces dietary diversity. Although crops like millet and sorghum are also sources of carbohydrates, they offer greater nutritional value thanmaize. This reliance on maize limits access to a wider variety of nutrientrich foods, potentially affecting the overall quality of diets and long-term health outcomes. Balancing modern agricultural practices with preserving traditional crops and foraged foods is crucial to ensure both economic stability and nutritional well-being.

In Kakamega, maize is the staple crop, and efforts to diversify diets by promoting nutrient-dense foods are ongoing. Despite agricultural productivity,



**Figure 3:** A picture depicting acres of maize plantation in Cherenganyi (Image credit: Mugambi Murithi)





many households struggle with dietary diversity. Approximately 60% of households do not meet the minimum dietary diversity, often consuming the same foods repeatedly. This lack of variety can lead to nutrient deficiencies and associated health problems. Promoting indigenous vegetables and highiron beans aims to improve dietary diversity and address these nutritional challenges.

# g. Willingness to attempt new approaches to forest regeneration

In Cherangani, the Sengwer community demonstrates a strong commitment to forest regeneration and conservation through proactive reforestation projects and innovative practices. A botanist, Milka (name changed for privacy), leads a notable initiative focusing on water catchment restoration by planting indigenous and exotic tree species weekly. The project addresses critical water scarcity issues caused by deforestation, blending scientific expertise with local engagement. The Sengwer also advocates for changes in government policies to stop grazing in the forest, which they believe disrupts indigenous foods and trees, negatively impacting the forest ecosystem. By stopping grazing, they aim to preserve natural vegetation and promote the growth of indigenous plant species. Additionally, the Sengwer utilize their deep knowledge of sustainable practices, such as traditional foraging of medicinal plants and honey collection, positioning themselves as vital stewards of the Cherangani Hills ecosystem. These practices, passed down through generations, are essential for their cultural heritage and environmental conservation efforts.

In Kakamega, the forest is a protected area with a buffer tea zone that separates the community from the forest, reducing human impact and

promoting conservation. Kakamega's Community Forest Associations (CFAs) involve local communities in forest management and conservation activities through the Pelis (Plantations Establishment and Livelihood Improvement Scheme) or Shamba system. This system allows community members to cultivate crops on forest land while maintaining and replanting trees, promoting agricultural productivity and forest regeneration. The "mushroom man;" emphasizes sustainable mushroom foraging by using a walking stick instead of a machete to avoid damaging the forest. His deep respect for the forest and commitment to sustainable practices reflect the broader community's attitudes toward resource use. The involvement of traditional practitioners, like the herbalist and the mushroom man, in conservation efforts is crucial. Their knowledge and expertise contribute to developing sustainable solutions that respect traditional practices while promoting forest conservation. The CFAs in Kakamega have successfully integrated traditional expertise with modern conservation techniques, fostering a collaborative approach between communities, regulatory bodies, and conservation organizations.

In summary, both Cherangani and Kakamega communities strongly commit to forest regeneration and conservation, utilizing a blend of traditional knowledge and modern techniques. While Cherangani focuses on reforestation and stopping grazing to preserve indigenous species, Kakamega integrates agricultural productivity with forest management through the Pelis/Shamba system and emphasizes sustainable foraging practices.



# Recommendations

As the section above has shown there is quite a bit of overlap between the two forests. However, the differences are also significant enough that applying these recommendations will require a bespoke approach that considers each community's context, needs, and perspectives. Six key recommendations stood out if we find a path to integrate modern and traditional practices towards the overarching goal of sustainable living with the ecosystem. They are:

# 1. Leverage traditional knowledge for forest regeneration and sustainable practices

The Sengwer and Kakamega communities possess extensive traditional knowledge, such as sustainable foraging and medicinal plant use, which has been developed over generations. A systematic approach is needed to integrate this knowledge into forest regeneration efforts. We can achieve thisby conducting participatory research projects where community members and conservation scientists work together to document these practices. Training programs can then be established to educate the community and external conservation workers on applying this traditional knowledge to modern conservation strategies. By doing so, the communities will see their cultural heritage respected and preserved and become active participants in conservation efforts, ensuring that these initiatives are culturally relevant and more likely to succeed.

# 2. Enhance community engagement and capacity building

Engaging local communities in conservation efforts is crucial for the sustainability of forest ecosystems. These efforts involve building the capacity of community members through training programs that combine traditional and modern practices. Capacity-building initiatives should empower local communities with the skills needed for effective forest management, including sustainable agriculture, forest regeneration techniques, and biodiversity conservation. Enhancing the community's capacity could foster a sense of ownership and responsibility towards forest conservation.

# 3. Develop sustainable livelihoods linked to forest conservation

To reduce the pressure on forest resources and create economic incentives for conservation, it is essential to develop sustainable livelihoods directly linked to the health of the forest. This can be achieved by identifying and promoting the production of non-timber forest products (NTFPs) such as honey, medicinal plants, and artisanal crafts. However, it is equally important to encourage the practice of regenerative agriculture, which focuses on enhancing the health of the soil, improving biodiversity, and increasing resilience to climate change. Rather than promoting the cultivation of a single crop, regenerative agriculture encourages the diversification of crops and the use of practices that restore and maintain the ecological balance.

Community workshops can provide training on these sustainable farming techniques, including producing and using organic fertilizers, crop rotation,





and companion planting to manage weeds and pests naturally. By combining these practices with the development of NTFPs, communities could generate an income while also improving the sustainability of their agricultural practices.

By establishing local cooperatives or forming partnerships with external markets, communities can market these sustainably produced goods, ensuring that the benefits of conservation are both economic and environmental. This approach creates a positive feedback loop where the protection and restoration of natural resources directly contribute to economic prosperity and community well-being.

# 4. Strengthen community forest associations for sustainable resource management

To effectively preserve and enhance indigenous food practices while ensuring sustainable management of forest resources, it is crucial to empower and strengthen Community Forest Associations (CFAs). These associations, already active in areas like Kakamega, play a central role in involving local communities in conservation efforts, such as forest regeneration, sustainable harvesting, and biodiversity protection. By providing CFAs additional resources, training, and legal support, they can more effectively manage forest resources to incorporate and protect traditional knowledge, including cultivating indigenous crops and sustainable foraging practices.

Enhancing the CFAs' capacity to advocate for community rights and sustainable practices is key. Training programs should equip CFA members with the skills needed for effective forest management, such as sustainable agricultural techniques that promote cultivating traditional crops, conflict resolution, and community mobilization. By linking CFAs with government agencies and NGOs, they can receive the support necessary to implement large-scale conservation projects that align with both traditional practices and modern conservation needs.

Furthermore, CFAs can help establish local bylaws that ensure the regulation of forest use in a manner that benefits both the environment and the community. These bylaws can integrate traditional practices, such as using medicinal plants and the sustainable harvesting of wild foods, ensuring that these practices are preserved and adapted for future generations. Strengthening CFAs in this way improves the management of forest resources and fosters a sense of ownership and responsibility among community members, leading to more resilient and sustainable conservation outcomes that honor and enhance indigenous food systems and traditional knowledge.

# 5. Secure land tenure rights to enhance conservation outcomes

The report underscores the importance of secure land tenure as a foundation for sustainable conservation efforts. To achieve this, a multistep approach can be taken. First, a legal framework must be established or strengthened to formally recognize the land rights of the Sengwer and Kakamega communities. This framework can involve mapping traditional lands, documenting customary land use practices, and advocating for policy changes that grant legal ownership. Once land tenure is secured, communities can be encouraged to develop land management plans that prioritize conservation. These plans could include sustainable land use practices, reforestation projects, and restrictions on activities that could harm the environment, ensuring that land security translates directly into long-term conservation benefits.



### 6. Conduct ongoing research and monitoring

Continuous research and monitoring are essential for adapting conservation strategies to changing conditions and emerging challenges. Long-term research programs should track conservation initiatives' effectiveness, understand environmental changes' impacts and document traditional knowledge. Monitoring programs can provide valuable data to inform policy adjustments and ensure conservation efforts remain practical and relevant. Collaborative research involving community members, scientists, and policymakers can enhance forest ecosystems' overall understanding and management.

These recommendations aim to create a balanced approach that supports the conservation of forest ecosystems while enhancing the socio-economic well-being of the forest-dwelling communities in Cherangani and Kakamega. By addressing the identified challenges and leveraging the strengths of traditional knowledge, these strategies can contribute to sustainable forest management and community resilience.

# Conclusion

This study underscores the critical interplay between indigenous practices and modern conservation techniques among forest-dwelling communities in the Cherangani and Kakamega forests. It demonstrates that while these communities rely heavily on forest resources for their livelihoods—through practices such as foraging, small-scale agriculture, and medicinal plants modern conservation strategies often impose restrictions that conflict with their indigenous ways of life. The findings reveal that sustainable forest management can only be achieved through an integrated approach that respects and incorporates indigenous knowledge systems. When supported and enhanced with modern techniques, indigenous practices offer a powerful solution for preserving both these communities' environment and cultural heritage.

Theinsightsgainedfromthisstudycanguidepolicymakersandconservationists in crafting interventions that effectively balance conservation efforts with the needs of indigenous communities. By integrating indigenous knowledge into formal conservation strategies, policymakers can develop ecologically sound and culturally appropriate solutions. Key recommendations include securing land tenure for indigenous communities to empower them in forest management, actively involving them in decision-making processes, and providing economic incentives for sustainable practices such as agroforestry and responsible foraging. These approaches can ensure that conservation efforts enhance local livelihoods, rather than undermine them, creating a mutually beneficial outcome.



This study is significant because it provides a nuanced understanding of how indigenous knowledge contributes to conservation efforts. Recognizing and supporting the practices of indigenous communities is essential not only for biodiversity preservation but also for their socio-economic resilience and empowerment. The findings demonstrate that indigenous knowledge is adaptive and can work harmoniously with modern conservation approaches when appropriately integrated. Ultimately, the study shows that sustainable forest conservation depends on the equitable inclusion of indigenous practices and the people who have long stewarded these ecosystems, ensuring a more just and practical approach to conservation globally.

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#### **About Busara**

Busara is a research and advisory organization, working with researchers and organizations to advance and apply behavioral science in pursuit of poverty alleviation. Busara pursues a future where global human development activities respond to people's lived experience; value knowledge generated in the context it is applied; and promote culturally appropriate and inclusive practices. To accomplish this, we practice and promote behavioral science in ways that center and value the perspectives of respondents; expand the practice of research where it is applied; and build networks, processes, and tools that increase the competence of practitioners and researchers.

#### **About Busara Groundwork**

Busara Groundwork lays the groundwork for future research and program design. As think pieces, they examine the current state of knowledge and what is needed to advance it, frame important issues with a behavioral perspective, or put forward background information on a specific context.

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