



MINISTRY OF AGRICULTURE, LIVESTOCK, FISHERIES, AND COOPERATIVES

**STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL
RESEARCH**

**COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT SYSTEM FOR
BARWESSA WARD IN BARINGO COUNTY**

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We would like to thank all that contributed in one way or the other in the development of this report on Community-Based Natural Resource Management System for Barwessa Ward in Baringo County. The report was developed through a participatory and consultative process involving a cross-section of stakeholders, under the coordination of a core planning team comprising representatives from the Ministry of Agriculture, Livestock, Fisheries, and Cooperatives (State Department for Crop Development and Agricultural Research), Agriculture Sector Development Support Programme Phase Two-Baringo, Baringo County environment department, Department of Agriculture-Baringo County Government (BCG), Emergency Locust Response Project (ELRP-Baringo), Water Resource Authority, and the Kenya Wildlife Service (KWS)- Baringo. The communities across the ward provided vital information. Chiefs and assistant chiefs played very significant roles in identifying and mobilizing stakeholders in their respective locations. Thank you all; without your support, we would have not made it.

We also wish to acknowledge the important role played by the Rural Livelihoods' Adaptation to Climate Change in the Horn of Africa (RLACC) in Kenya, in complementing the Drought Resilience and Sustainable Livelihoods Program (DRSLP – Phase I) through DRSLP 1 projects that have been implemented in Barwessa Ward. These were a good base to refer to. DRSLP is designed to support the additional dimensions of climate change resilience. The RLACC project covers two arid and semi-arid counties which are Baringo and Turkana. The project consists of three components: (i) Knowledge management and mainstreaming, (ii) Sustainable pastoral and agro-pastoral livelihoods, and (iii) Program activities coordination, monitoring, and evaluation. The project is funded by the Global Environment Facility (GEF) and the Government of Kenya (GOK).

EXECUTIVE SUMMARY

The Government of Kenya through the African Development Bank (AfDB), under the African Development Fund, specifically the Global Environment Facility, is implementing the Rural Livelihood's Adaptation to Climate Change, also referred to as RLACC, in the Horn of Africa. This is intended to improve the climate change resilience of the communities belonging to the target areas of this program by the support the ongoing Drought Resilience, and Sustainable Livelihoods Program (DRSLP-Phase 1). The target areas include Baringo and Turkana Counties. Through this program, a study was commissioned to prepare a Community-Based Natural Resource Management System for Barwessa Ward in Baringo County. This report captures the findings of a study conducted in the Ward, which could enable the communities to sustainably exploit their natural resources.

Natural resources are materials that occur in nature and are essential or useful to humans. Such natural resources include water, air, land, forests, fish and wildlife, and minerals. Natural resource management encompasses managing how people and natural landscapes interact. The management focuses on the understanding of resources and ecology and the life-supporting capacity of those resources. This report has documented how Barwessa residents interact with their natural resources and proposes ways in which the interactions can be improved to ensure a balance of the exploitations and sustainability of the natural resources.

The most significant natural resource for Barwessa is arable land with productive soil. The land mass in Barwessa Ward is approximately 475 square kilometers. The land accommodates and provides livelihood to the population of 29,905 (2019 census) living within the ward. The land consists of both highlands and lowland areas. Lowland areas provide lands for subsistence farming for the majority of the population. The highland ecosystems (hills) are majorly rocky and provide construction materials, fuel wood, and are the source of rivers and streams that support human and wildlife activities in the lowlands. The majority of the people have constructed houses in-between the highland and the lowlands.

Barwessa ward is essentially rangeland. Apart from scattered isolated pockets of dryland subsistence agriculture and small-scale irrigation agriculture in the area, the major socio-economic activities center on livestock and beekeeping. Although much has been done, especially on road infrastructure to increase accessibility within the ward, a large part of Ward's potential is yet to be tapped, especially on livelihood improvement.

Most of the highlands' natural resources can be developed by the introduction of effective and efficient methods of soil conservation and land management. In the lowlands, the main challenge is inadequate moisture for crop growth as well as unchecked erosion.

For an effective CBNRM, the government (County and National) and various stakeholders should come together to assist the community to explore various themes as captured in this document. These challenges include Wildlife–Human conflict, drought menace resulting in lack of water for any meaningful agricultural activities; poor quality of livestock with low productivity and susceptible to drought; deforestation and charcoal burning; unchecked soil erosion; water hyacinth suffocating L. Kamnarok; inadequate capital and skills (capacity) to exploit resources; inadequate infrastructure such as dams, irrigation roads, etc. to exploit the resources.

Having identified the challenges facing the community natural resource management, through a participatory process, the key activities were proposed. The key among them include: resolving the boundary problem around the Kamnarok National Reserve; Protection of both Rarau wetland and L. Kamnarok and manage the water hyacinth; Capacity to build the community, and develop and implement a community land-use plan; Land reclamation, conservation, and soil erosion control; Mobilization of KWS officers to control wildlife invasion (especially elephants); Protect L. Kamnarok, Fast-tracking all the pending proposed projects, including the proposed boreholes, irrigation schemes, and piping programs in Barwessa; Conduct feasibility studies and surveys for new water projects; Drilling of boreholes in areas identified under the surveys; Formulating WRUAs within Barwessa Ward in which department of agriculture in Baringo county should be a member; Training, capacity building, and facilitations of the WRUAs (through WRA) to effectively carry out their mandate; Reseeding of the pasture land within Barwessa Ward, hay production, conservation, and storage; Encourage individuals to privately initiate pasture development for domestic and commercial purposes; Develop and implement a community-livestock disease monitoring, treatment, and control system; Livestock quality improvement (adopt highly resilient and productive breeds); Training community on community-based wildlife management systems and reducing the conflicts; Create buffer zones between the rangelands and settlements on one hand and wildlife zones on the other; Reclamation of abandoned quarries, and eroded lands among other measures.

Extensive consultation was held with the community during the process of the study. Largely, the community is aware of the existing natural resources. However, they acknowledged their inadequate capacities (in terms of capital, technical, and know-how) to tap into these natural resources.

For an effective CBNRMS, Barwessa communities should be enlightened and capacity-built for various issues. They should be sensitized to agroforestry, improved livestock

husbandry, knowledge of soil conservation, water catchment, pest and diseases control, disaster management, water harvesting and conservation, conflict (wildlife-human), communication, infrastructure, security (cattle rustling), and Land degradation.

The study also emphasized mainstreaming of gender concerns in the resources management process to improve the social, legal/civic, economic, and cultural conditions of women, men, girls, and boys in Barwessa. Gender plays an important role in the choice of socio-economic activities in rural areas and it is a source of social injustice. Integrating gender equity is a matter of human rights and ensuring social justice, which is also essential for the sustainable use and management of the natural resource. Women are in the best position to ensure the guardianship of biodiversity since they are mostly small-scale farmers and provide food security and water for families as well as communities. When it comes to the understanding of the natural resources on which they depend, women are the most knowledgeable and the most likely to re-invest most of their income in sustaining their family.

If the above issues are resolved, in partnership with the line government departments, NGOs, FBO, CBOs, and private entities, then the natural resources within the ward shall be sustainably harnessed for the benefit of the community, wildlife, and the nation at large.

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
ASALs	Arid and Semi-Arid Lands
CBNRMS	Community-Based Natural Resources Management System
CBO	Community-Based Organization
CFAs	Community Forest Associations
CLMC	Community Land Management Committee
DRSLP	Drought Resilience and Sustainable Livelihoods Program
EIA	Environmental Impact Assessments
EMCA	Environment (Management, and Coordination) Act
FAO	Food and Agricultural Organization of the United Nations
FBO	Faith Based Organization
FCMA	Forests Conservation, and Management Act
FMDA	Fisheries Management, and Development Act
GEF	Global Environment Facility
KFS	Kenya Forestry Service
KNBS	Kenya National Bureau of Statistics
KWS	Kenya Wildlife Service
NCCRS	National Climate Change Response Strategy 2010
NDMA	National Drought Management Authority
NEAP	National Environment Action Plan
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NLC	National Land Commission
NRM	Natural Resource Management
RLACC	Rural Livelihoods Adaptation and Climate Change
WRA	Water Resource Authority
WRUA	Water Resource Users Association

1 INTRODUCTION

1.1 Background

The Government of Kenya through the African development bank, under the African Development Fund, specifically the Global Environment Facility (GEF), is implementing the Rural Livelihood's Adaptation to Climate Change (RLACC), in the Horn of Africa. This is intended to improve the climate change resilience of the communities belonging to the target areas of this program with the support of the ongoing Drought Resilience, and Sustainable Livelihoods Program (DRSLP-Phase 1). The target areas include Baringo and Turkana Counties.

The project intends to respond to the impacts of climate. 'Soft' measures of long-term planning are how the project seeks to approach addressing this issue and improving drought resilience in the community.

The community-based natural resources management system, hereafter abbreviated as C-BNRMS, approaches the natural resources are an interconnected system rather than a set of unrelated features. As such, having accounted for the natural resources in an area, the system can aid the community to utilize the resources sustainably. If the community is to utilize this system, it must have ownership of the system. Therefore, the C-BNRMS should be developed with inclusive community participation.

The C-BNRMS is set to become a vital tool in the development of a strategic vision for Barwessa Ward in Baringo North, facilitating the implementation of nature-based solutions to the environmental and socioeconomic issues in the community.

1.2 Objectives

The main objective of the project is to develop a natural resource management system for Barwessa Ward, in Baringo North Sub-County in Baringo County.

2 LEGAL AND POLICY FRAMEWORK ON NATURAL RESOURCES MANAGEMENT

2.1 Constitution of Kenya 2010, and Natural Resource, and Environmental Management

The Constitution of Kenya 2010 provides for the obligations of the State concerning the environment.

Article 11 of The Constitution of Kenya recognizes culture as the foundation of the nation, and as the cumulative civilization of the Kenyan people, and nation. It also provides for obligations meant to ensure sustainable management of natural resources, and the environment. This obligation lies against both the State and individual persons, communities, or institutions.

Article 60(1) (a) of the Constitution of Kenya, 2010 enumerates equitable access to land as one of the guiding principles of the land policy. Article 69(1) (a) provides that one of the obligations of the State concerning the environment is to ensure equitable sharing of the accruing benefits. Article 42 guarantees every person the right to a clean, and healthy environment, including the right to have the environment protected for the benefit of the present, and future generations through legislative, and other measures, particularly those contemplated under Article 69.

Table 2-1: Description of constitutional roles in national resources Management

Constitutional Obligation	Description
State Obligations in Environmental, and Natural resources Governance	<p>Environmental rights are now one of the universally accepted approaches to environmental conservation and management¹.</p> <p>Constitution of Kenya 2010 outlines the obligations of the State in respect of the environment including the duty to:</p> <ul style="list-style-type: none"> • Ensure sustainable exploitation, utilization, management, and conservation of the environment, and natural resources • Ensure the equitable sharing of the accruing benefits • Work to achieve, and maintain a tree cover of at least ten percent of the land area of Kenya • Protect, and enhance the intellectual property in, and indigenous knowledge of, biodiversity, and the genetic resources of the communities; • Encourage public participation in the management, protection, and conservation of the environment

¹ Dr. Kariuki Muigua, 2016: Implementing Constitutional Provisions on Natural Resources and Environmental Management in Kenya

	<ul style="list-style-type: none"> • Protect genetic resources, and biological diversity⁵ • Establish systems of environmental impact assessment, environmental audit, and monitoring of the environment • Eliminate processes, and activities that are likely to endanger the environment; and utilize the environment, and natural resources for the benefit of the people of Kenya.
Obligations of Citizens in Environment, and Natural Resources Management	Are citizens managers or they are mere spectators? Article 69(2) of the Constitution of Kenya places a duty on every person to cooperate with State organs, and other persons to protect, and conserve the environment, and ensure ecologically sustainable development, and use of natural resources. Art. 70(1) provides a person the right to a clean, and healthy environment.

2.2 Legal Framework on Community Base Natural Resource Management

There are many legal issues applicable to C-BNRMS. Summary of the relevant legal clauses have been summarized in the subsequent subchapters:

2.2.1 Agriculture Act Revised Edition 2012 (Cap 318)

The Agriculture Act provides for the development of arable land under good land-use practices. The Act stresses the need for the conservation of soil and its fertility and provides for soil erosion control. In effect, the Act provides for the control of the discharge of excessive sediments into sensitive habitats, such as wetlands, lakes, and rivers. The Act promotes the sustainable utilization of land resources, including national reserves and river basin areas by regulating the use of different categories of land for agricultural purposes.

2.2.2 Agriculture, Fisheries, and Food Authority (Amendment) Act, 2013

Consolidates the laws regulating, and promoting agriculture. This Act does not recognize wildlife farming or ranching as a form of agriculture, nor is wildlife meat recognized as food yet currently some wildlife (animals, and plants) are farmed and consumed.

2.2.3 Forest Act 2016

The Forests Conservation, and Management Act (FCMA), 2016 is the culmination of a review of the Forest Act, 2005 which realigned the act with the Constitution and address emerging issues on forest conservation, and management. *Forest Act*, 2005, was enacted, to provide for the involvement of local communities living around any forest in the management of those forests. The Act provides for Community Forest Associations, where local communities come together, and form an association, through which they can manage forest resources around them, and benefit from the sustainable utilization of forest produce. The Forests Act (2005) introduced participatory forest management, through the engagement of local communities, and the promotion of the private sector

investment in gazetted forest reserves, accompanied by associated institutional, and organizational change, notably the establishment of the Kenya Forest Service (KFS), and the formation of Community Forest Associations (CFAs).

The *FCMA, 2016* mandates the Kenya Forest Service to develop, manage, conserve sustainably, and rationally use all forest resources for socio-economic development. This involves permitting, and licensing for use of forest resources as provided for in *FMCA 2016*, but these are currently not harmonized with the permitting, and licensing provisions for the use of wild plants in *WCMA 2013*.

2.2.4 Wildlife Conservation, and Management Act, 2013

The Act as elaborated elsewhere provides for the conservation and control of wild fauna and flora, both terrestrial and aquatic. The Act invokes the Kenya Wildlife Service to declare protected areas. The restricted exploitation of natural resources in protected areas serves to conserve critical habitats. Controlled tourist activities within protected areas, help to promote eco-tourism and sustainable exploitation of resources.

The Wildlife Conservation and Management Act, 2013 was enacted, as a result of the Wildlife Policy 2012, to provide for the protection, conservation, sustainable use, and management of wildlife in Kenya, and connected purposes. The Act affirms that the benefits of wildlife conservation should be derived by the land user to offset costs, and to ensure the value, and management of wildlife do not decline; wildlife conservation and management should be exercised under the principles of sustainable utilization to meet the benefits of present, and future generations; and benefits accruing from wildlife conservation, and management should be enjoyed, and equitably shared by the people of Kenya. The Act provides for consumptive wildlife use activities, which include, game farming, ranching, live capture, research involving off-take, cropping, and culling. However, hunting is prohibited as a form of consumptive utilization. The Act also provides for the non-consumptive utilization of wildlife. A general permit may be issued by the Cabinet Secretary for non-consumptive wildlife user rights, including - wildlife-based tourism; commercial photography, and filming; educational purposes; research purposes; cultural purposes; and religious purposes. The functions of the Kenya Wildlife Service, under the Act, include, collecting revenue, and charges due to the national government from wildlife, and, as appropriate, developing mechanisms for benefit sharing with communities living in wildlife areas and developing mechanisms for benefit sharing with communities living in wildlife areas.

The 2013 Act provides for County Wildlife Conservation Committees, Community Wildlife Associations, Wildlife Managers, and community conservancies as institutions for promoting community participation. As far as regulation is concerned, the Act does away with an autonomous regulatory agency, and instead gives powers of wildlife regulation, and licensing to the Cabinet Secretary in charge of wildlife. The various institutions mostly

advise the Cabinet secretary who then makes the final decision. The approach adopted is also broadly protectionist.

2.2.5 Environment (Management, and Coordination) Act (EMCA)

The *Environment (Management, and Coordination) Act* (EMCA) 1999, tasks the National Environmental Management Authority (NEMA) with the responsibility of carrying out an Environmental Audit of all activities that are likely to have a significant effect on the environment. While Environmental Impact Assessment is conducted before the commencement of any new development to minimize negative environmental impacts, for ongoing activities, an Environmental Audit ascertains if the activities in question have significant environmental effects. In Kenya, an environmental impact assessment study preparation is generally required to take into account environmental, social, cultural, economic, and legal considerations, and should—identify the anticipated environmental impacts of the project, and the scale of the impacts; identify, and analyze alternatives to the proposed project; propose mitigation measures to be taken during, and after the implementation of the project, and develop an environmental management plan with mechanisms for monitoring, and evaluating the compliance, and environmental performance which should include the cost of mitigation measures and the time frame of implementing the measures.

2.2.6 Other relevant laws affecting community-based natural resources management system

Table 2-2: relevant laws affecting community-based natural resources management system

Law	Description, and relevance to C-BNRMS
<i>Meat Control Act (Cap 356), and the Kenya Meat Commission Act, Cap 363</i>	This act exercises control over meat, and meat products for human consumption, places where meat is processed, and the import, and export of meat. The Act is implemented through the Meat Control (Transport of Meat) Regulations 1976, Meat Control Local Slaughterhouses, and Licensing Regulations 2010, and 2011. This Act is closely related to the Kenya Meat Commission Act, Cap 363 whose overall aim is to provide a ready market for livestock meat. These Acts do not include wildlife meat, and its associated by-products, processing places, and related trade matters such as markets, and therefore protect the wildlife.
<i>Fisheries Management, and Development Act (FMDA), 2016</i>	Provides for the conservation, management, and development of fisheries, and other aquatic resources to enhance the livelihoods of communities. The Act defines 'fish' as any marine or aquatic animal or plant, living or not, and processed or not, and any of their parts, and includes any shell, coral, reptile, and marine mammal. The definition of fish in FMDA 2016 is inconsistent with the classification of fish in WCMA 2013. Some examples of 'fish' in the FMDA 2016 are actually 'wildlife' according to WCMA 2013.
<i>Disease Control Act, Cap 364</i>	Addresses animal diseases. This Act's relevance is in ensuring that C-BNRMS does not promote the spread of diseases through movement, consumption, slaughter, and disposal of carcasses. Its weakness is that it does not include the control of diseases related to birds.

Law	Description, and relevance to C-BNRMS
<i>Health Act, 2017</i>	Sections 75–79 of this Act promote traditional, and alternative medicines. The main sources of the active ingredients of traditional medicines are plants and animals. Their extraction for medicinal purposes must adhere to the provisions of this Act. The main gap in this Act is that it does not recognize wildlife (plants, and animals) as sources of alternative medicine.
<i>EMCA, 2015, and Environmental Conservation, and Management Act, 1999</i>	Sections 58 to 67 of this Act provide that environmental impact assessments (EIA) be carried out before a new project is started. The amended second schedule section 13 (a to g) will apply if any proposal in the C-BNRMS project shall require major changes in land use. Commercial exploitation of natural fauna and flora (e.g., biotechnology, tannin production, abattoirs, and meat-processing plants) should be subjected to EIA.
<i>County Governments Act, 2012</i>	Sections 102 to 115 provide for a county planning framework that integrates economic, physical, social, environmental, and spatial needs. Any proposed conservation measures will need to be integrated into the county planning process in line with these provisions.
<i>Climate Change Act, 2016</i>	Requires that environment-related activities are aligned to climate change adaptation and mitigation. This includes any proposed natural resource management activities.
<i>Employment Act, 2007</i>	This project should conform to this Act on matters related to job creation.
<i>Occupational Health, and Safety Act, 2007</i>	Provides for the safety, health, and welfare of workers. Jobs establishments shall ensure that they conform to the provisions of this Act, to guarantee the occupational health, and safety of employees, and wildlife.
<i>Lands Act, 2012</i>	C-BNRMS on lands under any form of administration will need to fulfill the land administration requirements of this Act.
<i>Land Registration Act, 2012</i>	Land under C-BNRMS must be registered under the provisions of this Act. However, stamp duty and other levies imposed during land transfers, registration, and leases may discourage landowners or communities from converting their land for other purposes.
<i>Physical Planning Act, 1996</i>	Addresses regional, and local physical development plans. Some C-BNRMS activities will have to abide by the provisions of this Act, especially where large-scale fencing will be necessary. This Act is currently under review, providing the opportunity to incorporate precise wildlife-related issues that are affected by physical planning.
<i>Prevention of Cruelty to Animals Act (Cap 360)</i>	The Act will be adhered to during the implementation of a C-BNRMS industry to prevent the cruel treatment of wildlife species being used.
<i>Science, Technology, and Innovation Act, 2013</i>	Promotes, coordinates, and regulates science, technology, and innovation in the country. Different forms of research and innovation will be needed before, and during C-BNRMS to inform its success, management, and administration. However, neither wildlife research nor a wildlife research institute is listed in this Act.
<i>Water Act No. 43 of 2016</i>	In some situations, conservation areas designated for C-BNRMS will share important water sources or catchments and therefore will need to observe relevant sections of this Act such as abstraction, catchments, constructions, obstruction, and pollution.

2.3 Policy Framework on Community Base Natural Resource Management

2.3.1 Kenya Vision 2030

Kenya Vision 2030 One of the flagship projects of this development blueprint for the environment is to secure and conserve wildlife migratory corridors, and dispersal areas to contribute to habitat integrity, connectivity, and movement of wildlife that are necessary for sustainable C-BNRMS.

2.3.2 Agricultural Sector Transformation and Growth Strategy

Ministry of Agriculture, Livestock, Fisheries, and Cooperatives developed nine flagships that serve as the core of our 10-year (2019-2029) Agricultural Sector Growth and Transformation Strategy (ASTGS). The strategy acknowledges that managing the natural resources is at the heart of Kenya's ability to respond to the big risks that threaten citizens' ability to achieve 100% food and nutrition security. The document highlights 5 key challenges to sustainability in food security. Sustainability includes insufficient water basin management and poor irrigation practices characterized by uncontrolled abstraction of water and under exploitation of ground, storm, waste and saline waters. FLAGSHIP 6 of the document seeks to boost the food resilience of 1.2 million farming and pastoralist households in arid and semi-arid lands (ASALs) through community-driven intervention design. This document therefore is vital and promotes the Barwesa CBNRM programs.

2.3.3 Agriculture Policy

Agricultural policy in Kenya aims at increasing productivity and income growth, especially for smallholders; enhanced food security and equity, emphasis on irrigation to introduce stability in agricultural output, commercialization, and intensification of production especially among small scale farmers; appropriate and participatory policy formulation and environmental sustainability. The key areas of policy concern, therefore, include:

- i. Increasing agricultural productivity and incomes, especially for small-holder farmers.
- ii. Emphasis on irrigation to reduce over-reliance on rain-fed agriculture in the face of limited high potential agricultural land.
- iii. Encouraging diversification into non-traditional agricultural commodities and value addition to reducing vulnerability.
- iv. Enhancing the food security and a reduction in the number of those suffering from hunger and hence the achievement of MDGs.
- v. Encouraging private-sector-led development of the sector.
- vi. Ensuring environmental sustainability.

The County of Baringo has formulated the draft Agriculture policy, whose scope includes a section with the strategy to alleviate the food and nutrition challenges that the county continues to face. The County however is yet to develop a strategy or action plan that refines these problems in the context of the livelihood zones and an approach to resolving the sustainable farming activities.

2.3.4 National Food and Nutrition Security Policy (FNSP 2011)

It is the policy of the government that all Kenyans, throughout their life-cycle enjoy at all times safe food in sufficient quantity and quality to satisfy their nutritional needs for optimal health. The broad objectives of the FNSP are:

- i. To achieve good nutrition for optimum health of all Kenyans.
- ii. To increase the quantity and quality of food available, accessible, and affordable to all Kenyans at all times.
- iii. To protect vulnerable populations using innovative and cost-effective safety nets linked to long-term development.

The FNSP addresses associated issues of chronic, poverty-based food insecurity and malnutrition, as well as the perpetuity of acute food insecurity and malnutrition associated with frequent and recurring emergencies, and the critical linkages thereof. These issues are:

- i. Food availability and access
- ii. Food safety, Standards, and quality control
- iii. Nutrition improvement
- iv. School nutrition and nutrition awareness
- v. Food security and nutrition information
- vi. Early warning and emergency management
- vii. Institutional and legal framework and financing

Baringo County has a comprehensive food and nutrition security policy strategy expected to contribute toward addressing the challenges of acute food and nutrition insecurity as well as poor access to local food and livestock markets among others.

2.3.5 Land Use Policy

Sessional Paper No. 1 of 2018 provides policy statements on the National land-use policy in Kenya. Chapter 3.4 of the National Land Policy has given clear policy principles, vision, strategies, direction, and course of action that the government intends to pursue on land use management in Kenya. The policy is based on a sound philosophy of economic productivity, social responsibility, environmental sustainability, and cultural conservation. The policy recognizes the importance of incentives for communities to participate in conserving natural resources. It also advocates harmonizing the policy

frameworks of various government departments, and agencies to ensure they conform to this policy. These general principles are all applicable to C-BNRMS.

The *National Land Use Policy* recognizes the low vegetation coverage, *and* requires that to address the low vegetation cover with other competing land uses, the government should do the following:

- i. Carry out an inventory of all land cover classifications;
- ii. Establish mechanisms to ensure protection, and improvement of vegetation cover over time;
- iii. Incorporate multi-stakeholder participation in forestation programs, and initiatives;
- iv. Develop a framework for incentives to encourage maintenance of forest cover;
- v. Promote the use of alternatives, and efficient production methods to reduce demand for forest products; and
- vi. Ensure public participation in stakeholder forums in the determination of planning zones.

The County of Baringo has a new Land Policy which aims at increasing public land by obligating a surrender of 10% of land for public use whenever any subdivision of group ranches into individual parcels is being done or 4% of the land where land over 2.5 acres is being subdivided into smaller units.

2.3.6 The National Wildlife Conservation, and Management Policy, 2012

The National Wildlife Conservation and Management Policy, 2012 (Wildlife Policy 2012) highlights how Kenya is endowed with natural resources, including a vast array of wildlife, and due to its species richness, endemism, and ecosystem diversity, under the Convention on Biological Diversity Kenya is categorized as a mega-diverse country. Accordingly, the Policy affirms the need for different conservation priorities, and measures, for each of the ecosystems.

2.3.7 Draft National Forest Policy 2020

The Draft National Forest Policy, 2020 provides a framework for improved forest governance, resource allocation, partnerships, and collaboration with the state, and non-state actors to enable the sector to contribute to meeting the country's growth, and poverty alleviation goals within a sustainable environment. The overall goal of the Policy is sustainable development, management, utilization, and conservation of forest resources, and equitable sharing of accrued benefits for the present, and future generations of the people of Kenya.

The *Draft National Forest Policy, 2020* acknowledges that to achieve the national forest cover target of 10% of land area, the major afforestation effort will have to be in community and private lands. It also states that at present, tree cover on farms is increasing, especially in more densely populated with higher agricultural potential areas. This, according to the Policy, demonstrates that farmers recognize the benefits of tree growing in improving land productivity. The Policy also recommends that to achieve the foregoing target, the Government should:

- i. Promote partnerships with landowners to increase on-farm tree cover, and reduce pressure on reserved forests;
- ii. Promote investment in farm forestry through the provision of economic, and non-economic incentives;
- iii. Promote on-farm species diversification;
- iv. Promote the development of forest-based enterprises;
- v. Promote processing and marketing of farm forestry products;
- vi. Promote forestry development through irrigation; and
- vii. Promote forestry extension and technical services.

Linked to the policy is the *National Climate Change Response Strategy 2010* (NCCRS), which has identified the forestry sector as a strong vehicle for undertaking both mitigation, and adaptation efforts, and intends to exploit incentives provided within the framework of UNFCCC, especially the REDD mechanism, to implement sustainable forest management approaches. Kenya is also an observer country to the UN-REDD Programme, and it is a participant country in the Forest Carbon Partnership Facility (FCPF). As part of its FCPF program, Kenya is developing its National REDD+ Strategy, and implementation framework in addition to establishing a Forest Reference Level/ Reference Emission Level, and a National Forest Monitoring System.

2.3.8 National Wildlife Strategy (NWS) 2030

National Wildlife Strategy (NWS) 2030 is one of the key elements of this strategy that is relevant to C-BNRMS is promoting equitable, and inclusive access to natural resources, and benefit-sharing as well as increasing awareness, and appreciation of wildlife by all Kenyans.

2.3.9 Climate Change Policies in Kenya

The process of developing a comprehensive policy and regulatory framework for climate change is well underway in Kenya, as demonstrated by the Climate Change Act, 2016, and National Climate Change Policy, 2018.

Regionally, the East African Community (EAC) Secretariat developed a Climate Change Policy and Strategy (2010) to guide partner states and other stakeholders on the preparation and implementation of collective measures to address climate change in the region. The Policy prescribes statements and actions to guide adaptation and mitigation to reduce the vulnerability of the region, enhance adaptive capacity, and build socioeconomic resilience of vulnerable populations and ecosystems. The EAC is developing a climate change bill and forest policy and strategy, and exploring the establishment of an alliance on carbon markets and climate finance.

2.3.10 Gender Policy

The overall goal of the Gender Policy Framework is to mainstream gender concerns in the national development process to improve the social, legal/civic, economic, and cultural conditions of women, men, girls, and boys in Kenya.

Gender plays an important role in the choice of socio-economic activities in rural areas and it is a source of social injustice. Integrating gender equity is a matter of human rights and ensuring social justice, which is also essential for the sustainable use and management of the natural resource. Women are in the best position to ensure the guardianship of biodiversity since they are mostly small-scale farmers and provide food security and water for families as well as communities. When it comes to the understanding of the natural resources on which they depend, women are the most knowledgeable and the most likely to re-invest most of their income in sustaining their family (90% compared to 30-40% for males) (Douma, et al., 2002). Even though women have this expertise, control over resources lies in the hands of men in male-dominated communities.

2.4 Institutional Framework

The institutional arrangement addressing natural resource protection and management has been less than integrated, as is the case with the legislation. The approach is mostly sectoral and not only involves government ministries (National Institutions), but also other government agencies, county governments, and non-governmental organizations. It also involves intergovernmental organizations, the business community, community-based organizations, and traditional institutions. This document has summarized the institutional framework as a concern addressing the issue of natural resource management.

2.4.1 National Level Institutions

The key line ministry concerned with natural resources includes the ministry of environment and natural resources. However, some roles are played by other ministries, such as the Ministry Of Agriculture, Livestock, Fisheries, and Cooperatives, Ministry of wildlife and tourism, ministry of water and irrigation, and ministry of energy and mining among others.

The Environmental Management and Co-ordination Act No. 8 of 1999 creates both National Environmental Management Authority (NEMA) and National Environment Committee (NEC). NEC has a membership composed of institutions relevant to environmental concerns in Kenya. The NEC is the policy formulating body of NEMA and among its other functions, oversees the National Environmental Management Authority, a corporate body charged with the day-to-day coordination of environmental activities in the country. The NEMA is mandated to “exercise general supervision and coordination over all matters relating to the environment and be the principal instrument of Government in the implementation of all relevant policies”. NEMA has several crosscutting functions to fulfill its mandate, which include:

- i. Co-ordinate environmental management activities by lead agencies and promote the integration of environmental considerations in development to ensure rational and sustainable utilization of resources;
- ii. Examine land use patterns to determine their impact on natural resources;
- iii. Identify development activities including policies for which environmental audit must be conducted;
- iv. Carry out environmental education and public awareness on environmental management as well as enlisting public support; and
- v. Develop contingency measures for the prevention of accidents, which may cause environmental degradation, and mitigation where accidents occur.

2.4.2 Regional Institutions

The role of regional institutions is primarily coordination and implementation of national policies at the regional level. The Kerio Valley Development Authority (KVDA), is a key agency in this regard. Established as a corporation, this agency is charged with various responsibilities aimed at realizing development objectives.

i) The Kerio Development Authority (CDA)

The KVDA established under the KVDA Act (Cap 441) is mandated with planning, facilitating, coordinating, and implementing development activities in the areas bounded by the watersheds of, the Kerio and Turkwell Rivers and their tributaries.

Its functions include the following:

- a) To plan for the development of their regions;
- b) To initiate studies, carry out surveys and assess alternative demands on the natural resources of their area, and to initiate, operate or implement projects in agriculture, forestry, wildlife, tourism, power generation, mining, and fishing;

- c) To avoid the duplication of effort by maintaining liaison with operational agencies of government, the private sector, and others; and
- d) To implement projects with a primary aim of socio-economic development.

The KVDA advocates for the effective management of natural resources by encouraging development projects that minimize negative environmental impacts for sustainable development.

2.4.3 The Mandate of the MoALFC

The mandate of the Ministry is to ensure 100% Food and Nutrition Security and to improve the livelihoods of rural Kenyans by transforming the sector to be competitive, commercially oriented, and responsive to the economic needs of the country. The Ministry has been restructured severally over the years and is currently comprised of four State Departments: Crop Development and Agricultural Research, Livestock, Fisheries, and Blue Economy and Cooperative Development.

In a devolved government structure, MoALFC, which is part of the National Government is responsible for policy formulation, regulation, and the creation of an enabling environment for investment and business operation by different actors while the 47 County Governments are each responsible for the direct implementation of agricultural programs, projects and day-to-day activities to support farmers, pastoralists, fisherfolk, cooperators and other stakeholders.

Kenya is currently implementing the Agriculture Sector Growth and Transformation Strategy (ASTGS 2019-2029) which is spearheaded by the Agriculture Transformation Office (ATO).

2.4.4 The County Government of Baringo

The implementation of Government policies at the county level also involves the county authorities, which include relevant departments such as Agriculture, environment, water, and irrigation among others. The county government is mandated to protect national reserves and implement the agricultural function. They are the trustees of the people in respect of trust land found in areas within their jurisdiction; they manage waste disposal, regulation of building standards, implementation of local and area plans, and the licensing of business and commercial establishments. This makes them important in natural resources management.

2.4.5 Community Base Organizations

Numerous other stakeholders in natural management have a bearing on habitat protection and proper management. At the core is however the communities who interact with the environment on daily basis. Community-based initiatives to protect critical

habitats include reforestation programs as well as sustainable agricultural activities. These efforts serve to reduce pressure on the resources and contribute to the conservation of habitats.

2.4.6 Other Institutions and partners

Under this project, the ministry recognizes the significant role and contribution of non-state actors and engages regularly with the Agriculture. Other arrangements in place at the county level is the County Environmental Committee (CEC), set up by the EMCA Act. The County Commissioner chairs the CEC with the County Director of Environment as its Secretary. CEC is responsible for environmental management.

Other players include WRA and its role in water management and interactions with WRUAs, Rural Development Donor Groups, the Kenya National Farmers' Federation, Kenya Small Scale Farmer's Forum, the Kenya Private Sector Alliance, and the Young Professional for Agricultural Development, and the 4-H Movement, among others.

3 PROJECT AREA

3.1 Administrative Location

Barwessa ward is located within Baringo North Constituency, in Baringo County, Kenya. The ward is approximately 475 square kilometers. The ward has two key administrative locations (headed by chiefs). These locations include; Kabosikei Kerio Location (Kuikui and Ayatia Sub location is the only sub-location within the project area), Lawan Location (with the following sub-locations: Konoo Sub location, Barwessa Sub location, Keturwo Sub location, and Muchukwo Sub Location being in the project area) and Kabutiei Location (consisting of Kabitel, Kapluk, and Muchukwo sub-locations). All the mentioned locations form part of the larger Barwessa Division:

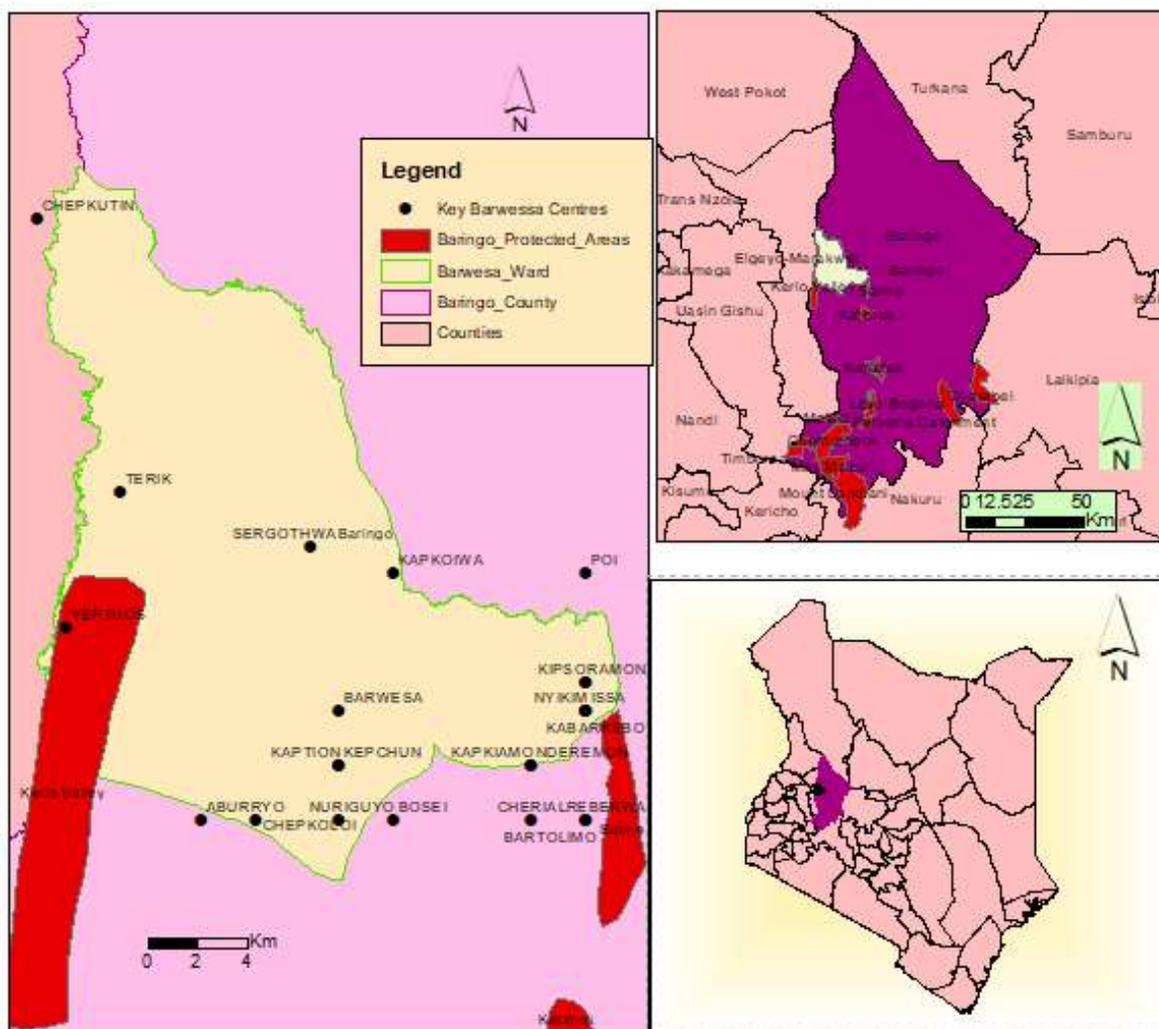


Figure 3-1: Map showing locations of the project area

3.2 Population

As per the 2019 population census report, Barwessa Ward had a total population of 29,905, out of which 14,931 were male and 14,974 were female. The total number of households was found to be 6,402. The table below provided a summary of the population distribution within the ward as per the census report.

Table 3-1: Population Distribution within Barwessa Ward

LOCATION	Total	Male	Female	Households
KABOSKEI KERIO	7,736	3,808	3,928	1,559
Ayatia	1,210	618	592	223
<i>Kuikui</i>	4,660	2,269	2,391	973
<i>Maregut</i>	1,866	921	945	363
KABUTIEI	8,786	4,355	4,431	1,882
<i>Kabitel</i>	3,022	1,486	1,536	620
<i>Kapluk</i>	3,323	1,661	1,662	730
<i>Muchukwo</i>	2,441	1,208	1,233	532
LAWAN	13,383	6,768	6,615	2,961
<i>Barwessa</i>	3,215	1,595	1,620	643
<i>Kaptilomwo</i>	1,987	1,033	954	399
<i>Konoo</i>	4,454	2,285	2,169	1,078
<i>Keturwo</i>	3,727	1,855	1,872	841
Total	29,905	14,931	14,974	6,402

(Source: 2019 Census Report)

3.3 Physical Setting

3.3.1 Topography

Barwessa ward, located within Baringo County, is situated in the Kerio Valley. The landscape consists of different topographical features, which include hills, valleys, plains, and ridges. The location ranges between elevations of 1000m to 1500m above sea level. Both the eastern and western edges of the ward are forested hills whereas the center remains a valley. The Tectonic and volcanic rock remnants were aligned towards Lake Kamnarok NR and Kerio River which explains why Lake Kamnarok cannot sustain a lot of water. The relief inside Kamnarok Reserve is a gentle slope in an east-west direction towards the Kerio River. The hills trend from North to South and mainly consists of volcanic rocks. Tugen Hills together with the escarpments are the most important source of seasonal rivers draining into Lake Kamnarok as well as into the National Reserve. The hills are very steep with prominent gullies. On the eastern and western parts of the hill are escarpments. Rivers on the floor of the hill in very deep gorges.

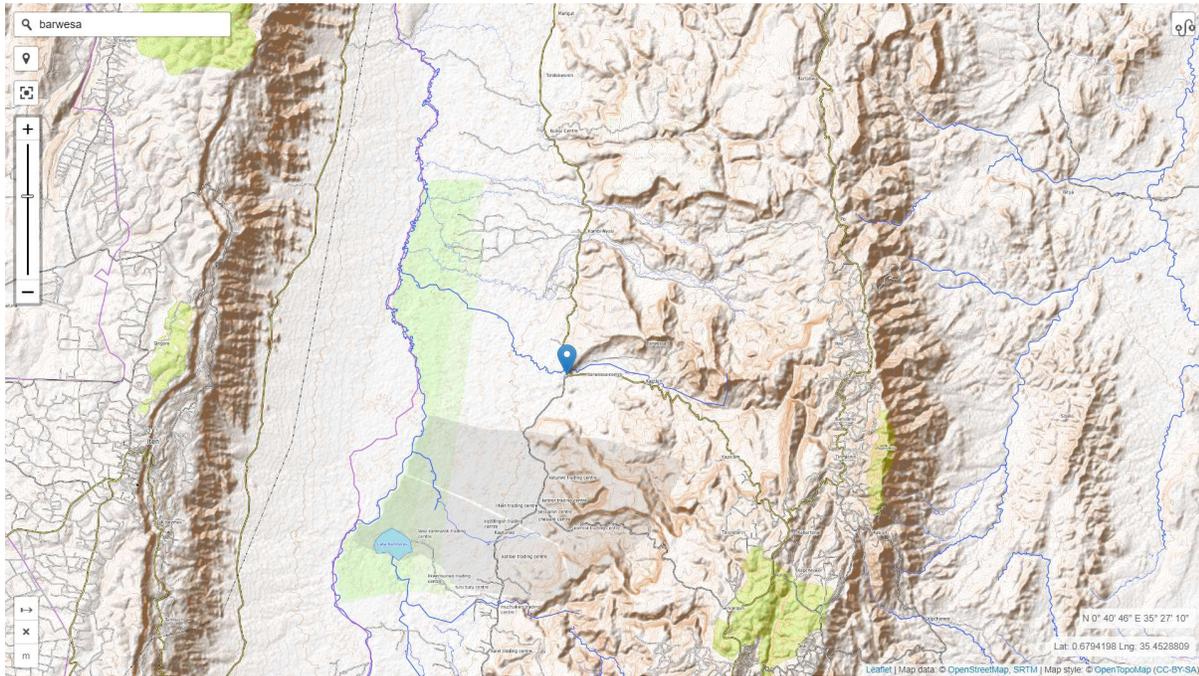


Figure 3-2: A topographical map of Barwessa ward

3.3.2 Soil and Geological Formation

In general, Barwessa Ward has complex soils with various textures and drainage characteristics, which have developed from alluvial deposits. Some of these soils are saline. A large part of the Ward is characterized by shallow stony sandy soils with rock outcrops, volcanic ash, and lava boulders.



Figure 3-3: Soil characteristics in Barwessa Ward

3.3.3 Flood prone areas

According to findings made by the Regional Centre for Mapping of Resources for Development, the following map shows the areas prone to flooding in Baringo County. Notably, sections of Barwessa ward fall among the flood-prone areas in Baringo County.

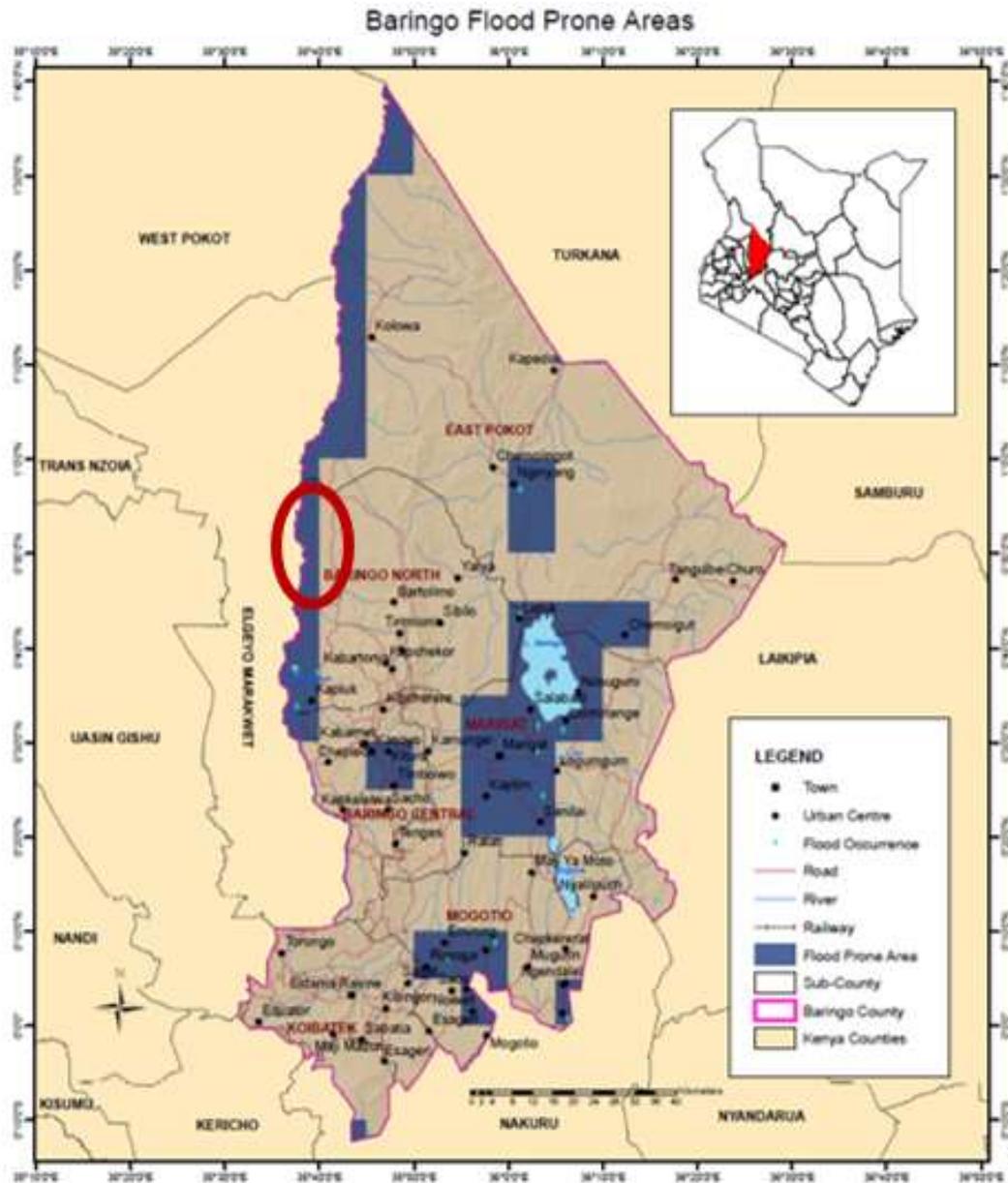


Figure 3-4: Flood-prone areas in Baringo County²

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From the map, it is inferred that the western edge of Barwessa ward is a flood-prone area.

² Sourced from Regional Centre for Mapping of Resources for Development

3.3.4 Wetlands

Rarau wetland, located within Barwessa ward, is one of the key wetlands found within Baringo County. The wetland is threatened by human activities, which also affects the wetland ecosystem. The locals have for a long time advocated for wetland protection.

3.3.5 Agro-ecological Zone (AEZ)

The quality and availability of land and water resources, together with socio-economic conditions and institutional factors, are essential to assure sustainable exploitation of natural resources and safeguard food security. AEZ provides a framework for establishing a spatial inventory of land resources. An AEZ is a land resource mapping unit, defined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use. AEZs also define geographical areas exhibiting similar climatic conditions that determine their ability to support rain-fed agriculture. It aims to provide the framework for ecological land-use potential. This coverage does not include information on the non-cultivated (pastoralist) areas³.

The major climate divisions, as defined for the Global Agroecological Zones (GAEZ) project (FAO/IIASA 2002), represent major latitudinal thermal (or temperature) shifts and are defined as follows:

Tropics: mean monthly temperature adjusted to sea-level⁴ greater than 18° C for ALL months

Sub-tropics: mean monthly temperature adjusted to sea level less than 18 ° C for 1 or more months

Temperate: mean monthly temperature adjusted to sea level less than 5° C for 1 or more months – *not applicable for Africa*

Boreal: mean monthly temperature adjusted to sea level less than 5° C for all months – *not applicable for Africa*

AEZ classification within Barwessa:

The major climates, moisture zones, and warm/cool surfaces were combined and each cell was classified into Agroecological zones classes using the following three-digit combinations:

³ There is, however a grid layer Kenya_LGP_Aez, based on length of growing period done by FAO which has information on the whole country and is available in the database.

⁴ Temperature was adjusted to sea level using a normal lapse rate of 0.55° C per every 100meters of elevation change. This was done in order to obtain unfragmented geographical areas.

Climate	Temperature/ elevation	Humidity
Temperate (not applicable): 1	Warm/Lowland : 1	Arid : 1
Subtropic : 2	Cool/Highland : 2	Semi-arid: 2
Tropic: 3	No distinction: 0	Subhumid : 3
Boreal (not applicable): 4		Humid: 4

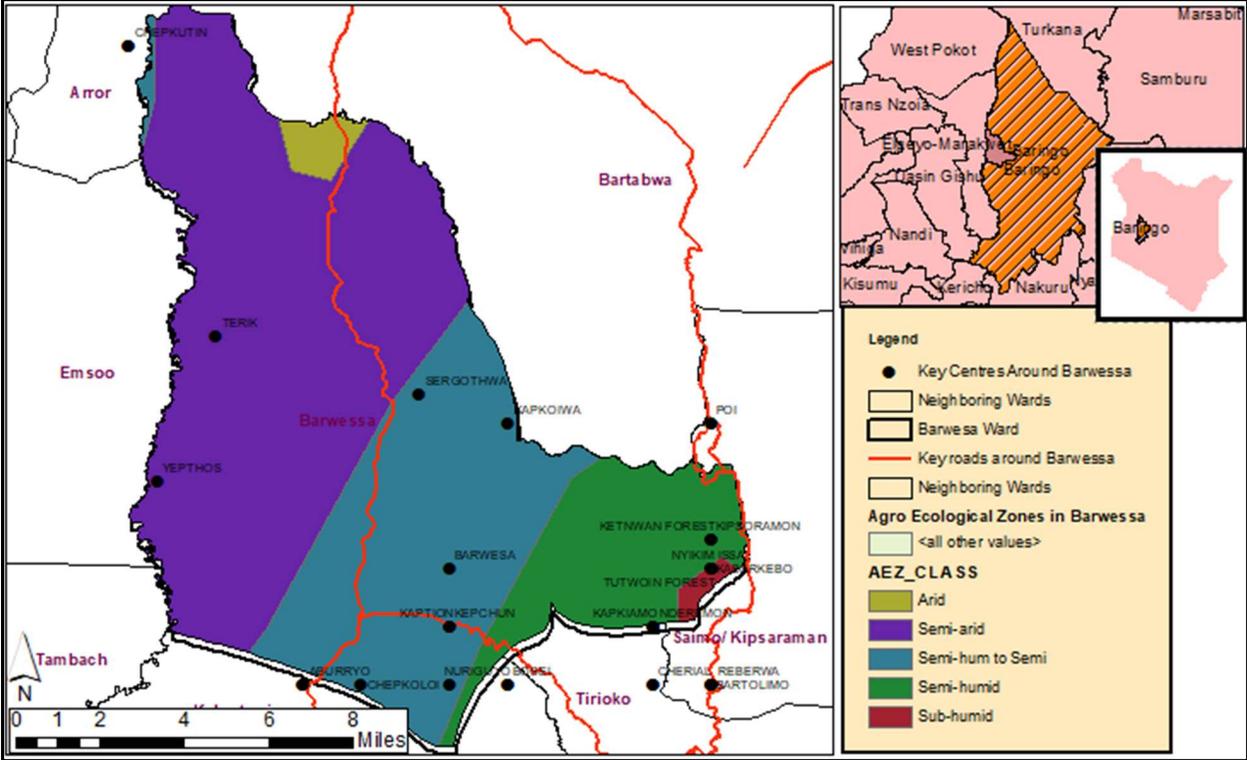


Figure 3-5: Agroecological zones within Barwessa Ward

3.4 Habitats and Wildlife

The environment within and surrounding Barwessa contains a wide range of valuable flora and fauna. Although the Ward has no gazette forest, planted and natural forests in the area provide habitat for plants and wild animals, including baboons, snakes among others.

Lake Kamnarok ecosystem also provides aquatic habitat as well as water for terrestrial habitat. Rare species of the white crocodile is found within L. Kamnarok. Other reptile species in the area include the monitor lizards, tortoises, and snakes. The water bodies in Kamnarok National Reserve and the entire Kerio Valley Conservation Area (KVCA) host 10 many fish species, including tilapia. Over 300 bird species have been recorded in the Lower Kerio valley Area (Jackson et al., 2018). The Kamnarok National Reserve is situated in an ecologically valuable corridor, which includes the Kerio River and Lake

Kamnarok, which serve as important elephant and crocodile habitats. Not only reserve vegetation cover and patches of thorn trees, but also roads characterize the wildlife habitat.

Over 25 large mammal species have been recorded in the area, which includes elephants, hippo, zebra, kudu, eland, impala, waterbuck, bushbuck, Warthog, and bush big. Leopard, common duiker and jackals. Other mammals around the area include monkeys, baboons, caracals, and aardvark.

Other habitats include the wetland habitat found within the Rarau wetland. Barwessa ward is surrounded by several forests. Since the entire county is classified as arid and semi-arid, Barwessa is known to receive very little annual rainfall. As a result, a majority of the ward contains grassland and shrub land habitats.

3.5 Climate

3.5.1 Climate conditions and projections

According to a baseline analysis conducted by the Kenya Inter-Agency Rapid Assessment, Baringo County has unpredictable seasons, but commonly the dry seasons are in January, February, and March, Long rains in April, May, June, and July, and the short rain seasons are in August, September, October, and November. (County seasonal calendar). The rainfall per annum ranges from 600mm to 1500mm.

According to the Kenya County Climate Risk Profile Series, the climate-related challenges affecting agriculture include; drought, floods, high temperatures, erratic rainfall, and uncertainty in the rainfall season onset and duration. Projections for the period 2021-2065 indicate the likelihood of increased heat stress, prolonged moisture stress, and increasingly variable rainfall. The population in the Lowlands areas, such as Barwessa Ward, is more vulnerable to floods, drought, and high temperatures.

Barwessa Ward is generally characterized by great temperature variation. The area has experienced high annual temperatures of 28 °C for the last twelve years (GoK records at Salawa Weather Station, 2017). The area also experiences high evapotranspiration with severe drought which recurs every 8 to 10 years. The most recent drought recurrence was in the following years; 1984, 1995, 2000, 2009, and 2017 (GoK, 2018). These drought incidences contribute to the drying up of lake Kamnarok as a result of high evapotranspiration.

3.5.2 Drainage and Hydrology

Fault lines within the Great Rift Valley determine the drainage pattern of the study area. Lake Kamnarok, which is situated inside the NR, is an ox-bow lake that was formed

because of the Kerio River meander. The lake is a wetland of significant importance. Several tributaries including Rarau stream, River Kerio, Cheplogoi, Kibunder, Kati Mok, and Terrain feed the lake.

3.5.3 Landscape, Geology, and Soil

The landscape in Barwessa has been formed by several phases or several intensive volcanic eruptions. Most of the extensive rocks include basalt, phonolite, trachyandesitic rocks, and alluvial deposits.

The rock formation in the area can be divided into basement systems (metamorphic), tertiary volcanic (extensive igneous), and quaternary alluvial deposits (sediments). Most of the coarse debris in these sediments is basement materials derived from the Tugen Hills and escarpment. They were derived from preexisting sedimentary rocks through mineralogical, chemical, and structural processes due to changes in temperature, pressure, and changes in the chemical environment in the earth's crust (Koskey. 2013).

The soils of the study area range from acidic to slightly alkaline and are mainly clay loam, with alluvial deposits from tertiary or quaternary volcanic and pyroclastic rock sediments that have been weathered and eroded from upland areas of the Tugen and Elgeyo escarpment.

While the soils of the Barwessa area are generally fertile, high evapotranspiration rates and low variable rainfall, create water scarcities that limit intensive, agricultural use.



Figure 3-6: Soil erosion features common in Barwessa Ward

3.5.4 Vegetation Cover

The vegetation cover within Barwessa can be categorized into two. In the lowlands, the vegetation types are acacia woodland along the rivers, grassland, and shrub lands. Barwessa highland areas (hills) have large chunks of forest cover, especially across Kerio Valley and Tugen Hills. The large coverage of forest cover can be categorized into plantations, indigenous, grassland, and bushland. However, there is no gazette forest under KFS.



Figure 3-7: Vegetation cover within Barwessa Ward

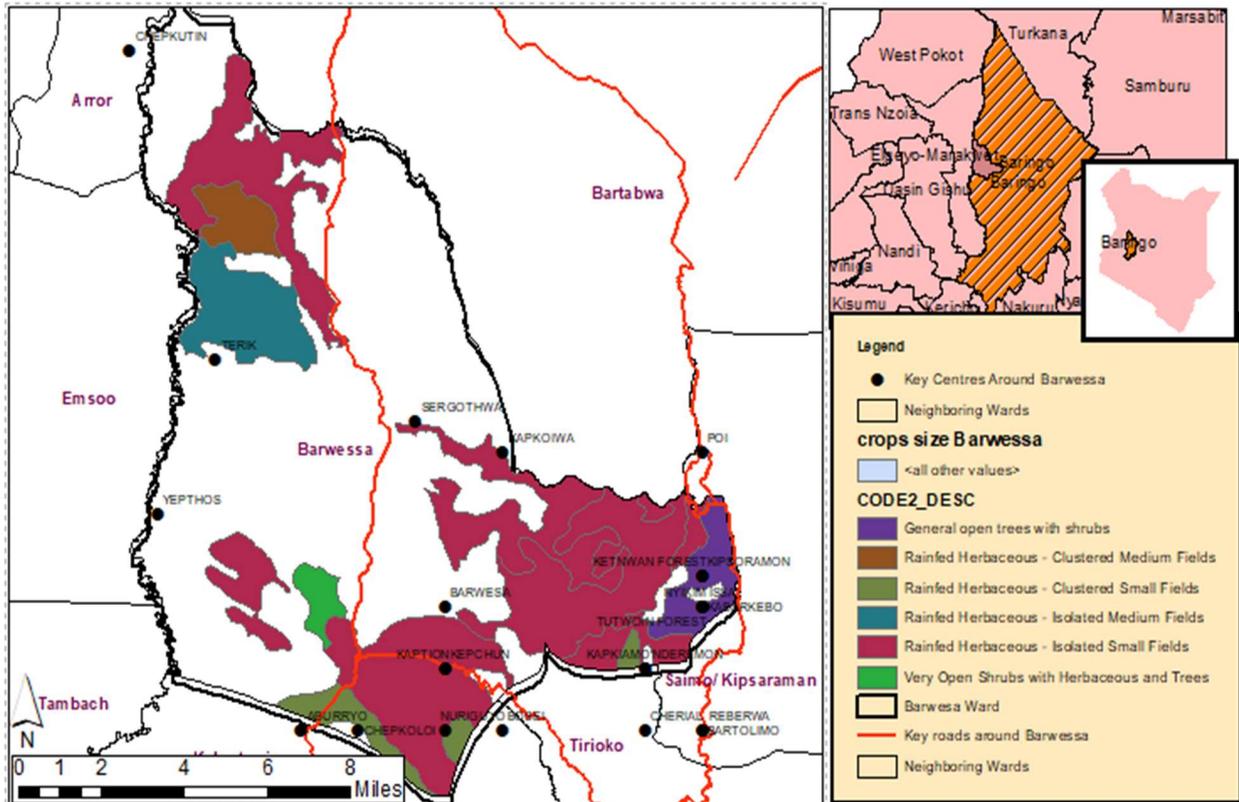


Figure 3-8: Areas under various categories of crop farming size as per FAO classification

3.6 Livelihood System

A livelihood is made up of the skills, actions, and assets (including both material and social resources) that contribute to a means of living. Pastoralism especially in wildlife rangelands contributes to livelihoods in a range of ways: directly as food, and as a source of income. It also provides other social benefits, such as reduced vulnerabilities to

poverty. Focusing on agriculture productivity, the 2019 Kenya Population and Housing Census established the number of households within Baringo County involved in the activities, table 3.2.

Table 3-2: Distribution of Households Practicing Agriculture, Fishing, and Irrigation by County and Sub County

County/Sub County	Total	Farming	Crop Production	Livestock Production	Aquaculture	Fishing	Irrigation
BARINGO CENTRAL	23,555	15,137	14,047	10,403	41	75	354
BARINGO NORTH	23,500	18,409	16,685	13,946	24	109	377
EAST POKOT	14,498	9,565	4,056	9,232	153	87	330
KOIBATEK	30,774	21,544	20,417	16,043	48	119	355
MARIGAT	19,854	13,596	11,608	10,954	64	221	4,956
MOGOTIO	18,184	13,607	11,962	11,756	51	101	537
TIATY EAST	12,153	8,607	5,651	8,092	130	129	256
BARINGO (TOTAL)	142,518	100,465	84,426	80,426	511	841	7,165

Source: 2019 Kenya Population and Housing Census: Volume IV

Communities living in Barwessa Ward (Baringo North Sub County) participate primarily in the practice of subsistence pastoralism, crop farming, and small-scale fishing. Any household surplus is taken to the local markets. Cotton is the main cash crop, though also grown on a small scale.

There have been some efforts from various stakeholders to sensitize the communities to adopt improved livestock breeds. In a move to upscale food security efforts, the County government of Baringo, in October 2019, distributed 270 Galla goats to residents of Barwessa Ward. The Goats were distributed across the Ward with each sub-location receiving 27 goats, which targets the vulnerable in the society to improve their livelihoods. The Galla goat, a strong breed of goat has a reputation for surviving droughts thanks to its higher resistance to opportunistic diseases that eliminate ordinary goats due to weakening the body's immune system. In addition, the County Government of Baringo has proposed to distribute doper sheep and Sahiwal cattle breeds that can adapt to harsh climatic conditions frequently experienced in these areas. These improved breeds fetch higher prices compared to indigenous breeds thus creating wealth for farmers while improving the food security of the Country.

3.7 Land Use

Barwessa ward can be divided into two major zones: the highlands and the lowlands. The higher elevations of the ward are in the modified tropical zones with soils that are generally well-drained and fertile. This zone contains high potential areas for agricultural and improved livestock development.

These agricultural activities are combined with soil conservation measures. In the lowland part, there is the farming of cereals and horticultural crops, as well as small-scale cotton production. There is a high potential for cotton production.

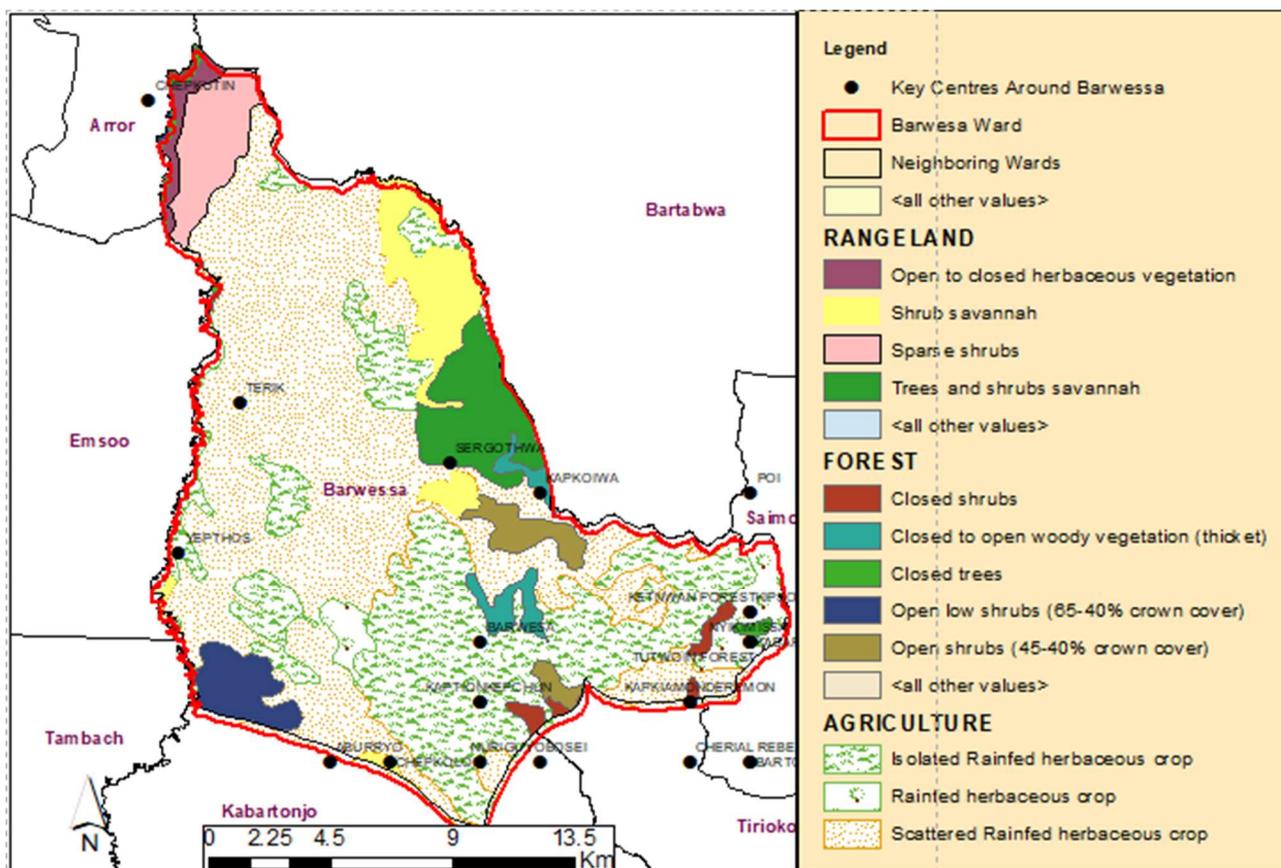


Figure 3-9: Map showing various land uses within Barwessa Ward

3.7.1 Agriculture

Agricultural activities in Barwessa Ward are highly dependent on seasonal rainfall. While there is huge potential for irrigation due to the land fertility as well as streams to tap water, there is little exploitation of irrigation options. An irrigation scheme being developed by DRSLP is yet to bear fruit, but the preliminary result showed high potential to significantly increase the productivity in the areas it will reach.

One of the most notable, successful, and exemplary agricultural projects is the Aiwet Irrigation Project. The project is located in the Lawan location. The project is located on the right bank of the River Yeptos. Aiwet Irrigation Project was initiated in 2019. Irrigation water is abstracted from the Molo River through a gravity-fed system and conveyed to various blocks in the fields by concrete-lined channels.

Aiwet Irrigation Project has a targeted irrigable area of 100 acres benefiting 100 household farmers. The project components include Weir; Intake works Main pipeline, Lay pipeline Distribution pipelines, thirty-one sluice valve chambers, and hydrants.

Potatoes, tomatoes, cabbages, garden peas, and green maize are among the crops grown in the project. Farmers can get enough produce from their farms to use in their homes and surplus to sell for income.



Figure 3-10 Aiwet Irrigation water intake at River Yeptos



Figure 3-11: Small scale irrigation within Barwessa Ward

The County Department of Agriculture estimates that Barwessa Ward has Potential-250ha for irrigation. Currently, 86.8 ha are in use. The crops grown under irrigation includes maize, beans, onions, kales, and watermelons. Other irrigation Two schemes new schemes proposed and earmarked for development include Rebeko and Kolewon.

3.7.2 Conservation, Cultural and Public lands

Climate change and climate variability affect weather patterns and cause shifts in seasons with serious repercussions such as declining food production and productivity for communities, not just within Barwessa Ward but across the entire households in Kenya. To mitigate the negative impacts of climate change and variability, several programs within the

ward have encouraged farming households to adopt different strategies such as new crop varieties, crop and livestock diversification, water-harvesting technologies, and planting of grass (re-seeding). If adopted, these adaptation strategies are expected to boost both the amount of food produced and the food security of an adapting household.

In general, Baringo County has several land conservations as well as expansive public land, most of which was traditionally commonly used for livestock. However, there are dynamics of land-use changes on the livelihood of the local communities in Baringo County.

The land is a principal factor of production, a source of life and livelihood. It provides a means of living and a variety of uses such as agricultural, human settlement, environmental conservation, and urban and industrial development purposes among others. These uses compete for space in a fixed area, hence the rising land-use conflicts and degradation witnessed in Barwessa, specifically around L. Kamnarok. The situation has threatened lives and livelihoods, making it difficult to plan for the livelihood activities in the Ward. This is happening against the backdrop of land use policy changes including; sessional paper no 3 of 2009 on the National Land Policy, the Constitution of Kenya 2010, the Land Act, 2012, the Land Registration Act, 2012, the Community Land Act, 2016 and sessional paper no 1 of 2017 on National Land Use Policy that was intended to alleviate the situation. This situation is now a major threat to the livelihood of the local communities within the ward.

4 MANAGEMENT OF NATURAL RESOURCES AT BARWESSA WARD

4.1 Introduction

The land mass in Barwessa is approximately 475 square kilometers and accommodates and provides livelihood to the population living within the ward. The ward has both highlands and lowland areas. The highlands are the main source of subsistent crops and food for the majority of the population. The highland ecosystems also provide construction materials, and fuel wood and are the source of rivers and streams that support life and wildlife activities in the lowlands.

One of the major problems affecting land productivity in the highlands has been land degradation. As the population pressure builds up, the demand for fuel wood and building materials, and land for cultivation has resulted in the decimation of forest cover and biodiversity. In Most parts of Barwessa arable lands, intensive cultivation of steep slopes without adequate soil conservation measures has resulted in soil impoverishment through soil erosion and, in some cases, total loss of agricultural land due to gully formation. Land tenure systems, inadequate extension approaches, and diminishing farm incomes have further discouraged investment in soil conservation, while intensification of cultivation has increased incidences of crop pests and diseases. The spiral of land degradation, reduced productivity, reduced farm incomes, and mining of the land resources has reduced the communities to poverty and food insecurity.

4.2 Key Natural Resources

Natural resources are materials that occur in nature and are essential or useful to humans. Such natural resources include water, air, land, forests, fish and wildlife, and minerals. There are many natural resources within the Ward; these resources can be tapped, managed, and enhanced to improve livelihood. The key resources vital to the community have been summarized below.

4.2.1 Arable Land

The quality of soil, (and its ability to support crop production) in arable land makes the respective land a natural resource, suitable for agricultural production. Arable land can be treated as a production resource, with a natural resource component and an anthropogenic capital component. Arable land is a stock, giving a renewable flow.

Agricultural lands consist of three main types: (1) arable land (including cropland and fallows), (2) land under permanent crops, and (3) pastures and hayfields. Barwessa Ward

possesses all three categories. However, due to various limitations, none of the categories is fully exploited and commercialized; rather the practice is small scale.

The lands are mostly privately owned. The land in the lowland areas is fertile and arable. On the higher side, the land is rocky and has been mostly reserved for human settlement.

The land is also able to support livestock. The most common livestock kept in the area includes goats, sheep, cattle, and donkeys, of which goats are the most preferred as the most important livestock resource due to their high rate of reproduction, and resilience to climate change. Beekeeping (apiculture) is also an activity practiced and there is huge potential for improvement.

Economic processes influence agricultural and wildlife-based enterprises as sources of income for producer communities while ecological processes influence the relative efficiencies of livestock and wildlife species in utilizing available natural resources.

4.2.2 Building Materials

Barwessa Ward, especially in the highland area, is endowed with many construction materials. These materials include building stone, sand, and rocks that can be fragmented into the ballast. The geology of the Project area shows that different types of rocks are well distributed within the area such that construction materials are also well distributed except for sand, which takes place on a small scale downstream. Sand mining is discouraged because the practice promotes land degradation and poor soil water conservation.

i) Ballast

Ballast in the area is normally produced by individuals who break the rock manually with small hand tools. These individuals are found in market centers or have their homes (base) adjacent to roads for easy access to markets. The main markets for the ballast are urban areas, market centers, and schools.

Ballast production on small scale is also done in other main market centers all over the two districts. Good quality ballast can be made from several rock types of volcanic origin. These are phonolite, trachy-phonolite, and basalt. Trachyte produces medium-grade ballast. The rocks are normally fine to medium-grained and dark-colored. Similar rocks are found in Bartum – Yatya – Nginyang – Natan areas, Maron area and Chebinyiny – Mukutani – Churo areas in Baringo County. Figure 4.1 shows the quality ballast from phonolite rock commonly found within Barwessa Ward.

ii) Building Stone

Building stone is common and well distributed within the ward. Building stone in the area has its source rocks as tuff, welded tuff, vesicular basalts, sediments of volcanic origin,

mudstone, and light diatomaceous rock. Diatomaceous stone is light and easily disintegrates when exposed to water and stress. Mudstone and other rocks of sedimentary origin are also fragile and also disintegrate when exposed to the above conditions. Some quarries are close to main roads and construction centers and therefore have ready markets. Some are isolated in areas with poor roads, and inaccessible. Figure 4.2 shows the typical construction stones mined from Barwessa Ward.



Figure 4-1: Good quality ballast from phonolite rock commonly found within Barwessa Ward



Figure 4-2: Typical Building stones mined within Barwessa Ward quarries

iii) Sand

Sand is a construction material that is found almost all over the lowlands of the Ward. It is found in almost all rivers in the regions. One of the sources of sand is River Kerio. Other rivers also have good quality sand, which flows from the hills.



Figure 4-3: Riverbed where sand is harvested during the dry season

The main reasons for the low exploitation of the building materials are:

- i. Competition from quarries near the urban centers. This leads to lower demand for stones from far-flung quarries, except where the stones are unique
- ii. Crude methods of excavation in the quarries, make the process slow, and lack precision, affecting the quality of materials
- iii. Poor roads to the quarries. This leads to high transportation costs.
- iv. Poverty makes the construction of stone houses unaffordable to many locals

4.2.3 Forests and Indigenous Trees

The ward has indigenous trees and forests. Some of these indigenous trees have medicinal values. However, there is no gazette forest within the ward. All the trees are therefore susceptible to destruction as they grow on private properties. Within Barwessa and areas surrounding the ward, KWS's efforts to protect the endangered plant species have been frustrated by the continuing logging. Baringo County is a major target by illegal sandalwood traders as the species is found in dry and semi-arid areas like Barwessa, Marigat, Lobo, Arabal, and Nginyag. Sandalwood is used to make expensive perfumes and has a market in India and the Far East.

Charcoal burning is highly discouraged by the local administration, and this has improved forest cover over the years. However, the practice continues low key, due to poverty and inadequate alternative income for locals.

4.2.4 Wildlife

With an estimated population of more than 10,000 crocodiles, 400 elephants, 13 species of other mammals, and a wide variety of birds, the world-famous Lake Kamnarok Game Reserve in Kerio Valley has been a landmark in Baringo County as well as a major revenue earner. In the past, local and foreign tourists would visit the 90 square kilometers reserve for scenery. However, destructive human activities such as charcoal burning and unsustainable farming practices are posing a major threat to the reserve. The ox-bow, which anchors the ecological system in the area, the lake was gazetted as a reserve in 1983. Lake Kamnarok is reported to be the second-largest in Africa after Lake Chad with the largest concentration of crocodiles and elephants in one ecosystem.

The other key threat faced by wildlife includes poaching of antelopes and smuggling sandalwood along Kerio valleys.

4.2.5 Water Resources

Largely, in Baringo County, there are many natural water resources such as rivers, lakes, and ground water. There are also man-made resources such as water pans, dams, boreholes, protected springs, and wells that are used for various purposes. Locals depend on these water sources for agricultural as well as domestic uses.

Barwessa has many surface and ground water resources that are mostly untapped. Though the Ward has many seasonal streams, the key water resource that Barwessa ward is the Kerio River. The river is found on the western edge of the ward and serves as the border between Baringo County and Elgeyo-Marakwet County.

i) Rivers and streams

There are many seasonal streams and rivers within Barwessa Ward. The key river is River Kerio, where most of the streams empty their water. Other rivers include Kuikui, River Yeptos, Kipra, Chepkolel and Keturwo rivers.

ii) Springs

The ward is also rich with springs, although the majority of them are not protected. The key ones include Konging Spring (Coordinate: Lat 0.807978, Long 35.691089), Kasirma spring (Coordinate: 0.581966, 35.690541), and Terenin spring (Coordinate: 0.570547, 35.652557). Other notable springs include: Ainabor, Kipra, and Ewanin

iii) Groundwater

The ward also has high potential in groundwater. The County Government has intervened in drilling boreholes in some areas such as Cheptenachuch and Kamalanget as well as Chesawany. Southern Part of Kerio valley lowland: More than 3 m³/hour of yield is

generally expected. There are some wells with above 15m³/hour of yield due to favorable topographic conditions where the water is easy to get together. The borehole/well depths are from 100m to 150m. Groundwater development in this area is relatively easy in the project area.

Table 4.1 below illustrates the hydrogeological condition and success rate of borehole construction within the Barwessa area.

Table 4-1: Groundwater potential within and around Barwessa Ward

Target area	Hydro-geological Condition		Possibility of Development
Kerio valley lowland (Sediment)	Ground-water recharge	The area is surrounded by hills of over 2000m ASL, and the catchment includes a high rainfall area. The recharged water concentrates in the area.	High
	Aquifers	Sediments at lowland (sandy soil), faults fracture zone, and cracks in rocks under sedimentary layers.	
	Water Quality	Detention time of groundwater seems to be short so the water quality is generally good. However, it may sometimes contain iron excess at the permissible concentration.	
Kerio Basalt	Ground-water recharge	Groundwater recharge from the rainfall-rich area of Tugen hills is expected.	Comparatively high
	Aquifers	Cracks and volume with a lot of void in basalt	
	Water Quality	Detention time of groundwater seems to be short so the water quality is generally good. However, it may sometimes contain iron excess at the permissible concentration.	

Source: Jica Research, 2012

The Baringo Bogoria aquifer stretches from the area south of Lake Logipi located at the Northern tip of Kenya near L. Turkana, and terminates weakly at the area south of Lake Bogoria characteristically, the Baringo-Bogoria aquifer has very high groundwater potential zones.

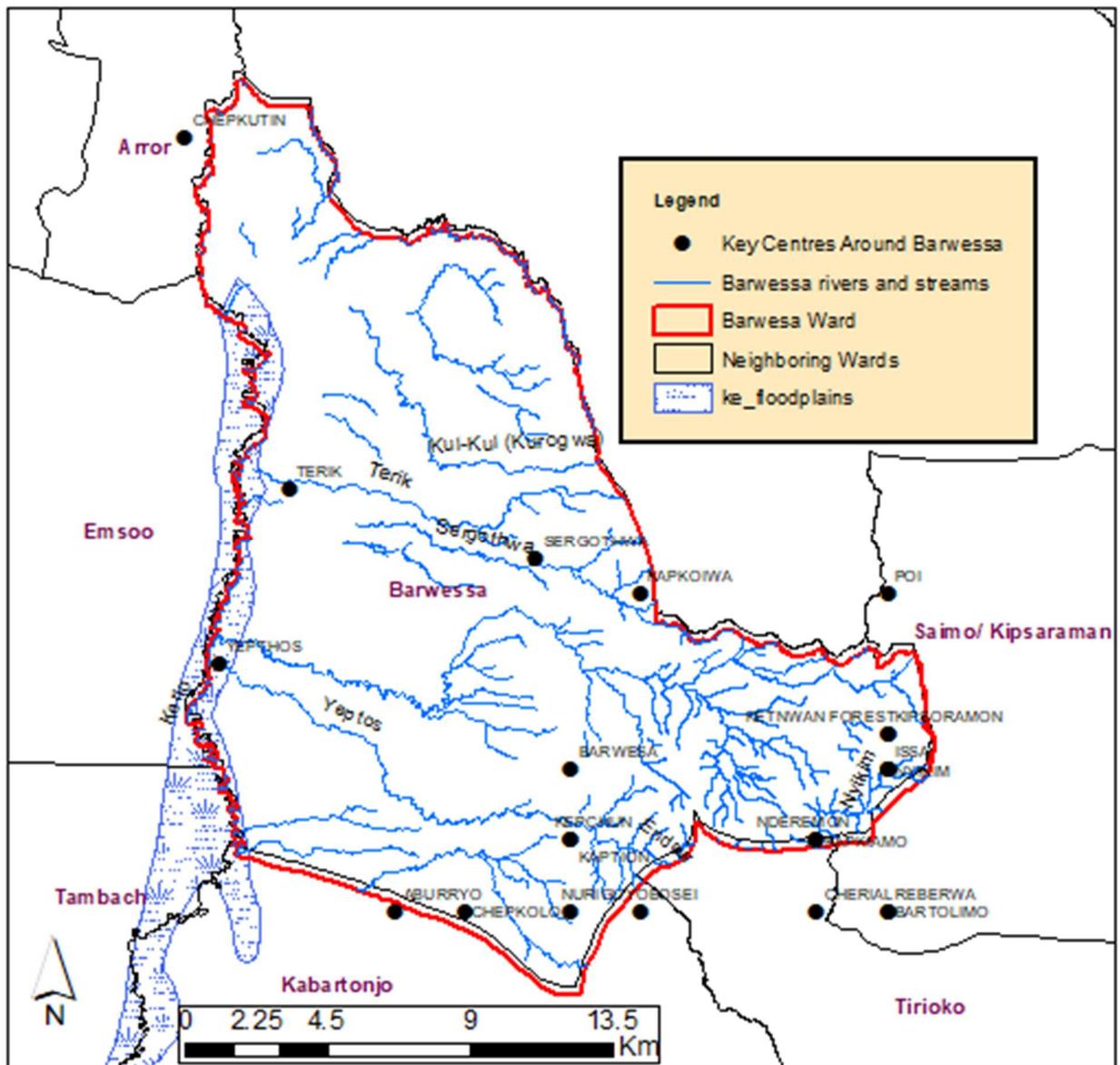


Figure 4-4: Key streams and rivers within Barwessa Ward

iv) Lake Kamnarok

This is the most significant water body in the area. It provides a vital ecosystem for the coexistence of humans and wildlife. The lake is useful for anglers, pastoralists, and domestic water purposes. It is the main source of water for wildlife.

From a unique attraction; point for bird watching, crocodiles, and its ox-bow shape to a playing field. Lake Kamnarok was once a key tourist attraction. It attracted both local and international tourists. Many flocked to watch birds and animals such as elephants within the Lake Kamnarok National Reserve (which was gazetted in 1984) and Kerio Valley National Reserve.



Figure 4-5: Water hyacinth covering L. Kamnarok

Restoration effort

The county government of Baringo made some attempts to restore the lake through soil erosion control upstream. This effort was however not sustained. The county government also attempted to remove water hyacinth from the lake. This effort also did not bear much fruit.

Key threats to the lake:

Intensive cultivation: this began when the adjacent land was declared community land in the late mid-90s. The population has since increased, with more people settling in the area.

- **Overstocking:** many people keep livestock in large numbers. Grazing takes place along the rivers and around the lake. The pressure exerted on land loosens the soil making it prone to erosion. The eroded soil ends up in the lake.
- **Charcoal burning:** Charcoal burning used to be common in the area, though the practice has significantly reduced. The impact is however still being felt
- **Deforestation:** The climatic conditions and the soil of the areas around Lake Kamnarok can support a few tree species. The common trees in the area are acacias. In the past, trees were haphazardly cut down for charcoal burning, fencing, firewood, timber, settlement, and agriculture. Through local administration intervention (chiefs and assistant chiefs), there has been a lot of sensitization on tree planting and minimizing felling trees.

- **Siltation- (associated with a new road constructed):** road (Oinobmoi-Salawa-Katibel) and other related activities were linked to heavy siltation of the lake.
- **Water hyacinth:** Lake Kamnarok covered by water hyacinth. The weed covers more than half the lake.
- **Human-wildlife conflict:** in the case of wildlife, the home range of some wild animals (Baboons, elephants, crocodiles) extends beyond the boundaries of the community. There is no physical boundary between the community lands and wildlife land. This means that the community must collaborate on important issues with its KWS. The County CIDP acknowledges that *“the main challenge facing public land is encroachment and grabbing in various parts of the county. This, in turn, constrains public utility provision when it is planned for as land availability no longer exists. There is, therefore, an urgent need to reclaim and protect all public land within the county.”*
- **Land issues:** The land occupied by the reserve is in contention between the county government and the local community. The community holds that the land is theirs; consequently, they feel they should not be forced to vacate without compensation. The communities contend that they have letters of allotments. The County Government holds that the allocation was irregular. Without resolution of the land issue, it won't be easy to conserve the lake's ecosystem. It will also not be possible to practice any meaningful farming since the human-wildlife conflict will persist.

4.2.6 Historic Sites and Recreation land resources

As part of the famous Kerio Valley, Barwessa is well placed to attract interest from stakeholders interested in archeology, historic, scenic, and well as recreational sites. Lake Kamnarok has the rear species of the white crocodile. It also provides water to the neighboring Kamnarok National Reserve, which among other animals, has elephants.

4.3 Man-Made Resources

Along with the natural resources, many man-made resources help the communities to tap the potential of natural resources. These include cattle dips (including Turturu cattle dip which needs rehabilitation; the semi-functional Marigot dip, Kuikui, and Barwessa cattle dips), water pans, tarmacked, and all-weather roads, sale yards, hay sheds, Barwessa

irrigation schemes, and market centers. The institutions found in the area include churches, primary and secondary schools, and health centers.

As per the CIDP 2018-2022, several agricultural programs have been proposed, including slaughterhouses, some of which are being constructed in Barwessa.

5 COMMUNITY NATURAL RESOURCE MANAGEMENT ACTION PLAN

5.1 Challenges Facing CBNRMS

Reviews were made on various CBNRM programs undertaken in Barwessa Ward and within the county. In many ways, the study inferred that new and different approaches to the management of land and natural resources need to be adopted.

Specific to the Barwessa community, most stakeholders highlighted the challenges facing the ward. These have been captured in Table 6.1. The table also captures the possible intervention areas identified and discussed with the community in various consultative setups.

Table 5-1: Key actionable areas to manage the natural resources in Barwessa Ward

Key natural resource challenges	Actions
Poor Agricultural Activities and output	<ul style="list-style-type: none"> • Water harvesting (damming) across the seasonal rivers and using the harvested water for irrigation • Adopt drought-resilient crops • Soil/crop management strategies to alleviate pests encouraged by intensified cropping • Conservation of crop genetic diversity • Assist farmers with certified seeds and inputs • Use improved livestock breeds • Adapt new and improved beekeeping/apiculture methods • Invest in soil erosion control • Increase extension services • Outlaw riparian cultivation, shifting cultivation, slashing, burning and planting, and other poor methods of farming are a problem.
<p>Lake Kamnarok is threatened by heavy silt deposits. The lake is also threatened by water hyacinth.</p> <p>Human settlement is also getting closer each day to the lake riparian.</p>	<ul style="list-style-type: none"> • The county government of Baringo bears the greatest responsibility in the management, protection, and restoration of the lake. It should come up with concrete restoration mechanisms. • Invest in soil erosion control upstream. This included controlled tree harvesting and outlawing riparian cultivation, especially along R. Yebros and Kolborok among others. The measures proposed should include terraces. • Continue monitoring and managing the water hyacinth in L. Kamnarok • Demarcate and agree with the community on the location/placement of a physical boundary around L. Kamnarok • There are no watershed management plans around Lake Kamnarok. Sensitize the community and initiate such management practices around the catchment areas. • Formulation and capacity build the WRUA around Barwessa and the wider catchment to manage Barwessa water catchment areas • Work closely with WRA to allocate resources and capacity-build WRUA. Among other things, WRA

	<p>should provide seedlings suitable for the area to protect the catchment</p> <ul style="list-style-type: none"> • Work with KWS, KFS, Baringo County Government, and partners to capacity build community on agroforestry, and forest management measures through effective community-based approaches
<p>The major hazard experienced in Barwessa includes flooding during heavy rains and severe drought. In the highlands, an occasional landslide is experienced.</p> <p>Huge gulleys that continue to spread across the ward, especially around Kapsogas, Ngorochera, Tartaria, and Litein areas among others were also cited as a potential hazard</p> <p>Other Hazards include insect and pests invasion that often hamper agricultural production in the area.</p>	<ul style="list-style-type: none"> • The National and County governments should work together to manage rivers prone to floods. Damming is one of the recommendations. • Adopt early warning systems for different categories of hazards • Soil erosion control. • Reseeding of the pasture lands • Seek support from the County Government and partners to assist with the restoration of the lands • Provision of tree seedlings to enhance tree cover and control erosion • The community should carefully manage the forest areas, all of which lie within the communities, clan, and private lands. Private individuals, chiefs, and CBOs can play different capacities to sensitize the community to reserve the trees
<p>Conflicting Land tenure: Principally, CBNRM programs change the ownership and control over natural resources. Some control and some benefits are handed over from the state to communities. In some cases, this is supported by legislation whereas in other cases implementation has come before legislation. Although land management is as important as the management of specific resources, very few CBNRM programs have dealt with the issue of land tenure systems. In Barwessa, the land is privately owned, and many people have been allocated pieces of land (private with individual allotment letters) in sensitive wildlife areas. This has caused human-wildlife conflict. Persuading private landowners to adopt a common front may be a tall order, and require special skills.</p>	<ul style="list-style-type: none"> • Develop and adopt participatory strategies to reduce threats to wildlife • Develop and implement sustainable and adaptive mechanisms to strategically address threats across the landscape. • Resolve the boundary issues, especially around Kamnarok National Reserve. • Erection of physical boundaries on agreed animal corridors to reduce human-wildlife conflict • Reclaim the massive unusable lands due to soil erosion.
<p>Though the RLACC program, through DRSLP – Phase I, has intervened and implemented many agriculture-based projects in Barwessa, there is still a need to do more. The community has inadequate partners to help them sustainably achieve more productivity.</p> <p>There need for more partnerships: CBNRM Leeds</p>	<ul style="list-style-type: none"> • Entice Private sector – community partnerships, for example, investors to set up abattoirs, tourism enterprises, and processing enterprises to provide a market for and add value to the products from the community. • The Government (County-departments of Agriculture, environment and natural resources and National level-KWS, KFS, MOALF) – should partner with the community, for example, to solve the boundaries, and also to offer extension services, capital, build infrastructure such as dams and irrigation, etc. to help the community fully exploit their resources.

to the development of a range of new partnerships.	<ul style="list-style-type: none"> Government – NGO partnerships, for example between the agencies responsible for wildlife management and NGOs representing the communities. The most important partnership is probably that between the private sector and communities.
Develop an integrated sub-catchment-based information management system built on existing data that is versatile and dynamic to be updated as new information becomes available	<ul style="list-style-type: none"> Develop a framework and an online open data management platform through a multi-agency team incorporating the National Drought Management Authority (NDMA), WRA, County Government of Baringo, Kenya Red Cross, and NGOs, among others, for information gathering, storage, management, and dissemination across agencies and the community
Barwessa community is not involved in catchment management initiatives	<ul style="list-style-type: none"> Promotion, integration, and coordination of community involvement in catchment management initiatives Develop a community-focused sensitization and training framework complete with systematic training modules designed for various levels and cadres of trainees in key NRM areas Conduct regular and systematic public meetings, display events and demonstrations which are catchment-focused

5.2 CBNRM Action Plan

The following table identifies actionable areas, and activities that could help resolve various threats to the natural resources. It also identifies possible actors and monitoring indicators.

Table 5-2: The recommended action areas to improve natural resources management within Barwessa

Action area	Activities	Responsibility	Monitoring indicator
Wildlife –Human conflict and Land reclamation	Resolve the boundary around the Kamnarok National Reserve	KWS, Community, NLC, BCG (Lands Dpt), Ministry of Lands	Physical Boundary/ Fence
	Protection of both Rarau wetland and L. Kamnarok	Barwessa Community, BCG (environment Dpt), WRA, NLC, Ministry of Lands	Physical Boundary/ Fence
	Capacity-build the community, and develop and implementation of a community land-use plan	BCG (Lands and physical planning Dept.), Barwessa Communities	Community land use plan in place
	Land conservation and soil erosion control	BCG (environment Dpt), Communities	Rehabilitated land, Trees and reseeded pasture
Drought menace	FastTrack all the pending proposed projects, including the borehole, irrigation schemes, and piping	MOAL&F, BCG (Agriculture, Livestock Development and Fisheries), NDMA, Red Cross, NGOs, WRA, WRUAs, National Irrigation Authority, Communities	Water infrastructure Individual water connections
	Feasibility studies and surveys for new water projects	KVDA, BCG (water and irrigation Dpts.), WRA, NDMA, NGOs, Communities	No. of proposals, surveys, and engineering designs completed

	Drilling of boreholes in areas identified under the surveys	BCG (Water and Irrigation), NDMA, WRA, NGOs, Communities	No. of boreholes
	Properly capacity built WRUA within Barwessa Ward	WRA, BCG (Water and Irrigation), Communities, NGOs	Active WRUA within Barwessa
	Training and capacity building of all WRUAs to effectively carry out their mandate	WRA, BCG, Community	No. of WRUAs fully trained on their mandate
	Demarcation and protection of the Rarau wetlands within the	WRA, BCG, Communities	Wetlands map developed and physical boundaries
Livestock improvement and resilience	Bee Keeping improvement, value addition, and marketing	BCG, DRSLP-RLACC, BCG, NDMA, NGOs, Communities	Eliminate/mitigate the deadly flowers Bee products processing factory
	Reseeding of the pasture land within Barwessa Ward	BCG, DRSLP-RLACC, BCG, NDMA, NGOs, Communities	Hectares of pasture developed
	Develop and implement a community-livestock disease monitoring, treatment, and control system	BCG, Lands Dept., Communities	livestock disease surveillance system managed by the community
	Livestock improvement on the need to adopt highly resilient and productive breeds (breeds improvement)	BCG, Lands Dept., Communities, Stakeholders	Increased news breeds of livestock
	Market research	BCG, NDMA, Lands Dept., Communities	Improved speed of livestock sales
	Value addition for the livestock and livestock product	BCG, Lands Dept., Communities	livestock processing plants established
Livestock pests and disease control	Cattle dips construction/ renovated	Livestock health improved/ livestock	No. of cattle dips constructed/ renovated
	Acaricides procured and distributed	BCG (Agriculture, Livestock Development and Fisheries)	Quantity of acaricides procured
	Dip committees trained Community disease reporter should be trained to collect data and occurrence of any animal diseases		No. of committee members trained
	Land purchased for cattle dips		No. of acres bought
	Entomological and parasitological survey		No. of parasitological and entomological surveys undertaken
	Vaccinations carried out		No. of vaccinations carried out
	Disease surveillance carried out		No. of disease surveillance carried out
	Movement permits issued		No. of movement permits issued
Pasture	Pasture reseeded		BCG, NGOs, NDMA, Lands Dept., Communities
	Privately initiated pasture development by individuals, for domestic and commercial purposes	BCG, NGOs, NDMA, Ministry of Lands, Communities	Hectares of pasture developed
	Hay production, conservation, and storage	BCG, NGOs, NDMA, Lands Dept., Communities	Tons of hay cultivated and stored
Wildlife	Guide the design and testing of wildlife-focused planning	KWS, BCG (tourism, natural resources, Env. And forestry Dpts.), Communities	
	Training community on community-based wildlife management	KWS, BCG (tourism, natural resources, Env. And forestry Dpts.), Communities	No. of people trained

	Set and comply with timelines within which human-wildlife conflicts are to be addressed	KWS, NLC, Ministry of land, BCG BCG (lands, tourism, natural resources, Env. And forestry Dpts.), Communities	No. of human-wildlife conflict cases resolved on time
	Enhance community sensitization and capacity building for wildlife management	KWS, BCG BCG (tourism, natural resources, Env. And forestry Dpts.), Communities	No. of community sensitization sessions held
	Create buffer zones between the rangelands and settlements on one hand and wildlife zones on the other	KWS, BCG BCG (lands, tourism, natural resources, Env. And forestry Dpts.), Communities	No. of buffer zone areas identified and demarcated in consultations with communities
Vegetation and Forestry	Embark on a massive tree planting exercise not only within Barwessa but within the entire catchment, especially on the Tugen hills to prevent more soils from being washed downstream which is one of the reasons for the silting lake Kamnarok	KWS, BCG (Env. And forestry Dpt.), Communities	Acres of land planted
	Reclamation of abandoned quarries, and eroded lands	Communities, KFS, BCG,	Number of reclaimed quarries, number of trees planted
	Develop an agroforestry plan for Barwessa	KFS, BCG (Env. And forestry Dpt.), Communities	Reports and plans for afforestation
	Conduct afforestation activities using indigenous tree species	KFS, BCG (Env. And forestry Dpt.), NDMA, NGOs, Communities	No. of tree seedlings planted Acreage of land afforested
	Register all community charcoal producer associations in the area	KFS, BCG(Env. And forestry Dpt.), Communities	A database of charcoal producers' associations
	Carry out capacity building program for community associations involved in forestry activities in the area (CFAs, charcoal producers, etc.)	KFS, BCG(Env. And forestry Dpt.), Communities	No. of training sessions with relevant groups
Land and Soil Conservation.	Soil erosion control up to the sloppy hills bordering Kabartonjo Ward	NEMA, WRA, Communities, BCG (environment, forestry, Agriculture, Livestock Development and Fisheries Depts.), NGOs, NDMA	Acres of riparian zones recovered
	Protection of riparian areas, especially in tree planting.		
	County Government should intervene and construct pan dams, at least one per sub-location to check the speed of water runoff	KVDA, BCG (Water and Irrigation, environment, forestry, Agriculture, Livestock Development and Fisheries Depts.),	Number of pans and dams constructed
Sustainable exploration of construction materials and Mineral resources	Improve/modernize quarry activities to improve the quality of stones and ballast. This can be done by equipping the	KVDA, MoP&M, BCG, Communities (CBO)	Mining Study Report
	Improve roads towards the quarries. This will improve accessibility and lower transportation costs.	BCG (Roads Dpt.), KURA	Length of roads constructed
	Market the materials to neighboring counties that lack the same.	Community	
	Feasibility study for mineral resources in Barwessa	BCG (natural resources Dpt.)	Reports
Community-based Disaster risk management	Establish an early warning systems	NDMA, BCG, CBOs	Early warning system in place

6 INTEGRATING GENDER IN NATURAL RESOURCES MANAGEMENT

6.1 Engaging youth and women in managing natural resources

Unemployment is one of the biggest challenges faced in Kenya. Suffice to say, this is the case in Barwessa, as in many other parts of the country, mainly because of the burgeoning population and limited opportunities in the formal employment sector.

In Barwessa, managing natural resources like soil, forest, fauna, and water is problematic without communities leading the efforts. It has been observed that the locals historically have immense knowledge about their environment and natural resources, and this knowledge is passed down orally through generations. However, due to a lack of documentation and change in lifestyle with the advent of technology, the knowledge is dwindling and diluting with time. There is a threat to this knowledge becoming extinct.

Vital information such as the most resilient crops, high value trees (including some with medicinal values), and animals is vital and should be reserved. This forms a strong case for involving men and women and youth of all gender while implementing community-based programs.

6.2 Gender Integration Strategy for CBNRM

The Goal: Gender and social inequalities that are constraints to economic growth and poverty reduction should be identified and addressed in all proposed plans, activities, and monitoring.

Objectives:

1. All Barwessa project activities include documented plans to mitigate any barriers to equal participation and to enhance gender equality in all activities.
2. The implementers should have adequate competence and capacity to conduct gender analysis and integrate a gender dimension into all projects

Indicator: Percentage (%) project documents and activities that include appropriate interventions to address gender-related barriers to and enhance benefits from participation

6.2.1 Gender Analysis

Output indicator: Percentage (%) of contract team reports that include gender analysis, such as target group assessments; benefit analysis; etc.

All CBNRM programs and activities should be conducted in a gender-sensitive and gender-aware manner and reflect an adequate gender analysis. This analysis should include general and specific concerns according to each project and activity.

Some key requirements that may affect several activities include:

- Determine if the project benefits are structured to be accessible by women and vulnerable groups
- Study the degree to which activities may inadvertently lead to additional inequitable or nontransparent “elite capture” of project benefits, and propose mitigation actions and alternate approaches to lessen the potential for these inadvertent negative impacts
- Assessment of who contributes and who benefits; using appropriate tools.
- Possible divergent interests between men and women; young and old; powerful and less powerful are identified and documented. This may involve the use of specific tools and segregated groups of men and women.
- Special attention is given to the vulnerability of girls and young women to older men with money and other drivers of epidemics including alcohol, multiple concurrent partners, and GBV.
- Engage mainly local people (Barwessa Ward) as much as possible with special consideration to gender and vulnerability for all levels of operation
- Identify any specific gender inequality (e.g. property rights; inheritance rights) and plan accordingly

6.2.2 Participation

Output indicator: __% of contract and beneficiaries that report on stakeholder participation; the report should include identifying barriers to the participation of youth, women, and persons living with disability and mechanisms put in place to address these barriers.

All stages and aspects of the project cycle and planned activities should ensure that women, men, and any vulnerable groups have opportunities for meaningful participation throughout and any barriers to full participation are addressed. To encourage equitable participation in the project activities by men and women, the following actions should be taken:

- Documentation of consultation process to show regard for gender differentials; needs of disabled; and vulnerable groups, (to be defined project by project)
- Training of women and members of other vulnerable groups to facilitate their full participation in their roles as leaders and members of committees
- Activities are planned to encourage women's full participation.

6.2.3 Decision Making and Leadership

Output indicator: Representation and participation (attendance at meetings) in all the structures of the project and funded activities to be representative of equity among women and men. Committees and boards that are established or that are engaged in the program activities should be assessed for their gender balance, and interventions to ensure women's participation as well as the participation of other identified marginalized groups at all levels – grant-making bodies; management committees; boards– will be undertaken as necessary.

Women or marginalized individuals can benefit from focused interventions to build leadership capacity. This may entail some project-funded activities offering:

- training programs on public speaking
- mentorship and support,
- Gender sensitivity training for both male and female board/committee members.
- Gender analysis training for relevant management.

6.2.4 Monitoring

Output indicator: 100% of contracts define which, if any, indicators must be disaggregated by gender.

This strategy requires that data is disaggregated by sex, age, and income level where practical, and that gender issues are appropriately incorporated into the M&E framework.

Gender disaggregation of all specified actions will help show how women and men participated, the level of their participation, and benefits from various actions, and the extent of gender-specific constraints. Contributions and benefits of land, education, information, capital, technology, income, time, and other resources should be captured.

Objective 2: The CBNRM has adequate gender competence and capacity to manage its program

Indicator: Every Annual Report contains information on how projects integrated gender into their activities.

Gender concerns should be anchored in the community's activities and management. This may be achieved through the three strategies below.

6.2.5 Training

Output Indicator: % of community members that have attended a gender integration training program/workshop. This training should extend to partners, sectors, governmental and non-governmental, as it will be encouraged to be included in the grant proposals.

6.2.6 Strategic Information Management, Communication, and Reporting

Output Indicator: # of site reports on gender

Case studies or assessments may be undertaken on selected projects (e.g. Land reclamation program, or irrigation project) that have the potential for the most impact on

addressing gender and social inequalities by looking at progress, challenges, and best practices.

6.2.7 Resources and Responsibilities Allocated

Output Indicator: The budget for gender mainstreaming and integration is available and used within stipulated time.

Sufficient resources - human, material, and financial - shall be in place for the CBNRM program to implement and monitor the gender integration strategy.

Partnerships will be developed with the county and national governments, civil society, and other donors, to diagnose the gender-related barriers and opportunities, and to identify appropriate actions to reduce these barriers and capitalize on the opportunities.

7 MONITORING AND EVALUATION

The implementation of CBNRM is a collective effort by communities, government, the private sector, and NGOs. The monitoring and evaluation (M & E) system is an essential part of the preparation and implementation of development assistance and allows for joint planning, programming, and review.

Monitoring and evaluation also facilitate learning from experience. The collection and analysis of data are necessary to improve accountability and the effectiveness of management decisions.

Monitoring:

- Is the routine collection of information on selected aspects of specified activities
- identifies what has changed, and what is needed, through an ongoing process;
- Is a management tool that provides information needed to make decisions;
- helps to ensure that effective use is being made of available resources;
- Results in individual and group learning;
- promotes ownership of the project activity;
- Enables transfer of learning to other situations.

Monitoring information can be quantitative or qualitative. Quantitative (usually relating to amounts or numbers) information, in the context of Barwessa CBNRM processes, could include factors such as:

- Wildlife –Human conflict (frequency of conflicts)
- Land reclamation (Amount of eroded land reclaimed-Ha, acres, sq.m, etc.)
- Drought menace (number of affected livestock)
- Livestock improvement and resilience
- Pasture (acreage reseeded)
- Vegetation and Forestry (number of trees planted, area under vegetation)
- Mineral resources (survey/ feasibility reports on minerals)
- Community-based Disaster risk management (number of people trained and equipped to respond to disaster)

A baseline survey must be conducted before intervention to enable the communities to effectively monitor the progress of efforts.

Table 7-1: Log frame for the Barwessa Ward Community Natural Resource Management System

Objective Hierarchy	Indicators (measures of achievements)	Monitoring mechanisms	Assumptions and risks
<p>GOAL</p> <ul style="list-style-type: none"> To assist support the Barwessa communities and conservancies to promote sustainable development based on sound natural resource management throughout Barwessa Ward. <p>(The long-term improved situation towards which the project is contributing.)</p>	<ul style="list-style-type: none"> Reduced human-wildlife conflict Community land use plan in place Rehabilitated land, planted trees, and reseeded pasture lands No. of boreholes, Improved water infrastructure including individual water connections Active WRUA within Barwessa, fully trained on their mandate Wetlands map developed and physical boundaries Animal products and bee products processing plants livestock disease surveillance system managed by the community Reports and plans for afforestation No. of tree seedlings planted Acreage of land afforested Mining Study Report 	<ul style="list-style-type: none"> Baseline surveys Feasibility reports Database of CBNRM activities 	<p>Sufficient capacity and resources exist to support the goal</p>
<p>PURPOSE</p> <ul style="list-style-type: none"> To develop and implement natural resource monitoring and management systems. <p>(The overall observable changes in performance, or resource status that should happen from the project.)</p>	<ul style="list-style-type: none"> Monitoring and management systems are in place and implemented. 	<ul style="list-style-type: none"> Natural resource management working group reports 	<p>Resources will be available to support monitoring and management plans.</p>
<p>OUTPUTS</p> <ul style="list-style-type: none"> Efforts of CBNRM support agencies in Barwessa (BCG, NDMA, Red Cross, NGOs, WRA, WRUAs, National Irrigation Authority, and CBOs) coordinated and synergized. Barwessa Communities supported to develop and maintain their resource data management systems. Systems for land reclamation and conservation management, monitoring, and recording 	<ul style="list-style-type: none"> Key stakeholders brought together Joint planning and implementation conducted Resource data management systems in place Number of plans and systems implemented Barwessa resources monitoring systems are being implemented 	<ul style="list-style-type: none"> NR working group and Barwessa Community reports Stakeholders workshops and reports Land reclamation and conservation management plans and monitoring systems 	<p>Key stakeholders (especially support agencies) willing to collaborate</p> <p>The capacity for developing systems exists</p> <p>CBOs are willing to receive assistance and support</p>

<p>are developed and implemented.</p> <ul style="list-style-type: none"> • Barwessa Community capacity is built with its monitoring systems developed and implemented. 		<ul style="list-style-type: none"> • Barwessa natural resources monitoring systems are being implemented 	
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8 CONCLUSION

Barwessa Ward is largely based in rangeland. Apart from scattered isolated pockets of dryland subsistence agriculture and small-scale irrigation in the area, the major socio-economic activities center on livestock and beekeeping. Although much has been done in terms of road infrastructure, key investments that could help the communities explore the potential of their natural resources are yet to be made. Most of the highlands can be developed by the introduction of effective and efficient methods of soil conservation and land management. In the lowlands, the main issue is the lack of adequate moisture for crop growth. And therefore, heavy investment in water harvesting and irrigation infrastructure is highly recommended.

For an effective CBNRMS, the communities should be enlightened and capacity built on how they can deal with deforestation, improved crop and animals husbandry, inadequate knowledge on soil conservation, destruction of water catchment, the frequent outbreak of crop and livestock pests and diseases, flooding, drought, wildlife-human conflict, poor infrastructure, insecurity (cattle rustling) and land degradation. If these issues are resolved in partnership with the community, then the natural resources within the ward shall be sustainably used to meet the community demand.

It should also be acknowledged that CBNRM is not a solution that can be applied with success in every situation. There are many areas in Barwessa Ward where the ecological problems are so great that CBNRM approaches might not be viable unless land issues are first resolved. CBNRM approaches tend to work best in those environments that are relatively intact and provide opportunities for generating substantial financial incentives to change the way people perceive and manage their land and natural resources. In areas where natural resources are severely degraded (such as huge gullies in Kapsogas, Ngorochera, Tartaria, and Litein all in Barwessa Ward) and people are poor, there might not be sufficient incentives to change the way resources are managed, unless there are adequate external interventions, either through County Government (departments charged with environment and natural resources, agriculture, water), National Government (Ministries in charge of environment, water, agriculture, mining, and natural resources), allied NGOs, or FBO.

9 REFERENCE

Agricultural Sector Transformation and Growth Strategy (2019-2029)- Towards Sustainable Agricultural Transformation And Food Security In Kenya

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National Food and Nutrition Security Policy 2011

APPENDIX:

MINUTES OF PUBLIC PARTICIPATION

**MINUTES OF NATURAL RESOURCES MANAGEMENT OF THE LAND VILLAGE,
BARWESSA WARD, BARINGO NORTH SUB-COUNTY IN BARINGO COUNTY.
HELD AT THE LAND CHIEF CAMPGROUND ON 13th OCTOBER 2021**

ATTENDANCE LIST

AGENDA

1. Preliminaries
2. Resources Mapping
3. Challenges
4. Suggestions from the villagers and consultants
5. A.O.Bs

MIN 01/2021 Preliminaries

The area chief welcomed the participants to the meeting. He asked The Land (location) chairperson of the borehole project to say a word of prayer. There was a self-introduction session led by the area chief and the Barwessa ward officer Mr. Kandie.

MIN 02/2021 Resource mapping

The consultant-led the session and the farmers were able to name the available resources around The Land village. According to members present, the resources available in the area include

- I. Crops; finger millet, sorghum, cowpeas, cassavas, cotton, beans, and maize on small scale due to antiquate rainfall received in the area.
- II. Land, water, swamps,
- III. Livestock; indigenous cattle, goats, and poultry
- IV. Wildlife; Elephants, bamboos, and crocodiles
- V. Fruits trees; Mangoes and pawpaw
- VI. Springs; Ainabor, Kipra and Ewanin
- VII. Rivers; semi- seasonal rivers; Kipra ,Chepkolel
- VIII. Underground water; the potential areas e.g. Margut, Kaptein, and The land.

MIN 03/2021 Challenges

- Farmers are facing a lot of challenges such as a shortage of water for irrigation and domestic use because most of the rivers are seasonal. Wildlife conflict, Elephants, and bamboos are very dangerous to crops such as maize, cassavas, and beans.
- Members cited Elephants and Bamboos as the major agents of destruction. Also, sometimes domestic animals are very destructive such goats may destroy crops in the field such as maize and vegetable due to lack of a fence. Most of the farmers are cultivating along the river banks due to lack of water for irrigation the activity will result in soil erosion and water siltation.

MIN 04 /2021 Suggestions from the farmers

- 1) Due to insufficient water because most of the rivers are seasonal farmers request the drilling of boreholes and construction of water pans due to the high volume of the runoff water from up the stream to the lower part of Kerio.
- 2) Upgrading of the indigenous livestock to highbred to increase the productivity
- 3) Piping of The land borehole water to every household because of the distance
- 4) Pasture establishment for animals' sustainability for both the community and individual if it's possible because most of the months are very dry animals may die in large numbers due to lack of green pasture and clean water.
- 5) Fencing of the game reserve to restrict the wild animals coming to their farms.
- 6) Construction of bridges along the main roads because during the rainy season the roads are impassable.
- 7) To employ more extension officers to provide services to farmers such as how to construct and maintenance of chicken gardens and other farmer practices.
- 8) Provision of certificate seeds of cow's peas and groundnuts also seedlings of pawpaw and mangoes to increase the productivity which in turn improves the people's livelihoods

MIN 05/2021 A.O.B

- The consultant advised the community to encourage the youth to attend the Barazas to be part of the solution making process.
- Farmers urged to reduce shift cultivation due to deforestation and soil erosion.

MIN 06/2021 Adjournment

There being no other business the business adjourned at 1:30 pm by a word of prayer from one of the farmers.



Figure 0-1 Consultant engaging members of the land community



13/10/2021

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Tanus Justin		M	✓ 304		Theland Borchilo	Theland	0702833567
2.	Gideon Cheptaus		M	✓		Theland Borchilo	Theland	0702943825
3.	Felix Keroti		M	✓		Theland member	Theland	0757434690
4.	Musa Chemtoi		M		✓	Village & Elder	Theland	0725827257
5.	Argiso Turtaek		M		✓	Theland Pore-bote	Theland	0724782017
6.	Johann K. Tomitich		M		✓	Theland Borchilo	"	0723371417
7.	Joseph C. W. Prandi		M		✓	Committee member for potato	Theland Council	0707772663
8.	Patrick Chelimo		M	✓		Secretary	Theland	0721865069
9.	Kiprono Kipkirez		M		✓	Theland B/role member	Theland	0710966176
10.	Carmyne Yano		M		✓	Theland member / her member	Theland	0713905380

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	FELIX W. CHERUTOI		✓		✓	ASSISTANT	THE LAND	0723234933
2.	Kipsang Kewamusi		✓		✓	Village Elder	The Land	0722635551
3.	James Cherutoi		✓		✓	Community Dev.	The Land	0724691948
4.	JULIUS CHERMERIK		✓		✓	POLICE OFFICER	THE LAND	0720382794
5.	Francis Tomireh		m		✓	Farmer	THE LAND	0711665122
6.	Magdalene Kiptaru	F			✓	GROUP Treasurer	The Land	0721177302
7.	JOHANA KHERTIRIM		m		✓	Farmer		0701233163
8.	RICHARD KIPTEGOMBE		M		✓	Member	The Land	—
9.	EDINAH CHERUHOT		M		✓	GROUP SECRETARY	The Land	0729849700
10.	Lilian KIPROOH		F		✓	Farmer	The Land	—



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	marion kulei	F		✓		farmer	theland	0719325851
2.	Elena Komor	F			✓	Farmer	the-land	-
3.	ELLEN JEREMIAN	F			✓	Farmer	The-land	-
4.	Jackson Tonje	M			✓	farmer	The-Land	0745535638 →
5.	Kakuron cholimo	m			✓	Farmer	The-land	-
6.	Augustus Oryembo	m			✓	consultant	NRB	072255959
7.	Januarius D. Agullo	M			✓	consultant	NRB	0722831065
8.	SUSAN KIPROTICH	F		✓		MOA	Kabameret	0791709978
9.								
10.								

***MINUTES OF NATURAL RESOURCES MANAGEMENT OF KUIKUI VILLAGE,
KUIKUI SUB –LOCATION, KAPNOSGEI KERIO LOCATION, BARWESSA WARD,
BARINGO NORTH SUB-COUNTY IN BARINGO COUNTY. HELD AT KUIKUI CHIEF
CAMPGROUND ON 13th OCTOBER 2021.***

Members Present; Refer to the attendant list

AGENDA

- 1) Preliminaries
- 2) Identification of Natural resources
- 3) Challenges
- 4) Suggestions

MIN 01/2021: Preliminaries

The meeting was brought to order by a word of prayer by the village spiritual leader at 15:00 hr followed by the departmental instructions and then the area chief welcome everyone into the meeting.

MIN 02/2021: Identification of Natural Resources

The community described various natural resources in detail such as rivers, land, livestock, crops, and trees.

The following important points were noted during the natural resource identification exercise.

- Land; land acreage per household is 3 acres and land ownership is private some of the farmers have land title deeds and others don't.
- Rivers are both seasonal and semi-permanent rivers
- Livestock; indigenous cows, goats, sheep, and poultry
- Crops; finger millets, sorghum, cowpeas, maize, cassava, and maize
- Fruits; mangoes, oranges, lemons, bananas, and pawpaw
- Indigenous trees for livestock feeds and source of energy.

MIN 03/2021: Challenges faced by farmers

Members pointed out the following challenges in the use and management of resources.

- Insufficient water; most of the Kuikui rivers are seasonal and the area experiences a long period of dry spells which results in drought which is a serious issue for both humans and animals.
- Lack of pasture and grazing fields for livestock; most of the livestock dies during dry seasons due to a lack of green pasture and clean water.
- Wildlife conflict; Kuikui river has a lot of crocodiles who attack goats along the river banks also the Elephants always destroy their crops and fruits e.g. mangoes and oranges.

MIN 03/2021: Suggestion

The community suggested the following major things to the consultants.

- Drilling of borehole and construction of water pan to solve the problem of water shortages in the area
- Pasture establishment by supplying certified seeds of pasture to farmers to reduce the mortality of livestock
- Upgrading of livestock breed to hybrid bred to increase the productivity of milk and meat.

MIN 04/2021: A.O.B

- Members did not have any issues to raise but just hoped that their suggestions will be considered.
- The consultant appealed to community members to continue conserving the environment for better use in the future. The meeting was at 16:20hrs by word of prayer.

MIN 04/2021: Adjournment

There being no other business, the meeting ended at 16:20 with a word of prayer from one of the members



Figure 0-2: Natural Resources Public Participation meeting of Kuikui community

15/10/2021

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Joseph Kokwon		m		1 ✓	farmer	Kuikui	0715783748
2.	Joseph Khandaga		m		1	farmer	Kuikui	0712162516
3.	Deuben Aengwo		m		✓	farmer	Kuikui	0721227593
4.	Thomas C. Chesera-Goa		m		✓	farmer	Kuikui	07A1801645
5.	Samuel Chesera		M		✓	farmer	Kombosang.	0791654218
6.	Luki Ketelit		M		✓	farmer	Kuikui	075261856
7.	Selwa Ng'ũ		M		✓	farmer	Kuikui	077141350
8.	Musa Chesera		M		✓	farmer	Kama	0703819817
9.	Wycliff Ajabei		m		✓	farmer	Kuikui	0729623308
10.	Muiron Chesera		m		✓	farmer	Chesera	0719139774



No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
11.	Isaiah Chomwa		M		✓	Farmer	Keptit	071500175
12	John K. Cheteng		M		✓	farmer	chesanjoc	0796 44121
13.	MERRY Joseph		F		✓	farmer	Chesanjoc	07
14.	Priscilla K. Chesang		F	✓		Farmer	chesanjoc	0744 698103
15	Priscilla K. Chesang		F		✓	Farmer	Kabara	0717784657
16	Bartha Kibira		M		✓	farmer	Turbei	072669234
17.	Priscilla K. Chesang		M	✓		farmer	chesanjoc	0722 697 034
18.	MARY TELLO		F		✓	Teacher	Torolokwanin	0721527897
19.	Loise Yano		M	✓		Teacher	metyut	0716707857
20.	Godys Kura		F		✓	farmer	Kabara	0712439292
21.								



13/11/2021

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	SILAS KILIMO	✓			✓	Farmer	forobokwini	0721435009
2.	Igaiah chebit	~			✓	farmer	Kabero	0726006274
3.	MOSES ANDONY	✓			✓	PASTOR	kwilvi	0744296284
4.	SYMON O. WIPCHAGA	✓			✓	farmer	Kipitai	0700819258
5.	Sikiria Komen		M		✓	farmer	Karero	-
6.	JEREMIAH K TEMO		M		✓	sheep	Kabero	0725172382
7.	LUKA CHEBOI		m		✓	farmer	KHEPTINUAL	075196354
8.	AADON TOBALLE		m		✓	farmer	KUMBI	0729538731 0729538735
9.	JOSH DOBOY		m		✓	farmer	KW KUI	0729574158
10.	LAWREN KIBET	~			✓	farmer	K. UI KUI	0792855794



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	SISTE Bantui	F			✓	Farmer	Kuikiu	-
2.	Dinah Barkotai	F			✓	Farmer	Turbei	0717925551
3.	SYLVIA KAKUGO	F		✓		Farmer	Chosegion	0717868706
4.	Rebecca susumo daeman	F		✓		Farmer	Kuikiu	-
5.	MARY CLAUDIO RONO	F			✓	Farmer	Kuikiu	
6.	Faustino Ayabei	F			✓	Farmer	Turbei	079827427
7.	MUSA CHEPHIRIA		M		✓	farmer	Kuikiu	
8.	Joseph O Kiptum		M		✓	farmer	Chaptinoch Kipando	0710227180
9.	Emock O KANDAIKOR		M	✓		Farmer	MARANDI	0719411337
10.	LUCA BUTTO		M		✓	farmer	Chaptinoch	07



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Daudi Gator		M		✓ 1	farmer	Timber	0720370214
2.	Musa K. CHEPKERER		M		✓	farmer	Koukot	0725213376
3.	William Chesire		M		✓	farmer	Koukot	0 N/A
4.	Joseph Waboi		M		✓	farmer	Koukot	0700249365
5.	John Kabany		M		✓	Somas	Kuikui	0710233366
6.	Julius K. CHEPKERES		M		✓	Farmer	Kuikui	0715561810
7.	Lazaro W. KANDAR		M		✓	farmer	Kuikui	0919371374
8.	Moses MEGWO		M		✓	pastor	Kuikui	0710712923
9.	Ramban Kiseri		M		✓	pastor	Kuikui	0710747974
10.	Joseph MUKHAYI		M		✓	Pastor	Kuikui	0723712476



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	ISAAC CHENJOT		M			Farmer	Kana	072556529
2.	Kiplatony Kientet		M			Farmer	Kurku	
3.	Reuben Chibon		M			farmer	Kaptigi	07
4.	John Tobole		M			farmer	Kabera	0707771498
5.	Luka Logono		M			farmer	Kurku	07
6.	Smith Moses		M			Farmer	Kuikui	0722573598
7.	Reuben Chelanga		M			farmer	Kuikui	0710674409
8.	Simon Chelugo		m			farmer	Kuikui	0707996503
9.	John Chesang		M			Farmer	Kurken	072308709
10.	Johana Chesang		m			farmer	Kuikui	0706600156

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	MIRIAM CHEBON	F			✓	Farmer	chesambich	0717 050439
2.	Talitha Kemboi	F			✓	Farmer	Cheptigit	-
3.	Terigit Kegu	F			✓	Farmer	Kaboo	-
4.	Jane cholaa	F			✓	Farmer	Chosangich	-
5.	Jennifer Chapcheing	F			✓	Farmer	Kaboo	0727827912
6.	Monica Tunyo Kangwony	F			✓	Farmer	Kuitui	-
7.	SOTE KIPKACH	F			✓	Farmer	Kamaa	-
8.	Christine Cholimo	F			✓	Farmer	Cheptirochu	0706514261
9.	Jennifer Chesiro	F			✓	Farmer	Cheptirochu	0794860021
10.	Talaa Chesire	F			✓	Farmer	Turbei	-



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	EDNAH CHELWOTO	F			✓	farmer	Turboi	0796406973
2.	RAEL JEPKO TARUS	F			✓	farmer	Turbei	-
3.	James cheptiong	F			✓	Farmer	Madamar	0715351 925
4.	Thomas cheptomo	F			✓	Farmer	cheptiong	0207 959 230
5.	Benjamin Roturo	F			✓	Farmer	Chesngich	-
6.	HILARY CHEBURCI	M		✓		farmer	Chesngich	0757070315
7.	Nash Chesngich	M			✓	farmer	Chesngich	0796441121
8.	William Kibet	M			✓	Farmer	Kerikeri	-
9.	KIPPONICH SUWAN	F			✓	MUALBP	KBT	0791 709 278
10.								

**MINUTES OF NATURAL RESOURCES MANAGEMENT PUBLIC PARTICIPATION
HELD AT MUCHUKWO VILLAGE, MUCHUKWO SUB –LOCATION, KABUTEE
LOCATION, BARWESSA WARD, BARINGO NORTH SUB-COUNTY, BARINGO
COUNTY HELD AT CHIEF OFFICE CAMP ON 14/10/2021.**

Members present; Refer to the attendant list

AGENDA

- 1) Preliminaries
- 2) Identification of the natural resources
- 3) Challenges
- 4) Suggestions
- 5) A.O.B

MIN 01/2021: Preliminaries

The meeting started at 11:50 am with a word of prayer from a spiritual leader and the area chief welcome the participants into the Baraza followed by a self –introduction.

MIN 02/2021: Identification of natural resources

The communities were able to list the resources available in the village as follows;

- 1) Land; The land ownership is private, acreage covering 2 acres per house hole
40% of the farmers have their title deeds but 60% don't have
- 2) Livestock; The community kept indigenous cattle, sheep, and goats
- 3) Crops; finger millet, cowpeas, green grams, cotton, sorghum, and maize
- 4) Rivers; most of the rivers are seasonal
- 5) Fruits; mangoes and pawpaw
- 6) Indigenous trees for animals feed, herbal and source of energy
- 7) Minerals such as ballast and sand

MIN 03/2021: Challenges

Challenges experienced include;

- Inadequate supply of water; most of the rivers are seasonal during the dry season the rivers dry up.

- Wildlife conflict; elephants are the most destructive animals along the Kerio valley
- Drought; most of the months are dry
- Infestation of predators; birds and monkeys

MIN 04/2021: Suggestions

The following suggestions were made;

- 1) Drilling of many boreholes to supply water to every household to solve the problem of inadequate water.
- 2) Construction of water pans to collect the runoff water for irrigation to increase productivity which will result in improvement of people's livelihoods.
- 3) Upgrading of livestock into high bred such as Sahiwal bull and dairy goats
- 4) Pasture establishment by providing certificate seeds to an individual to enough stock for animal feeds during dry seasons
- 5) Request the government to the issues concerning the KWS for the farmers to practice farming fully.

MIN 05/2021 A.O.B

- The consultant urged the community to continue conserving the soil to control soil erosion.
- In addition, community members were encouraged members to accompany their children to meetings for them to learn about the community issues.



Figure 0-3: Natural Resource Management Public Participation meeting at Keturwo village



14/11/2021

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	JOHN OBERAIK		M		✓	ELDER	KALEL	0718543888
2.	ISAAC KOMEN		M		✓	SEC. WATER	MUDHUKWO	0728800532
3.	JAMES OIBOI		M		✓	ELDER	KASIRMA	0795704604
4.	ENOCH MASOP		M		✓	V-ELDER	KIPIMAN	0702674605
5.	PAUL KAROS		M		✓	V-ELDER	KASIRMA	0757219928
6.	JAMES B. KAMURUK		M		✓	MEMBER	MUDHUKWO	0728304890
7.	JOSEPH MOSAIOS		M		✓	V-ELDER	KASIRMA	0707731450
8.	ELIJAH KAHLOLO		M		✓	V-ELDER	KAMURUK	071126878
9.	JOSEPH SUMAKI		M		✓	V-ELDER	CHUMUL	0712716757



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1	Abraham Kaudie	M	✓		✓	MOA	Banwasa Ward	0721687011
2	KIPROTICH SUAY JENKOPAN	F		✓		MOA	Baringo County	0791709278
3	PAUL K. CHEPTUMO	M			✓	NGAO	Kabutee Location	0726733043
4	ANTHONY W. CHEPUP	M		✓		NGAO	KAPUR Sublocation	0728582913
5	Simon MURAR	M		✓		FARMER	EL SURUKO	0706400796
6	Joseph Somak	m.		✓		FARMER	Chemul.	0712716757
7	ESJAI KANGOGO	M			✓	FARMER	KAMURHOK	0711636573
8	Joseph Momo	M			✓	Farmer	Kasima	0701731450
9	Emily Angwo	F			✓	Farmer	Kapur/ Kasire	0708331936
10	DAVID CHESOO	M			✓	Farmer	MUKUKWO	0711268743

***MINUTES FOR NATURAL RESOURCES MAPPING FOR KETURWO VILLAGE,
KETURWO SUB-LOCATION, BARWESSA WARD, BARINGO NORTH SUB-
COUNTY, BARINGO COUNTY. HELD AT KETURWO VILLAGE ON 14/10/2021.***

Members Present; Refer to attend list.

AGENDA

- 1) Preliminaries
- 2) Identification of the natural resources
- 3) Challenges
- 4) Suggestions
- 5) A.O.B

MIN 01/2021: Preliminaries

The meeting started at 1430 hrs. with a word of prayer from a spiritual leader and assist Chief Joseph Kandie welcome members and encouraged them to feel free and ask any questions relevant to the meeting.

MIN 02/2021: Identification of Natural Resources

The community has several natural resources;

- Land for crop farming and rearing of livestock, most of the lands are bare soil may be carried out by soil agent to lower part of the area Kerio Valley
- Rivers; most of the rivers are seasonal this indicates there is a need for boreholes and water pans
- Livestock; cattle, goats, and sheep
- Crops; beans, groundnuts, green grams, finger millet, sorghum, and maize
- Fruits; pawpaw, oranges, mangoes, and bananas

MIN O3 /2021: Challenges facing by farmers

Farmers highlighted the following challenges

- Insufficient water; most of the Keturwo rivers are seasonal rivers that dry up during a long period of drought leading to a serious issue both for human beings and animals.

- Lack of pasture and grazing fields for livestock; most of the livestock dies during dry seasons due to a lack of green pasture and clean water.
- Wildlife conflict; Keturwo river has a lot of crocodiles who attack goats along the river banks also the Elephants always destroy their crops and fruits e.g. mangoes and orange

MIN 04 /2021: Suggestions made by farmers

- Upgrading of livestock breed to enhance milk and meat productivity
- Construction of boreholes and water pans
- Establishment of pasture

MIN 05/2021: A.O.B

Consultants advised farmers to continue practicing farming as agriculture is important for the improvement of their lives.

MIN 06/2021: Adjournment

There being no other business the meeting ended at 1600 hours with a word of prayer from one of the members.



Figure 0-4 Natural Resource Management Public Participation Meeting at Muchukwo Village



14/10/2021

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Chebi Chebi		M		✓	farmer	Keturwo	
2.	DICKSON CHANG		m		✓	village elder	keturwo	0708195263
3.	SAMON CHEVIREK		M		✓	elder	KIBILAKOIS	0768182490
4.	CHANG KORDON		m		✓	farmer	KIBILAKOIS	-
5.	John Chetalaom		m		✓	farmer	KIRSANG	-
6.	SILU SIMA		M	✓		farmer	keturwo	0728405992
7.	Julius Komen		m		✓	farmers	keturwo	0716466716
8.	Job CHEVIRE		M		✓	Farmer	KEURWO	0724425096
9.	Johana MINGIRO		M.		✓	Farmer	KEURWO	0714012452
10.	Willy SHESANG		M.		✓	Farmer	keturwo	07183433274



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Abraham Kandie		✓		✓	MOA		0721627011
2.	Johana Chebet		✓		✓	MOH		0721222375
3.	Kabari Chemose	✓			✓	Farmer	Keturwo	-
4.	Jomas Chaptum		✓		✓	Farmer	Keturwo	079065900
5.	Hasan Seguton		✓		✓	Farmer	Keturwo	072907609
6.	PAUL CHEPSOM		✓		✓	Farmer	Kimii	0729247891
7.	Festus KocciH		✓		✓	Farmer	Kimii	0721621329
8.	Luka Korkole		✓		✓	Retiree T.	Korror	0707694866
9.	Samuel Kangogo		✓		✓	Farmer	Litein	078962895
10.	Kapkor		✓		✓	Farmer	Keturwo	-



LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Moses K. Okali		M		✓	Farmer	Betunwo	0794860606
2.	Josiah Rvijo Kandio		M		✓	Interior Ass. Officer	Kisumu	0720324484
3.	Lidia Chesem	F			✓	Farmer	Kipsaa	0713577926
4.	Salina Chepkoi	F			✓	Committee KIPSA Farmer	KIPSA	-
5.	Asen Kikai		M		✓		KIPSA	0713695269
6.	Spencer Kipso		M		✓	Committee KIPSA Farmer	KIPSA	07703243379
7.	Linan Tuitok	F			✓	farmer	Kimii	0725375963
8.	Prisca Bongolia	F			✓	farmer	Kimii	071807643
9.	Manica Chesoi	F			✓	Committee center KIPSA	Kimii	0726808758
10.		f			✓	farmer	Kipsaa	0711768570



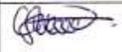
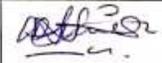
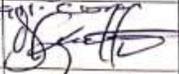
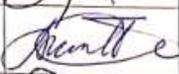
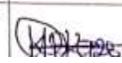
LIST OF PEOPLE CONSULTED

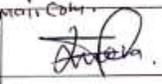
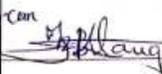
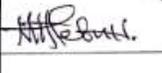
No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Gideon Chemiso		M		✓	Farmer	Keturwo	0715827408
2.	Daniel Chemelgat		M		✓	Farmer	Kamer	070090549
3.	Micah Kipkooh		M		✓	Farmer	Keturwo	-
4.	Daniel Chemiso		M		✓	Farmer	Keturwo	0713824417.
5.	FRANCIS CHESANG		M			FARMER	KETURWO	0712949495
6.	PATRICK CHEROP		M			FARMER	KETURWO	0798072011
7.	John Aboti		M			Farmer	Keturwo	0710910481
8.	Isaac Cheptoo		M		✓	Farmer & driver	Keturwo	0762237526
9.	David Agut		M		✓	Farmer	Keturwo	0793615433
10.	Kobilo Cheptoo		F		✓	Farmer	Keturwo	-

LIST OF PEOPLE CONSULTED

No.	Name	Sex		Age		Organization	Village	Contacts
		F	M	Below 35 Yrs	Above 35 Yrs			
1.	Esther Chebet	F			✓	Leader	Kimui	07-0326 85165
2.	Kohalo Chebet	F			✓	Farmer	Kimui	—
3.	Gracia Chebet	F			✓	Farmer	Kipkairo	0795352571
4.	Tega Malait	F		✓		Farmer	Kimui	074642311
5.	Roda Nipoch	F			✓	Farmer	Kimui	—
6.	Chapchig Kennedy	M			✓	Teacher	Mosho	0798701432
7.	Wilson Lengwa	M			✓	Farmer	Kipsaa	—
8.	SHANACK Lengwa	M		✓		Cotton Farmer	Kipsaa	0713824453
9.	Sesua Cherrony	M			✓	Cotton	Kipsaa	0713 625355
10.	Wilson S Kenen	M			✓	FARMER	"	0793 644924

KEY STAKEHOLDERS INPUTS

 STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL RESEARCH Resilience and Sustainable Livelihoods Program (DRSLP) Rural Livelihoods Adaptation to Climate Change Project (RIACC)		COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT SYSTEM (RANGELAND AND WATER) FOR BORINGO COUNTY			October 2021
No.	Name	Designation	Organisation	Contacts	Signature
1.					
2.	Christophers M. Senek	Lead Technical Officer	FAO Kenya	0724799457	
3.	Aholipama C. Ruto	SCCDO Baringo North	MOALDF	0724387021	
4.	LAWRENCE M SAMMY	DCDA - CROPS Devt & food security	BCE - Kericho	0724779425	
5.	John KIPKOP	CRSSLO	ELRP - Baringo	0722283187	
6.					
7.	JUDY KIPSERE	INTERN	MOALDF Baringo	071959569	
8.	David Ruelo	GISD	USRTD	0716547770	
9.	Frank Nyagah	CPC	AIDCP II	0729061692	
10.	Taru Benjamin	MSE	AIDSO II	0728-880517	
11.	David Mgetich	OPL	KWS	0700827616	
11.	Jennifer Kipkazi	CDE	Baringo County - Env	0722914153 Jenniferkipkazi	

 STATE DEPARTMENT FOR CROP DEVELOPMENT AND AGRICULTURAL RESEARCH Resilience and Sustainable Livelihoods Program (DRSLP) Rural Livelihoods Adaptation to Climate Change Project (RIACC)		COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT SYSTEM (RANGELAND AND WATER) FOR BORINGO COUNTY			October 2021
12.	Willy Leparwa	Urban Planner / GIS Assistant	Baringo County - Lands	Willyleparwa@gmail.com 0706 151 829	
13.	Jared K. Bitange	Kenya Forest Service	Kabarnet Forest	Jbitange@kwas.com 0720352480	
14.	Michael A. Kipkelent	BAKI WRA WRA	Kabartonjo Kapcheperkor	0727259289	
15.					