A COMMUNITY LED RESEARCH ON LOSS AND DAMAGE INCURRED BY THE ENDOROIS COMMUNITY LIVING WITHIN LAKE BOGORIA LANDSCAPE.

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Acronyms

EIWEN – Endorois Indigenous Women Empowerment Network

L&D – Loss and Damage

PIC – Project Implementation Committee

FGD – Focus Group Discussion

KII – Key Informant Interview

PRA – Participatory Rural Appraisal

PWD – Persons with Disabilities

NRM – Natural Resource Management

UNESCO – United Nations Educational, Scientific and Cultural Organization

SDA – Seventh Day Adventist (Church)

IO Dipole – Indian Ocean Dipole

Foreword

Loss and damage from human-induced climate change is an emerging issue, as the adverse impacts of climate change are becoming more and more visible within the arid and semi-arid parts of Kenya, ranging from more severe droughts to destructive floods, as well as heat waves and loss of natural resources and culture. Better risk reduction methods means we can now save people's lives, but the devastation to households, agriculture and infrastructure caused by climate change-induced disasters leave people in disarray and displaced for long periods. The important issue is that loss and damage from human-induced climate change is different from adaptation; its impacts exceed the adaptive capacity of communities and ecosystems. The community led research has already given insight of those directly impacted by the loss and damage within the lake Bogoria landscape

Endorois are an indigenous minority community living in Baringo, Nakuru and Laikipia counties. This is a community that despite their long struggle for the recognition and compensation for their land that the government of Kenya had forcefully taken away from them in 1974, they have as well incurred huge losses and damages due to climate change within their community. Considering that this is a pastoral and patriarchal community, loss and damage have had more harm on Women, People with disability and girls within the community more than other social groups, including gender based violence, early forced marriages and high rate of school dropouts.

It is with great pleasure that we introduce this research on the impact of loss and damage (L&D) experienced by the Endorois community living within the lake Bogoria landscape, Kenya. The research provides critical insights into the challenges faced by these marginalized groups due to climate change related loss and damage. The findings of this study are crucial in informing policymakers and stakeholders on the necessary interventions to address these losses and damages and promote inclusivity and diversity in key decision making processes in Kenya, especially within marginalized indigenous communities.

We encourage all stakeholders to use this research to inform their work and support communities recover from loss and damage due to climate change, particularly those from marginalized communities. May this research be a catalyst for change and a call to action for all of us to continue working towards promoting climate justice and protecting the violation of human rights as a result of climate change especially to the marginalized and Indigenous communities.

Acknowledgement

The Endorois community, through the Project Implementation Committee (PIC), extends its heartfelt appreciation to everyone who contributed to the successful completion of this community-led research on the loss and damage experienced by the Endorois community within the Lake Bogoria landscape.

We are especially grateful to ESCR-Net for their essential support and resources, which made this research possible. Our sincere thanks also go to the Endorois Indigenous Women Empowerment Network for their invaluable contributions, expertise, and partnership throughout the project. Additionally, we acknowledge the Baringo County government, particularly the Lake Bogoria National Reserve Management, for their support.

We extend our deep appreciation to the Endorois indigenous community for their cooperation, active participation, and openness during the research process. Their perspectives and experiences were crucial to the project's success.

The PIC also thanks all individuals who offered their time, expertise, and resources to support this project. Their contributions have been vital in shaping the findings and recommendations of this research.

Finally, we express our gratitude to Mr. Fredrick Kibon, the chairperson of the Project Implementation Committee, and the entire team for their dedication, hard work, and commitment to conducting this research on loss and damage. Their professionalism, attention to detail, and deep understanding of the community have been instrumental in producing the insightful findings and recommendations presented in this report.

We also wish to recognize the following PIC members for their significant contributions to this research:

1. **Fredrick Kibon** – Chairperson
2. **Aurelia Sigilai** – Vice-Chairperson
3. **Zadok Bett** – Secretary
4. **Willis Keitany** – Vice-Secretary
5. **Alice Kipsang** – Treasurer (Representative for Persons with Disabilities)
6. **Cynthia Kiprop** – Member
7. **Elizabeth Kochei** – Knowledge Holder
8. **Johanah Karato** – Opinion Leader

Their extensive knowledge and expertise on issues of loss and damage have greatly enriched the research outcomes.

Project implementation committee Members

Project Implementation Committee for the Endorois Community

Executive Summary

This research project investigates the impacts of loss and damage (L&D) experienced by the Endorois community residing in the Lake Bogoria region of Kenya. The primary objective was to collect, document, and analyze the extent of these impacts, with a special focus on the experiences of women, individuals with disabilities, and community elders. The research was carried out by a Project Implementation Committee (PIC) comprised of eight community members, including women, men, individuals with disabilities, and elders, in collaboration with the Endorois Indigenous Women Empowerment Network (EIWEN) team.

The study provides a detailed report that outlines key findings and offers recommendations for addressing loss and damage. This includes the development of an indigenous early warning system designed to help the community anticipate and mitigate potential losses and damages. The report also features a printed map illustrating the climate change impacts from the community's perspective and a document detailing the financial costs incurred by the Endorois community due to climate change.

The research highlights both material and non-material losses experienced by the community. Material losses include tangible assets such as livestock, grazing land, and infrastructure. Non-material losses encompass social impacts and the degradation of vital natural resources that hold cultural significance for the Endorois people.

The report makes several key recommendations. First, it emphasizes the need for capacity building to enhance the skills and knowledge of marginalized Indigenous communities on climate mitigation strategies, better equipping them to handle climate-induced challenges. It also advocates for strengthening climate early warning systems by developing and integrating both traditional and modern climate warning systems to improve the community's preparedness and response to environmental changes.

In addition, the report suggests creating information, education, and communication materials to support advocacy efforts. These materials would focus on the drivers and accelerators of climate-induced displacement and aim to raise awareness among stakeholders. Finally, it recommends conducting bilateral meetings and engagements between the Endorois community and government authorities. These discussions would center on the findings related to climate-induced displacement and explore strategies for mitigating these impacts.

EIWEN mobilizes the community to engage in critical discussions on land loss and damage, fostering collective insights for informed advocacy and resilience .

Introduction

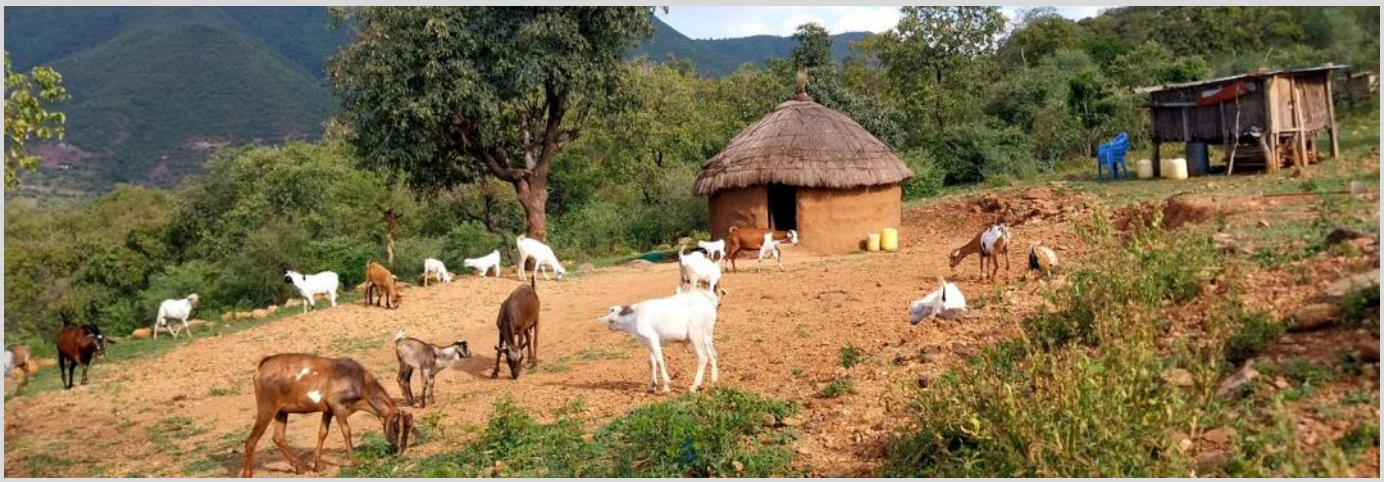
The Endorois community, an indigenous group whose ancestral lands are located along the shores of Lake Bogoria in Kenya, has for generations relied on a pastoralist way of life. Pastoralism, which involves the rearing of livestock such as cattle, sheep, and goats, has been central to their social, economic, and cultural existence. Their deep connection to the land, water, and natural resources of the Lake Bogoria area has shaped their identity, traditions, and spirituality. For the Endorois, the landscape is not just a source of livelihood but also a living embodiment of their heritage, containing sacred sites, grazing fields, and water points critical for their survival.

However, in 1974, the Kenyan government unilaterally designated their ancestral territory as the Lake Bogoria Game Reserve, a decision made without adequate consultation with the Endorois community or compensation for their displacement. The establishment of the game reserve led to the forced eviction of the Endorois people from their ancestral lands and restricted their access to vital resources around Lake Bogoria. This displacement disrupted their traditional livelihood systems, severed their spiritual and cultural ties to the land, and led to significant economic losses. For decades, the community fought a protracted legal battle to reclaim their rights, seeking redress for the injustices inflicted upon them.

The turning point came in 2010, when the African Commission on Human and Peoples' Rights delivered a landmark ruling in favor of the Endorois community. The ruling recognized the Endorois as a distinct indigenous people and called for the Kenyan government to:

a. ***Recognize and restore the Endorois' ancestral land rights around Lake Bogoria.***
b. ***Grant the Endorois community unrestricted access to Lake Bogoria and its resources.***
c. ***Provide adequate compensation for the losses suffered by the Endorois due to their displacement.***
d. ***Ensure the equitable sharing of royalties from economic activities in and around the Lake Bogoria Game Reserve.***

This ruling was celebrated as a significant victory for the Endorois and indigenous peoples' rights across Africa. However, more than a decade later, the recommendations remain largely unfulfilled. The Kenyan government has yet to take meaningful steps to implement these directives, leaving the community in a state of uncertainty and vulnerability. The failure to address these historical grievances has compounded the community's challenges, exacerbating their social, economic, and environmental vulnerabilities.



An Endorois homestead blending tradition and change, where a traditional hut stands alongside goats, symbolizing adaptation to evolving livelihoods

Introduction

In addition to the legal and human rights issues, the Endorois community has faced escalating threats from climate change and environmental degradation. Over the past few decades, climate-induced events have increasingly impacted the Lake Bogoria landscape. The lake's swelling, due in part to increased rainfall and geological changes, has flooded large areas of grazing land, residential areas, and culturally significant sites. Prolonged droughts have led to severe water scarcity, degraded pastures, and increased livestock mortality, while recurrent flash floods have caused extensive soil erosion, infrastructure damage, and loss of property. These events have significantly disrupted the community's ability to maintain their pastoralist way of life, exacerbating their economic and social challenges.

The intersection of historical injustices and contemporary environmental challenges has created a dual crisis for the Endorois. The community's rights to their land and resources remain in limbo, while their traditional livelihoods are increasingly threatened by climate change. This precarious situation has forced the Endorois to navigate complex and uncertain futures, balancing the struggle for justice and restitution with the urgent need to adapt to rapidly changing environmental conditions.

This community-led research study aims to document the full extent of loss and damage experienced by the Endorois due to both historical dispossession and ongoing climate-induced events. By combining community knowledge with scientific analysis, the study seeks to provide a holistic understanding of the environmental, social, and economic impacts on the community. It will explore how these challenges affect the Endorois' ability to sustain their pastoralist livelihood, maintain their cultural and spiritual practices, and secure their rightful place in their ancestral lands.

Moreover, the research aims to understand the broader implications of these challenges for the community's cultural survival and resilience. It highlights the urgent need for a comprehensive response that addresses both the historical grievances and the emerging climate threats faced by the Endorois. By documenting these impacts, the study seeks to inform policy decisions, advocate for the implementation of the African Commission's recommendations, and propose sustainable solutions that enhance the Endorois community's resilience and protect their rights to their ancestral lands.

Ultimately, this research is a critical step toward ensuring justice, recognition, and sustainability for the Endorois community, whose fight for their rights and survival embodies the broader struggle for indigenous peoples' rights and environmental justice in Kenya and beyond.

In a vibrant celebration of their cultural identity, Endorois community members don their traditional attire and engage in a cultural ceremony, highlighting the rich heritage that has been a cornerstone of their identity.

Purpose of the Report

The purpose of this report is to highlight the pressing challenges the Endorois community faces as a result of climate change and environmental shifts in the Lake Bogoria region, a landscape that forms the heart of their ancestral lands. Lake Bogoria holds both ecological and cultural importance, providing resources essential to their livelihoods and serving as a site of spiritual and cultural significance. However, climate-related disruptions such as the swelling of the lake, prolonged droughts, and erratic weather patterns have placed immense pressure on the community, jeopardizing their way of life and undermining their social and economic stability. This report seeks to document the full range of these impacts, encompassing both material losses—such as displaced households and damaged infrastructure—and non-material impacts, including the erosion of cultural identity and spiritual practices.

Beyond documentation, this report aims to advocate for the inclusion of the Endorois community in climate adaptation planning and decision-making processes. Indigenous communities such as the Endorois possess valuable traditional knowledge and practices that have sustained them through generations, making them essential partners in developing sustainable adaptation solutions. However, these communities often encounter systemic barriers, including exclusion from decision-making platforms and limited access to climate financing. This report calls for the recognition and integration of Indigenous knowledge, rights, and values as vital components of climate resilience efforts, ensuring that solutions reflect the needs and priorities of the Endorois people.

Finally, the report emphasizes the need for climate justice by drawing attention to the disproportionate burden that climate change places on marginalized Indigenous communities like the Endorois, who contribute minimally to global greenhouse gas emissions. Their struggle exemplifies the broader injustice faced by Indigenous peoples worldwide, who are often the first to experience the harshest effects of environmental changes while having the least capacity to respond. This report advocates for equitable and inclusive climate policies, urging governments, NGOs, and international bodies to collaborate with Indigenous communities to ensure their voices are heard, their rights respected, and their ways of life preserved for future generations.

Lake Bogoria: Celebrated as a UNESCO World Heritage Site and Important Bird and Biodiversity Area, Recognized for Its Unique Natural and Ecological Significance.

Scope of the Report

The Endorois community that lives near Lake Bogoria is the subject of this report, which focusses on the environmental, social, and cultural effects of climate change. It looks at how the lake has gotten bigger, how frequent droughts, irregular rains, and flash floods have caused infrastructure damage, the loss of grazing pastures, and the submersion of important cultural sites. The Report discusses the traditional livelihood systems of the community, especially pastoralism, and looks at how these are being put under pressure due to dwindling availability to resources like water and pasture. The community faces food insecurity and financial difficulties as a result of the viability of these livelihoods being jeopardized by rising climatic variability.

The Report discusses non-material ramifications as well as material ones, such as the loss of ritual locations and burial grounds as well as the deterioration of cultural identity and customs. The community's social cohesiveness and spiritual health are severely impacted by these disruptions because many cultural customs are linked to now-submerged or inaccessible areas. The Report emphasizes the value of these intangible cultural components to the Endorois' feeling of continuity and identity, emphasizing the necessity of preserving them despite the community's environmental difficulties.

The study also looks at the community's resilience tactics, which include campaigns for land rights, natural resource management programs, and investigations into other livelihoods that are less susceptible to climate unpredictability. These tactics demonstrate the community's ability to innovate in the face of formidable obstacles because they are based on both conventional knowledge and contemporary adaption methods. However, favorable legislation, resource availability, and strong collaborations with stakeholders are necessary for these initiatives to be successful.

Lastly, the scope includes determining the structural impediments that prevent the Endorois community from effectively adapting. These difficulties include a lack of infrastructure to enable sustainable adaptation, poor representation in the formulation of climate policy, and restricted access to climate finance. The report advocates for cooperative endeavours among governmental entities, non-governmental organizations, and global organizations to tackle these obstacles, guaranteeing the Endorois' complete involvement in and advantages from climate resilience initiatives. In promoting environmental sustainability and cultural continuity, it emphasizes the significance of inclusive and participatory practices that respect Indigenous rights and knowledge systems.

Lake Bogoria's stunning landscape, once a breathtaking expanse of natural beauty, is increasingly being eroded by the impacts of climate change. The lake, renowned for its striking features including geysers, hot springs, and the vibrant flocks of flamingos that frequent its waters has long been celebrated for its ecological and aesthetic significance

Methodology

This research employs a mixed-methods approach, integrating both qualitative and quantitative techniques to comprehensively assess the impacts of historical injustices and climate-induced events on the Endorois community. By combining various data collection methods, the study aims to capture a nuanced understanding of the social, economic, and environmental dimensions of the challenges faced by the community. The methodology is designed to be participatory, ensuring that the voices and experiences of the Endorois community are at the forefront of the research process. The following methods were employed:

Community Consultations and Focus Group Discussions: To understand the lived experiences and perspectives of the Endorois community, a series of community consultations and focus group discussions were conducted. These sessions were organized with various groups, including elders, women, youth, and pastoralists, to gather insights into the social, cultural, and economic impacts of climate-induced events such as droughts, flooding, and lake swelling.

The consultations were designed to be inclusive and participatory, using open-ended questions to encourage detailed responses and dialogue. Facilitators trained in participatory rural appraisal (PRA) techniques guided the discussions, ensuring a safe and respectful environment where all voices could be heard. The focus groups provided a platform for different community members to share their experiences, concerns, and coping strategies, highlighting the differential impacts of these events on various segments of the population, including vulnerable groups like women, children, and the elderly.

Household Surveys: To quantify the extent of losses and damages experienced by the Endorois community, structured household surveys were conducted across a representative sample of households within the Lake Bogoria landscape. The surveys were designed to collect data on various parameters, including the number of livestock lost, the extent of grazing land affected, water scarcity issues, and damage to infrastructure caused by the swelling of Lake Bogoria, prolonged droughts, and recurrent flash floods.

The survey instrument included both closed and open-ended questions to capture quantitative data (e.g., the number of livestock lost, the area of land inundated) and qualitative data (e.g., perceptions of changing climate patterns, challenges in accessing resources). Enumerators were selected from the community and trained to administer the surveys in a culturally sensitive manner, ensuring accurate data collection and minimizing any biases. The survey data was then analyzed using statistical software to identify patterns and correlations between different variables, providing an empirical foundation for understanding the scale of the impacts faced by the community.

Methodology

Key Informant Interviews: Key informant interviews were conducted with a diverse range of stakeholders, including local leaders, government officials, environmental experts, NGO representatives, and community-based organizations. These interviews aimed to gain multiple perspectives on the challenges faced by the Endorois community and the responses by different actors to address these issues.

The interviews were semi-structured, allowing for flexibility in exploring different topics based on the expertise and insights of each informant. Questions focused on areas such as policy implementation, environmental management, climate adaptation strategies, and the fulfillment of the African Commission's recommendations. This approach enabled the research team to triangulate data from various sources, providing a holistic understanding of the broader context within which the Endorois community operates.

Geospatial Analysis: To assess the extent of environmental changes in the Lake Bogoria landscape over the past three decades, geospatial analysis was conducted using remote sensing data and Geographic Information System (GIS) tools. High-resolution satellite imagery was obtained and analyzed to map changes in land cover, water levels, and vegetation over time. This analysis helped to quantify the extent of land loss, inundation of grazing areas, and environmental degradation due to the swelling of Lake Bogoria, droughts, and flash floods.

Geospatial data was cross-referenced with historical records and local knowledge to ensure accuracy and relevance. The GIS tools enabled the visualization of changes in the landscape, providing a powerful tool for communicating the scale and nature of the challenges faced by the Endorois community. The spatial analysis also supported the identification of priority areas for intervention and adaptation strategies, contributing to evidence-based decision-making.

Data collectors during focus group discussions

Methodology

Data Analysis and Synthesis: Data from all these methods were analyzed using a combination of qualitative and quantitative techniques. The qualitative data from focus group discussions and key informant interviews were coded thematically to identify common patterns, themes, and insights. Quantitative data from household surveys were analyzed statistically to determine the magnitude of losses, trends over time, and correlations between different factors. The geospatial data provided a visual and spatial dimension to the analysis, illustrating the environmental changes and their impacts on the community.

The participatory mapping process was facilitated by researchers and local community leaders and used tools such as large-scale printed maps, markers, and overlays to enable community members to physically mark locations and areas of significance. This approach ensured that the community's deep understanding of their environment and the changes they have witnessed was incorporated into the study. The maps generated through these sessions were digitized and integrated with the GIS data to provide a comprehensive spatial representation of the Endorois' landscape, which is essential for advocacy and planning purposes.

Participatory Mapping: To integrate local knowledge into the research, participatory mapping exercises were conducted with community members, including elders, youth, and women. These sessions involved creating maps that identified ancestral lands, key resources (such as water points, grazing areas, and sacred sites), and areas affected by climate-induced events.

By integrating these various methods, this study provides a multi-dimensional perspective on the loss and damage experienced by the Endorois community. It allows for a comprehensive understanding of the intersection between historical injustices and contemporary environmental challenges and lays the groundwork for developing targeted interventions that are both culturally appropriate and contextually relevant.

The research project implementation committee facilitated a series of focus group discussions to gather in-depth insights from various segments of the Endorois indigenous community residing along the Lake Bogoria landscape. Four distinct focus groups were conducted to ensure diverse perspectives:

1.Adult Male Focus Group: This group comprised adult men from the community, offering insights into the impact of climate change on their traditional pastoral practices, economic activities, and overall way of life.

2. Adult Female Focus Group: The discussions with adult women explored the specific challenges faced by female members of the community, including impacts on household responsibilities, access to resources, and cultural practices.

3. Youth Focus Group: Engaging with the younger generation provided a perspective on how climate change affects their opportunities, aspirations, and involvement in the community's adaptation and resilience strategies.

4. Persons with Disabilities Focus Group: This group focused on understanding the unique challenges faced by individuals with disabilities within the community, including how climate-induced events exacerbate their vulnerabilities and affect their access to resources and support.

Approaches

The project implementation committee, led by the chairperson, conducted these interviews across the four key locations within the Lake Bogoria landscape: Loboi, Kapkuikui, Koibos, and Sandai. In addition to interviews, the team documented the most affected areas, including public amenities and infrastructure, through extensive photographic evidence.

A). Questionnaires

To quantify the impacts of climate change on the community, 22 key respondents were administered structured questionnaires. These questionnaires included 15 questions designed to capture detailed information on the following aspects:

I. **Environmental Impacts**: Changes in the local climate, including alterations in rainfall patterns, temperature shifts, and extreme weather events.

II. **Loss and Damage**: Quantification of losses related to livestock, grazing land, water resources, and infrastructure due to climatic changes.

III. **Community Effects**: Assessments of how these environmental changes have affected the community's daily life, economic stability, and cultural practices.

B). Interviews

A total of 28 community members, including both local residents and leaders, were interviewed to provide comprehensive insights into the losses and impacts experienced by the Endorois community. These interviews focused on:

I. **Resource Loss**: Detailed accounts of lost resources, including livestock, pasture, and water sources.

II. **Lifestyle Changes**: How shifts in climate patterns have affected traditional practices, agricultural activities, and community cohesion.

III. **Cultural Impact**: Effects on cultural heritage and practices resulting from environmental changes and resource scarcity.

C). Survey and Mapping

The survey and mapping component of the research involved a comprehensive assessment of key areas within the Lake Bogoria landscape. This included:

I. **Survey**: Conducting interviews and focus group discussions to gather data on changes in weather patterns, impacts on agriculture and livestock, and access to water and natural resources.

II. **Mapping:** Identifying and mapping areas of vulnerability, such as those prone to flooding and drought, as well as areas critical to the community's adaptation and resilience efforts. The mapping exercise also integrated local knowledge to highlight areas of significant cultural and economic importance. By mapping these vulnerabilities and adaptation strategies, the research aimed to provide a clear visualization of the impacts and to support the development of targeted interventions to enhance the community's resilience and sustainability.

Limitations of the Community-Led Research

The community-led research encountered several limitations that affected the overall effectiveness and comprehensiveness of the study:

1. **Absence of Comprehensive Historical Data**: One significant challenge was the lack of detailed historical data regarding the Endorois Indigenous Community and their environment. This scarcity of historical records made it difficult to accurately measure the extent of loss and damage caused by climate change. Without baseline data, assessing changes over time and understanding the full impact of environmental shifts on the community's traditional practices and resources became problematic.

2. **Language and Cultural Barriers**: Language differences and cultural nuances posed obstacles in communication, data collection, and interpretation of findings. These barriers sometimes led to misunderstandings between researchers and community members, potentially skewing the data and affecting the accuracy of the research outcomes. Effective communication is crucial for gathering precise information and ensuring that the community's perspectives are accurately represented.

3. **Challenges in Community Engagement**: Engaging community members in the research process proved difficult at times, leading to limited participation from various segments of the population. This lack of engagement restricted the diversity of perspectives included in the study and may have led to an incomplete understanding of the community's experiences and responses to climate change.

4. **Ethical Considerations and Validity**: Conducting research with a vulnerable population requires careful ethical considerations to ensure that the study does not exacerbate existing challenges or exploit the community's situation. Issues related to informed consent, privacy, and potential distress were critical to address. Any lapses in ethical practices could affect the credibility and validity of the research findings and hinder meaningful engagement with the community.

Underrepresentation of Indigenous Knowledge: The research had limited focus on integrating indigenous knowledge and perspectives of the Endorois community. This oversight led to an undervaluation of traditional ecological knowledge and the community's understanding of climate change impacts. Indigenous knowledge is crucial for assessing adaptive strategies, resilience, and cultural values related to environmental changes. The lack of emphasis on these aspects may have resulted in an insufficient understanding of how the community traditionally copes with climate variability and what practices could be leveraged for future resilience.

Addressing these limitations is essential for future research efforts to enhance the accuracy and inclusivity of findings. Incorporating comprehensive historical data, overcoming language and cultural barriers, improving community engagement, adhering to ethical standards, and valuing indigenous knowledge are critical steps to ensure that research effectively captures the full scope of the challenges faced by the Endorois community and contributes to meaningful solutions.

Pictures above: Community focused group discussions from Sandai and Loboi locations narrating their views on the loss they have incurred over the years.

A group photo of the Endorois community, bringing together women, elders, youth, and persons with disabilities during a collaborative meeting on loss and damage.

An Endorois community member and person living with a disability was respondent during the research.

EIWEN staff carefully navigate a makeshift bridge, highlighting the challenges and damage caused by recent floods.

Literature Review

Historical Context and Environmental Impact of Lake Bogoria

Lake Bogoria, situated in Baringo County within Kenya's Rift Valley, is a notable saline lake surrounded by a complex and resource-rich catchment area. The historical context and environmental impact of Lake Bogoria highlight the intricate relationship between ecological changes and the livelihoods of the Endorois community.

Historical flooding and drought events have demonstrated the vulnerability of the community to climate variability, while also showcasing their resilience and adaptation strategies. This catchment encompasses a diverse range of natural resources, including:

a. **The Lake Itself:** Lake Bogoria is known for its high salinity and geothermal features, which include hot springs and geysers along its shores. These features contribute to the lake's unique ecological conditions and influence the surrounding environment.

b. **Forests and Rivers:** The upper catchment is covered by forests that serve as the source of the Waseges River, the primary freshwater inflow into the lake. These forests are critical for maintaining the lake's water quality and regulating its hydrology.

c. **Wildlife and Land Use:** The catchment supports various wildlife species and provides land that is used for both agriculture and pastoralism, making it an integral part of the local ecosystem and economy.

Historical Environmental Changes

a. **Flood and Overflow Incidents:** 1903 and 1965 Floods: Historical records indicate that Lake Bogoria experienced significant increases in water levels during 1903 and 1965. These flooding events led to the inundation of approximately 20 km^2 of land, which was crucial for livestock grazing, salt licks, and sacred prayer sites for the Endorois community. The flooding disrupted pastoral activities and led to a substantial loss in livestock production.

b. **Impact on Livestock and Community:** The flooding not only diminished grazing areas but also contributed to outbreaks of livestock diseases, resulting in the death of approximately 2,000 animals. This loss had severe consequences for the community's livelihood and food security, underscoring the profound impact of environmental changes on traditional pastoral economies.

c. **Droughts and Food Insecurity:** 1964 Drought: In 1964, a prolonged drought caused significant livestock mortality within the Endorois community. The drought led to severe food shortages, contributing to social stress and family breakdowns due to the lack of resources. Government intervention was necessary to provide relief food to affected families, highlighting the vulnerability of the community to climate-induced disasters.

d. **Social and Economic Impact:** The drought not only affected livestock but also disrupted social structures and community cohesion. The reliance on external aid underscored the challenges faced by the Endorois in managing climate variability and its impacts on their traditional livelihoods.

Climate Variability and its Impacts

1. **Precipitation Patterns and Seasonal Variability:**

   I. **Rainfall Distribution:** In the Lake Bogoria landscape, rainfall is primarily concentrated between April and November, with average precipitation ranging from about 700 mm on the Loboi plain to 1,200 mm on the adjacent highlands. This seasonal variability influences the water levels of the lake and the health of the surrounding ecosystems.

   II. **El Niño Events:** El Niño years are associated with increased rainfall and flooding along the lake's shores. For instance, in 2020, Lake Bogoria's area expanded to approximately 4,690 ha (11,600 acres) due to elevated rainfall. This expansion was influenced by a combination of factors, including a strong positive Indian Ocean Dipole index and enhanced long-rains season precipitation.

2. Climate Change and Extreme Weather Events:

   I. **Temperature and Rainfall Anomalies:** 2020 was one of the hottest years on record, characterized by both depressed short-rains and above-average long-rains. Such anomalies reflect the broader impacts of climate change, which include increased temperature extremes and altered precipitation patterns.

   II. **Ecosystem and Community Implications:** The interaction between extreme weather events and seasonal precipitation affects the lake's ecological balance and the livelihoods of local communities. Variability in water levels and increased flooding can lead to further disruptions in grazing areas and agricultural activities.

Climate change has had a profound impact on the Endorois community, particularly by decimating the livestock that once formed the backbone of their livelihood. With the herds diminishing, many households are now facing increased poverty, hunger, and economic hardship. Additionally, the loss of livestock has disrupted traditional practices, ceremonies, and cultural identity tied to animal husbandry, affecting the community's social fabric and resilience.

Role of Indigenous Knowledge and Adaptation

1. **Traditional Knowledge and Climate Resilience:**

   I. **Endorois' Adaptation Strategies:** Indigenous communities like the Endorois have developed unique adaptation strategies to cope with climate variability. These include traditional knowledge systems, such as forecasting weather patterns based on natural indicators, and cultural practices that enhance community resilience.

   II. **Innovative Responses:** The Endorois' responses to climate change involve integrating traditional knowledge with modern technologies. This approach helps in managing resources more effectively and building resilience against environmental shocks.

2. Contribution to Ecosystem Management:

   I. **Ecosystem Stewardship:** Indigenous peoples play a crucial role in managing and conserving ecosystems. Their deep connection to the land and traditional practices contribute to the preservation of biodiversity and the sustainable use of natural resources.

   II. **Public Discourse and Recognition:** Despite their significant role, indigenous contributions are often underrepresented in mainstream climate change discussions. Recognizing and incorporating indigenous perspectives can enhance efforts to address climate change and promote sustainable development.

A section of indigenous trees planted by EIWEN, contributing to the restoration and conservation efforts along the Lake Bogoria ecosystem

Climate Change and Indigenous Perspectives

Indigenous peoples, such as the Endorois, are often underrepresented in broader climate change discussions despite their significant role in managing and maintaining ecosystems. Climate change disproportionately affects Indigenous communities, who contribute minimally to the causes of climate change, such as greenhouse gas emissions. Indigenous peoples are, however, integral to the ecosystems they inhabit and can play a crucial role in enhancing the resilience of these ecosystems.

The Endorois community demonstrates how traditional knowledge and practices can contribute to climate change adaptation. They have historically adapted to environmental changes using indigenous knowledge, which includes practices and technologies that can offer insights into coping with climate impacts. This knowledge, however, is frequently overlooked in mainstream climate change strategies.

Historical Climate Events

Rainfall Patterns and Extreme Weather

The Lake Bogoria landscape experiences a distinct seasonal rainfall pattern, with most precipitation occurring between April and November. Rainfall averages around 700 mm on the Loboi plain and 1,200 mm in the adjacent highlands. However, this pattern is subject to significant variability, particularly during El Niño years. For example, in 2020, Lake Bogoria's area expanded to approximately 4,690 hectares (11,600 acres) due to increased rainfall and flooding.

Despite generally depressed rainfall during the short-rains season (October to December), the year experienced enhanced rainfall during January and February, attributed to the strong positive Indian Ocean Dipole index and increased precipitation during the long rains season (March to May). This period also saw Lake Victoria rise to record levels, highlighting the impact of extreme weather events on regional hydrology.

The Endorois community landscape, vital for agriculture, is increasingly under threat as rising waters from Lake Bogoria and flooding displace families, jeopardizing their livelihoods and food security

Colonial and Post-Independence Dispossession

The Endorois community has a long history of land dispossession that dates back to the colonial era. Colonial authorities-imposed restrictions and boundaries on the Endorois' traditional lands, significantly reducing their access to critical resources. Following Kenya's independence in 1963, the situation for the Endorois did not improve.

In 1973, the Kenyan government allocated substantial portions of the Lake Bogoria area for conservation purposes, specifically for the creation of the Lake Bogoria National Reserve. This decision was made without adequate consultation with or compensation to the Endorois, leading to forced displacement from their ancestral lands. The establishment of the reserve marked the beginning of ongoing struggles for the Endorois, whose traditional livelihoods and cultural practices were deeply tied to the land and lake.

Intensified competition between wildlife and livestock emerges as Lake Bogoria swells and land degradation reduces available grazing areas, threatening the delicate balance of the ecosystem and local livelihoods

The Endorois community, who had inhabited the Lake Bogoria area for centuries, lost access to their ancestral land, which was central to their identity and cultural practices. This land was not only their home but also a vital part of their cultural heritage, with sacred sites, grazing areas, and natural resources that were essential to their way of life

Climate Change and Environmental Impact on the Lake Bogoria Landscape

1. Ecosystem Degradation

The Lake Bogoria landscape, located in the Great Rift Valley of Kenya, has been increasingly affected by the impacts of climate change. Over recent decades, the area has experienced a series of environmental challenges, including prolonged droughts, lake swelling, and severe flooding. These events have dramatically altered the physical environment, disrupted local ecosystems, and had significant socio-economic and cultural impacts on the communities, particularly the Endorois, who have lived in and around Lake Bogoria for centuries.

In contrast to the droughts, the Lake Bogoria landscape has also experienced significant episodes of lake swelling, where water levels have risen dramatically, causing the lake to overflow its natural boundaries.

These combined impacts of droughts, lake swelling, and floods highlight the vulnerability of the Lake Bogoria landscape to climate variability and change. They underscore the fragility of the region's ecosystems and the urgent need for adaptive strategies to build resilience against future climate-related shocks. For the Endorois community, these environmental changes represent a crisis of survival and identity.

The severe environmental destruction brought on by heavy rains and unmanaged stormwater runoff is eloquently illustrated by gully erosion. This process not only depletes the soil of its fertility but also damages habitats, uproots flora, and modifies the way water flows naturally. Deep channels that have been carved into the terrain throughout time have threatened buildings and roads, limited livestock grazing grounds, and rendered the soil un-usable for cultivation. Furthermore jeopardising the water quality and biodiversity of the surrounding rivers, lakes, and wetlands is the erosion's contribution to their siltation. Reforestation, water conservation measures, and sustainable land management techniques are needed to address this issue and lessen potential harm.

3. Agricultural and Pastoral Challenges

I. **Crop Failures**: Irregular rainfall and prolonged droughts have led to significant crop failures, affecting local food security. Farmers around Lake Bogoria, who rely on predictable weather patterns for agriculture, have faced declining yields and financial losses.

II. **Livestock Decline**: The reduction in water availability and grazing land due to climate change has severely impacted livestock health and productivity. Pastoral communities, heavily reliant on their herds, have experienced reduced milk production, lower animal weights, and increased mortality rates.

4. Water Supply Strain

Droughts and erratic rainfall have strained water supply systems, leading to shortages of potable water. This shortage has affected local communities' access to clean water, exacerbating health issues and daily living conditions.

5. Economic Impact

I. **Tourism Revenue Losses**: Lake Bogoria, renowned for its hot springs and bird-watching opportunities, has seen a decline in tourism due to climate-induced alterations in the lake's conditions. Changes in the lake's attractiveness to tourists have led to reduced visitor numbers, negatively impacting local businesses and economies that depend on tourism revenue.

II. **Economic Hardships**: The cumulative effects of environmental degradation, reduced agricultural productivity, and decreased tourism have led to economic hardships for the Endorois community. Many individuals and families have struggled to sustain their livelihoods in the face of these challenges.

The submergence of the Lake Bogoria National Reserve gate made it difficult for tour operators to access the reserve, leading to a decline in visitor numbers. This has resulted in substantial financial losses for businesses that depend on tourism, including local hotels, tour guides, artisans, transport providers, and small-scale vendors who sell local products to tourists.

6. Current Situation and Ongoing Challenges

As of the present, the Endorois community continues to face the compounded effects of historical dispossession and current climate change impacts. The ongoing struggle for recognition of their land rights and the adverse environmental conditions have created a challenging context for the community's survival and prosperity.

Efforts to address these issues include advocacy for full implementation of legal rulings, restoration of ancestral lands, and the development of climate adaptation strategies that incorporate indigenous knowledge and practices. The Endorois community's resilience and adaptation efforts remain crucial in mitigating the impacts of climate change and ensuring the preservation of their cultural and environmental heritage.

7. Situation Analysis

Lake Bogoria has recently experienced episodes of swelling and flooding due to erratic weather patterns and rising temperatures. These events have resulted in the displacement of community members, destruction of property, loss of livestock, and deterioration of sacred cultural sites.

Prolonged droughts have compounded these challenges, leading to reduced access to water, food insecurity, and economic instability. The Endorois community's traditional way of life, heavily dependent on natural resources, has been significantly impacted, necessitating an urgent need for effective responses to safeguard their livelihoods, cultural heritage, and ecosystem health.

Human pressure on natural resources has significantly affected the availability of firewood at the household level, particularly in communities that rely on wood as their primary source of fuel for cooking and heating.

Livelihood Disruption in the Endorois Community

The Endorois community, a semi-nomadic pastoralist group, has experienced profound disruptions to their livelihoods due to climate change. This disruption is primarily driven by significant alterations in environmental conditions, which have severely impacted their traditional pastoral way of life. The following sections detail the various facets of this disruption:

I. **Reduced Grazing Areas -** The Endorois community relies heavily on expansive grazing lands for their livestock. However, climate-induced changes have drastically affected these lands. The swelling of Lake Bogoria and the degradation of adjacent areas have led to a reduction in available grazing fields. The shrinking of these vital lands has forced the community to seek alternative, often less suitable, grazing areas, leading to increased competition for resources and overgrazing in remaining areas.

II. **Loss of Key Resources —** The inundation of previously accessible grazing lands has not only diminished the quantity of available pasture but has also led to the loss of crucial resources such as natural salt licks. These resources are essential for maintaining the health and productivity of livestock. The loss of such resources directly affects the quality and quantity of animal products, including milk, meat, and hides.

III. **Erratic Rainfall —** Traditional pastoralism depends on predictable rainfall patterns to sustain the growth of vegetation necessary for livestock. Climate change has led to increasingly erratic and unpredictable rainfall. This variability disrupts the natural growth cycles of plants and reduces the reliability of water sources, further exacerbating the challenges faced by pastoralists.

IV. **Water Scarcity—**With changing rainfall patterns, the availability of water for both livestock and household use has become increasingly unreliable. Prolonged droughts and fluctuating rainfall have strained the community's access to clean water, impacting their daily lives and livestock health. The scarcity of water sources has forced the Endorois to travel greater distances in search of water, increasing the risk of conflict over resources and impacting the health of their animals.

The expansion of the lake into the mainland has caused trees in the surrounding areas to become inundated, leading to their drying up and dying.

V. Impact of Floods and Swelling Lake—The livelihood disruption faced by the Endorois community due to climate change and environmental changes has been profound.

Vl. Displacement and Property Loss— In 2013, the swelling of Lake Bogoria caused significant displacement and property loss, affecting 53 households. The situation worsened in May 2024 when floods, caused by the bursting of riverbanks adjacent to the lake, displaced 365 households. The total number of affected households reached 418. These floods not only destroyed homes and property but also disrupted the community's access to essential resources

Flooding has resulted in significant displacement of families and institutions situated near rivers, with shelters being severely impacted by rising water levels.

A section of infrastructure submerged by the swelling waters of Lake Bogoria, marking a significant loss to the community's economic empowerment efforts through tourism and local enterprise

Food Security Challenges in the Endorois Community

Following the eviction of the Endorois community from their ancestral lands, the community faced a critical need to adapt their way of life to ensure food security. Transitioning from traditional pastoralism to agriculture, the community embraced farming as a new livelihood strategy. However, this shift has been met with significant challenges due to changing climate patterns, which have severely impacted their agricultural efforts.

I. **Transition to Farming:** In response to displacement and land loss, the Endorois community adopted farming as an alternative means to sustain themselves. This transition involved cultivating various crop varieties to provide food for the community. The Kamonong irrigation scheme was established to support this new agricultural approach, covering 1,000 acres of land dedicated to crop production.

II. **Significant Crop Losses:** Over the past three years, the Kamonong irrigation scheme has faced substantial losses in crop yields due to adverse climate conditions. The consistency of these losses highlights the severe impact of shifting climate patterns on the community's agricultural efforts. The scheme's inability to maintain stable crop production underscores the broader challenges faced by the community in adapting to their new way of life.

III. **Reduced Agricultural Output:** The repeated crop failures and significant land losses have severely affected the community's ability to produce sufficient food. The loss of agricultural land and damage to crops have diminished the community's food supplies, leading to increased reliance on external sources of food.

IV. **Economic and Social Impact:** The financial strain on farmers due to continuous crop losses has further exacerbated the community's difficulties. The economic burden of investing in agricultural practices that fail due to climate extremes has intensified the challenges of maintaining food security. Additionally, the social impact includes increased food insecurity and heightened vulnerability among community members, particularly those dependent on agriculture for their livelihoods.

V. **Impact of Flooding in 2024:** The situation further deteriorated in 2024 when Sandai location, home to many Endorois community members, experienced severe flooding. This event resulted in the destruction of 1,700 acres of maize farms. The flooding, caused by the overflow of riverbanks and intense rainfall, devastated maize crops and significantly impacted food production in the region.

Impacts on Lake Bogoria National Reserve

Lake Bogoria, renowned for its natural beauty and ecological significance, has faced severe impacts due to rising water levels. The lake, celebrated for its geothermal hot springs and vibrant flamingo population, is undergoing significant environmental changes that threaten its ecological balance and tourism appeal.

I. **Hot Springs and Geysers:** Lake Bogoria's geothermal features, including its famous boiling springs and geysers, have been critically affected by the rising water levels. Many of these hot springs have been submerged, leading to the suppression of geysers that once drew tourists and researchers alike. The loss of these unique features has diminished the lake's allure as a geothermal destination.

II. **Impact on Flamingos:** The lake's flamingo population, once numbering in the millions, has significantly declined. The rise in water levels has submerged critical algae-feeding areas, which are essential for the flamingos' survival. As the algae-rich feeding grounds are lost, flamingos are forced to navigate through submerged thorny trees in search of suitable wading areas. This has resulted in injuries and fatalities among the flamingos, further exacerbating the decline in their numbers.

III. **Impact on Surrounding Areas:** The rising water levels in Lake Bogoria have caused extensive flooding in the northern parts of the lake, affecting surrounding villages and settlements. The floodwaters have submerged the main entrance to the lake and inundated nearby schools, homes, and shopping centers. Many residents have been displaced, seeking refuge on higher ground or with relatives and neighbors.

IV. **Contamination and Health Risks:** The flooding has led to contamination of several water points and the submergence of latrines, increasing the risk of water-borne disease outbreaks in the affected areas. The lack of access to clean water and sanitation facilities poses a significant health hazard to the displaced populations and surrounding communities.

V. **Decline in Revenue:** Lake Bogoria's status as a major tourist destination has been adversely affected by the changes in the lake basin. The submersion of key tourist attractions, including the geothermal features and the flamingo habitats, has led to a noticeable decline in visitor numbers. This drop in tourism has resulted in reduced revenue for local businesses and the national park, affecting the economic stability of the region.

Lake Bogoria, before when it was with pristine rich biodiversity and unique geological features.

Below is Lake Bogoria Amidst Environmental Challenges. Climate change, in particular, has dramatically affected the lake's ecosystem and the livelihoods of communities surrounding it.

Rising Water Levels

Ecosystem Degradation

A man stands helpless at the edge of Lake Bogoria, reflecting on the loss of his livelihood and the once-thriving work he engaged in, now submerged beneath the rising waters

Fallen trees near the swollen Lake Bogoria highlight the impact of rising waters, as saturated ground conditions undermine the stability of large trees, leading to their collapse.

Economic Losses Due to Rising Water Levels at Lake Bogoria

Lake Bogoria's rising water levels, which have also seriously damaged vital communal infrastructure and public spaces. In addition to interfering with daily life, these losses have limited the local residents' access to services and created job possibilities. A summary of the main areas impacted is provided below:

Main Gate of Lake Bogoria: The Lake Bogoria National Reserve's main entrance, which controlled visitor access and made entry collection easier, is now underwater. The flow of visitors into the reserve has been significantly hampered by this submersion, which has had an impact on park management and led to a drop in admission fee revenue.

Hot Springs: Beneath the swelling waters, the well-known geothermal hot springs, which are highly sought-after for their therapeutic qualities, have all but vanished. Due to this loss, Lake Bogoria is now less desirable as a travel destination for both domestic and foreign travelers, which has had a detrimental effect on local economic activity and significantly reduced tourism revenue.

Airstrip: Flooding has destroyed the airstrip, which was formerly utilized for emergency landings and small aircraft. The lack of a working airstrip has made it extremely difficult to access the region, which has an impact on tourist visits and jeopardizes emergency response and evacuation capabilities.

Picnic Site: Floodwaters have flooded a tourist-designated picnic place, limiting the variety of recreational opportunities for guests. This loss has had a negative effect on tourists' overall travel experiences and has added to the drop in tourism.

Damaged roads in the Lake Bogoria National Reserve: The floods has severely damaged or submerged a number of the reserve's important routes. These roads' deterioration makes it harder to access different areas of the reserve, which increases the difficulty of managing the park and deters tourists because of the bad travel conditions.

A portion of the bridge has washed away, cutting off important transportation connections and cutting off people' access to resources and services. The difficulties experienced by locals are made worse by this disturbance, which not only interferes with everyday commutes but also hinders the movement of products, such as food and medical supplies.

2. Community and Religious Facilities

A. Seventh Day Adventist Church, Loboi:

Description: The church building in Loboi has been partially or fully submerged.

Impact: The loss of this place of worship disrupts community gatherings and religious activities, affecting the spiritual and social life of the residents.

B. Full Gospel Church of Kenya, Loboi:

Description: Another important place of worship in Loboi has been affected.

Impact: Similar to the Seventh Day Adventist Church, the loss of this church impacts community cohesion and religious practices.

C. Loboi Dispensary:

Description: The local health facility has been damaged or submerged.

Impact: The destruction of the dispensary hampers access to medical services, posing a serious health risk to the community and increasing reliance on distant health facilities.

E. Lake Bogoria Girls' School (Partially Swollen by August 2024):

Description: The girls' school has been partially submerged.

Impact: Damage to the school disrupts education, affects students' learning environment, and may lead to long-term educational setbacks for the girls.

F. Loboi Bridge:

Description: The bridge connecting Loboi has been damaged or submerged.

Impact: The destruction of this critical infrastructure impedes transportation, affects access to essential services, and isolates communities.

G. Koichapai Pan Dam:

Description: The dam, which was used for water storage, has been affected.

Impact: The loss of the dam affects water availability for both drinking and agricultural use, exacerbating water scarcity issues.

H. Majimoto Chief's Store Office:

Description: The local administrative office has been damaged or submerged.

Impact: This office played a crucial role in local governance and administration. Its loss disrupts administrative functions and impedes local government operations.

I. Majimoto Primary Dining Hall:

Description: The dining hall used for school meals has been affected.

Impact: The loss of this facility impacts the provision of meals to school children, affecting their nutrition and overall well-being.

3. Loss of Traditional Medicinal Plants

Many important medicinal herbs and trees that were essential to the traditional medicine of the Endorois have been drowned and rendered inaccessible by the flooding. These plants, which include Tankartwee, Parmukute, Asubweh, Arweh, and Muchukwe, are more than just botanical resources; they represent the foundation of an intricate, multigenerational knowledge system of natural healing that dates back hundreds of years.

The traditional therapeutic techniques that have been the foundation of the Endorois community's healthcare system for generations are disrupted by the disappearance and lack of accessibility to these essential plants. Spiritual ideals, communal knowledge, and cultural beliefs are all intricately entwined with these practices. With fewer of these plants available, there may be a movement towards a greater reliance on modern medicine, which could cause traditional knowledge to erode and cultural practices to gradually disappear.

Once a thriving area of indigenous trees, this ground now bears new grass species that have emerged, signaling a shift in the ecosystem and the loss of native flora

4. Sacred and Cultural Sites

Disruption of Cultural and Religious Rites

The submersion of sacred shrines has also disrupted several key cultural and religious rites that are central to the Endorois identity and way of life. Rites such as **Ayebisye, Ndasumee, Kerekabeek, Kebirchibei, and Ketis** are traditionally performed at these designated sacred sites. These ceremonies and rituals are not mere cultural practices; they are fundamental expressions of the community's values, beliefs, and social cohesion.

The inability to perform these rites threatens to unravel the cultural fabric of the community. These rituals are critical for maintaining cultural continuity, social cohesion, and the transmission of traditional knowledge and values from one generation to the next. Without these practices, younger members of the community may grow up disconnected from their cultural roots, lacking the opportunity to learn and participate in the traditions that have defined their identity for centuries.

Furthermore, these rites are moments of communal gathering, storytelling, teaching, and reinforcing cultural values and wisdom. The loss of sacred sites prevents these gatherings, leading to a gradual erosion of social cohesion, as shared experiences and rituals that bond the community together are lost. This disintegration weakens the sense of unity, collective identity, and cultural heritage that has sustained the Endorois community through time.

This cultural crisis has broader implications beyond the Endorois community. It highlights the intersection of environmental changes and indigenous rights, underscoring the need for urgent action to protect cultural heritage in the face of climate-induced challenges. The loss of these sacred sites and cultural practices calls for recognition, support, and efforts to restore or mitigate these damages, ensuring that the Endorois can continue to practice their traditions and preserve their cultural identity for future generations.

Resilience in Celebration: Endorois Community Members Honor Their Cultural Heritage Amidst a Changing Landscape affected by Loss and Damage.

5. Implications for Cultural Activities

I. **Disruption of Traditional Practices:** The loss of medicinal herbs and sacred sites impairs the community's ability to perform traditional practices and rituals. This disruption affects not only individual well-being but also community cohesion and cultural identity.

II. **Erosion of Cultural Knowledge:** With the loss of sacred sites and traditional herbs, the community faces the risk of losing valuable cultural knowledge and practices that have been passed down through generations. The inability to practice traditional rites can lead to a disconnect between the current and past generations, reducing the transmission of cultural heritage.

III. **Impact on Community Identity:** Cultural practices and sacred sites are central to the Endorois community's identity and sense of belonging. The erosion of these elements weakens the community's connection to their cultural roots and may lead to cultural erosion over time.

IV. **Adaptation and Preservation Challenges:** The community may need to adapt by finding alternative ways to preserve and practice their cultural heritage. This may involve documenting traditional knowledge, creating new cultural sites, or integrating traditional practices with modern approaches to ensure the continuity of their cultural identity.

Women Bearing the Brunt of Climate Impacts, Yet Leading the Way in Resilience and Adaptation.

6. Social Impacts

The displacement of 418 households and the loss of 3000 acres of land have had profound social impacts on the Endorois community. These impacts extend beyond immediate physical displacements to affect various aspects of daily life, health, and social cohesion. The life-threatening implications of these changes include:

A. **Immediate Shelter Crisis:** The displacement of 418 households has led to an urgent need for temporary shelter. Many affected individuals were forced to seek refuge in makeshift accommodations or in schools and with relatives, leading to overcrowded and inadequate living conditions. The displacement has disrupted family structures and routines, causing significant stress and trauma, particularly for vulnerable groups such as women, children, and the elderly.

B. **Loss of Homes and Personal Belongings:** The destruction of homes and personal property has resulted in severe economic and emotional losses. Families have lost not only their physical homes but also essential personal belongings, which has compounded their hardship and instability.

Crops Struggle to Survive Amidst the Devastating Impact of Floodwaters

Homes of Families Living Along Waterways Damaged by Flooding

7. Land and Livelihood Disruptions

A. **Agricultural Losses:** The loss of 3000 acres of land has severely impacted agricultural activities. This land was crucial for crop cultivation and livestock grazing, which are central to the Endorois' livelihoods. The loss of productive land has led to food shortages, reduced income from agriculture, and a decline in the community's ability to sustain itself. The disruption of agricultural activities has forced many families to rely on external aid, increasing their vulnerability.

B. **Economic Hardship:** The displacement and land loss have resulted in economic instability. Many community members who previously relied on farming and pastoralism for their income are now struggling to find alternative sources of livelihood. The destruction of public amenities and infrastructure has further exacerbated economic challenges, hindering access to markets, schools, and health services.

Invasive Prosopis Plantation Alters Tree Cover, Threatening Indigenous Tree Species and Ecosystems.

8. Health and Sanitation Issues

A. **Increased Risk of Disease:**The flooding and displacement have compromised sanitation facilities, leading to the contamination of water sources and an increased risk of water-borne diseases such as cholera and dysentery. The lack of proper sanitation and clean drinking water heightens health risks, particularly for children and the elderly, who are more susceptible to illness.

B. **Mental Health and Trauma:** The upheaval caused by displacement and loss has led to significant mental health issues, including stress, anxiety, and depression. The trauma of losing homes, land, and personal belongings can have long-lasting psychological effects on individuals and families. Social support structures are often strained in crisis situations, reducing the community's capacity to address mental health needs effectively.

Social Workers Faces Challenges Reaching Target Groups Due to Road Breakdown

9. Social Disintegration

A. Erosion of Social Cohesion: Displacement disrupts established social networks and community cohesion. Traditional communal activities and support systems are undermined as families are dispersed and social interactions are limited. The loss of communal spaces and public amenities further weakens social ties, affecting the community's ability to organize and support one another.

B. Educational Disruptions: The destruction of educational facilities and the displacement of families have disrupted children's access to education. School closures and displacement can lead to increased dropout rates and long-term educational setbacks for children and youth.

Stormwater flooding displaces communities, highlighting the urgent need for effective water management and disaster preparedness strategies

Swept away soil leaves farms barren and unable to support crop growth, underscoring the severe impacts of erosion and environmental degradation

10. Loss of Cultural Heritage

A. Impact on Traditional Practices: The displacement has affected the community's ability to practice traditional customs and rites. Sacred sites and cultural landmarks that were submerged or destroyed play a critical role in the community's cultural life, and their loss has disrupted cultural continuity.

B. Adaptation Challenges: The community faces challenges in adapting to new living conditions while trying to maintain their cultural identity. The displacement has forced many to live in unfamiliar environments, which complicates efforts to preserve cultural traditions and practices.

Traditional containers essential for Endorois cultural ceremonies face the threat of climate change, highlighting the urgent need to preserve both cultural heritage and the environment

10. People Living with Disabilities (PWDs)

A. Limited Mobility and Accessibility: The rising water levels of Lake Bogoria have significantly limited mobility for persons with disabilities, particularly those with mobility impairments. Uneven terrain and flooded pathways hinder their ability to access vital resources such as safe drinking water, food supplies, and healthcare facilities. This has worsened pre-existing challenges, as many PWDs face difficulties in navigating the rugged and unstable terrains surrounding the lake.

B. Barriers to Safe Water Access: Rising water levels have resulted in contamination and reduced accessibility to freshwater sources. For PWDs, accessing clean and safe water became even more challenging. Many reported that traversing flooded or unstable areas to reach water points is not only dangerous but often impossible without assistance. This further limits their autonomy and increases dependency on caregivers or community support.

C. Disrupted Livelihoods and Economic Activities: PWDs who engage in livelihood activities, such as small-scale trading or fishing, have been disproportionately affected by the lake's swelling. Access to markets and economic opportunities has been curtailed due to submerged infrastructure and impassable roads, making it difficult for PWDs to sustain their livelihoods. This has led to increased economic insecurity and heightened poverty levels within this vulnerable group.

D. Social Isolation and Exclusion: The geographic isolation caused by the rising waters has led to greater social isolation for PWDs. Many reported feeling cut off from their social networks, essential services, and community events due to inaccessible roads and pathways. The loss of access to social support exacerbates the challenges PWDs face, increasing the sense of exclusion and marginalization.

E. Inadequate Disaster Response and Support Systems: During emergencies such as flooding, disaster response mechanisms often fail to address the specific needs of PWDs. Limited evacuation options and a lack of accessible temporary shelters mean that PWDs are more vulnerable during and after disasters. Many PWDs reported receiving inadequate support during evacuation efforts, leaving them exposed to further risk and harm.

F. Increased Dependence on Caregivers: As access to essential services like healthcare, markets, and social support networks dwindles, PWDs are becoming increasingly dependent on caregivers. This increased reliance places additional strain on both the individuals with disabilities and their families or caregivers, who may already be struggling with the impacts of the flooding.

G. Heightened Vulnerability to Health Risks: The flooding and rising water levels have created conditions that heighten health risks for PWDs, including the spread of waterborne diseases. Access to healthcare services is limited, and mobility restrictions mean that many PWDs cannot reach healthcare facilities in time for treatment, compounding their vulnerability.

11.Proliferation of Prosopis Trees in the Lake Bogoria Landscape:

A. Rapid Spread and Invasion of Grazing Lands: The proliferation of Prosopis trees in the Lake Bogoria region has accelerated in recent years, spreading across grazing lands and reducing the available pasture for livestock. This invasive species has thrived in the arid conditions typical of the area, rapidly expanding into rangelands that were once critical for the pastoral livelihoods of the Endorois and other local communities. The encroachment of Prosopis has significantly restricted access to key grazing areas, contributing to challenges in sustaining traditional livestock-based economies.

B. Displacement of Native Vegetation: Prosopis, with its deep-rooted and aggressive nature, has outcompeted native vegetation across the Lake Bogoria landscape. Indigenous plant species, which play an essential role in the local ecosystem and are adapted to the semi-arid conditions, are being displaced. This loss of biodiversity not only affects the flora but also has a cascading effect on local wildlife and ecosystems that depend on these native plants. The Prosopis tree monopolizes water and soil nutrients, limiting the regeneration of native grasses and shrubs that are essential for both wildlife and livestock.

C. Impact on Water Resources: Prosopis trees are known for their high water consumption, exacerbating the strain on already scarce water resources around Lake Bogoria. As the trees spread, they contribute to the depletion of groundwater and surface water supplies, critical for both human and animal survival in the region. This is particularly concerning given the fluctuating water levels of Lake Bogoria, which are already impacted by climate change. The presence of Prosopis increases water competition, affecting traditional water sources such as springs and seasonal rivers, further stressing the local ecosystem and communities.

D. Deterioration of Livestock Productivity and Livelihoods: The proliferation of Prosopis has a direct negative impact on livestock productivity by reducing the availability of nutritious grasses and shrubs for grazing. Livestock that graze on Prosopis pods may suffer from health issues, as the pods are known to cause digestive problems in some animals, especially goats and cattle. This has led to decreased livestock health and productivity, undermining the economic resilience of pastoralist communities around Lake Bogoria. The loss of suitable grazing land has forced many herders to move their livestock further from the lake, increasing labor and transportation costs.

E. Reduction of Biodiversity and Ecological Balance: The dominance of Prosopis in the Lake Bogoria ecosystem is altering the ecological balance, reducing both plant and animal biodiversity. Native species that once thrived in the ecosystem, such as acacia trees and various indigenous grasses, are now at risk of disappearing as Prosopis takes over. The reduction in biodiversity not only affects wildlife but also has long-term consequences for soil health, water cycles, and the overall resilience of the ecosystem. Furthermore, the diminished plant diversity reduces the availability of traditional medicinal plants and food sources that local communities have relied on for generations.

G. Increased Community Vulnerability to Climate Change: As an invasive species, Prosopis has exacerbated the vulnerabilities of local communities to climate change. Its aggressive growth in flood-prone areas and dry rangelands has diminished the resilience of the land to climate extremes such as droughts and floods, which are already becoming more frequent and severe due to climate change. By limiting the capacity of the land to support diverse plant life, Prosopis reduces the natural buffers that protect communities from these climate impacts, leaving them more exposed to food insecurity, loss of livelihoods, and environmental degradation.

H. Challenges in Management and Eradication Efforts: Efforts to manage and eradicate Prosopis in the Lake Bogoria landscape have faced significant challenges. The tree's ability to regenerate quickly after cutting or burning has made it difficult to control its spread. Additionally, community-led efforts are often underfunded and lack the technical resources necessary to effectively manage the invasion. While some initiatives have sought to use Prosopis wood for fuel or other economic purposes, these solutions are insufficient to curb the extensive proliferation of the species. Without coordinated and well-supported intervention, the continued spread of Prosopis poses a serious long-term threat to the landscape and local livelihoods.

I. Cultural and Socioeconomic Impacts: The invasion of Prosopis has also had cultural implications for the Endorois and other indigenous communities around Lake Bogoria. As grazing lands and native vegetation diminish, traditional pastoralist practices are becoming harder to sustain. This has led to disruptions in cultural practices tied to livestock herding, community gatherings, and land stewardship, which are core aspects of the Endorois identity. Moreover, the economic strain caused by reduced livestock productivity has forced some community members to seek alternative livelihoods, further weakening the social fabric and cultural continuity of the community.

Community Responses and Adaptation Strategies

The Endorois community, with its deep-rooted cultural heritage, has historically employed various traditional practices to manage and adapt to environmental changes. However, with the increasing unpredictability of climate patterns and the associated impacts, the community has been compelled to integrate both traditional knowledge and contemporary adaptation strategies to mitigate the adverse effects of climate change. Here is an expanded view of their responses and strategies:

A. Traditional Practices for Climate Prediction and Adaptation

I. **Animal Slaughter and Intestinal Observation:** Historically, the Endorois community relied on the practice of slaughtering animals and examining their intestines to predict weather patterns and upcoming climate changes. This practice was rooted in traditional knowledge and was used to make decisions about resource management and preparation for adverse weather conditions. Although this practice is deeply ingrained in the community's cultural heritage, the increasing frequency and unpredictability of climate events have diminished its reliability as a sole method for climate prediction.

II. **Praying Shrines and Rain-Making Ceremonies:** The Endorois community traditionally gathered at sacred praying shrines to perform rituals aimed at invoking favorable weather conditions and dispelling bad omens. These ceremonies played a crucial role in fostering community solidarity and addressing perceived environmental challenges. The loss of sacred sites due to environmental changes has significantly impacted the community's ability to conduct these traditional rituals, affecting their cultural practices and sense of spiritual connection to the land.

B. Contemporary Adaptation Strategies

I. **Restoration of Indigenous Trees:** In response to the environmental degradation and loss of biodiversity, the Endorois community has initiated efforts to restore indigenous trees in the region. This includes planting and nurturing native species that are better adapted to the local climate and can help stabilize the soil, improve water retention, and support local wildlife. The restoration of indigenous trees also helps in sequestering carbon, thereby contributing to climate change mitigation efforts and enhancing the resilience of the ecosystem.

II. **Protection of Water Catchment Areas:** Recognizing the critical importance of clean water sources, the Endorois community has taken measures to protect water catchment areas from pollution and over-exploitation. This includes setting up community-managed conservation zones and enforcing regulations to prevent contamination and unsustainable use of water resources.

By safeguarding these catchment areas, the community aims to ensure the availability of clean water for drinking, agriculture, and other essential uses, which is vital for their survival and well-being.

Reduced Grazing Areas and Impaired Access to Essential Community Infrastructure Impacting Local Livelihoods. The reduction in grazing areas and impaired access to essential community infrastructure have had profound effects on local livelihoods, particularly for rural and pastoral communities dependent on livestock and agricultural activities. As environmental changes and infrastructure damage limit access to critical resources and services, the impacts ripple through every aspect of daily life and economic stability.

C. Barriers to Effective Adaptation

I. **Inadequate Government and Institutional Support:** Despite the community's proactive efforts, they face significant barriers due to the lack of support from government agencies and relevant institutions. This includes insufficient financial resources, technical assistance, and policy support needed to implement and sustain adaptation strategies effectively. The limited engagement and collaboration with external stakeholders have hindered the community's ability to scale up their adaptation efforts and address the broader challenges posed by climate change.

II. **Resource Constraints and Capacity Limitations:** The Endorois community encounters resource constraints that impact their capacity to carry out large-scale restoration and conservation projects. Limited access to funding, equipment, and technical expertise can undermine their adaptation efforts and reduce their effectiveness. Additionally, the community's capacity to adapt is constrained by the ongoing socio-economic impacts of displacement and land loss, which divert resources and attention away from climate adaptation initiatives.

D. Community Engagement and Collaboration

I. **Strengthening Local Knowledge and Networks:** The Endorois community's traditional knowledge and practices remain a valuable asset in adapting to climate change. Efforts to document, preserve, and integrate this knowledge with modern scientific approaches can enhance the effectiveness of adaptation strategies. Building strong local networks and fostering collaboration within the community can improve coordination and collective action in addressing environmental challenges.

II. **Advocacy and Policy Engagement:** Engaging with policymakers and advocating for the inclusion of indigenous perspectives and needs in climate change policies is crucial. The Endorois community can benefit from greater recognition and support in national and regional climate adaptation frameworks. By participating in policy dialogues and seeking partnerships with NGOs and research institutions, the community can access additional resources and expertise to bolster their adaptation efforts.

Community engagement and collaboration unite diverse stakeholders, fostering collective efforts to strengthen resilience systems and enhance the community's ability to adapt and thrive.

Community Recommendations

1. **Compensation and Immediate Relief Measures**

a. **Government Compensation for Loss and Damage**: The national and county governments should create a comprehensive compensation framework to cover losses and damages suffered by the Endorois community due to climate-induced events, such as flooding, drought, and lake swelling. This framework should include financial aid, restoration programs, and reconstruction of damaged infrastructure, including homes, schools, and health facilities, to ensure quick recovery.

b. **Establishment of Community-Based Early Warning Systems**: Develop and implement community-led early warning systems for climate-related disasters. These systems should use locally available technology and indigenous knowledge to provide timely and accurate information on impending events like floods or droughts. Community members should be trained in using early warning tools, interpreting data, and communicating alerts effectively to prevent loss of life and property.

c. **Rapid Response Mechanism for Disasters**: The government should establish a rapid response mechanism that involves local authorities and community leaders. This should include the pre-positioning of emergency supplies, clear evacuation plans, and coordination with humanitarian organizations to ensure prompt assistance during disasters.

2. Ecosystem Restoration and Environmental Protection

a. **Indigenous Tree Planting and Ecosystem Restoration Initiatives**: Launch large-scale tree-planting campaigns involving indigenous tree species to restore degraded lands, conserve water resources, and protect local biodiversity. These initiatives should engage local community members, especially youth and women, in tree nursery management, planting, and monitoring activities to promote ownership and sustainability.

b. **Integrated Landscape Management Plans**: Develop and implement integrated landscape management plans that include soil conservation, reforestation, and sustainable agriculture practices. These plans should be developed in partnership with the Endorois community to ensure they align with traditional knowledge and practices.

3. Education, Employment, and Economic Opportunities

a. **Provision of Bursaries and Scholarships**: Use revenues generated from community resources, such as ecotourism, to create bursary and scholarship programs that support Endorois youth in accessing education and skills training. Special consideration should be given to women, persons with disabilities, and other vulnerable groups.

b. **Creation of Local Employment Opportunities**: Prioritize employment of Endorois community members in local government projects, conservation efforts, and development initiatives. Employment should focus on roles that leverage local knowledge and skills, such as community guides in ecotourism, forest rangers, or positions in local businesses.

4. Community Engagement, Awareness Building, and Capacity Building

a. **Community Awareness and Education Campaigns**: Organize regular forums and meetings to educate the community on climate trends, risks, and adaptation strategies. These forums should be participatory and incorporate the use of local languages, stories, and examples that resonate with community members.

b. **Capacity Building and Training Programs**: Develop and implement training programs focused on climate-resilient agricultural practices, sustainable livestock management, water conservation, and other adaptation strategies. Training should be tailored to local needs and integrate indigenous knowledge to build community resilience.

5. Water Resource Management and Infrastructure Development

a. **Construction of Water Pan Dams and Rainwater Harvesting Systems**: Increase investment in water infrastructure by constructing water pan dams, boreholes, and rainwater harvesting systems to provide reliable access to water for domestic, agricultural, and livestock needs. This will help mitigate the impact of droughts and other water shortages.

b. **Development of Climate-Resilient Infrastructure**: Invest in building and upgrading infrastructure such as roads, schools, and health facilities to withstand climate impacts. This should include designing infrastructure that can handle extreme weather events, ensuring continued access to essential services.

6. Strengthening Community Resilience and Resource Management

a. **Local Capacity Building for Climate Resilience**: Invest in capacity-building programs for the Endorois community that focus on climate-resilient agricultural practices, sustainable livestock management, and water conservation techniques. This includes training on using climate-resistant crops, soil management techniques, and water-saving methods.

b. **Community-Based Resource Management Committees**: Establish and support community-led resource management committees responsible for overseeing the sustainable use of local resources such as water, grazing lands, and forests. These committees should work closely with local authorities and organizations to enforce regulations, mediate conflicts, and promote sustainable practices.

Community Recommendations

7. Policy and Legal Frameworks to Protect Indigenous Rights

a. **Recognition of Indigenous Land and Resource Rights:** Advocate for legal recognition and protection of the Endorois' land and resource rights in national policies, in alignment with international agreements such as the UN Declaration on the Rights of Indigenous Peoples (UNDRIP). This should include securing legal titles to ancestral lands and ensuring their active participation in decision-making processes.

b. **Inclusive Policy Development:** Ensure the Endorois community is actively involved in the development and implementation of climate adaptation and mitigation policies. Their traditional knowledge, needs, and perspectives should be integrated to ensure policies are effective and culturally relevant.

8. Economic Support and Livelihood Diversification

a. **Provision of Financial Assistance:** Provide targeted financial support, such as grants, low-interest loans, and microfinance programs, to help the Endorois community diversify and adapt their livelihoods to changing climate conditions. This support should prioritize sustainable ventures, such as climate-resilient agriculture, beekeeping, and eco-friendly tourism.

b. **Promotion of Livelihood Diversification:** Promote initiatives that diversify income sources for the Endorois community. This could include developing community-based ecotourism projects, supporting beekeeping cooperatives, and encouraging the production of traditional crafts. These activities reduce reliance on climate-sensitive livelihoods and provide alternative income streams.

9. Research, Monitoring, and Integration of Indigenous Knowledge

a. **Ongoing Climate Impact Studies:** Conduct regular studies to monitor the specific impacts of climate change on the Endorois community and their environment. These studies should generate data to inform adaptive strategies and ensure interventions are evidence-based and locally relevant.

b. **Integration of Indigenous Knowledge in Research and Policy:** Document and integrate traditional ecological knowledge of the Endorois into climate research, adaptation strategies, and policy development. This knowledge, which includes practices for sustainable resource management, should be recognized as a valuable asset in building climate resilience.

10. Health and Well-Being Support Services

a. **Improved Access to Healthcare Services:** Strengthen local healthcare services with a focus on addressing climate-related health issues such as water-borne diseases, malnutrition, and heat stress. Establish mobile clinics and train community health workers to ensure timely and accessible healthcare services.

b. **Provision of Mental Health Support:** Provide mental health support services to address the psychological impacts of climate-induced displacement, loss, and trauma. This should include counseling services, community support groups, and culturally sensitive mental health programs.

Community Recommendations

11. Partnerships and Collaboration

a. **Development of Multi-Stakeholder Partnerships:** Encourage partnerships between the Endorois community, government agencies, NGOs, academic institutions, and international organizations to coordinate and enhance adaptation efforts. Collaboration ensures shared resources, knowledge, and expertise, increasing the effectiveness and reach of adaptation initiatives.

b. **International Funding and Technical Assistance:** Seek international funding and technical support through mechanisms like the Green Climate Fund (GCF) and the Adaptation Fund to support local adaptation projects. This will help mobilize resources for large-scale adaptation efforts and capacity building.

12. Advocacy, Representation, and Public Awareness

a. **Empowerment of Local Voices in Climate Advocacy:** Support the Endorois in advocating for their rights and needs at national and international forums, ensuring their participation in climate discussions. This includes building their capacity in advocacy, public speaking, and policy negotiation.

b. **Media Engagement and Awareness Raising:** Engage with local and international media to highlight the impacts of climate change on the Endorois community. Raise awareness and garner public support for their rights and adaptation needs.

13. Monitoring, Evaluation, and Feedback Mechanisms

a. **Establishment of a Robust Monitoring and Evaluation Framework:** Create a comprehensive monitoring and evaluation framework to assess the progress and effectiveness of adaptation and support initiatives. This should include regular reviews, data collection, and stakeholder feedback to ensure that interventions are achieving desired outcomes.

b. **Development of Community Feedback Mechanisms:** Implement mechanisms that allow the Endorois community to provide continuous feedback on the effectiveness of interventions. This input should be used to adapt and improve ongoing programs, ensuring they remain relevant and responsive to community needs.

Land cultivated with crops and interspersed with trees reflects the community's commitment to environmental conservation, balancing agricultural productivity with sustainable practices.

Conclusion

The Endorois indigenous community has long faced marginalization by governmental systems that have largely ignored their struggles for recognition, land rights, and the preservation of their cultural heritage. This community-led research underscores the pressing challenges faced by the Endorois, including the loss of ancestral lands, disruptions to their traditional livelihoods, and the erosion of cultural identity. The Endorois community is particularly vulnerable to the impacts of climate change due to its deep reliance on natural resources for food, medicine, and cultural practices. The forced displacement from their ancestral lands has further diminished their capacity to adapt to climate-induced changes.

The severe loss and damage resulting from climate impacts have significantly affected agriculture and livestock farming, which are the mainstays of the Endorois' economy, leading to increased poverty and economic instability. Despite these challenges, the Endorois community has demonstrated resilience by proactively developing adaptation strategies, such as replanting indigenous trees, protecting water catchment areas, diversifying their sources of income, practicing sustainable land management, and advocating for favorable policy changes. However, these efforts require broader recognition and external support to be sustainable and impactful.

The community-led research process has played a crucial role in empowering the Endorois by acknowledging and validating their experiences and traditional knowledge. It highlights the importance of community-driven approaches in understanding and addressing the local impacts of climate change. Furthermore, this research has been instrumental in quantifying the extent of the loss and damage endured by the community, both presently and in past years. To address these challenges, there is a clear need for a holistic and collaborative approach that integrates the voices and knowledge of the Endorois community into broader climate adaptation and mitigation strategies.

The Endorois community proudly celebrates their cultural ceremony, a cherished tradition that faces challenges from the loss and damage to their land, highlighting the resilience of their heritage amid adversity.

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Appendix A: List of Project Implementation Committee Members

1. **Fredrick Kibon** – Chairperson
2. **Aurelia Sigilai** – Vice-Chairperson
3. **Zadok Bett** – Secretary
4. **Willis Keitany** – Vice-Secretary
5. **Alice Kipsang** – Treasurer (Representative for Persons with Disabilities)
6. **Cynthia Kiprop** – Member
7. **Elizabeth Kochei** – Knowledge Holder
8. **Johanah Karato** – Opinion Leader

Appendix B: Community—Led Research Questionnaire

COMMUNITY-LED RESEARCH QUESTIONNAIRE ON LOSS AND DAMAGE DUE TO CLIMATE CHANGE WITHIN LAKE BOGORIA LANDSCAPE IN BARINGO COUNTY.

PERSONAL INFORMATION:

Date :.....

County of Residence :.....

Sub- County.....

Location :.....

Sub-location :.....

Village :.....

GENERAL QUESTINNAIRES:

1. What do you understand about climate change?

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2. Have you ever been affected by the climate change?
   a) If YES, How?

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b) If NO, have you witnessed any other community member who has been affected by climate change? If YES, how?

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3. What do you understand on the relation between climate change and human rights violation?

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4. How has climate change impacted the Endorois community culture/way of life?

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5. List some of the major material and non-material loss and damages that the community has experienced due to climate change?

NO.	MATERIAL LOSS & DAMAGE	NON-MATERIAL LOSS AND DAMAGE
1.		
2.		
3.		
4.		
5.		
5.		
6.		
7.		
8.		

6. In your own understating, is there an overburden on the chores of women in the community due to climate change? How have these climate changes affected people with disability?

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7. What are the impacts of climate towards People with Disability within the lake Bogoria landscape?

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8. What are the impacts of climate change to the elderly within the community?

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9. What are the impacts of climate change to human health?

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10. Do you feel that the eviction of the Endorois community from their ancestral land by the Kenyan government contributed more to the extreme effects of climate change? Were there any compensations?

11. Are you aware of any government department responsible for assisting community during the loss and damage due to climate change?

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12. Have you ever received any assistance from the government or any other body on the loss and damage experienced as a result of the negative effects of climate change? If yes, what form of assistance?

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13. What are some of the traditional methods used to curb climate change within the Endorois community? Are they still applicable? And if **NO**, why?

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14. What are the negative impacts of climate change to vulnerable groups in the society such as Women, Girls and People with Disability?

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15. In your own words, what are the measures that should be taken by the government of Kenya to assist the community on climate change effects?

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Appendix D: List of Key Informants and Focus Group Participants

	Name	Gender	Location
1.	Musa Kitilit	Male	Koituimet-Koibos Soi
2.	Richard Kiomo	Male	Koituimet-Koibos Soi
3.	Cheptiony Chepyegon	Male	Koituimet-Koibos Soi
4.	David Kiprop	Male	Maji Moto
5.	Ann Koech	Female	Maji moto
6.	Chepkeitany Chepyegon	Male	Kapkuikui
7.	Grace Kiptek	Female	Sandai
8.	Nelson Kibon	Male	Sandai
9.	Pauline Tinga	Female	Sandai
10.	Regina Koech	Female	Sandai
11.	Chepkonga Joseph	Male	Sandai
12.	Albert Cheboiwo	Male	Kapkuikui
13.	Alestine Kiprop	Male	Loboi
14.	Lexy Koriema	Male	Loboi
15.	Kabon Lobolei	Female	Loboi
16.	Emmy Bogoria	Female	Loboi
17.	Finidy Kurere	Male	Loboi
18.	Harisson Komen	Male	Loboi
19.	Jane Kiprotich	Female	Loboi
20.	Jonathan Tireito	Male	Loboi
21.	Matiba Cherono	Male	Loboi
22.	Regina Biwott	Female	Loboi

Appendix C: Map

Appendix E: Summary of Economic Losses

Livelihood Disruption:

Gender	Number of people affected
Male	198
Female	220
PWD's	15
Children	3341
TOTAL	3374

Summary of the number of Endorois community members affected by the effects of swelling of the Lake Bogoria.

Water and sanitation intervention costs

Water and Sanitation	Number
Number of boreholes affected by floods - Sandai Bore Hole, Poi (I) Bore Hole, and Chepkoimet Bore Hole.	2
Submerged dykes for lake Bogoria.	1
Number of shallow wells affected by floods.	2
No of shallow wells contaminated.	4
No of water pans (damaged/silted and rehabilitated)(Lake Bogoria for wildlife) Koimugul , Ngor-koin , Mawe Moto , Konglel) Community adjacent - , Mbechot, Nyalilbuch, Asenwe Kabarbaya , Chepkoimet , Koichabai and Kapkole	11
No of irrigation schemes damaged (for groups) embosses- irrigation pipeline, irrigation intake/weir- Sandai, Loboi Sukutek, Kapkuikui Kapmonong and Kamosgoi	6
Irrigation schemes - Sandai, Eldume, Loboi , Kamonong ,Sukutek , Maji Moto Emsos and Kamoskoi this requires the construction of Gabions ,	8
No of water pumps and pipes destroyed (Lorwai- Lake Bogoria (Primary and Secondary –Loboi centre to Lake Bogoria Primary school) around 6 km	1
Number or latrines destroyed	58

A canal in sandai serving a 5000 acres farmers damaged.

Appendix E: Summary of Economic Losses

Agriculture

Direct losses from crops of the members of the Endorois indigenous community were damaged by floods in 5th May, 2024.

Direct losses from crops

Crop Type	No. of acreage
Bananas	150
Watermelon (acres)	400
Maize (acres)	4800
Tomatoes (acres)	1000
Kales (acres)	400
Mangoes trees (acres)	2
Beans (acres)	106

Irrigation Schemes

Heavy rainfall experienced in the lake's landscape were so severe that two of the main rivers (Loboi and Waseges) burst its banks, leading to mass destructions at the surrounding ecosystem.

Lakes Busting its Bank/Rivers	1000 acres by Lake Bogoria swelling
	67 acres River Waseges

Health recovery needs

Activity	Number
Health facility repair	1
Relocation, construction and equipping of totally submerged facilities Loboi health facility.	1
Construction of latrines (Toilets) Units	58
SGBV/GBV Preparedness and Response **Strengthening of TWGs, capacity building of key sectors and sensitization of communities.** **Referral of SGBV/GBV victims**	5 clusters

Appendix E: Summary of Economic Losses

Natural resource management

National Reserves, Conservation Areas, Community conservancies and Tourism Facilities.

Resource	Effects	Number/size	Lost cost(KES)
Lake Bogoria National reserve	Wildlife habitats have been affected by floods Loss of food Water salinity	1.5 million flamingoes in L. Bogoria 300 Greater Kudu 40 Impalas 400 Baboons 149 Red Patas Monkeys 100Warthogs 300 Zebras	Loss of revenue and visitors in numbers i.e. Financial year 2018/2019 KES 82 million with 112,000 visitors in Lake Bogoria
	Loss of hot-springs	190 geysers lost which is equivalent to 80% of the springs	
		Salt licks	40% of the shorelines
		Magadi	All the magadi were submerged
	All submerged Infrastructures.	1 administration block	2,800,000
		1 Education center	3,600,000
		3 blocks (Washrooms and toilets)	6,000,000
		9 Curio shops	2,200,000
		1 registration block(pay point/inspection unit/strong room/armory house)	15,000,800
		16 CCTV cameras and installation	2,000,000
		Roads leading to the park submerged in 2013	900,000,000
		1 airstrip	5,000,000
		1 meteorological station	3,000,000
		1 office network	1,800,000
		1 road network (Loboi-Emsos-Majimoto)	30,000,000
		4 Picnics and campsites	3,000,000
		1 kitchen block	1,800,000
		2 Septic Tank	3,500,000
		15 Signages	1,800,000

Appendix E: Summary of Economic Losses

Community Infrastructure development			
	Community conservancy	Kiborgoch community conservancy	35,000ha -Change of habitat for the wildlife and domestic animals Flooding of Loboi River
		Irong Community Conservancy	64,430Ha- Change of habitat/Corridors for the wildlife and domestic animals Human Wildlife conflict because of population pressure around conservancy
		Spiritual shrines and prayer sites-4 sites(logoiywob Barsalai, Kapindasum, Kimwochei, & Kirobon	
		1 Playing Ground- Greater Kudu Youth stadium submerged	2 million
		Full gospel Churches of Kenya-Loboi	3,000,600
		Seventh Day Adventist church, Loboi fully submerged in 2013	2,000,000
		150 Plots at Loboi	KES 200,000
		L. Bogoria Girls Partially Swollen in 2012	5 Acres
		Loboi Bridge swept away by floods in 2018	103,000,000
		Koibos Chief's Store Office destroyed by winds in 2017	2,000,000
		Kamaech Footbridge swept away by floods on 2024	3,000,000
		Loboi – Lokumkum road damaged by floods in May 2024	30,000,000
		Majimoto Primary Dining Hall roofing damaged by wild winds in 2018	2.8 million
Tourism Facilities		Papyrus Hotel	2,000,000
		Zakayo's Hotel	3,000,000
		Lake Bogoria spa resort	Loss of revenue and visitors up to 70% of the total revenue collection due to low turnout of Visitors to Lake Bogoria

Abstracts from informants and Focus Group Participants

Kabon Lobolei's Story on Climate Change and Loss of Traditional Life in Loboi, Endorois Community

Kindependence. In 1964, a severe famine killed many livestock, forcing people to eat salted fish provided by the government. When heavy rains finally came in 1965, they caused destructive floods, killing more cattle and displacing people. Over the years, climate change has worsened, with reduced rainfall, increased drought, and saline soils making farming difficult. Traditionally, the Endorois lived off their livestock, drinking milk and using herbal soups. However, as the environment deteriorated, food production declined, livestock died, and poverty increased. Displacement from ancestral lands, such as Lake Bogoria, further disrupted their way of life. Despite promises of compensation for the loss of their ancestral land, they never received any, leading to continued hardship.

Kabon describes the emotional toll of losing livestock, property, and wealth, leading to stress and illness. Women, girls, and people with disabilities (PWDs) are particularly affected, as they are left to manage homes without adequate resources. With harsh environmental conditions, tourism and grazing opportunities have also diminished, worsening the community's financial situation. Traditional rituals, once used to predict the future and bring rain, have declined due to the influence of education and Christianity. Modern tools like smartphones now help track weather patterns, reducing reliance on traditional practices. Kabon appeals to the government to provide compensation, farmland, and long-term support to improve the community's living conditions and help educate their children, as food donations alone are not enough to address their challenges.

Lexy Koriema's Story on Climate Impact in Loboi, Endorois Community

"The flooding changed everything for us. It destroyed our farm produce, swept away our home, kitchen, and one acre of tomatoes that were just about to flower. We even lost half an acre of maize that we depended on for food and to pay school fees. It's been devastating for my family. After the flood, toilets filled with water, creating a serious health risk, and families were forced to move out. I am still struggling to cope—my ulcers have worsened from the stress, and my husband has become sick from the anxiety. For women like me, farming groups were more than just a way to earn an income. They were our support system, but even those got disrupted. It's been particularly hard for people with disabilities (PWDs) because damaged roads and bridges made it impossible for them to access food or healthcare. Many PWDs were left alone during the floods with no help, which breaks my heart because they rely heavily on family and the community.

On top of everything, diseases like malaria, typhoid, cholera, and flu have become more common since the floods hit. Some of us found refuge with friends, but we received no compensation for what we lost. Even wildlife has become problem hippos now wander into our farms, causing more damage. When floodwaters mix with the lake water, it releases a terrible smell that hangs over everything. The Red Cross gave us a bit of relief a tent, some utensils, and sleeping bags—but it's not enough. I miss the traditional prayers, like Kimwoche, that used to unite us during difficult times. But now, everyone is struggling in their own way, and people can't offer the same support anymore. I just hope the government can step in to help us recover. We need food aid and support with school fees, at the very least. Our community is trying, but the road to recovery feels very long."

Musa Kitilit from Kaibos Soi location

"I lost my house when the rains came," Musa Kitilit shares, "and it destroyed my gal sheets roofing mabatis, my television set, the wires that connect with the solar power, and even the battery that powered it. I lost furniture, beds, utensils, televisions, and many other things." His hardships didn't end there: "My maize farm was flooded twice, ruining my crops, and even my academic certificates, which I valued deeply, were washed away. This destruction has forced me to start over despite the economic hardships involved."

Reflecting on climate change, Musa emphasizes the impact of human actions. "When people cut down trees, it destroys what helps prevent the strong winds that have now destroyed our houses." He notes that without trees to stabilize the land, erosion has worsened, increasing damage during heavy rains. Musa urges proactive action, saying, "If the community and the government could help with reforestation, we might be able to reduce some of these impacts in the future."

Kipyegon Cheptiony (PWD) - Kaibos Sub location.

"I've lost 10 cows, goats, and we haven't harvested anything from the farms for three years," says Kipyegon Cheptiony, a resident of Kaibos Sub -location and a person with disabilities. "Now, I'm left with just ten goats and no farm produce because of this drought." The toll has extended beyond his livestock; even family support has dwindled. "My son's wife left because there were no more trees to burn for charcoal she saw it was becoming more difficult to stay here," he explains.

Cheptiony recalls the shifting climate patterns over the years: "It used to rain heavily every fourth year, but now the rains are unpredictable for almost three years, there's been no rain, and the lake's springs have been vigorously boiling." He believes deforestation has only worsened the situation, stripping the land of its wildlife and leaving the community increasingly vulnerable. "The drought has impacted everyone, especially the elderly and the poor, who now suffer without support," he says, urging for much-needed assistance, especially for those with disabilities and the elderly.

This Loss and Damage Research Document, focusing on the Endorois community living within the Lake Bogoria landscape, is the culmination of dedicated efforts from multiple organizations and individuals. We extend our deepest gratitude to all those who contributed to this vital project, providing their time, expertise, and unwavering commitment.

Our sincere appreciation goes to **ESCR-Net**, the primary financier of this research, for their generous support and belief in the importance of documenting the impacts of climate change on Indigenous communities. Their funding made this research possible, enabling us to highlight the unique challenges faced by the Endorois community.

A heartfelt thanks to the **Endorois Indigenous Women Empowerment Network (EIWEN)**, the implementing partner, whose dedication and on-the-ground support were instrumental in guiding this project from inception to completion. EIWEN's commitment to advocacy and empowerment of the Endorois people has been invaluable in driving this project forward and ensuring the participation of community voices.

Lastly, we extend our gratitude to the **Project Implementation Committee**, comprised entirely of community members, who contributed their knowledge, insights, and experiences to the research process. Their firsthand perspectives and active engagement have enriched this document, making it a true reflection of the challenges and resilience of the Endorois people.

Thank you all for your unwavering support and dedication. It is our hope that this document will serve as a critical resource for advancing climate resilience, justice, and sustainable development for the Endorois community and beyond.

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