## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

# COMPREHENSIVE PROJECT REPORT

**PROPOSED CONSTRUCTION OF KEBENONIN EARTH DAM IN KAPKURMAT/ KAMUGELE VILLAGE, KAPTURO SUB LOCATION, BARTUM LOCATION, RIBKWO WARD, BARINGO WEST SUB COUNTY; BARINGO COUNTY.**

GPS Coordinates: Latitude 0.904549° and Longitude 35.813624°, 1,455 m above sea level.

## STATE DEPARTMENT OF AGRICULTURE (BREFONS)

Location: Kapkurmat_Kamugele Village, Kapturo Sub Location, Bartum Location, Ribkwo Ward, Baringo West Sub County; Baringo County.

**MARCH, 2026**

| PROPONENT: | FIRM OF EXPERTS |
|---|---|
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# FACT SHEET

<table>
<tr><td>Project Name</td><td>Proposed Construction of Kebenonin Earth Dam in Baringo County, in Kapkurmat_Kamugele Village, Kapturo Sub Location, Bartum Location, Ribkwo Ward, Baringo West Sub County; Baringo County.</td></tr>
<tr><td>Assignment Name</td><td>Environmental and Social Impact Assessment (ESIA)</td></tr>
<tr><td>ESIA Tool</td><td>Comprehensive Project Report (CPR)</td></tr>
<tr><td>Location</td><td><table>
<tr><td>County</td><td>Baringo</td></tr>
<tr><td>Sub County</td><td>Baringo West</td></tr>
<tr><td>Ward</td><td>Bartabwa</td></tr>
<tr><td>Location</td><td>Ngorora</td></tr>
<tr><td>Sub Location</td><td>Kapturo</td></tr>
<tr><td>Village</td><td>Kapkurmat_Kamugele</td></tr>
</table></td></tr>
<tr><td>GPS Coordinates</td><td>Latitude 0.904549° and Longitude 35.813624°, 1,455 m above sea level.</td></tr>
<tr><td>Project Description</td><td>• Excavation of the Earth Dam, clearing of overburden materials and the top soil<br>• Construction of the Earth Dam, installation of toilet facilities.<br>• Construction of cattle and shoat (sheep and goat) water troughs, and Fencing of the Dam site to enhance safety and controlled access.</td></tr>
<tr><td>Dam Design Parameters</td><td>• Dam Type: Homogeneous earth-fill embankment<br>• Crest Length: Approximately 120 meters<br>• Crest Width: 4.0 meters<br>• Maximum Embankment Height” 5.5 meters<br>• Upstream Slope: 1:2.5 (horizontal: vertical)<br>• Downstream Slope: 1:2.5 (horizontal: vertical)<br>• Total Storage Capacity: 21,800 cubic meters (m³) at Full Supply Level (FSL)<br>• Full Supply Level (FSL): Determined by topographic survey and hydrological analysis<br>• Spillway Type Open-channel trapezoidal earth spillway<br>• Spillway Design Flood: 1-in-50-year return period (peak discharge = 0.442 m³/s)<br>• Gross Freeboard: 1.5 meters (includes allowance for wave run-up and settlement)<br>• Design Life: 20 years (based on population growth and water demand projections)</td></tr>
<tr><td>Proponent</td><td>Ministry of Agriculture and Livestock Development (MoALD)<br>State Department for Agriculture<br>Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)</td></tr>
</table>

## CERTIFICATION

**For and on Behalf of:**
**Ministry of Agriculture and Livestock Development (MoALD)**
**State Department for Agriculture**
**Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)**

This Environmental Impact Assessment (EIA) Comprehensive Project Report was prepared in accordance with the Environmental Management and Coordination Act (EMCA) 1999 and the Environmental Impact Assessment and Audit Regulations 2003 (revised 2015 & 2019) and the **Africa Development Bank (AfDB)** Environmental and Social Safeguards in order to meet the statutory requirements for the implementation of projects under schedule ii. We, the undersigned, confirm that the contents of this report are a true representation of the ESIA process for the ***Proposed Construction of Kebenonin Earth Dam in Kapkurmat_Kamugele Village, Kapturo Sub Location, Ngorora Location, Bartabwa Ward, Baringo West Sub County; Baringo County.***

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**For and on behalf of: -**
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**State Department for Agriculture**
**Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)**

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AfDB | African Development Bank |
| AIDS | Acquired Immune Deficiency Syndrome |
| ASAL | Arid and Semi-Arid Land |
| BREFONS | Program to Build Resilience for Food and Nutrition Security |
| CAP | Crisis Action Plan |
| CBOs | Community Based Organizations |
| CDDC | Community Driven Development Committee |
| CIAP | Community Integrated Action Plan |
| CIDP | County Integrated Development Plan |
| CMS | Convention on Migratory Species |
| COC | Code of Conduct |
| CPCU | County Project Coordination Unit |
| CPP | Consultation, Public Involvement, and Participation |
| CPR | Comprehensive Project Report |
| CPs | Contracting Parties |
| CSR | Corporate Social Responsibility |
| EAP | Emergency Action Plan |
| EAs | Environmental Assessments |
| EMCA | Environmental Management and Coordination Act |
| ER | Emergency Response |
| ERP | Emergency Response Plan |
| ESIA | Environmental and Social Impact Assessment |
| ESIA/ EA | Environmental and Social Impact Assessment /Environmental Audit |
| ESMMP | Environment & Social Management Monitoring Plan |
| ESMP | Environmental and Social Management Plan |
| ESS | Environmental and Social Standards |
| FGD | Focused Group Discussion |
| FPIC | Free Prior and Informed Consultation |
| GBV | Gender Based Violence |
| GDP | Gross Domestic Product |
| GHG | Greenhouse Gases |
| GRM | Grievance Redress Mechanism |
| IAPs | Interested and Affected Parties |

| | |
|---|---|
| ISLM | Integrated Sustainable Land Management |
| IUCN | International Union for Conservation of Nature |
| Km | Kilometers |
| $Km^2$ | Square Kilometers |
| m | Meters |
| M | Million |
| $m^3$ | Cubic Meter |
| MEA | Multilateral Environmental Agreements |
| MEO | Monitoring & Evaluation Officer |
| mm | Millimeter |
| MoU | Memorandum of Understanding |
| MW&I | Ministry of Water and Irrigation |
| NEAP | National Environmental Action Plan |
| NEMA | National Environment Management Authority |
| NGOs | Non-Governmental Organizations |
| OHS | Occupational Health and Safety |
| PAPOLD | Participatory Analysis of Poverty and Livelihood Dynamics |
| PEPB | Pest Control Products Board |
| PICD | Participatory Integrated Community Development |
| PMC | Project Management Committee |
| PPE | Personal Protective Equipment |
| RCC | Reinforced Cement Concrete |
| SEA | Sexual Exploitation and Abuse |
| SESA | Strategic Environmental and Social Assessment |
| SH | Sexual Harassment |
| SLM | Sustainable Land management |
| SOP | Standard Operating Procedure |
| UG | Underground |
| UNFCCC | United Nations Framework Convention on Climate Change |
| WA2016 | Water Act 2016 |
| WHO | World Health Organization |
| WRA | Water Resource Authority |
| WUA | Water User Association |

# EXECUTIVE SUMMARY

## Introduction

This **Comprehensive Project Report (CPR)** presents the findings of the Environmental and Social Impact Assessment (ESIA) for the proposed Construction of Kebenonin Earth Dam in Baringo County, in Kapkurmat_Kamugele Village, Kapturo Sub Location, Bartum Location, Ribkwo Ward, Baringo West Sub County; Baringo County. The project is being implemented by the Ministry of Agriculture and Livestock Development (MOALD) under the State Department for Agriculture through the Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS). The assessment evaluates the potential environmental and social impacts associated with the proposed excavation works and outlines appropriate mitigation and management measures to ensure environmentally sustainable and socially responsible implementation of the project.

The report presents the assessment findings in accordance with the Environmental Management and Coordination act (EMCA) 1999, Environmental (Impact Assessment and Audit) regulations and the EIA and audit guidelines. Earth Dams are listed under schedule 2 of EMCA, 1999 (Revised 2015) and in legal notice no. 31 of April 30, 2019, that categorized Earth Dams as medium risks projects among projects requiring an ESIA. The EIA assessed the baseline environment condition and predicated the possible negative impacts and mitigation measures and an environmental management plan for the proposed project.

## Project Justification

The proposed dam project is justified by the persistent water scarcity experienced by the local community, which has significantly affected their livelihoods, health, and socio-economic well-being. Currently, residents rely on a semi-permanent water source located several kilometers away, forcing households to travel long distances in search of water for domestic use and livestock. This situation places a heavy burden on community members, particularly women and children who are primarily responsible for water collection. The time spent fetching water also reduces opportunities for children to attend school regularly and limits the time available for other productive activities.

The limited access to reliable and safe water has also exposed the community to health risks, as many households are sometimes forced to use contaminated water sources. This has resulted in the occurrence of water-related diseases and compromised overall community health. Additionally, the lack of adequate water has led to frequent livestock losses, which directly affects household income and food security since livestock rearing forms a key livelihood activity in the area.

Furthermore, the absence of a dependable water source has constrained the community's ability to engage in agricultural production. Many households are unable to practice crop farming due to inadequate water availability, which has contributed to food insecurity and increased vulnerability to drought and climate variability.

The proposed dam will provide a reliable and accessible water source for domestic use, livestock watering, and potential agricultural activities. Improved water availability will enhance livelihoods by supporting small-scale farming, improving livestock productivity, and creating opportunities for alternative economic activities such as fish farming. The project will also reduce the time and effort spent fetching water, improve hygiene and sanitation, and support better education outcomes for children. The project is expected to enhance the resilience, productivity, and well-being of the community while promoting sustainable water resource management through community ownership and participation.

## ESIA Methodology

Desk study and field investigations were conducted. The process included: collection of baseline data to describe the status of the project site before project implementation commences; data analysis and evaluation; public participation to the neighbouring communities and person that are likely to be affected by the proposed project; and preparation of an ESIA Comprehensive project report encompassing the details specified in the Environmental Impact Assessment/Audit Regulations (2003) revised in 2015 and its subsequent amendments in 2019 vide legal notice No. 30 and 31.

## Policy, Legal and Regulatory Framework

The proposed construction of the Kebenonin Earth Dam is anchored within Kenya's national environmental and development policy framework and complies with applicable legal and institutional requirements. The project is governed by the Environmental Management and Co-ordination Act (EMCA), 1999 (revised 2015), which regulates ESIA processes in Kenya. In accordance with the Second Schedule of EMCA (as amended by Legal Notice No. 31 of April 2019), the project is classified as a Category (2) ***Medium Risk Projects***, thus requiring the preparation of a **Comprehensive Project Report**.

The proposed construction of the Kebenonin Earth Dam is aligned with Kenya's national environmental and development policy framework and complies with the relevant legal and institutional requirements governing environmental management. The project is guided by the **Environmental Management and Co-ordination Act (EMCA), 1999 (revised 2015)**, which regulates Environmental and Social Impact Assessment (ESIA) processes in Kenya. In accordance with the **Second Schedule of EMCA (as amended by Legal Notice No. 31 of April 2019)**, the project falls under medium-risk activities requiring the preparation of a Comprehensive Project Report.

The project also aligns with the **African Development Bank (AfDB) Integrated Safeguards System (ISS)**, which provides the environmental and social safeguard framework for AfDB-supported projects, ensuring that potential environmental and social risks are adequately assessed and managed. In addition, the project is consistent with relevant national policies and legislation, including the Water Act 2016, Water Resources Management Rules 2007, Occupational Safety and Health Act 2007, Public Health Act, and the Physical and Land Use Planning Act 2019. Institutional oversight by the National Environment Management Authority (NEMA), the Water Resources Authority (WRA), and the Baringo County Government, together with the participation of the local community, will ensure regulatory compliance, effective stakeholder engagement, and the long-term sustainability of the project.

## Public Consultation and Participation

Consultation and public participation have been undertaken to gather environmental data, understand likely impacts, determine community and individual preferences, select project alternatives and design viable and sustainable impact mitigation measures. More so the study also collected views from the vulnerable groups within the project location, including women and youth.

The consultant conducted key informant interviews with various stakeholders from the both the County and National Government agencies as well as from the respective communities. Public consultations with local community was held between Kapkurmat and Kamugele Villages on 26th February, 2026. A total of 39 community members (3 Female, 36Male and 16 youth) attended the ESIA public meeting. A total of 15 questionnaires were administered and completed during the public meetings. Members of the public were consulted through public participation meeting in order to gather their views on various aspects as well as creating awareness on the proposed project. The members in attendance were mainly Kebenonin Earth Dam Community Members surrounding the Proposed Earth Dam in Kapkurmat_Kamugele Sub Location comprising elders, women, youth and the local administration.

## Project Impacts and Mitigation Measures

The proposed **construction of the Kebenonin Earth Dam** is a key intervention aimed at mitigating the impacts of drought by improving water availability for both domestic use and livestock. By restoring the storage capacity of the Earth Dam, the project will enhance water security for the surrounding communities and pastoral livelihoods, particularly during prolonged dry periods when alternative water sources are scarce.

The project is expected to generate significant socio-economic benefits by ensuring a more reliable and sustainable water source. Increased water availability will support livestock

productivity and small-scale livelihood activities, thereby strengthening household incomes and food security. In addition, easier access to water will reduce the time and physical burden associated with water collection, particularly for women and youth, enabling them to engage in other productive and social activities. Overall, the project will contribute to improved community resilience to climate variability and recurring drought conditions.

To ensure that these benefits are realized sustainably, the project incorporates a comprehensive framework for mitigating potential environmental and social impacts. During the construction phase, mitigation measures such as controlled site clearance, dust suppression, proper waste management, and advance community notification will be implemented to minimize disturbances such as soil erosion, noise, and temporary disruption of water access.

For the operational phase, the project design includes the installation of silt traps, fencing of the Earth Dam, and the implementation of catchment management practices to reduce siltation and protect water quality. Additionally, a Dam Safety and Crisis Action Plan will be developed to manage potential safety risks associated with the Earth Dam structure. Social safeguards will also be integrated, including measures to prevent Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA), promotion of local employment opportunities, and community sensitization on child protection and responsible resource use.

Through this balanced approach of maximizing socio-economic benefits while proactively addressing potential environmental and social risks, the Kebenonin Earth Dam project is expected to provide a sustainable and resilient water resource that will significantly improve the well-being and adaptive capacity of the Kapkurmat_Kamugele community in the face of recurrent drought.

## Environmental and Social Management Plan

The cost of implementing the Environmental and Social Management Plan (ESMP) will be **Ksh 2,185,000.00.** Implementation of the pre-construction and construction Phase of the ESMP will cost **Ksh. 1,280,000.00** and should be included as part of construction cost and loaded into the contract. For the annual operations a cost estimate of **Ksh. 1,675,000.00** should be set aside for monitoring and trainings, this should be spearheaded by the **Kapkurmat_Kamugele Community Group** and the **Proponent** and an estimated cost of **Ksh. 230,000.00** for decommissioning phase is projected.

## Conclusion and Recommendation

There was upmost acceptability and goodwill from the community living in the project area for the proposed project. Some of the positive impacts identified by the community included; access to clean water for domestic and irrigation purposes, Employment,

increased development in the area, capacity building and awareness campaigns benefits, improved skills from local workers, Increased local incomes and Economic growth. Their key concerns were; opportunity for employment for local labourers, water borne diseases, accidents, Earth Dam safety and associated social immorality. Mitigation measures have been proposed for every negative impact raised in construction, operation and decommissioning under the environmental and social management plan (ESMP) for consideration in this various stage of the proposed project. The following are some of the recommendations for the proposed project.

a) The mitigation measures proposed should be followed by the proponent as it is highlighted in this comprehensive project report.
b) The design, construction and operation should be carried out in accordance to the specific report for the proposed project.
c) A complete audit be undertaken by the proponent and submitted to NEMA every year after commissioning of the project to ensure that all the proposed mitigation measures have been complied with.
d) Local Employment: Prioritize hiring local community members for unskilled and semi-skilled jobs. Skilled workers can be sourced externally.
e) Worker Safety:
    - Provide appropriate Personal Protective Equipment (PPE) such as gloves and gumboots.
    - Insure all workers through the Work Injury Benefits Act (WIBA).
f) Site Safety: Install proper signage, control site access, and raise community awareness to prevent accidents involving children and livestock.
g) Environmental Restoration: Minimize vegetation clearance and rehabilitate disturbed areas after construction.

In conclusion, the positive impacts outweigh the negative impacts. The listed negative impacts can be corrected with the proposed mitigation measures and it is our recommendation that the proposed project be allowed to proceed.

# 1. INTRODUCTION

## 1.1 BREFONS Project Background

The BREFONS project, part of the Program to Build Resilience for Food and Nutrition Security in the Horn of Africa, represents a crucial initiative in Kenya's ongoing efforts to address food security challenges exacerbated by climate change. BREFONS, funded through a loan facility from the African Development Bank (AfDB), builds upon the successful groundwork laid by previous projects like the Drought Resilience and Sustainable Livelihoods Programme (DRSLP).

BREFONS marks the second phase of DRSLP in Kenya, aiming to enhance resilience and sustainable livelihoods further. Drawing on lessons learned from DRSLP-1, as well as projects like the Small-scale Irrigation and Value Addition Project (SIVAP) and Rural Livelihoods Adaptation to Climate Change (RLACC), BREFONS is uniquely positioned to leverage experience gained across different regions.

The overarching goal of BREFONS is to strengthen resilience against food and nutrition insecurity, climate change, and promote peace and security in the Horn of Africa. Key objectives include enhancing sustainable productivity and agropastoral production systems, increasing incomes from agropastoral value chains, and building adaptive capacity to climate change risks.

At the national level, the State Department for Crop Development under the Ministry of Agriculture & Livestock Development (MoALD) serves as the executing agency. Policy and implementation oversight are provided by a project steering committee chaired by the Principal Secretary of the State Department for Crop Development (PS-SDCD).

County Coordination Units (CCUs) oversee day-to-day project activities in the seven targeted counties: **Baringo,** Isiolo, Marsabit, Samburu, Turkana, West Pokot, and Garissa. These units play a critical role in ensuring effective implementation and coordination at the grassroots level.

The project comprises four major components, each designed to address specific challenges and deliver tangible outcomes:

1. **Strengthening Pastoral and Production Systems:** This component focuses on enhancing livestock and water infrastructure, including constructing/ rehabilitating **Earth Dams,** livestock saleyards, boreholes, livestock markets, and irrigation schemes.

2. **Supporting Agribusiness Development:** Activities under this component aim to empower agro-pastoral communities through capacity building in livestock insurance, technology adoption, and crop campaigns.
3. **Enhancing Adaptive Capacity to Climate Change:** Measures include disseminating climate information, strengthening partnerships for climate risk insurance, and capacity building for early warning systems.
4. **Project Management and Coordination:** This component emphasizes capacity building at institutional levels to ensure efficient project execution and mainstreaming of cross-cutting issues like environmental safeguards and gender equality.
5. **Project Impact and Sustainability:** The expected outcomes of BREFONS are diverse, ranging from increased agricultural productivity and job creation to improved climate resilience among farmers and pastoralists. By targeting nearly 183,000 households across seven counties, the project seeks to create lasting impacts on food security and livelihoods in Kenya's vulnerable regions.

These objectives align with Kenya's commitment as a signatory to the United Nations Framework Convention on Climate Change (UNFCCC). Embracing climate-smart agriculture becomes instrumental in achieving national goals of food security, productivity, income generation, and reducing greenhouse gas emissions.

In complying with the Kenyan development regulations, the proponent commissioned the Experts to prepare this Environmental and Social Impact Assessment (ESIA) Comprehensive Report for the ***Proposed Construction of Kebenonin Earth Dam in Baringo County, in Kapkurmat_Kamugele Village, Kapturo Sub Location, Bartum Location, Ribkwo Ward, Baringo West Sub County; Baringo County.*** The report provides the project background as well as an assessment of the associated beneficial and adverse environmental and social impacts of the development.

## 1.2 Background of the Kebenonin Earth Dam Sub Project

The proposed dam project is intended to address the persistent water scarcity experienced by the local community. For many years, residents in the area have faced significant challenges in accessing reliable and safe water for domestic use, livestock, and agricultural activities. Due to the absence of a dependable nearby water source, community members are often forced to walk long distances in search of water, frequently relying on the semi-permanent **Toisaror River**, located approximately six kilometers away. This situation has placed a considerable burden on households, particularly women and children who are primarily responsible for water collection.

The prolonged water shortages in the area have led to numerous socio-economic and health challenges. Community members have reported frequent cases of livestock mortality due to lack of adequate water, which has negatively affected livelihoods since livestock keeping forms a key economic activity in the area. In addition, many households have had to rely on contaminated water sources, resulting in the spread of water-related diseases among residents. Children are also affected, as they often miss school while assisting their families in fetching water, which disrupts their education and overall well-being.

The lack of a reliable water source has further limited the community's ability to engage in agricultural production. Many residents indicated that they are unable to fully practice crop farming due to inadequate water availability, which has contributed to food insecurity in the area. Consequently, the community has remained highly vulnerable to the effects of drought and climate variability.

The proposed dam project therefore presents an important opportunity to improve water availability and enhance the livelihoods of the community. Increased access to water is expected to support productive activities such as small-scale crop farming and livestock rearing, while also creating opportunities for additional livelihood options such as fish farming. Furthermore, the project is expected to reduce the time spent fetching water, improve hygiene and sanitation, and enable community members especially the youth to engage more actively in education and other socio-economic activities. The project is designed to be community-owned and managed, with the active participation and cooperation of local residents being essential for its successful implementation and long-term sustainability.

The Environmental and Social Impact Assessment (ESIA) process for the project includes stakeholder consultations and public participation to ensure that the views, concerns, and suggestions of the local community and other interested parties are incorporated into the project design and implementation. The construction of the Kebenonin Earth Dam is therefore expected to provide a sustainable solution to the water challenges experienced in the area while promoting community ownership and long-term sustainability of the facility.

## 1.3 Justification for the Environmental Comprehensive Project Report

The preparation of an **Environmental and Social Impact Assessment (ESIA) Comprehensive Project Report (CPR)** for the proposed **Kebenonin Earth Dam Sub-Project** is necessary to ensure that the project is implemented in an environmentally sustainable and socially responsible manner. The proposed project involves the

**construction of an Earth Dam**, activities that may generate both positive and negative environmental and social impacts during the construction and operational phases. Undertaking the ESIA study is therefore essential to identify potential environmental and social risks and impacts, and to propose appropriate mitigation and management measures to minimize adverse effects while enhancing the anticipated benefits of the project.

The requirement to undertake an environmental assessment is also guided by the **Government of Kenya's environmental policy and legal framework**, which requires that projects likely to have environmental and social implications undergo environmental assessment during the planning stages. This ensures that environmental considerations are integrated into the **design, construction, operation, and eventual decommissioning** of the project. In this regard, the preparation of this Comprehensive Project Report complies with the provisions of the **Environmental Management and Coordination Act (EMCA), No. 8 of 1999 as amended in 2019**, and its associated regulations. Specifically, projects falling under the **Second Schedule of EMCA**, including water resource development projects such as dams and Earth Dams, require environmental assessment and approval by the **National Environment Management Authority (NEMA)** prior to implementation.

In addition, the preparation of this ESIA report is aligned with the **African Development Bank (AfDB) Integrated Safeguards System (ISS)**, which requires that all projects financed or supported by the Bank undergo appropriate environmental and social due diligence. In particular, the study has been undertaken in line with the relevant **AfDB Operational Safeguards**, including **Operational Safeguard 1 (Environmental and Social Assessment)**, **Operational Safeguard 2 (Involuntary Resettlement, Land Acquisition, Population Displacement and Compensation)**, **Operational Safeguard 3 (Biodiversity, Renewable Resources and Ecosystem Services)**, **Operational Safeguard 4 (Pollution Prevention and Control, Hazardous Materials and Resource Efficiency)**, and **Operational Safeguard 5 (Labour Conditions, Health and Safety)** where applicable to the sub-project. These safeguards aim to ensure that development interventions supported by the AfDB promote **environmental sustainability, social inclusion, and improved livelihoods for beneficiary communities**.

Furthermore, the preparation of this Comprehensive Project Report was informed by the **environmental and social screening process** undertaken for the sub-project and the guidance provided by the **County Director of Environment (CDE)** and the ESIA consulting team. The screening exercise identified the project as one requiring a

**Comprehensive Project Report** in order to adequately assess the potential environmental and social impacts and recommend appropriate mitigation measures.

The ESIA process also facilitates **public participation and stakeholder engagement**, which are key requirements under both the **Kenyan environmental regulatory framework and the AfDB safeguards system**. Through this process, local communities, project affected persons, and other stakeholders are given an opportunity to provide their views, concerns, and recommendations regarding the proposed project. Their input helps to inform project planning and ensures that the project is implemented in a manner that is socially acceptable, environmentally responsible, and sustainable.

Overall, the preparation of this Environmental and Social Impact Assessment Comprehensive Project Report is justified as a critical step toward ensuring **regulatory compliance, environmental protection, stakeholder inclusion, and alignment with AfDB environmental and social safeguard requirements**, while supporting the long-term sustainability and resilience of the Kebenonin Earth Dam Sub-Project.

## 1.4 ESIA CPR Scope, Objective and Methodology of the ESIA

### 1.4.1 Objectives of the ESIA

The principal objective is to highlight the possible positive and negative environmental and social impacts expected during the establishment and operation of the proposed project, with the aim of proposing the possible mitigation measures to the negative impacts. This is in line with ensuring that such a development does not negatively impact the environment in terms of social, health, economic and physical (soil, water, plant and animals) state of the area. The CPR identified the possible environmental impacts during the construction, implementation and operational phases of the project. The exercise was carried out in accordance with the National Environmental Management Authority (NEMA) Environmental Impact Assessment and Audit Regulations and guidelines.

In brief, the specific objectives of the study were to:

i. Describe the proposed project including the technology to be used.
ii. Collect, collate and present baseline information (Physical environment; Biological environment and Socioeconomic and cultural environment)
iii. Identify impacts, both positive and negative, the direct, indirect, cumulative, irreversible, short- term and long-term effects anticipated; and identify mitigation measures.
iv. Carry out stakeholders' participation and consultations to collect the concerns, expectations, and opinions of affected, concerned and interested stakeholders.
v. Prepare a comprehensive Environmental Management Plan (EMP)

vi. To present results of the ESIA in such a way that they can guide in informed decision-making.

## 1.5 Data Collection Procedures and Methodology

The Consultant first undertook environmental screening and scoping to avoid unnecessary data. The data collection was carried out through questionnaires (See sample, ***Appendix 3***), observations and photography, site visits, desktop environmental studies and scientific tests where necessary in the manner and criteria specified in Part V (section 31-41) of the Environmental (Impact Assessment and Audit) Regulations, 2003.

The report applied an inter alia approach incorporating environmental, social, cultural, economic, safety and health impacts of the project. The integrated nature of the impacts review ensured all possible negative impacts were identified and adequately mitigated. Given that nature and magnitude of the ***Proposed Construction of Kebenonin Earth Dam Sub Project,*** a Comprehensive Environmental Impact Assessment Project Report, was opted for to ensure comprehensiveness and completeness of the assessment. The methodology followed during the assessment was as follows:

### 1.5.1 Environmental Screening

According to the 2nd schedule of Environmental Management and Coordination Act (EMCA Cap 387) – amendment via legal notice no. 31 – April 2019, the ***Proposed Construction of Kebenonin Earth Dam Sub Project*** lies within Category (2) ***Low Risk Projects.*** The screening process revealed that anticipated environmental issues would be minimal. Therefore, the proponent – **National Government of Kenya; Ministry of Agriculture & Livestock Development (MoAL&D) - Program to Build Resilience for Food and Nutrition Security in the Horn of Africa (BREFONS)** in collaboration with the County Government of Garissa - through an Environmental Consultants undertook an Environmental Impact Assessment to submit a **Comprehensive Project Report (CPR)** pursuant to Regulation 7 (1) of the Environmental (Impact Assessment and Audit) (Amendment) Regulations, 2019.

Further, the **African Development Bank (AfDB) environmental and social risk classification** was also considered in relation to the proposed **Construction of the Kebenonin Earth Dam Sub-Project**. Under the **AfDB Integrated Safeguards System (ISS)**, projects are classified into environmental and social risk categories (Category 1, Category 2, Category 3, and Category 4) based on the nature, scale, and potential magnitude of their environmental and social impacts.

Based on the environmental and social screening undertaken for the proposed sub-project, the **Kebenonin Earth Dam construction project is considered a medium-risk intervention** involving construction of an existing water infrastructure with limited footprint and localized impacts. In line with the AfDB ISS screening criteria, the project would therefore fall under **Category 3**, which typically includes projects expected to have **minimal or negligible adverse environmental and social risks and impacts**.

### 1.5.2 Desktop Study

Desktop study included documents review on the nature of the proposed activities, project documents including designs, policy and legislative framework as well as the environmental setting of the area among others. Key documents reviewed included the following: Kenya policies, strategies and guidelines; National and County laws and regulations; applicable Multilateral Environmental Agreements (MEAs) and World Bank social and environmental safeguard policies.

### 1.5.3 Physical Inspection of the Site and Surrounding

Physical inspection of the proposed site which included field investigation at site and surrounding areas was done between **23rd February, 2026 and 28th February, 2026.** The field investigations were meant for physical inspections of the site characteristics and the environmental status of the surrounding areas to determine the anticipated impacts from the project.

### 1.5.4 Public Participation

Public participation was undertaken through a combination of public consultation meetings, administration of questionnaires, and key stakeholder and informant interviews. These approaches were applied to ensure that the views, concerns, and suggestions of the affected communities and other interested parties were adequately captured during the Environmental and Social Impact Assessment (ESIA) process. Questionnaires were administered to project stakeholders, neighbouring households around the proposed Kebenonin Earth Dam site, and other surrounding enterprises *(Appendix 3).* The information collected from these engagements was analyzed and incorporated into the ESIA Comprehensive Project Report.

Considering the nature of the proposed project and its potential environmental and social impacts, a **major public consultation meeting** was conducted with members of the Kebenonin Earth Dam community and neighbouring residents. The meeting was held on 26th February, 2026. A total of 39 community members (3 Female, 36 Male and 16 youth) attended the ESIA public meeting. Further, key informant interviews/

consultations were conducted to incorporate views from key stakeholders as described in chapter 6.

## 1.6 Data Analysis, Documentation and Report Structure

The Environmental Impacts Assessment report was compiled from the findings in accordance with the EIA guidelines issued by NEMA for Comprehensive Project Report. The Consultant ensured constant briefing of the proponent during the exercise.

The exercise culminated with the production and documentation of this Comprehensive Project report designed to ensure that the proposed development complies with the Environmental Management and Coordination Act (EMCA, Cap 387). The report structure is organized in 9 chapters as outlined below: -

- **Chapter 1: Introduction:** *Gives Background Information to the Study Describing the Objectives and the Terms of Reference.*
- **Chapter 2: Project Description:** *Description of Project Site.*
- **Chapter 3: Baseline Information:** *Outlines the Baseline Information of the Study Area.*
- **Chapter 4: National Policy, Legal and Institutional Framework:** *Describes the overarching government regulations, laws, policies, and institutions relevant to the project's environmental and social considerations.*
- **Chapter 5: Analysis of Project Alternatives:** *Evaluation of project alternatives (Design, location, materials and technology).*
- **Chapter 6: Public Participation and Stakeholder Consultation:** *Summarizes the outcome of the Stakeholder Engagement and Public Consultations process.*
- **Chapter 7: Anticipated Impacts and Mitigation Measures:** *Assessment of the issues likely to arise as a result of implementation of the proposed project*
- **Chapter 8: Environmental and Social Management & Monitoring Plan (ESM&MP)**
- **Chapter 9: Conclusion and Recommendation:** *Concludes the findings and recaps the main recommendations.*
- **References**
- **Appendices**

# 2. PROJECT DESCRIPTION

## 2.1 Overview

This chapter presents a comprehensive description of the proposed project, focusing on the engineering design, selected construction materials, and associated technical specifications. The project design is supported by scaled drawings and plans duly prepared and signed by a qualified engineer. The chapter further outlines the key project activities anticipated during the construction, operation, and decommissioning phases, with due consideration to environmental and social safeguards at each stage. It includes the project layout and design details, a description of proposed activities, and an estimated cost for implementing the project within the proposed area.

## 2.2 Project Scope

Based on the detailed engineering design and the Bill of Quantities (BoQ), the comprehensive scope of works for the Kebenonin Earth Dam Construction Project is defined as follows:

1. **Civil and Earthworks**
    - Site clearance, grubbing, and topsoil stripping along the dam centerline, from chainage 0+200 to 0+12260, as indicated on the existing ground level profiles.
    - Excavation and construction of the existing reservoir to achieve the designed storage capacity of 21,800 m³.
    - Construction of the embankment, including foundation preparation, core trenching, and layer-wise compaction of fill material. The embankment will have a maximum depth of 5.5m.
    - Excavation and shaping of the spillway, complete with a cattle ramp.
    - Construction of a reinforced concrete intake structure, with details for reinforcement bar placement as per standard specifications.
2. **Hydromechanical and Water Abstraction System**
    - Supply and installation of the draw-off piping system, including the intake pipeline.
    - Construction of a draw-off outlet structure to facilitate controlled abstraction for domestic and irrigation use.
    - Installation of seepage control measures, including an impervious reinforced concrete (RC) membrane. The membrane section will be 4000mm wide, incorporating vertical bars and horizontal bars.
    - Construction of a water kiosk with tap stands for community water access.
    - Construction of a cattle trough for livestock watering.

- Laying of distribution pipelines from the dam to the water kiosk and cattle trough as per the BoQ.
- Provision of all necessary valves, fittings, and air vents to ensure a functional and safe water abstraction system.

2. **Ancillary Structures**
   - **Water Kiosk:** Construction of a masonry structure with a reinforced concrete roof, a PVC storage tank, and water taps.
   - **Cattle Trough:** Construction of a reinforced concrete watering trough (e.g., 10,000mm long with 2,000mm overhangs as per complete with stone pitching, a 50mm GI washout pipe with gate valve, and ball valves on the supply line. The trough foundation will include compacted hardcore and a 1:2:4 RC concrete mix with reinforcement details such as D10-200V and D8-200B2. A cut-off drain (ditch) sloping at 0.05 will be constructed uphill of the trough to divert surface runoff.
   - **Security Fencing:** Erection of a perimeter chain-link fence (approx. 680 m). The fence will utilize reinforced concrete posts (150mm x 100mm) with mass concrete footings (1:2:4 mix). Fencing details include diagonal bracing at every 30m interval and steel gates, as per the provided fencing drawing.
3. **Professional Services & Compliance**
   - Full-time professional supervision by a qualified engineer.
   - Preparation and submission of project progress reports.
   - Implementation of the Environmental and Social Management Plan (ESMP).
   - Preparation of project completion reports and as-built drawings.
   - Detailed design drawings and specifications are provided in the **BoQ**.

## 2.3 Detailed Project Activities

### 2.3.1 Pre-Construction Phase Activities

1. **Site Mobilization and Establishment**
   - Clearance of vegetation and topsoil stripping.
   - Setting up contractor's camp, offices, and storage facilities.
   - Installation of project signboard and safety signage.
   - Establishment of erosion control measures.
2. **Environmental and Social Safeguards Implementation**
   - Activation of Environmental and Social Management Plan (ESMP).
   - Dust suppression systems setup.
   - Establishment of grievance redress mechanism.

- Community sensitization on construction activities.

### 2.3.2 Construction Phase Activities

1. **Earthworks and Embankment Construction**
   - **Reservoir Excavation:** Removal of silt and overburden to achieve a total capacity of 21,800 m³, guided by the existing ground levels at specified chainages.
   - **Embankment Construction:**
     - Foundation preparation and core trench excavation.
     - Layer-by-layer placement of fill material to a maximum depth of 5.5m.
     - Compaction to specified density.
     - Slope formation and trimming.
   - **Spillway Construction:**
     - Excavation and shaping of the spillway channel, integrated with a cattle ramp.
   - **Silt Trap Construction (Provisional):**
     - Excavation of 20m × 25m × 2m trap.
     - Installation of stone pitching for erosion control.
2. **Hydromechanical Works**
   - **Intake System Installation:**
     - Construction of the reinforced concrete intake tower and shallow well, with reinforcement as per standard details.
     - Installation of the intake pipeline.
   - **Impervious Layer Construction:**
     - Placing of the reinforced concrete membrane as a seepage barrier, ensuring correct placement of T12 reinforcement bars at 150mm centers.
3. **Ancillary Structures Construction**
   - **Water Kiosk:** Foundation works, masonry construction, and installation of PVC storage tank and taps.
   - **Cattle Trough:** Construction of reinforced concrete trough (approx. 10m long) with a 1:2:4 mix, installation of 25mm GI ball valves and a 50mm washout pipe, and placement of surrounding stone pitching on a 0.05 slope.
   - **Security Infrastructure:**
     - Excavation of holes and concreting of foundations for fence posts.

- Erection of 680 m perimeter fencing with 4.5mm galvanized high tensile chain-link wire.
- Installation of steel gates (main and pedestrian) with 50mm bush hinges.
- Installation of concrete posts (150mmx100mm) with diagonal bracing at corners and every 30m interval.

## 2.4 Dam Capacity

The construction of Kebenonin Earth Dam is designed with a total storage capacity of **21,800 cubic meters (m³)** at Full Supply Level (FSL). This capacity was determined through detailed topographic surveying and hydrological analysis. The reservoir will have a maximum water depth of **5.5 meters**. This capacity is designed to meet the projected multi-purpose water demands of the beneficiary community, supporting domestic use, livestock watering, and small-scale irrigation.

## 2.5 Material and Equipment

The inputs to implementing the proposed project are human labour, plant and machinery, fuel, solar water pump, concrete, self-regulatory water valves, chain link, steel sections, and paints.

- **A. Construction Materials**
  - **Earthworks:** Sandy clay (on-site and borrowed as needed), stone for pitching and masonry works.
  - **Concrete:** Cement, sand, aggregate, and reinforcement steel (e.g., T12, D10, D8 bars as per RC Impervious Layer-Impervious xsection (A2).pdf) for structural elements. Concrete mix ratios for mass concrete footings and reinforced concrete are specified as **1:2:4** on the drawings.
  - **Steel Sections:** 100mm x 100mm x 4mm RHS poles, 50mm x 25mm x 1.5mm RHS frames, and 25mm x 25mm x 1.5mm SHS for gates as per the structural details.
  - **Piping & Fittings:** Galvanized Iron (GI) pipes (25mm, 50mm), gate valves, ball valves, jointing materials, and protective sleeves as detailed in auxiliary structure drawings.
  - **Fencing:** 4.5mm galvanized high tensile chain-link wire, 150mm x 100mm reinforced concrete posts, steel gate components, and mass concrete for footings.
  - **Finishes:** Cement plaster, paint, and damp-proof materials where specified.
- **B. Plant and Equipment:** The construction will require, but is not limited to, the following equipment:

- **Earth Moving:** Excavators, bulldozers, graders, and dump trucks.
- **Compaction:** Sheepsfoot rollers and smooth drum rollers for embankment compaction.
- **Concrete Works:** Concrete mixers, vibrators, and bar-bending/cutting tools.
- **General:** Water bowsers, generators, welding machines, and hand tools.

- **C. Operational Equipment**
  - Cattle trough with associated fittings, water kiosk components, and the solar-powered pumping system.

All materials will be sourced from certified suppliers and must meet the specifications outlined in the design report and relevant Kenyan standards.

## 2.6 Project Activities Categories

The activities associated with the proposed project have been categorized under four phases: planning, construction, operation, and closure/decommissioning.

- **Planning Phase Activities:** Community mobilization, tendering services, site handover, and handover of drawings and plans.
- **Construction Phase Activities:** Mobilization, setting out works, site clearance and topsoil stripping, earthworks, excavations, construction of all structures (including the RC impervious membrane, intake, fencing with diagonal and corner bracing), drainage works, and final handover.
- **Operation Phase Activities:** Operationalizing the water trough, draw-off system, community water point, and water kiosk.
- **Decommissioning Phase Activities:** Demolition of structures, removal of materials, and site landscaping and re-vegetation.

## 2.7 Proposed Project Cost

The costs of ***Construction of Kebenonin Earth Dam*** are estimated at **Kenya Shillings, Thirty-Nine Million Four Hundred Ninety-Six Thousand Two Hundred Twenty Shillings and Fifty Cents. Only. (KSh. 39,496,220.50)** which includes the cost of preliminaries, excavation of the reservoir, spillway and established of ancillary facilities.

# 3. BASELINE INTRODUCTION

## 3.1 Preamble

This section describes a brief of the project location including the map area of the specific site location with land ownership details, possibility of environmentally sensible areas, supportive environmental infrastructures with a validation to land conformity in accordance with the existing land use plan in the area.

## 3.2 Project Location

The proposed Kebenonin Earth Dam is situated within Baringo County, an arid and semi-arid region in the former Rift Valley Province of Kenya. The project site is administratively located in **Kapkurmat and Kamugele Villages, Kapturo Sub Location, Bartum Location, Ribkwo Ward, Baringo West Sub County; Baringo County.**

The geographical coordinates of the project site are approximately **Latitude 0.904549° N and Longitude 35.813624° E, at an elevation of 1,455 meters above sea level.**

*Figure 3:1: Location Map of the project area*

## 3.3 Physiographic and Natural Conditions

### 3.3.1 Physical & Topographic Features

The broader project area is characterized by varying elevation levels ranging between approximately **889 m and 1,979 m above sea level**, indicating a landscape with significant altitudinal variation. The proposed dam site is located at a mid-level elevation within this range, which allows for the natural accumulation of surface runoff from the surrounding higher ground areas. These elevation gradients play an important role in directing runoff water toward lower-lying sections of the catchment where the dam is proposed to be constructed.

The topography of the area generally consists of **gently undulating to moderately sloping terrain**, interspersed with localized depressions and seasonal drainage channels. The higher elevation areas surrounding the site form part of the catchment that contributes runoff during rainfall events, while the lower sections serve as natural collection points for surface water. This topographic arrangement is suitable for the development of a water storage structure such as a dam, as it allows efficient harvesting and retention of runoff water.

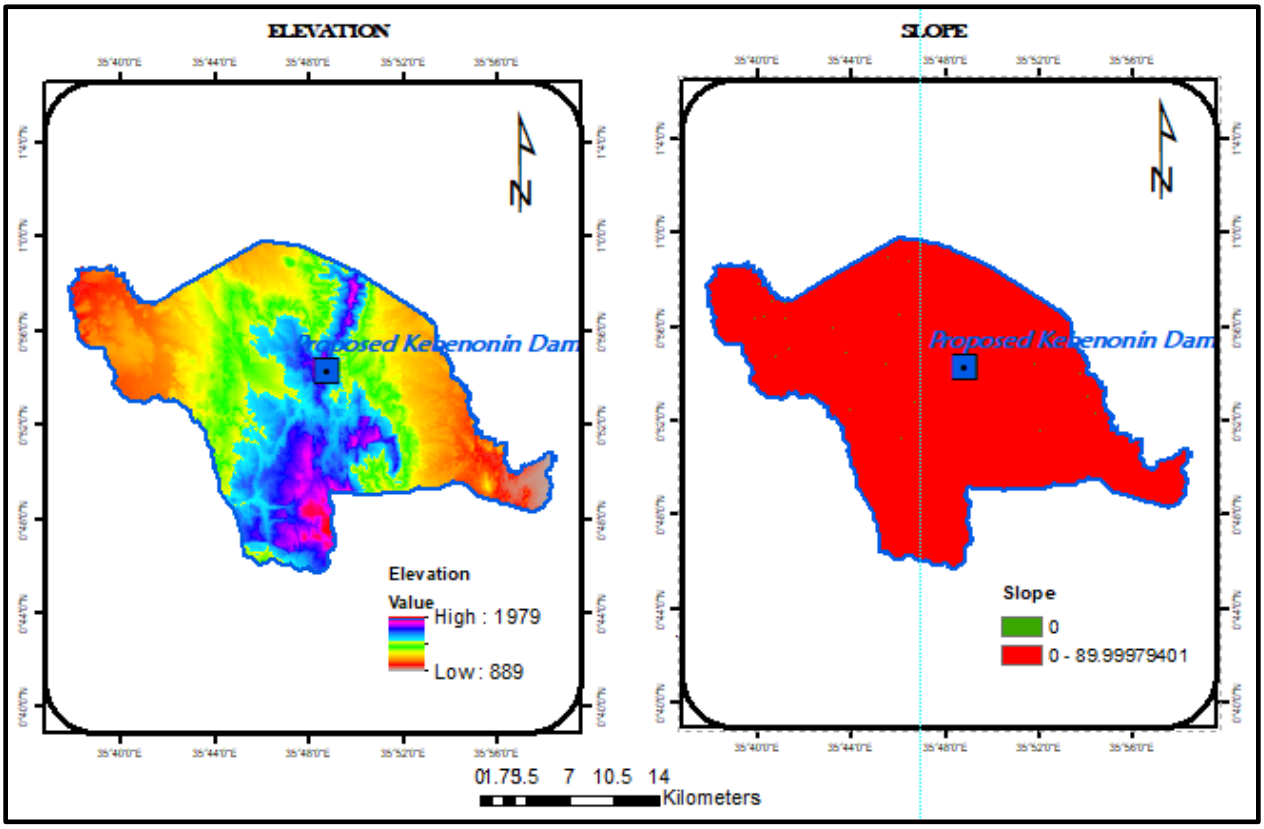


*Figure 3:2:Topography of the project area*

Natural drainage patterns in the area are primarily seasonal, with surface runoff flowing through small ephemeral streams and drainage paths that feed into the proposed dam site during rainy periods. These drainage characteristics enhance the potential of the site to capture and store water for community use. The terrain around the project area is predominantly open, supporting grazing activities and limited subsistence farming where water availability permits.

The physical and topographic characteristics of the Kebenonin Dam site are favorable for water harvesting and storage. The moderate slopes, natural drainage systems, and the site's mid-slope elevation position provide suitable conditions for the construction and sustainable operation of the proposed dam.

### 3.3.2 Geology and Soils

The geology of the project area is typical of the wider Baringo region, which is characterized by formations associated with the Rift Valley geological system. The area generally consists of sedimentary and volcanic deposits that have undergone weathering over time, resulting in the development of clay-rich soils. These geological formations influence the soil structure, drainage characteristics, and the suitability of the site for water storage structures.

The soils within the proposed project area are predominantly **very clayey in texture**, with a **kaolinitic clay mineral composition**. Kaolinitic clays are typically formed through the intense weathering of feldspar-rich rocks and are characterized by relatively stable mineral structures. These soils generally exhibit moderate to low swelling potential compared to other clay types and tend to have good structural stability when properly compacted.

*Figure 3:3: Soils and general topography of the project area*

Due to the high clay content, the soils have **low permeability**, which reduces the rate of water infiltration and makes them suitable for water retention. This characteristic is particularly advantageous for dam construction, as clayey soils can contribute to reducing seepage losses from the reservoir when adequately compacted during construction. The presence of such soils therefore enhances the suitability of the site for water harvesting and storage.

However, clayey soils may also present some challenges during construction, especially during the rainy season when they become highly plastic and difficult to handle. Proper engineering practices such as controlled excavation, compaction, and drainage management will therefore be required to ensure stability of the dam embankment and associated structures.

Overall, the clayey and kaolinitic nature of the soils in the project area provides favorable conditions for the construction of the proposed dam, particularly in terms of water retention and embankment stability when appropriate construction techniques are applied.

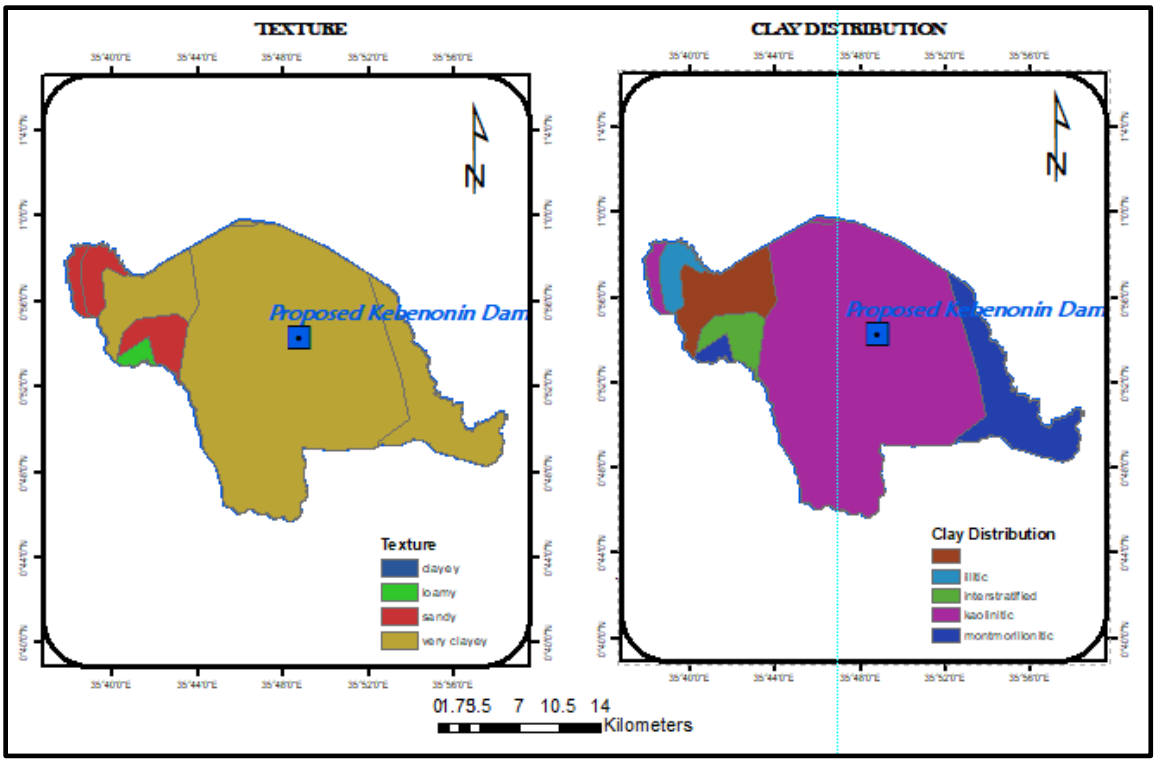


*Figure 3:4: Soil Texture and Clay Distribution*

### 3.3.3 Biodiversity

The project site is situated in Kapkurmat/Kamugele village, Bartabwa Ward, Baringo West Sub-County. Baringo County is widely recognized for its great ecological diversity,

providing habitat for a wide variety of flora and fauna across its contrasting landscapes, from the forested Tugen Hills to the arid lowlands.

- **Ecological Context**

The project site lies within an arid to semi-arid zone, characteristic of most parts of Baringo County, including Baringo West. The local vegetation in such zones is typically dominated by **acacia trees and shrubs**, which are well-adapted to the dry conditions. Rainfall in these areas ranges between 300 mm and 500 mm per annum. The biodiversity of the area is part of a larger ecosystem that includes critical habitats, community conservancies, and wildlife corridors that support both resident and migratory species.

- **Flora (Plant Life)**

The vegetation around the proposed dam site is expected to be predominantly composed of drought-resistant **acacia species and shrubs**. The broader county is home to several threatened indigenous tree species, including **African oak and sandalwood**, which are under pressure from exploitation. In the highland areas of the county, which are not far from the project's general location, one finds indigenous forests with species such as **red cedar and fig trees**. These forests are crucial for providing habitat and maintaining water catchments. Community-led conservation efforts in the county, such as those in the Mangar Conservancy, focus on conserving indigenous trees like **tamarind and various acacias**, highlighting the regional importance of these species.

- **Fauna (Animal Life)**

Baringo County is a haven for wildlife, and while the immediate dam site may not host large populations, it is part of a wider ecosystem that supports numerous species. The area is likely to be a habitat for, or a corridor for, a variety of animals.

**Mammals:**

The greater kudu, the county's emblem, is a flagship species found in many parts of Baringo, including the highlands and conservancies near the proposed project area . Other mammals that may be present or pass through the area include:

- **Antelopes:** Lesser kudu, dik-diks, and impala.
- **Primates:** Vervet monkeys, and in some forested pockets, the endangered **black and white colobus monkeys** .
- **Large Mammals:** Leopards, spotted hyenas, and zebras are also part of the county's wild variety, though they are more commonly found in the larger protected areas and conservancies . The Ruko Conservancy, for example, is known for its successful reintroduction of the endangered **Rothschild's giraffe**.

**Reptiles:**

The county hosts a variety of reptiles, including different species of snakes and tortoises. The leopard tortoise, with its distinctive spots, is one of the notable species, alongside the pancake tortoise. Crocodiles are present in the perennial water bodies like Lake Baringo and its influent rivers.

**Avifauna (Birds):**

Baringo County is globally renowned as a birdwatcher's paradise, with Lake Baringo alone hosting over 470 bird species. The project area, being in a riverine and depression zone, is likely to support a variety of birdlife. The region's bird species include:

- **Water-associated birds:** African fish eagle, marabou storks, African darter, and various herons.
- **Terrestrial birds:** Ostriches (the world's largest bird), hornbills, guinea fowls, and eagles.
- **Migratory Birds:** The region, including Lake Bogoria, is a key habitat for hundreds of thousands of **lesser and greater flamingos**.
- **Ecosystem Services and Conservation Context**

The biodiversity in the area provides essential ecosystem services. Forests and woodlands act as water catchments, which is critical for a dam project. For example, the Morop Tarambus Conservancy in the highlands supplies fresh water to Kabarnet town and has an artificial dam, demonstrating the link between upland forest conservation and water availability. Furthermore, the region's plants have significant cultural and medicinal value, with local communities utilizing over 200 species of trees for traditional medicine.

The proposed dam site is within a landscape increasingly managed through **community conservancies**, which aim to protect biodiversity while supporting sustainable livelihoods. These conservancies help restore degraded ecosystems and protect critical habitats for diverse flora and fauna, thereby increasing healthy habitats for wildlife species

### 3.3.4 Climatic Conditions

The proposed Kebenonin Earth Dam site is located in Baringo West Sub-County, within the larger Baringo County, which experiences a **semi-arid to arid climate** characteristic of Kenya's Great Rift Valley region. The county's climate is shaped by its position within the Rift Valley, with variations influenced by altitude, where the lowlands are generally hotter and drier compared to the more temperate highlands.

- **Temperature**

Temperatures in Baringo County are generally warm to hot throughout the year, with minimal seasonal variation but significant diurnal (day-night) variation. The average temperatures across the county range from a minimum of **10°C to a maximum of 35.0°C** in different parts.

For the general Baringo area, the hottest period occurs from late January to early April, with average daily high temperatures exceeding **33°C** . March is typically the warmest month, with average highs of **33-34°C** and average lows of **18-19°C**. The cooler months are from late June to early September, when average daily high temperatures drop below **30°C**, with the coolest period centered around July and August. During these months, nighttime temperatures can be significantly cooler, often dropping to **15-18°C**.

More localized data from the nearby town of Kabarnet, the county capital, provides further insight into monthly temperature variations relevant to the project area:

- **Rainfall and Seasons**

The project area experiences a bimodal rainfall pattern, with two distinct rainy seasons interspersed with dry periods. A long-term study (1981-2020) in the nearby Lake Bogoria landscape, which shares similar climatic characteristics, recorded a **mean annual rainfall of 814 mm** . The study also noted a statistically significant increasing trend in rainfall over the four decades, coupled with high interannual variability. This variability is typical of semi-arid environments and has implications for water resource management and agricultural planning.

The seasonal patterns are defined as follows:

- **Long Rains (March to May):** This is the wettest period of the year, with April typically being the wettest month, receiving significant rainfall. These rains are crucial for recharging water sources but can also make roads and terrain difficult to navigate.
- **Dry Season (June to October):** This is the longest dry spell, characterized by minimal rainfall, clear skies, and warm days with cooler nights. It is an ideal period for construction activities.
- **Short Rains (November to December):** A period of shorter, less intense rainfall that brings a second greening of the landscape.
- **Hot and Dry (January to February):** A brief, intensely hot and dry period before the onset of the long rains.
- **Other Climatic Factors**

- **Sunshine and Cloud Cover:** The region experiences significant seasonal variation in cloud cover. The cloudiest period is during the long rains, particularly April, while the clearest skies are typically observed in September.
- **Wind:** Average wind speeds also vary seasonally. The windier period is from October to April, with March being the windiest month (average speeds of up to 13.1 km/h). The calmest period is from April to October, with July typically being the calmest month. The prevailing wind direction is predominantly from the east for most of the year.
- **Implications for the Project**

The climatic conditions have direct implications for the Kebenonin Earth Dam project:

- **Construction Planning:** The dry seasons (June to October and January to February) provide the most suitable windows for earthworks and construction, as heavy rainfall during March-May and November-December can hinder access, delay earthmoving, and affect compaction quality.
- **Dam Design and Yield:** The bimodal rainfall pattern and total annual rainfall are key inputs for calculating the dam's anticipated yield and designing the spillway to safely manage peak flood flows during the rainy seasons. The long-term rainfall trend and variability must be considered to ensure the dam's design capacity remains resilient to potential future climate fluctuations.
- **Water Availability:** The seasonal nature of rainfall means the dam will play a critical role in storing water from the wet seasons for use throughout the prolonged dry periods, supporting both community water supply and livestock.

## 3.4 Socio-economic Environment

### 3.4.1 Population

According to the 2019 Kenya Population and Housing Census (KPHC) conducted by the Kenya National Bureau of Statistics (KNBS), Baringo County has a total population of **666,763 persons**. This population comprises 336,322 males, 330,428 females, and 13 intersex persons, indicating a relatively balanced gender distribution across the county . The county has an annual population growth rate of **2.6%** and a population density of approximately **60 persons per square kilometer**.

**Sub-County and Ward Level Population**

The proposed Kebenonin Earth Dam is located in **Baringo West Sub-County** (administratively part of Baringo North Constituency), specifically within **Bartabwa Ward**. The population distribution for the relevant administrative units is as follows:

*Table 3:1: Sub-County and Ward Level Population*

| Administrative Unit | Population (2019 Census) |
|---|---|
| **Baringo North Sub-County** | **104,871** |
| *Bartabwa Ward* | *6,920 (adult population)* |

*Source: KNBS 2019 Census*

The population data indicates that Bartabwa Ward has an estimated adult population of **6,920 persons**, which forms the primary demographic base for the project area. This population is predominantly rural, with livelihoods centered around livestock rearing and subsistence agriculture, as characteristic of the larger Baringo North region .

**Ethnic Composition**

The project area is predominantly inhabited by the **Tugen community**, who are a sub-tribe of the larger Kalenjin ethnic group. The Tugen people in this area include sub-groups such as the Samor and Chapchap . Other communities present in Baringo County that may have representation in the project area include the **Pokot, Ilchamus (Njemps), Endorois, Turkana, and Kikuyu**. The Endorois community, in particular, is recognized as a minority group within the county with historical ties to the Lake Bogoria region

## 3.5 Infrastructure and Access

This section provides an overview of the existing infrastructure and access conditions within the project area, drawing from the background information and the broader context of Baringo West Sub-County.

### 3.5.1 Road Network and Accessibility

The proposed Kebenonin Earth Dam site is located in Kapkurmat/Kamugele village, within Bartabwa Ward. The area's road network consists primarily of **murram and earth roads**, which are often rough and subject to seasonal weather conditions. During the dry seasons, the roads are generally passable, providing essential links to market centers and neighboring towns. However, during the rainy seasons (particularly March to May and November to December), these roads can become **impassable or highly challenging** for motorized traffic, including vehicles transporting construction materials. This seasonal inaccessibility presents a significant consideration for project planning, requiring construction activities to be scheduled primarily during dry periods. The terrain around the dam site may also require the construction of temporary access roads or tracks to facilitate the movement of earthmoving equipment and machinery during the construction phase.

### 3.5.2 Water Infrastructure

The project area is characterized by a **severe lack of reliable water infrastructure**, which forms the primary rationale for the proposed dam. As noted in the project background, the community currently relies heavily on the **semi-permanent Toisaror River**, located approximately six kilometers away. This distance places a significant burden on households, particularly women and children, who must travel long journeys, often multiple times a day, to collect water for domestic use and livestock.

There is a notable absence of piped water schemes, boreholes, or protected springs in the immediate vicinity of the proposed dam. The lack of these facilities forces community members to rely on surface water sources that are often unreliable and of questionable quality. The semi-permanent nature of the Toisaror River means it may dry up during extended dry periods, exacerbating water scarcity and forcing residents to seek alternative, often more distant and potentially contaminated, sources. This situation underscores the critical importance of the proposed dam as a foundational piece of water infrastructure for the community.

### 3.5.3 Energy and Communication

Access to modern energy and communication services in the project area is limited but gradually improving.

- **Electricity Supply:** The project area falls within the broader Baringo County, which has a low national grid connectivity rate. In 2019, only **21% of households in the county had access to electricity**, with a significant disparity between urban (71%) and rural (17.2%) areas . The project site, being in a rural location, likely falls within the latter category, where most households rely on alternative sources such as **kerosene lanterns, solar home systems, and dry-cell batteries** for lighting . The proximity of the proposed dam to the national grid is unknown and will require verification during detailed project planning.
- **Communication Networks:** Mobile phone coverage in Baringo County has expanded in recent years, though connectivity can be variable in the more remote and hilly areas. The county has several telecommunication masts (both mobile and FM), and most of the population lives within range of a mobile signal . However, access to **internet services remains limited**, particularly in rural areas, with only **4.9% of county residents having internet access** at home as of 2019 . Community members who need internet services often rely on mobile data or travel to urban centers like Kabarnet.

### 3.5.4 Social Infrastructure

Social infrastructure in the project area, including education and health facilities, is present but may be under-resourced relative to the population.

- **Education Facilities:** Baringo County has a network of educational institutions, including primary schools, secondary schools, and vocational training centers . The immediate project area may have one or more primary schools serving the local community. However, the long distances children must travel to access education can be a barrier. The project background highlights that children, particularly boys, are sometimes required to assist with livestock herding, while others may miss school to help with water collection, disrupting their education .
- **Health Facilities:** Access to healthcare in rural Baringo is often constrained by distance and poor road infrastructure. The county has a tiered system of health facilities, including dispensaries, health centers, and hospitals . The nearest health facility to the proposed dam site is likely a dispensary, which may offer basic outpatient services. However, for more comprehensive care, residents may need to travel to Marigat or Kabarnet towns. The project background notes that reliance on contaminated water sources has led to the spread of **water-related diseases** among residents, indicating a clear link between water infrastructure deficits and public health challenges.

### 3.5.5 Water Supply

As described in Section 3.5.2, the existing water supply situation in the project area is precarious and inadequate. The primary sources of water are:

1. **The Semi-Permanent Toisaror River:** Located approximately six kilometers from the community, this is the main source but is unreliable, especially during dry seasons.
2. **Other Surface Sources:** This may include small streams, springs, or hand-dug wells, which are often unprotected and prone to contamination.
3. **Seasonal Ponds:** During the rainy seasons, temporary ponds may form, providing a nearby but unsafe source of water.

The lack of a reliable, safe, and proximate water source has profound implications for the community's health, livelihoods, and overall well-being. The situation creates a significant time burden, particularly on women and girls, exposes the population to waterborne diseases, and limits economic productivity. The proposed dam is therefore

not merely an infrastructure project but a critical intervention to address a fundamental development deficit.

### 3.5.6 Electricity Supply

Access to electricity in the project area is limited, consistent with the rural electrification statistics for Baringo County. While some households may have adopted **solar home systems** for basic lighting and phone charging, connection to the national grid is not widespread. The lack of reliable electricity constrains economic activities, limits access to information and communication technology, and affects the quality of life. For the proposed dam, the absence of grid power may necessitate the use of **solar-powered pumping systems** for water abstraction, which aligns with sustainable and off-grid solutions.

### 3.5.7 Sanitation and Waste Management

Sanitation infrastructure in rural Baringo is typically basic. Many households rely on **pit latrines**, as indicated by project documents referencing pit latrine construction . However, coverage is not universal, and open defecation may still occur in some areas. The quality of pit latrines can vary, and improper construction or maintenance can lead to groundwater contamination, posing a public health risk.

Waste management systems are largely absent in the formal sense. Most household waste is disposed of through **on-site methods** such as burning, burying, or open dumping. There are no organized waste collection services in the rural areas of the county. The lack of proper sanitation and waste management infrastructure contributes to environmental degradation and increases the risk of disease transmission, particularly when combined with unreliable water supplies.

### 3.5.8 Communication and Social Infrastructure

This section consolidates information on communication and social infrastructure, which are intertwined in rural development.

- **Communication:** As noted, mobile phone coverage is expanding, but internet access remains a luxury for most. The primary means of communication within the community is face-to-face interaction, with mobile phones used for essential coordination. Community meetings, often led by local elders or administrative chiefs, remain the primary platform for disseminating information and making collective decisions.
- **Social Infrastructure:**
    - **Community Meeting Points:** Villages often have designated meeting areas, such as under a large tree or at a local market, where gatherings are held.

These spaces are crucial for community mobilization and project sensitization.

- **Religious Facilities:** Churches are common in the region and serve as important social and spiritual centers.
- **Markets:** Local markets, while not permanent structures, provide essential points for trade and social interaction, where community members can access goods and exchange information.

### 3.5.9 Overall Access

Overall, access to infrastructure and services in the proposed Kebenonin Dam project area is characterized by **significant deficits**. While some services exist, they are often distant, unreliable, or of poor quality. The key challenges are:

- **Geographic Isolation:** The distance to basic services like water, markets, and health facilities is a major barrier.
- **Seasonal Impassability:** The poor road network becomes a critical constraint during rainy seasons, cutting off access to essential services and markets.
- **Lack of Basic Utilities:** Limited access to electricity and clean water hampers development and affects health and education outcomes.
- **Weak Social Infrastructure:** While community structures exist, formal education and health facilities are likely under-resourced and may not adequately serve the population.

The proposed dam project directly addresses the most critical of these deficits water supply. Its successful implementation, combined with complementary interventions in other sectors, has the potential to significantly improve overall access and quality of life for the community. The project's community-owned and managed approach also aims to strengthen local social infrastructure and build resilience for the future.

# 4. NATIONAL POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

## 4.1 General Overview

This chapter looks at the policy, legal and institutional framework that governs environmental and social management of the proposed Kebenonin Earth Dam project.

## 4.2 Policy Framework

### 4.2.1 Kenya Constitution 2010

Article 42 states "every person has the right to a clean and healthy environment, which includes the right a) to have the environment protected for the benefit of present and future generations through legislative and other measures, particularly those contemplated in Article 69, and b) to have obligations relating to the environment fulfilled under Article 70". Chapter 5 provides the main pillars on which the 77 environmental statutes are hinged and covers "Land and Environment" and includes the aforementioned articles 69 and 70. The Chapter seeks to eliminate processes & activities likely to endanger the environment.

*In this ESIA CPR and the ESMMP the proponent has taken prior measures in ensuring the project contributes to a clean and healthy environment for the community in Bartabwa Ward. Through the ESMMP proponent has captured all the concerns raised through the public participation and consultations for redress.*

### 4.2.2 Vision 2030

Vision 2030 is being implemented through a series of five-year Medium-Term Plans (MTP). The MTP identifies the key policy actions and programmes for each Ministry Department and Agency (MDA). The overall goal of the Environment, Water and Sanitation Sector as outlined in the Vision is to attain a "clean, secure and sustainable environment" by 2030. Kenya vison 2030 includes equity as a recurrent principle in economic, social and political programmes. Special attention has been given to investment in arid and semi-arid (ASAL) counties, communities with high incidence of poverty, unemployed youth, women, and all vulnerable groups.

*The construction and maintenance of Earth Dams align with the Vision's goals by providing essential water storage solutions that ensure a reliable supply of water for domestic consumption, particularly in ASAL regions. This supports the Vision's objectives of promoting sustainable development, improving living standards, and addressing the needs of vulnerable populations. By investing in water infrastructure like Earth Dams, Vision 2030 aims to enhance water security, reduce the burden of water scarcity, and contribute to the overall socio-economic development of communities.*

### 4.2.3 Agricultural Sector Transformation and Growth Strategy (ASTGS 2019–2029)

The Agricultural Sector Transformation and Growth Strategy (ASTGS 2019–2029) aims to enhance food security, nutrition, and farmer incomes through climate-smart agriculture, improved water management, and strengthened agricultural value chains, particularly in arid and semi-arid areas.

*In summary, the Kebenonin Earth Dam construction is a practical implementation of the ASTGS at the community level. It integrates climate resilience, improved water management, and support for key agricultural value chains to deliver tangible food security and economic benefits to the people of Kapkurmat_Kamugele Village.*

### 4.2.4 National Gender and Development Policy, 2000

The policy outlines the national agenda for gender equality and how Kenya intends to realize these ideals. The National Gender and Development Policy, 2000 purposes to promote the constitution national values and principles of governance.

*This Policy will be applied in project implementation especially during hiring of staff to be involved in the project, procuring of suppliers, sub consultants and sub-contractors. The project will strive to achieve equality of opportunity and outcomes with respect to access to and control of national and county resources and services; and equality of treatment that meets the specific and distinct needs of different categories of women and men.*

### 4.2.5 Policy on Gender and Sexual Based Violence 2017

The purpose of this policy is to put in place a framework to accelerate implementation of laws, policies and programmes for prevention and response to SGBV. The overall objective of the policy is to progressively eliminate sexual and gender-based violence through the development of a preventive, protective, supportive and transformative environment.

*The project proponent has put in place plans through the ESMMP to develop and implement a SGBV action plan with an Accountability and Response Framework as part of the Contractor-ESMP (C-ESMP) and administration of the whole project cycle.*

### 4.2.6 The National Environmental Sanitation and Hygiene Policy-2016-2030

The Policy is devoted to environmental sanitation and hygiene in Kenya as a basic right, public service and an economic good with major contribution to the dignity, health, welfare, social well-being and prosperity of all Kenyan residents. It demands the scaling up of access to improved rural and urban sanitation facilities by county governments as sanitation is a devolved function.

The implementation of the Policy will greatly increase the demand for sanitation, hygiene, food safety, improved housing, use of safe drinking water, waste management, vector control at the household level and encourage communities to take responsibility for improving the sanitary conditions of their immediate environment.

Under Policy Strategy # 2: assuring clean and healthy environment free from public nuisances, it demands adequate systems for managing wastewater treatment and seeks the protection of wetlands and water courses under threat from indiscriminate disposal of waste through provision of adequate targeted services in areas close.
*The proposed project already covers this through the initiative to construct new sanitation facilities at the Earth Dam to avoid contamination of the water source. The Earth Dam also contributes towards achievement of this policy through provision of safe water to area residents for livestock and domestic consumption.*

### 4.2.7 National Food and Nutrition Security Policy (NFSP)

It is the policy of the Government that all Kenyans should enjoy at all times safe food and water in sufficient quantity and quality to satisfy their nutritional needs for optimal health. Access to food and safe water is linked to national security, development and contributor to rural income. The lack thereof water is seen as prohibitive to food security, thus government pledge to promote and support sustainable water management systems and investment in infrastructure, including water storage facilities.

*By increasing the capacity and functionality of the Kebenonin Earth Dam, the project will help support livestock production, small-scale farming, and domestic water use, which are key components of local food systems. Improved water availability contributes to better livestock health, increased agricultural productivity, and enhanced household food security, thereby aligning with the policy's goal of ensuring sustainable access to food and water resources.*

### 4.2.8 The BETA Agenda

The BETA Agenda, as espoused in the Kenya Kwanza manifesto, was meant to provide inclusive growth so that even the mama mboga and bodaboda can feel the growth. A hustler fund was launched to rehabilitate the majority of these individuals so that their credit scores can be worthy before financial institutions.

*Water system as an enabler for this and driver of economic growth and food security.*

### 4.2.9 National Environment Policy (NEP) 2013

The policy sets out important provisions relating to the management of ecosystems and the sustainable use of natural resources, recognizing fresh waters are part of the country's critical ecosystems due to their capacity to store water for various uses.

Under water and sanitation as a key aspect of environmental quality and health, the policy notes that Seasonal and regional water scarcity exacerbates the difficulty to improve water supply. The government therefore pledges to improve the management and conservation of water supply sources.

It also requires infrastructural projects to undergo Environmental and Social Impact Assessment. In addition, public participation in the planning and approval of the proposed project is mandatory.

*Further the proposed project helps assist the government meet its obligation towards improve the management and conservation of water supply sources. The project will also fully comply with this policy through optimal utilization of resources in improving the quality of human environment.*

### 4.2.10 The National Land Use Policy (NLUP) - Sessional Paper, No. 1 of 2017

The National Land Use Policy guides Kenya towards an environmentally and socially responsible use of land and allied resources for socio-economic transformation of the people of Kenya. Its mission is to promote best land use practices for optimal utilization of the land resource in a productive, efficient, equitable and sustainable manner. The principal objective of the NLUP is to provide legal, administrative, institutional and technological framework for optimal utilization and productivity of land and land related resources in a sustainable and desirable manner at National, County and Sub-county and other local levels.

*The proposed project will contribute to achievement of this policy's mission through implementation of sustainable land management practices such as tree planting, terracing and storm water harvesting.*

### 4.2.11 Kenya National Youth Policy 2006

This Policy aims at ensuring that the youth play their role alongside adults in the development of the Country. The National Youth Policy visualizes a society where youth have an equal opportunity as other citizens to realize their fullest potential.

*The proposed Earth Dam development Project will provide direct employment to the youth as required by the Policy. The Youth Employment Programme will be used in the implementation of the ISLMP in the Kebenonin watershed.*

### 4.2.12 National Policy on Water Resources Management and Development - Sessional Paper Number 1 of 1999.

The National Water Policy of Kenya was developed in 1999 as the National Policy on Water Resources Management and Development (NWP 1999) and was amended in 2012 (draft still). The NWP 1999 aims to achieve sustainable development and management of the water sector by providing a framework and policy direction for the

sector: Treat water as a social and economic good; Preserve, conserve and protect all available water resources and allocate it in a sustainable, rational and economical way; Supply of water of good quality and in sufficient quantities to meet the various water needs including poverty alleviation, while ensuring safe disposal of wastewater and environmental protection etc.

*Construction of Kebenonin Earth Dam is an initiative towards Water Resources conservation and meeting government's obligation towards supply of water of good quality and quantities to its citizens for poverty alleviation.*

### 4.2.13 The National Occupational Safety and Health Policy, 2012

The main objective of this policy is to establish National occupational safety and health systems and programmes geared towards the improvement of the work environment. The Policy seeks to reduce the number of work-related accidents and diseases, and equitably provide compensation and construction to those injured at work or who contract occupational diseases. It thus requires employers to ensure safety and health at workplace, establishment of safety and health committees at workplaces, conduct training on occupational safety and health and report accidents, diseases and other dangerous occurrences to relevant authorities.

*The contractor will be given a copy of the ESMP to develop contractor-ESMP for compliance during construction including provision of PPE, erection of signages at critical points, sealing the Dam construction area to avoid unauthorized entry and accidents*

### 4.2.14 National Land Policy

The Policy designates all land in Kenya as Public, Community or Private. Through the policy, the government will ensure that all land is put into productive use on a sustainable basis by facilitating the implementation of key principles on land use, productivity targets and guidelines as well as conservation.

*The land in use is classified as community (public land) and reserved for purposes of the Earth Dam. Construction of the Dam ensures the land is put into productive use.*

### 4.2.15 Baringo County HIV and AIDS Strategic Plan 2016/2019

The Baringo County HIV and AIDS Strategic Plan 2016–2019 was developed to guide the county's multisectoral response to HIV in alignment with national frameworks. Its objectives include reducing new HIV infections, improving health outcomes for people living with HIV, reducing HIV-related stigma and discrimination, strengthening integrated services and systems, enhancing data use, increasing domestic financing, and promoting accountable leadership in the HIV response. The strategy also guides

collaborations among government, partners, and communities to deliver accessible and quality HIV services.

*The proponent will refer to this strategic plan in planning and implementing HIV/AIDS measures in this CPR and ESMP, including identifying relevant stakeholders for engagement and aligning project interventions with the strategic objectives.*

## 4.3 Relevant Legislative Framework

### 4.3.1 Environmental Management and Coordination Act (EMCA) 1999

According to legal Notice No. 31 & 32 of 2019, the Environmental Management and Coordination Act 1999 (NO. 8 of 1999) Amendments of the second schedule the proposed construction of the Kebenonin Earth Dam is categorized a community project and low risk project. The new regulation provides for preparation and submission **of Comprehensive Project reports (CPR)** for low-risk projects. Section 58 (1) of the act requires that the proponent of the low-risk project shall before commencement of the project prepare and submit to the Authority an environmental impact assessment through an EIA expert of the likely environmental impacts of the project for approval.

*In carrying out the ESIA and preparing this CPR the requirements of these regulations and those of the African Development Bank Environmental and Social Safeguards have been integrated and followed throughout the process. The proponent did the screening and scoping then as advised by the NEMA office commissioned this CPR. The proponent will observe the guidelines as set out in the ESMMP laid out in this CPR in the avoidance of adverse impacts arising from the project activities.*

#### *4.3.1.1 EMCA (Waste Management Regulations 2006)*

This regulation gives guidelines on both operational and administrative activities that are used in handling, packaging, treatment, condition, storage, and disposal of waste and is implemented by NEMA. It prohibits anyone from disposing of any waste on any part of the environment except in designated waste receptacle or facility provided by the relevant authority which may be legitimate dumpsites or landfills. Since the proposed project will generate waste in form of waste soils and other solid wastes this act provides for the waste generator to be responsible for the collection, segregation at source and proper disposal of their wastes.

*In this CPR and the ESMMP the proponent has provided measures for managing waste generated through the proposed project. Measures to be undertaken for proper waste disposal include clearance of non-reusable and recyclable waste and disposing off in designated disposal site. Reusing excavated soil for Earth Dam embarkment.*

#### *4.3.1.2 EMCA (Noise & Excessive Vibration Pollution Control Regulations, 2009) Legal Notice 61*

This regulation prohibits any person from causing unreasonable, unnecessary, or unusual noise which annoys, disturbs, injures, or endangers the comfort, repose, health or safety of others and the environment. Part 11 section 6 (1) provides that no person shall cause noise from any source which exceeds any sound level as set out in the First Schedule of the regulations. It gives standards for maximum permissible noise levels for construction sites, mines, and quarries.

*The proponent through this CPR has established all the sources of noise and vibrations and has provided appropriate mitigation measures for compliance with outlined maximum levels provided for in this regulation. The chosen contractor will implement the measures provided for in the ESMMP (such as provision of ear muffles to workers and switching off engines or machinery when not in use)*

#### *4.3.1.3 EMCA (Water Quality) Regulations, 2006*

These Regulations apply to drinking water, water used for industrial purposes, water used for agricultural purposes, water used for recreational purposes, water used for fisheries and wildlife, and water used for any other purposes. Section 4 of the regulation which focusses on the protection of sources of water by preventing any form of pollution. Section 6 (1) of the regulation states that no person shall abstract groundwater or carry out any activity near any lakes, rivers, streams, springs and wells that is likely to have any adverse impact on the quantity and quality of the water, without an EIA license issued in accordance with the provisions of the Act.

*The Proponent has adhered to the provisions of this regulation to protect the proposed water resource from all possible sources of pollution during the construction and operation phase by carrying out this ESIA. The proponent has outlined water quality control measures in this CPR including proper waste disposal measures for oil spills and other wastes, proposed fencing of Earth Dam area, and provision of livestock troughs and communal water drawing point.*

#### *4.3.1.4 EMCA (Air Quality) Regulations, 2008.*

The objective of these regulations is to provide for prevention, control, and abatement of air pollution to ensure clean and healthy ambient air. The regulations provide for compliance with emission standards for various sources of air pollution including mobile

sources (e.g. motor vehicles) and stationary sources (e.g. industries) as outlined in the Environmental Management and Coordination Act of 1999.

*The proponent by this CPR and the ESMMP will ensure compliance with air quality regulations by enforcing all the proposed preventive and mitigation measures in the ESMMP e.g. proposed water sprays and mists to suppress dust, regular maintenance of vehicles and avoiding unnecessary vehicle and machinery movement.*

#### *4.3.1.5 Environmental Management and Co-Ordination (Fossil Fuel Emission Control) Regulations, 2006*

These Regulations set out emission standards for internal combustion engines and provide for the licensing of persons who treat fuel and for the appointment of environmental inspectors for purposes of emission inspection.

It states that any person who operates or owns an internal combustion engine and permits it to be operated upon any road, street, public highway or any premises, which emits smoke or other air contaminants in excess of emission standards set out in the First Schedule makes an offence

*All vehicles on site will be regularly serviced and maintained to ensure the set standards/limits for emissions are not exceeded.*

### 4.3.2 The Water Act, 2016 (The National and Storage Regulations, 2019)

This Act provides for the regulation, management and development of water resources and water and sewerage services in line with the Constitution.

The ACT establishes the Water Resources Authority ("Authority") among other institutions.

According to the regulations under this **ACT,** prior to constructing the waterworks, the owner or developer or other person charged with the mandate of developing, managing and or maintaining waterworks shall – **(a)** *Apply for and obtain a water use permit under the Water Resources Regulations 2019, and (b) Apply for and obtain an environmental impact assessment license under the Environmental (Impact Assessment and Audit) Regulations 2003 made under Environmental Management and Coordination Act 2015.* Works to be designed by Qualified Water Resources Professional. Works to be constructed by the appropriate category of contractors.

A monitoring and evaluation system for optimal use of the works to be put in place for safety, health, and environmental conservation. The developer to implement any other

measures necessary for the safe operation management of the waterworks according to the provisions of this regulation.

*The Proponent has undertaken the ESIA and developed this CPR as required by the provisions of the water act 2016. The proponent has undertaken hydrological assessment of the proposed Kebenonin Earth Dam during project design. This CPR has advised the proponent to obtain a written authorization/permit for the construction work. The Proponent will apply for the water use permit after the completion of the Dam and once filled with water.*

#### *4.3.2.1 Water Resources Management (Water) Rules 2006*

Requires persons intending to or currently undertaking any of the water use activities including construction of works to obtain approval from the Authority to undertake the activity

*The project shall apply and receive an authorization to construct works. Once construction commences supervision, management, and monitoring of the Earth Dam shall be in line with the regulation classification of the Earth Dam as low risk. After the successful implementation and operationalization of the project observations, surveillance, inspections, and continuing evaluation are required to assure the satisfactory performance of the water reservoir.*

### 4.3.3 The Public Health Act (Cap. 242)

Section 115 of the Act states that no person/institution shall cause a nuisance or condition liable to be injurious or dangerous to human health. The law requires that all lawful, necessary, and reasonably practicable measures be taken to maintain areas under jurisdiction clean and sanitary to prevent the occurrence of nuisance or condition liable for injurious or dangerous to human health.

*The proponent through this CPR and the ESMMP has defined the necessary measures to prevent the occurrence of conditions liable for injurious or dangerous to human health during the construction and the operation phase of the project. Proposed measures include ensuring OHS during construction; dust management through watering of ground; proper disposal of non-recyclable or non-reusable waste; and in operation, safe use of agricultural chemicals and water pollution control.*

### 4.3.4 The Physical Planning and Land Use Planning Act, 2019

The objectives of the Act are to provide the principles, procedures, and standards for the preparation and implementation of physical development plans at the national, regional, county, urban, and rural and cities level and provision of the procedures and

standards for development control and the regulation of physical planning and land use.

*The proposed project is located in Kebenonin watershed and is in harmony with existing land uses. By this CPR and the ESMMP the proponent has taken adequate measures such as waste water management, SLM such as terracing among others to ensure sustainable use of the land and water resource.*

### 4.3.5 Penal Code (Cap. 63)

This act addresses commission of offenses that are punishable by law. Section 191 of the Penal Code provides that any person or institution that voluntarily corrupts or fouls water for public springs or reservoirs, rendering it less fit for its ordinary use shall be guilty of an offense.

*The proponent in this CPR has identified all the relevant legislations in the proposed Earth Dam upgrading project and demonstrated compliance and on how further compliance will be attained.*

### 4.3.6 The Occupational Health and Safety Act, 2007

This requires that workplaces be kept safe for workers therein. Workers who are exposed to wet or any injurious or offensive substances are required under Section 101 of the Act to be provided with suitable protective clothing. The Act also generally provides for safety and health policies and programmes, workplace safety health and welfare conditions, occupational health and hygiene and welfare conditions.

*In this CPR in the ESMMP the proponent has put in place measures to be observed by the contractor during the construction and operation phase of the project to ensure the health and safety of workers and the community. The proponent will share the ESMMP with the contractor to enable the latter to develop a C-ESMMP which will be strictly followed during construction. A comprehensive occupational health and safety audits will be carried out periodically to ensure compliance with this Act.*

#### *4.3.6.1 Fire Risk Reduction Rules, 2007*

The rules require installation of electrical equipment in accordance with the respective hazardous area classification system. All flammable materials are stored in appropriately designed receptacles, electrical equipment is inspected after six months by a competent person and the Proponent is required to keep records of such inspections, installation and maintenance of firefighting systems in workplaces, fire drills at least once a year, assembly points be marked, undertake annual fire safety audits etc.

*The contractor will be required to store all flammable materials and liquids safely to avoid risk of fire.*

#### *4.3.6.2 Medical Examination Rules of 2005*

It requires workers on site to undergo regular medical examination to identify the symptoms of hazardous exposures on the body, especially those who handle food or food products. This is with a sole purpose of monitoring exposure for remedial action.

*The contractor will institute and implement regular medical examinations for its staff at the facility.*

### 4.3.7 Employment Act, 2007

Section.3. (1) States that this Act shall apply to all employees employed during the project implementation under a contract of service. Section 5 (3) demand that no employer shall discriminate directly or indirectly, against an employee or prospective employee or harass an employee or prospective employee on grounds of race, colour, sex, language, religion, political or other opinions, nationality, ethnic or social origin, disability, pregnancy, mental status or HIV status.

*The Proponent through the contractor will make sure that fairness and gender equity are followed during the recruitment of the labour force to be used during the construction phase. Preference will be given to the local community for both skilled and unskilled labour.*

### 4.3.8 Work injury benefits Act, 2007

Section.7. (1) Require that the proponent to obtain and maintain an insurance policy, in respect of any liability that the employer may incur under this Act to any of his employees.

*The proponent will ensure the engaged contractor is qualified, registered and licensed for the excavation of the Earth Dam; and should ensure that those employed are well insured. The contractor will also provide requisite PPEs to the workers and the latter will always be required to wear these.*

### 4.3.9 National Construction Authority Act (2011)

The National Construction Authority Act, Number 41 of 2011 streamlines, overhauls and regulates the construction industry in Kenya. The Act contains provisions on the quality and safety standards of any construction work.

*The Proponent will ensure the engagement of a registered and qualified contractor as*

*required under the water act for the construction of the project. The proponent will ensure that regular site meetings by all the relevant stakeholders are held to oversight the work. The work site will be registered with Director of Occupational Safety and Health (DOSH)*

### 4.3.10 National legal provisions on Gender, HIV/AIDS and Gender Based Violence (GBV) and Sexual Exploitation and Abuse (SEA)

#### *4.3.10.1 The Sexual Offences Act of 2006 (The Sexual Offences (Amendment) Bill, 2016)*

This is an Act of Parliament to make provision about sexual offences, their definition, prevention and the protection of all persons from harm from unlawful sexual acts, and for connected purposes. Makes provision about sexual offences aims at prevention and the protection of all persons from harm from unlawful sexual acts and for connected purposes. Section 15, 17 and 18 focuses mainly on sexual offences on minor (children).

*The Proponent will develop and implement a SEA action plan with an Accountability and Response Framework (ARF) as part of the Construction-ESMP (C-ESMP). The SEA action plan will follow guidance on the World Bank's Good Practice Note for Addressing Gender-based Violence in Investment Project Financing involving Major Civil Works (Sept 2018) and National policies and regulations on SEA.*

#### *4.3.10.2HIV and AIDS Prevention and Control Act No. 14 of 2006*

This legislation provides measures for the prevention, management and control of HIV and AIDS, to provide for the protection and promotion of public health and for the appropriate treatment, counselling, support and care of persons infected or at risk of HIV and AIDS infection, and for connected purposes.

Among the purposes of this Act as outlined in section 3 (a) is to promote public awareness about the causes, modes of transmission, consequences, means of prevention and control of HIV and AIDS; and (d) to positively address and seek to eradicate conditions that aggravate the spread of HIV infection. Section 7 makes provision for HIV and AIDS education in the workplace in this case even the informal workplace is included.

*This proponent in this ESIA CPR has captured HIV/AIDS as a risk in the proposed project and through the ESMMP provided adequate measures. The HIV Policy will be complied with during implementation of the Project; the Contract will incorporate in Bid Document and implement HIV awareness initiatives during construction of the Project.*

### 4.3.11 The National Museums and Heritage Act 2006

This is an Act of Parliament to consolidate the law relating to national museums and heritage; to provide for the establishment, control, management and development of national museums and the identification, protection, conservation and transmission of the cultural and natural heritage of Kenya; to repeal the Antiquities and Monuments Act (Cap. 215) and the National Museums Act; and for connected purposes.

This Act aligns with the African Development Bank's **Integrated Safeguards System (ISS)**, particularly **Operational Safeguard 3 (OS3): Biodiversity, Renewable Resources and Ecosystem Services**. OS3 recognizes that the preservation of cultural heritage, including sites, landscapes, and practices with historical, archaeological, or traditional significance, is often closely linked to the conservation of biodiversity and the sustainable management of natural resources. The safeguard requires that projects financed by the AfDB avoid or minimize impacts on natural habitats and associated cultural values, and where avoidance is not possible, implement appropriate mitigation measures.

In accordance with both the National Museums and Heritage Act and AfDB OS3 requirements, the project will implement the following measures:

- **Chance Find Procedures:** The Contractor will adhere to the standard chance find procedures outlined in **Appendix 7** should any previously unknown heritage resource be accidentally encountered during project construction. These procedures ensure that any discovery of archaeological, paleontological, or cultural heritage sites is reported to the relevant authorities (National Museums of Kenya) and that appropriate measures are taken to protect and manage the find before any further work proceeds in the affected area.
- **Cultural Heritage Screening:** During the pre-construction phase, the project site will be screened for any visible or known cultural heritage features that could be affected by project activities, in line with both national law and AfDB requirements for due diligence on cultural heritage.

*The Contractor will follow the chance find procedures outlined if previously unknown heritage resource is accidentally encountered during the project construction period. (See Appendix 7 for the chance find procedure in Kenya).*

### 4.3.12 Malaria Prevention Act (CAP 246)

Article **23.** (1) of the Act states unless with the written consent of a health authority, a person shall not, within an area subject to the control of a health authority— *(a)* build or maintain a dam or other construction so as to obstruct the flow of water into or out

of a drain under the control of the health authority; *(b)* alter the level of water so as to reduce the flow of water; or *(c)* construct a step, bridge or platform over a drain under the control of a health authority. 24. (1) A person shall not, within an area subject to the control of a health authority, plant trees or cultivate land in such a manner as is likely, in the opinion of a health authority, to obstruct the flow of water in, into or out of a drain or culvert under the control of a health authority.

*The Proponent has adequately provided measures (such as sensitize the community on use of treated mosquito nets, local spraying and bush clearing near households) for the prevention and control of malaria.*

### 4.3.13 County Government Act No. 17 of 2012

The Act provides for county governments' powers, functions and responsibilities to deliver services and for connected purposes. It covers matters of planning, placing the responsibility of planning within counties and mandating them to coordinate integrated development planning. One of the objectives of county planning is to ensure productive use of scarce land, water and other resources for economic, social, ecological and other functions across a county.

PART VIII of the Act provides for a wide variety of matters relating to public administration at local level including Citizen Participation principles such as timely access to information, data, documents, and other information relevant or related to policy formulation and implementation among others.

*The proposed project is taking place on land planned and set aside for water resources purposes by the county.*

*The Proponent has complied with the principle of citizen participation as the identification of this project is through a community Participatory Integrated Community Development (PICD) process. Further the community was involved through the planning, screening, designing and ESIA process. The proponent will continue to engage the community throughout the project cycle.*

### 4.3.14 Land Act 2012

It is the substantive law governing land in Kenya and provides legal regime over administration of public and private lands. It also provides for the acquisition of land for public benefit. The government has the powers under this Act to acquire land for projects, which are intended to benefit the general public.

This Act provides for the procedure to be followed during compulsory acquisition of land by the Government and the just compensation which should be paid promptly and in full to all persons whose interest in land has been affected.

*The Earth Dam is constructed located on a land parcel that is categorized as community land held in trust by the County Government of Baringo and therefore no land acquisition is anticipated.*

### 4.3.15 Energy Act 2019

PART VIII provides for energy efficiency and Conservation of energy resources. The Act advocates for project owners to develop, promote and manage in collaboration with other agencies, the use of renewable energy and technologies.

*The project complies through an inbuilt solar system for the shallow well- comprising of a solar pump delivering water to elevated plastic water tanks complete with all its accessories, pipes and controllers.*

### 4.3.16 The Standards Act CAP 496

This Act promotes the standardization of the specification of commodities, and provides for the standardization of commodities and codes of practice to ensure public health and safety. It establishes the Kenya Bureau of Standards (KEBS) and defines its functions as related to:

- promotion of standardization in industry and commerce; and
- Making arrangements or provision of facilities for the testing and calibration of precision instruments, gauges and scientific apparatus, for the determination of their degree of accuracy by comparison with standards approved by the Minister on the recommendation of the Council, and for the issue of certificates in regard thereto.

*This means that the contractor under the supervision of the county engineer will ensure that all materials used on site adheres to the highest standards and do not pose any human health and safety risk.*

### 4.3.17 Climate Change Act number 11 of 2016

An act for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development. It requires national and county governments to mainstream climate change responses into development planning, decision making and implementation and to build resilience and enhance adaptive capacity to the impacts of

climate change. In this it pushes for mainstream intergenerational and gender equity in all aspects of climate change responses.

*The construction of the Earth Dam is in response to the national and government obligation to enhance community adaptation to climate change and enhance resilience to droughts through provision of water for livestock purposes.*

### 4.3.18 HIV and AIDS Prevention and Control Act 2011

The objective and purpose of this Act is to promote public awareness about HIV and AIDS as well as protect the human rights and civil liberties of any person suspected or known to be infected with the virus.

Section 31 prohibits any form of discrimination against qualified employees, on the basis of actual, perceived or suspected HIV status unless the employer can prove to a tribunal that the job requires a particular state of health or medical or clinical condition.

*The contractor will sensitize workers/community on HIV/AIDs as well as other measures such as provision of condoms on site during construction.*

*Voluntary Counselling and Testing (VCT) services will be provided by the contractor. The results will be private and not disclosed to any third party. Fair employment practices will be followed.*

## 4.4 Institutional Framework

### 4.4.1 Ministry of Agriculture and Livestock Development (MoALD)

The Ministry of Agriculture and Livestock Development (MoALD) is the principal government institution responsible for overseeing the agricultural and livestock sectors in Kenya. The ministry operates at both the national and county levels, with the national government providing policy guidance, technical support, and large-scale development programs, while the county governments are responsible for implementation, extension services, and localized agricultural development

*The project is being implemented under initiatives supported by the African Development Bank through the Building Resilience for Food and Nutrition Security in the Horn of Africa Project, which aims to strengthen the resilience of communities in arid and semi-arid lands through improved water resource infrastructure. Through this framework, the Ministry collaborates with the County Government of Baringo, local administration, and community members to support the planning and implementation of water infrastructure projects such as Earth Dams. The programme further promotes community participation in monitoring and evaluation, ensuring that the Earth Dam*

*projects respond to local needs, enhance community ownership, and contribute to improved livelihoods, water security, and resilience to drought and climate variability.*

### 4.4.2 County Government of Baringo

Water is a devolved function as per the Constitution of Kenya, 2010. The Fourth Schedule of the Constitution outlines the distribution of functions between the national and county governments. Specifically county governments are responsible for water and sanitation services, including the implementation of specific national government policies on natural resources and environmental conservation, including soil and water conservation.

*The County Government will be responsible for approving the designs of the proposed Earth Dam extension and construction project and supervision of the construction works to ensure the ESMP is adhered to. Its various departments will inspect the site on regular basis to ensure provisions e.g., on public health are adhered to by the contractor and proponent.*

### 4.4.3 Water Resources Authority (WRA)

The objective of WRA is to protect, conserve, control and regulate the use of water resources through the establishment of a national water resource strategy. In addition, the WRA is responsible for: formulation and enforcement of standards, procedures and regulations for the management and use of water resources; policy development; planning and issuing of water abstraction permits; and setting and collecting permits and water use fees.

*The proponent has engaged WRA in undertaking hydrology assessment for the proposed project. As per the requirement of the WATER ACT (No. 43 of 2016)-The National and Storage Regulations, 2019 the proponent has applied for the water use and works permit from WRA.*

### 4.4.4 Water Resource Users Association (WRUA)

WRUAs are local community institutions established under the Water Act, which work with the Water Resources Authority (WRA) to manage water resources at the grassroots level. The county, in partnership with WRA, will support the establishment and capacity building of the Kapkurmat_Kamugele Water Users Association (WUA) Committee to effectively manage water resources in the project area.

*The proponent will collaborate with the established Kapkurmat_Kamugele WUA Committee for the effective and successful implementation of the proposed water*

*project and efficient utilization of water resources, including activities such as tree planting in the Kebenonin watershed. The WRA will undertake capacity building for the Kapkurmat_Kamugele WUA Committee and the Kebenonin Earth Dam Management Committee to enhance the sustainable management of the project and the catchment area of the Earth Dam.*

### 4.4.5 National Environment Management Authority NEMA

The National Environment Management Authority (NEMA) exercises general supervision and co-ordination over all matters relating to the environment and is the principal instrument of Government of Kenya (GoK) in the implementation of all policies relating to the environment. Specific NEMA roles related to this project are:

- Review (in collaboration with other lead agencies) and prove approval or issuance of improvement comments on the project ESIA report.
- Issue ESIA license and the associated conditions
- Routinely monitor the ESMP, ESIA license conditions compliance and issuance of compliance note or stoppage or improvement orders to the project.

### 4.4.6 Department of Occupational Health and safety (DOSH)

Directorate of Occupational Safety & Health Services (DOSHS) is an Institution established under OSHA Act 2007 with a mandate of ensuring compliance with the provisions of the Occupational safety and health Act 2007 and promote safety and health of workers. The project contractor will register the site as a work place with DOSHS and also engage the directorate in handling work related accidents if any.

### 4.4.7 National Environmental Tribunal

Its principal function is to receive, hear and determine appeals on environmental matters. These mostly arise from decisions of the NEMA on issuance, denial or revocation of environmental impact assessment (EIA) licenses, among other decisions. Any disputes that may arise from licensing of this project will be heard by the tribunal.

### 4.4.8 Land and Environment Court

Established as a court of the same standing as the High Court, this will handle all environment disputes brought to it by any aggrieved party. The court is also however expected to advocate for application of alternative dispute resolution mechanisms

## 4.5 African Development Bank (AfDB) Environmental and Social Framework

The **African Development Bank Environmental and Social Framework (ESF)** provides a comprehensive system for managing environmental and social risks associated with projects financed by the Bank. The framework ensures that development interventions

are implemented in a manner that promotes **environmental sustainability, social inclusion, and protection of communities and natural resources**. It requires that all AfDB-funded projects integrate environmental and social considerations throughout the project cycle, including **project identification, preparation, appraisal, implementation, monitoring, and evaluation**. Through this framework, project proponents are required to conduct appropriate environmental and social assessments such as **Environmental and Social Impact Assessments (ESIAs)** to identify potential impacts and develop mitigation measures.

The AfDB ESF is implemented through the **Integrated Safeguards System (ISS)**, which consists of a set of **Operational Safeguards (OS)** designed to address key environmental and social risks. These includes;

### 4.5.1 Operational Safeguard 1 (OS1): Environmental and Social Assessment

OS1 requires projects financed by AfDB to undergo an **Environmental and Social Assessment (ESA)** to identify potential environmental and social risks and impacts. For the Kebenonin Earth Dam construction project in **Baringo West Sub-County**, this ESIA process ensures that potential impacts such as **soil erosion, dust generation, disturbance of vegetation, and safety risks to nearby communities** are identified and mitigated. The assessment also ensures that an **Environmental and Social Management Plan (ESMP)** is prepared and implemented throughout the project lifecycle.

### 4.5.2 Operational Safeguard 2 (OS2): Involuntary Resettlement, Land Acquisition, Population Displacement and Compensation

OS2 addresses issues related to **land acquisition, displacement of people, and loss of livelihoods** that may occur as a result of project implementation. In the case of the Kebenonin Earth Dam project, the construction works are being undertaken within an **existing Earth Dam footprint**, which significantly minimizes the likelihood of displacement or land acquisition. However, the safeguard remains relevant to ensure that **any potential impacts on land use, grazing areas, or community access are addressed through consultation and appropriate compensation measures where necessary**.

### 4.5.3 Operational Safeguard 3 (OS3): Biodiversity and Ecosystem Services

OS3 focuses on the protection and conservation of **biodiversity, natural habitats, and ecosystem services**. Construction activities may temporarily disturb **local vegetation, soil structure, and small wildlife habitats** around the Earth Dam. This safeguard requires the project to implement measures that **minimize habitat disturbance, avoid unnecessary**

**vegetation clearing, and promote construction of disturbed areas after construction**. Proper management will also help ensure that the Earth Dam continues to support **livestock, wildlife, and ecosystem functions** within the semi-arid environment.

### 4.5.4 Operational Safeguard 4 (OS4): Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource Efficiency

OS4 addresses issues related to **pollution prevention, waste management, and efficient use of natural resources**. During the construction works, there is potential for **dust emissions, fuel spills from machinery, noise, and improper disposal of excavated materials**. The safeguard requires the project to adopt measures such as **proper waste management, controlled fuel handling, dust suppression, and safe disposal or reuse of desilted materials** to prevent environmental contamination and ensure efficient resource use.

### 4.5.5 Operational Safeguard 5 (OS5): Labour Conditions, Health and Safety

OS5 focuses on ensuring **safe and fair labour practices**, including protection of workers' health and safety during project implementation. Construction activities such as excavation and movement of heavy machinery present potential **occupational health and safety risks**. The safeguard requires the contractor to provide **personal protective equipment (PPE), enforce safety procedures, prevent child labour, and ensure safe working conditions** for all workers involved in the project. It also emphasizes **community health and safety**, particularly for nearby residents and livestock owners who may access the Earth Dam during construction.

The application of these **AfDB Operational Safeguards** ensures that the **Kebenonin Earth Dam construction project** is implemented responsibly by minimizing environmental impacts, protecting community interests, and promoting sustainable water resource management in **Bartabwa Ward** and the surrounding areas. Compliance with these safeguards strengthens the project's contribution to **water security, livestock production, and climate resilience** for local communities.

## 4.6 International Conventions and Treaties

Kenya has ratified or acceded to numerous international treaties and conventions. Those that have implications on Project are described below.

### 4.6.1 Conservation of Biological Diversity (CBD) Regulations 2006

These regulations are described in Legal Notice No. 160 of the Kenya Gazette

Supplement No. 84 of December 2006. These Regulations apply to the conservation of biodiversity which includes Conservation of threatened species, Inventory, and monitoring of BD and protection of environmentally significant areas, access to genetic resources, benefit-sharing and offenses and penalties.

*The proposed project site is not habitat to any threatened or endangered species of flora or fauna. Therefore, it does not pose any threat to any plant or animal life in the project context. Through the ESMMP provided mitigation measures such planting of indigenous trees, establishment of community tree nurseries and catchment protection through community SLM practices the Proponent will contribute to flora and fauna conservation in the project area.*

### 4.6.2 United Nations Convention to Combat Desertification, 1994

The convention addresses the problem of the degradation of land by desertification and the impact of drought, particularly in arid, semi-arid and dry semi-humid areas. This convention is domesticated in EMCA CAP 387.

*The proposed SLM practices in the Kebenonin watershed, tree nursery establishment and revegetation in this CPR by the proponent will contribute to the goal of this Convention.*

### 4.6.3 Sustainable Development Goals (SDGs)

The goals relevant to the implementation of this project are; **Goal 2:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture. **Goal 5:** Achieve gender equality and empower all women and girls. **Goal 6:** Ensure availability and sustainable management of water and sanitation for all.

*Through this CPR the Proponent has shown that Kebenonin Earth Dam water project will contribute to improvement in food and nutrition security, ensure readily availability of fresh water and improvement in sanitation through the proposed construction of latrines in the project site.*

# 5. ANALYSIS OF PROPOSED SUB-PROJECT ALTERNATIVES

## 5.1 Introduction

The environmental management measures proposed for the entire project cycle are considered adequate to mitigate the identified potential environmental and social impacts associated with the project. However, it is important to analyze possible alternatives to the proposed project in order to inform decision making by relevant government agencies and stakeholders, while also improving the environmental performance and sustainability of the project.

The analysis of alternatives is a key component of the Environmental and Social Impact Assessment (ESIA) process as it helps determine the most suitable and sustainable option for addressing the identified water challenges in the project area. The local community has experienced persistent water scarcity for many years, relying mainly on the semi-permanent Toisaror River located approximately six kilometers away. This situation has negatively affected livelihoods, livestock production, agriculture, education, and community health. The proposed Kebenonin Dam therefore seeks to provide a reliable and sustainable water source for domestic use, livestock, and potential agricultural activities.

In evaluating the most appropriate solution to the existing water challenges, several feasible alternatives were considered. These include:

- The 'No Project' alternative
- The 'Yes Project' alternative
- Alternative location and source of water
- Alternative design and technology

## 5.2 The 'No Project' alternative

The "No Project" alternative refers to a scenario where the proposed Kebenonin Dam is not constructed and the current situation remains unchanged. Under this option, the community would continue relying on the semi-permanent Toisaror River located approximately six kilometers away as the main source of water.

Maintaining the current situation would mean that the existing challenges associated with water scarcity would persist. Community members would continue to travel long distances in search of water for domestic use and livestock, placing a significant burden particularly on women and children. Children would also continue missing school while assisting their families in water collection, thereby affecting their educational performance and overall well-being.

In addition, the community would remain vulnerable to waterborne diseases due to the continued use of unsafe and contaminated water sources. Livestock mortality resulting from inadequate water availability would also persist, negatively affecting household livelihoods since livestock keeping is a major economic activity in the area. Agricultural activities would remain limited due to unreliable water availability, thereby contributing to food insecurity and economic vulnerability.

Therefore, the "No Project" alternative would not address the existing water challenges in the area and would perpetuate the socio-economic and environmental problems currently experienced by the community.

## 5.3 The 'Yes Project' alternative

The "Yes Project" alternative refers to the implementation of the proposed Kebenonin Dam project as planned. This option involves the construction of an earth dam to harvest and store surface runoff, providing a reliable water source for the surrounding community. Implementation of the project is expected to significantly improve water availability in the area. The dam will provide water for domestic use, livestock watering, and potentially small-scale irrigation, thereby supporting agricultural production and improving food security. The availability of water will also reduce the time and effort spent by community members particularly women and children in searching for water.

In addition, the project is expected to improve public health by reducing dependence on contaminated water sources. Livestock productivity will also improve due to the availability of reliable water for watering animals. The project may further create opportunities for additional livelihood activities such as fish farming and small-scale farming.

The proposed dam will also promote community ownership and participation, which will contribute to sustainable management of the water resource. Overall, the "Yes Project" alternative provides the most practical and sustainable solution to the persistent water challenges experienced by the community.

## 5.4 Alternative Location

Alternative locations for the construction of the dam were considered during the planning stage of the project. However, the selected site was determined to be the most suitable due to its favorable topographic and hydrological characteristics.

The proposed site is located within a natural drainage area where surface runoff from surrounding higher elevations naturally converges. The topography allows efficient collection and storage of runoff water during rainfall events. In addition, the site is located

within reasonable proximity to the beneficiary community, making it convenient for water access and management.

Relocating the dam to another site could reduce the efficiency of water harvesting due to less favorable drainage patterns, and could also increase construction costs due to additional excavation requirements and infrastructure development. Therefore, the current site is considered the most appropriate location for the proposed dam.

## 5.5 Alternative Water Sources

Different water supply options were also considered in order to determine the most suitable approach for addressing the water challenges in the project area.

### 5.5.1 Exploitation of Groundwater

One alternative considered was the development of groundwater sources through drilling boreholes. Although groundwater can provide reliable water supply in some areas, the drilling of boreholes requires detailed hydrogeological investigations and may involve high initial investment costs.

In addition, groundwater availability in some areas may be uncertain, and boreholes may experience declining yields or mechanical failures that require costly maintenance. Considering these factors, reliance solely on groundwater development may not provide a sustainable long-term solution for the entire community.

### 5.5.2 Source Water from Elsewhere

Another alternative considered was the supply of water from external sources through pipeline systems. This option would involve constructing long-distance pipelines from other water sources such as rivers or existing water supply systems.

However, this option would require significant financial investment for pipeline construction, pumping infrastructure, and maintenance. It would also require continuous energy supply for pumping, making it less economically sustainable for the rural community.

### 5.5.3 Roof Water Catchment

Roof water harvesting was also considered as an alternative water supply option. This method involves collecting rainwater from rooftops and storing it in tanks for later use. While this option can supplement household water supply during rainy seasons, it is limited by the amount of rainfall received and the size of roof catchment areas.

Furthermore, roof water harvesting systems may not provide sufficient water for livestock or agricultural activities, especially during prolonged dry periods. Therefore, while useful as a supplementary source, it cannot adequately meet the overall water demand of the community.

## 5.6 Alternative Design and Technology

Different design and technological options were also considered for the proposed dam project. These include variations in dam structure, construction methods, and materials.

The selected design involves the construction of an earth dam, which is considered appropriate for the site due to the availability of suitable clayey soils in the area. Earth dams are also cost-effective and can be constructed using locally available materials and labor. In addition, they are relatively easy to maintain and repair compared to more complex concrete structures.

Alternative designs such as reinforced concrete dams would involve significantly higher construction costs and technical requirements. Considering the local conditions, availability of construction materials, and the intended purpose of the project, the proposed earth dam design was determined to be the most practical, cost-effective, and environmentally appropriate option.

Overall, after evaluating the different alternatives, the construction of the Kebenonin Earth Dam at the proposed location using the selected design and technology provides the most viable and sustainable solution for addressing the water needs of the community.

*Table 5:1: Dam selection criteria*

| Selection criteria | Earth Dam | Concrete dam | Sand dam | Sub-surface dams |
|---|---|---|---|---|
| Availability of local materials | +++ | + | + | + |
| Handling of construction material | +++ | + | + | + |
| Foundation condition | +++ | ++ | ++ | + |
| Cost of construction | +++ | + | ++ | + |
| Total | 12 | 5 | 6 | 4 |

*Key; + is a comparative score where; each + is a positive core.*

From the selection criteria in Table 5.1, the best alternative appeared to be the Earth Dam for the proposed project site owing to its comparably lower cost, ease of obtaining construction material and its ability to be applied on non-rocky foundation.

# 6. PUBLIC PARTICIPATION AND STAKEHOLDER CONSULTATIONS

## 6.1 Overview

Public consultation is not only one of the most effective means of encouraging and obtaining community input and feedback, it also serves to inform the community members and key stakeholders on the proposed projects. One main public participation meeting was held around proposed project area and its environs to discuss the proposed project *(see **Appendices 1,2 and 3** for consultation minutes and attendance list).* Key stakeholders were also consulted through key informant interviews**.** The aim of the consultation was to ensure that the views of stakeholders and the interests of the communities were identified and taken into account at the earliest during the ESIA study. Local communities were mobilised with the help of the National, County and local administration. The public meetings brought together representatives from the larger community including women and youth (see appendices 1 and 2 for minutes and list of stakeholders consulted respectively) This chapter summarizes the feedback on the consultations undertaken with other governmental and non-governmental organizations including the Ministry of Agriculture, Livestock & Development, National Environment Management Authority (NEMA), Water Resources Authority (WRA) and the local Administration.

## 6.2 Objectives of Public Consultation

The objective of the public consultation was to ensure that stakeholder and community interests were identified during the ESIA process and that stakeholder and community views were taken into account. The key objectives of such consultations were to.

- Inform the community members and key stakeholders on the proposed project activities.
- Receive community and key stakeholders' comments/ feedbacks/ questions about the proposed project.
- Solicit their views and inputs on the possible adverse environmental and social impacts, and possible mitigation measures. Additionally, it also aims to identify community concerns and provide a forum to discuss and address these.

## 6.3 Methodology

Public participation for the proposed project was conducted through the public consultative meetings and admission of questionnaires to allow for systematic understanding and interaction of the project beneficiaries, neighbours, local community members/surrounding enterprises and any other would be affected/interested parties.

### 6.3.1 Public consultation questionnaires

ESIA questionnaires were administered, to gather information from key stakeholders and the members of the public. This was done using structured questionnaires to assess the environmental and socio-economic views of the respondents. A total of 15 questionnaires were administered in the project area. Filled questionnaires administered in the project area are appended to this report (**Appendix 3**).

### 6.3.2 Public consultation meetings

In seeking the views of the key stakeholders, and any other would be affected/interested parties the consultant organized a consultative meeting targeting mainly Kapkurmat and Kamugele Village Members and community members surrounding the Proposed Earth Dam in Kapkurmat_Kamugele Sub Location comprising elders, women, youth, people with special needs and the local administration. The Environmental Lead Experts, Sub County Agricultural Officer (SCAO) and the Ward Agricultural Officer (WAO) were in attendance during the meetings that took place on **26th February 2026.** The meeting was used to publicize the proposed Kebenonin Earth Dam project and the anticipated effects and benefits. Prior to the meeting, a stakeholder mapping was carried out to identify key stakeholders to be invited for the meeting. Stakeholders that were directly affected by the proposed project were critically analysed in consultation with the proponent.

The table 6-1 below presents a summary of the participants of the public consultative meetings. The list of participants is appended to this report (***Appendix 2)***.

*Table 6:1: Summary of the participants*

| Date | Female | Male | Youth |
|---|---|---|---|
| 23rd February 2026 | 3 | 36 | 16 |
| **Total** | **39** | | |

Presentation of the project scope was outlined, after which an open discussion forum followed during which all pertinent issues were raised and agreed upon with all stakeholders. During the public participation meeting, stakeholders had a chance to interact with the proponent represented by the EIA expert and ministry of agriculture officials at county and sub-county level. The findings are incorporated into this report and captures the issues, suggestions, concerns and recommendations from public meetings on site. The meetings were well attendend and the attendees participated actively during the meetings (Figure 6-1 and 6-2).

*Figure 6:1: Public participation meeting at Kapkurmat and Kamugele Village*

*Figure 6:2: CDE Nema Addressing the community*

### 6.3.3 Consultation and Disclosure Outputs

The Appendices present the information on the public consultations undertaken under the environmental impact assessment for the proposed pigeon peas value addition project. This information includes selected responses as detailed in the minutes (***Appendix 3***). It was noted that members lauded the project and were eager to see the start of the project. However, there were a few areas that the members sought clarity. A summary of the key concerns raised by the participants is provided in table 6-2 below:

Table 6:2: Stakeholder Consultative meeting key concerns

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| **Increased waterborne diseases (malaria, bilharzia)** | The community members shared their concerns on the Stagnant reservoir water may increase mosquitoes and snails, affecting children and livestock. | The ESIA consultant informed the community that a recommendation to Implement vector control program; periodic reservoir drawdown, public health sensitization; collaboration with the County Health Department. |
| **Siltation reducing dam storage capacity** | Community members raised concern on upstream erosion and flash floods may rapidly fill the reservoir with sediments. | The ESIA consultant recommended the development of a catchment management plan; promote afforestation and soil conservation; construct silt traps and gabions. |
| **Risk of dam failure or extreme flooding** | Community feared catastrophic flooding during intense rainfall events | The ESIA consultant assured that safe and strong construction will be done but for due diligence a recommendation for the contractor on site to design dam to international safety standards; incorporate Probable Maximum Flood (PMF) analysis; establish Emergency Preparedness and Response Plan (EPRP). |
| **Loss of biodiversity and vegetation** | Community members noted that construction would require clearing of indigenous vegetation and disruption of habitats. | The ESIA expert and the NEMA director assured a recommendation to minimize clearing footprint; compensatory tree planting (1:3 ratio); and ensure biodiversity monitoring |

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| **Climate Change Vulnerability** | Community expressed concern that prolonged droughts may reduce dam water levels, while extreme rainfall events may cause overtopping or structural stress. | The ESIA Expert is to recommend Integrate climate risk assessment in design; size spillway for extreme rainfall scenarios; incorporate drought contingency planning; promote integrated water resource management (IWRM); establish long-term hydrological monitoring; align project with Kenya's National Climate Change Action Plan (NCCAP). |
| **Groundwater table alteration** | The community members were highly concerned about possible drying or contamination of shallow wells and boreholes. | The ESIA expert is to highly recommend conducting a hydrogeological assessment; monitor groundwater; reservoir lining where necessary; protect community water points. |
| **Influx of workers and social risks** | With the contractor's team being new to the community members expressed fear of insecurity, GBV, and communicable diseases. | The ESIA expert recommended for workers' Code of Conduct; prioritize local hiring; HIV/AIDS and GBV awareness programs; grievance redress mechanism. |
| **Noise and vibration impacts** | Community members expressed concerns about disturbance to schools, homes, and livestock dung construction activities. | The ESIA expert promised to recommend restricting construction to daytime; notify community prior to blasting; use well-maintained equipment. |
| **Water contamination from construction activities** | Community members expressed further contamination from a risk of fuel spills, cement washout, and improper waste disposal | The ESIA expert recommended for the experts on the construction site to Implement Construction Environmental Management Plan (CEMP); banded fuel storage; spill |

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| | | response kits; proper waste handling. |
| **Dust and air pollution during construction** | Most women and older community members raised concerns on potential respiratory concerns due to dust from earthworks and trucks. | The ESIA expert is to recommend water sprinkling; speed control; PPE for workers; regular equipment maintenance |

## 6.4 Suggestion made by the Participants

- Agricultural productivity: Support smallholder farmers with irrigation training; establish water user associations; ensure equitable water allocation.
- Drought resilience: Develop clear water rationing plans during drought periods; prioritize vulnerable households and institutions
- Construction employment: Prioritize local youth and women for job opportunities; ensure transparent recruitment process
- Reduced water-fetching burden: Locate water access points within safe walking distance; ensure proper lighting/security at water points
- Public health improvement: Integrate sanitation facilities and hygiene awareness campaigns alongside the water project
- Aquaculture development: Provide training and starter support for fish farming; ensure equitable access to fishing rights (Extension Services)
- Improved infrastructure and access roads: Maintain access roads after construction; ensure roads benefit the wider community and not only the project site.
- Groundwater recharge benefits: Monitor nearby water sources and protect them from contamination; share monitoring results with community.
- Operation & maintenance jobs: Provide technical training to local residents to enable them qualify for skilled roles

- Mental health awareness: Create awareness about Mental health issues and champion on suicide awareness to prevent any suicide cases in the dam.

## 6.5 Community and Stakeholder Engagement

While this ESIA reports on the consultation and disclosure undertaken as part of the ESIA, it is acknowledged that consultation is an ongoing process and forms part of the life cycle of the project and social corporate governance of the sponsor. Environmental Management Plan (EMP) will therefore, ensure that the people in the community and stakeholders continue to be informed during construction and, where appropriate, during operation of the dam. Community and Stakeholder Engagement are covered in the Environmental Management Plan section.

# 7. ANTICIPATED IMPACTS AND MITIGATION MEASURES

## 7.1 Preamble

This chapter identifies both positive and negative environmental impacts likely to be occasioned by the project's construction/ installation, operation and decommissioning phases.

## 7.2 Positive Environmental and Social Impacts during construction

### 7.2.1 Improved Community Infrastructure Awareness

The construction process will raise awareness among community members on the importance of maintaining water infrastructure and protecting the environment around Earth Dams.

### 7.2.2 Employment Opportunities

Construction activities will create short-term employment opportunities for local residents, particularly youth and women in Kapkurmat_Kamugele **Village**, through unskilled and semi-skilled labor during excavation, fencing, and other project activities.

### 7.2.3 Local Economic Stimulation

The presence of construction workers and contractors will increase demand for locally available goods and services such as food supplies, water, and basic materials, thereby supporting small businesses within the community.

### 7.2.4 Skills Transfer

Local workers engaged in the project may gain practical experience in activities such as earthworks, site management, and environmental protection measures, which can enhance their skills for future employment opportunities.

### 7.2.5 Strengthened Community Engagement

The involvement of local stakeholders during construction will strengthen collaboration between the community, project implementers, and local authorities, promoting ownership and support for the project.

## 7.3 Negative Environmental Impacts and Mitigation during the Construction Phase

### 7.3.1 Temporal Restriction Access

During the construction and expansion works on the Earth Dam the community will not have access to the water resource. While this effect is temporary it could be significant especially if there is a delay in the works. The restriction access to the Earth

Dam may bring about community resentment if not prepared and information on the restrictions relayed in advance.

The proposed **mitigation measure** will include;

- Prior notice be given to community members through the local administration on the restriction access before commencing the work.
- The proponent and the contractor to consider alternative ways of executing the works to allow continued use of water in the Earth Dam such as draining of the water to temporal storage area.
- Consider an alternative source of water to the community for livestock use during the construction period such as water trucking.

### 7.3.2 Disturbance of Vegetation and biodiversity

Site clearance will result in the removal of vegetation, pasture and biodiversity losses. The construction of the Earth Dam will increase irrigated land in acres.

**Mitigation measures**

- Site clearance to be limited to the project demarcated area and selective removal of vegetation or trimming of trees to be exercised where possible.
- Local community to be allowed to harvest areas of natural vegetation that are to be cleared prior to clearing.
- The proponent to support establishment of a community tree nursery for indigenous trees
- Compensatory planting of trees or other appropriate vegetation after construction works
- Construction workforce to be sensitized on environmental and ecological conservation

### 7.3.3 Soil erosion

Activities undertaken during the preparation and the construction stage of the Earth Dam such as clearance/disturbance of vegetation, excavation and tramping by people and machineries/vehicles may result in soil erosion.

**Mitigation measure**

- Contractor to avoid construction during the wet season.
- Contractor to limit excavation to the marked boundaries of the project site.
- Contractor to ensure proper compaction at recommended soil moisture where required.
- Contractor to provide designated routes for vehicles.

- Where possible the contractor to exercise selective removal of mature, indigenous trees.
- Compensatory planting of trees or other appropriate vegetation after construction
- Sensitization of construction workforce on environmental and ecological conservation and protection.

### 7.3.4 Noise and Vibration Generation

Continuous exposure to noise levels above 85 dB may cause hearing problems leading to occupational deafness. Noise and vibration produced during construction may have some temporary negative impacts to the immediate residents. Sources of noise pollution include excavation and earth moving machines and during mobilization of the construction materials to the site. The impact is low risk as the nearest dwelling units are over 3km away.

**Proposed mitigation and management measures.**

- Avoid idling of machinery or engine when not in use.
- Restrict activities that create noise to daytime only.
- Workers to be provided with ear muffles.
- Contractor to ensure the use of well-maintained machineries and vehicles.

### 7.3.5 Air pollution (Motor vehicle emissions and dust generation)

The potential sources of air pollution include traffic, emission from excavator and material supply vehicles. This is a short-term negative impact and will last within the actual excavation period and ferrying of materials. This impact is considered low risk as there are no residential units nearby.

**Mitigation measures**

- Ensure that maintenance on all machinery is done regularly to avoid the emission of noxious gases.
- Drivers and machine operator to avoid unnecessary running of motor vehicle engines and machinery when not in use.
- Provision of dust masks to workers and ensure their use.
- Locating haul roads, tips, and stockpiles away from sensitive receptors, considering prevailing wind directions.
- Contractor to instruct the drivers to avoid unnecessary speeding near settlements in the project areas

- Contractor to make sure water sprays and mist are applied as dust suppression measures on loose soils and stockpiles.

### 7.3.6 Oil spills

Oils and grease spillage on the ground may cause contamination to the soil and surface water making the water to be unsuitable for use by both people and livestock.

**Mitigation measures**

- Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site.
- The contractor should properly handle, store, and dispose off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations.
- Site staff to be sensitized on safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff.

### 7.3.7 Solid waste generation and accumulation

The volume of solid waste generated from the construction of water troughs, latrines and any other masonry structure and packaging materials such as cement bags will be small with low impact.

**Mitigation measures**

- The contractor to exercise waste segregation and to ensure waste not reusable or recyclable is cleared from the project site and disposed off as per NEMA and County Government regulations
- Contractor to provide temporal waste disposal receptacles in site
- Contractor to liaise with licensed waste collector to routinely collect and dispose the waste

### 7.3.8 Earth Excavated material & desilted silt

The debris from excavation and desiltation is expected to be of a large volume and would be washed back in to water channels and surface water storage structures if not handled well.

**Mitigation measures**

- Contractor to dump unused excavated materials and debris in designated places as directed by the supervising engineer.

- Contractor to use excavated soil for the Earth Dam wall/embankment.
- Excavated silt can be incorporated with compost for use as potting media in the tree nursery.

## 7.4 Negative Socio-economic impacts in the construction phase.

### 7.4.1 Occupational Health and Safety (OHS)

During the excavation and construction stage of the Earth Dam accidents may result caused by the moving part of the excavator. Accidents may also occur in the construction of the auxiliary structures (latrine, livestock troughs) and other masonry structures caused by falls in excavated sites or injuries by wrongly placed equipment, tools or other construction materials.

**Mitigation measures**

- The sites to be protected or fenced off from unauthorized intrusions and warning signs; barricades should be properly displayed and strictly adhered to.
- All workers to be provided with full protective gear (PPEs) and trained on appropriate use
- Workers to be trained on first aid & a fully equipped First Aid Kit provided at site.
- The contractor to have Incident and Accident Registers on site for recording of injuries or any OHS incidence.
- Contractor to prepare an emergency management and preparedness plan for accident response & avail Emergency contacts for police, ambulance, etc.
- Contractor to appoint a qualified health and safety person to manage OSH issues.
- Tools and equipment to be placed in a safe place when not in use.

### 7.4.2 Risk of Accidents to the community

Hauling of equipment (plant and machinery) and other materials and supply to the project site may pose a potential risk of accidents to animals, people, especially children.

**Mitigation measures**

- Contractor to sensitize the community on the project and the project period and what caution to be taken by the community. Restricted access to the construction site for community members unless where necessary.
- Contractor to employ qualified drivers.
- Drivers to be instructed to observe required speed limits.

- Installation of warning sign boards at the construction site and identified risk areas.

### 7.4.3 Increased exposure to transmissible diseases including HIV/AIDS

The construction and expansion of the Kebenonin Earth Dam in Baringo County brings with it concerns about potential increases in HIV/AIDS and STIs. Such projects often attract a transient workforce and disrupt local social dynamics, increasing vulnerability to risky behaviours like unprotected sex and substance abuse. To mitigate these risks, robust health education programs, access to HIV/AIDS and STI prevention services, and community involvement in project planning are essential. Strengthening local health systems and promoting safe practices are critical steps to ensure that development efforts enhance community well-being without compromising public health.

**Mitigation measures**

- Contractor to sensitize workers and community members on HIV/AIDS and other communicable diseases.
- Contractor's Health and Safety Management Plan (CHSMP) to be enforced through the Directorate of Occupational Health & Safety (DOSH)
- Controlled access to Contractor's Workforce Camps by outsiders.
- Contractor to provide standard quality condoms at the construction site during the construction period.

### 7.4.4 Labour risks including labour influx

The excavation work will be mechanical and the labour required for the construction of auxiliary structures (water troughs, fencing, latrines) will mostly use the local labour force. Influx of labour from nearby towns such as Moyale may cause an increase in illicit behaviour and crime and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse and prostitution.

**Mitigation measures**

- The proponent adherence to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor.
- All workers engaged in the project to be sensitized on the national code of conduct and the World Bank policies
- Local community members will be given priority in employment opportunities, in casual and unskilled labour.
- Train the community on the project requirements and product.

- The Contractor to ensure that comprehensive data on all workers involved in the project during construction is kept (register of all workers kept on site).
- Training of PMC and community policing of the project

### 7.4.5 Risk of Social Conflict

Conflicts may arise between the local community and the construction workers, which may be related to cultural, or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labor force, and pre-existing conflicts in the local community may be exacerbated.

**Mitigation measures**

- The proponent adherence to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor.
- Contractor to sensitize the workers on code of conduct (COC)
- Develop and implement local hiring rules in consultation and partnership with the local community.
- Train workers and the project management committee and rank members on conflict management and resolution

### 7.4.6 Child Labor and School Dropout

The proposed project may result in increased opportunities for the sale of goods and services to the incoming workers, which can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.

**Mitigation measures**

- The proponent to sensitize the community on national children welfare policies, children laws and World Bank policies on the protection of children and the importance of children being educated.
- The Proponent to ensure the Contractor complies with national and WB policies and rules on welfare of children.
- Control to ensure there is no child labour at the construction. This can be done by using Identification Cards to verify the age of the workers and casuals.

### 7.4.7 Gender Based Violence (GBV)

This impact is triggered during Project Construction Phase when the Contractor fails to comply with gender inclusivity requirements in hiring of workers and entire Project Management as required by Gender Policy 2011 and 2/3 gender rule. Failure

to protect Human Risk Areas Associated with, Disadvantaged Groups, interfering with Participation Rights, and interfering with Labour Rights may also result in GBV.

**Mitigation Measures** of Human Rights and Gender Requirements are.

- The contractor will implement provisions that ensure that GBV at the community level is not triggered by the Project, including:
    a) Effective and on-going community engagement and consultation, particularly with women and girls.
- Review of specific project components that are known to heighten GBV risk at the community level e.g. hiring procedures and renumeration.
- The contractor shall develop specific plan for mitigating these known risks, e.g., sensitization employment.
- The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation.

### 7.4.8 Sexual Exploitation and Abuse (SEA) by project workers against community members

This impact refers to sexual exploitation and abuse committed by Project staff against communities and represents a risk at all stages of the Project, especially when employees and community members are not clear about prohibitions against SEA in the Project. Such risks also occur where project workers with some level of authority abuse this power e.g., through promise of jobs in return for sexual favours.

**Mitigation Measures** to Risk of SEA include.

- Proponent to develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP.
- The SEA action plan will include how the project will ensure necessary steps are in place for:
    a) Prevention of SEA through including Code of Conduct (CoC) and ongoing sensitization of staff on responsibilities related to the COC.
    b) Response to SEA by including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures.
    c) Engagement with the community & development of confidential community-based complaints mechanisms discrete from the standard GRM.
    d) Integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA.

## 7.5 Positive Environmental and Social Impacts during operation phase

### 7.5.1 Improved Water Security

Restoration of the Kebenonin Earth Dam will improve the availability of water for domestic use, livestock watering, and small-scale irrigation, particularly during prolonged dry seasons commonly experienced in **Baringo West Sub-County**.

### 7.5.2 Enhanced Agricultural Productivity

Improved access to water will support small-scale irrigation activities, enabling community members to grow vegetables and other crops, thereby contributing to improved household food security and nutrition.

### 7.5.3 Improved Livelihoods and Income

Increased agricultural production and improved livestock productivity are expected to enhance household incomes and reduce the community's vulnerability to climate-related shocks.

### 7.5.4 Reduced Water Collection Burden

The project will reduce the distance and time spent fetching water, particularly for women and children, allowing them more time to engage in productive economic activities and education.

### 7.5.5 Improved Livestock Health

Reliable water supply will improve livestock health and reduce animal mortality during dry seasons, thereby supporting pastoral and agro-pastoral livelihoods.

### 7.5.6 Strengthened Climate Resilience

The increased water storage capacity of the rehabilitated dam will enhance the community's ability to cope with recurrent droughts and erratic rainfall patterns.

### 7.5.7 Community Empowerment and Ownership

Active participation of the local community in the management and maintenance of the Earth Dam will strengthen local capacity, promote ownership, and support long-term sustainability.

### 7.5.8 Environmental Improvement

Proper management of runoff and controlled water use will help reduce soil erosion and environmental degradation around the Earth Dam area.

### 7.5.9 Support to Vulnerable Groups

Improved access to water and enhanced agricultural production will particularly benefit vulnerable households, including women-headed households and youth, by improving livelihoods and food security.

## 7.6 Negative Environmental and Mitigation Measures during the Operation phase

### 7.6.1 Surface and Ground Water Pollution

Water pollution may be from several sources. Pollution of the water could make the water unsuitable for the proposed use in the project. This could be from: watering of animals directly from the Earth Dam, unattended oil spillage during the construction period, poor farming technologies upstream, use of agrochemicals and destruction of catchment. Leaching of agrochemicals would result to ground water pollution.

**Mitigation measures** include the following.

- The Earth Dam should be fenced as indicated in the BQ and having only one controlled entrance.
- The users should draw off water from the designated sites only.
- The Contractor to clear the site of all solid wastes, construction materials and any spills after completion of the construction works.
- The Proponent to ensure the construction of pit latrines in the site as provided in the BOQ at a safe distance from water sources.
- The Proponent to develop and implement (through sensitization of farmers) an *Integrated Pest Management Plan* (IPMP)
- Proponent to ensure regular monitoring of water quality.

### 7.6.2 Soil Erosion and Siltation of the Earth Dam

Concentration of many livestock in the project area as they come for watering and poor farming practices will result in soil erosion. Overstocking of livestock in the project area will also result in overgrazing and soil erosion. The erosion of the inlet water course and the degradation of the Earth Dam catchment will result in the siltation of the Earth Dam resulting in increased water turbidity and reduced volume of the Earth Dam.

**Mitigation measures**

- Construction of silt traps along the inlet water course as will be guided by the supervising engineer
- Regular maintenance of the check dam/silt traps by the community
- The embankment to be grown with suitable grass as outlined in the design plan.
- The proponent to ensure the implementation of the developed ***integrated sustainable land management (ISLM)*** plan.
- The catchment community to be sensitized on the ISLM & to be trained on farm SLM practices e.g. terracing, minimal tillage, agroforestry crop rotation, intercropping.

- Regular construction should be undertaken (removal of silt from the reservoir using manual labour can be periodically organized during the dry season).
- The proponent to consider piping water to other sites in future to avoid animal concentration and overgrazing in the project area.
- Sensitize the community on appropriate stock rate.

### 7.6.3 Earth Dam Breaking Its Walls and Associated Risks

Above normal rains over a longer period, damage of the Earth Dam walls and lack of maintenance could result in the Earth Dam walls breaking and suddenly discharging its water. The outcome may be destruction of property, land degradation and risk to the people living downstream.

**Mitigation measures**

- The Proponent should develop the Kebenonin Earth Dam Crisis Action Plan (CAP). The CAP should contain the details for Earth Dam CAP as shown under Appendix 12.
- A qualified Water Resource Professional should inspect the site every year and at least at the end of every rainy season.
- Undertake regular (continuous) monitoring and assessment of the Earth Dam and project site especially with the current climate change, before and after the rainy season.
- Proper inspection should be done once in 3 years to a maximum of once in 5 years by a qualified professional
- The inspection forms (see on annex 8) should be properly filled, maintained and action recommended.
- Train the project management committee and the local administration (local technical team) on scouting which will lead to early detection and responding to any risk situation.
- An Emergency Action Plan (EAP) should always be maintained by the operation and maintenance team and this should be done during the routine preventive maintenance by the local technical team (see the plan on annex 13).
- Undertake Environmental Audit for the Kebenonin Earth Dam annually as required by NEMA.

### 7.6.4 Solid Waste Generation

Due to the farming activities, there would be generation and accumulation of wastes including wrapping and packaging materials and containers. Some of the packaging/wrapping and containers will be from agrochemicals which if not properly disposed off would result in toxicity in the environment.

**Mitigation measures**

- Sensitization of the farmers on the disposal of used agrochemical wrappings, containers and packages.
- Proponent to ensure wastes from farming activities are sorted before disposal
- Proponent to provide litter/waste bins in the project area for temporal storage of waste.
- Use of a NEMA registered waste collector, transporter and disposer.

### 7.6.5 Risk of Drowning

The Earth Dam filled with water presents the risk of drowning to people or animals that may stray into the perimeter fence of the Kebenonin Earth Dam or can be used in self-suicide.

**Mitigation measures**

- The risk has been significantly reduced through the proposed fencing and installation of a gate.
- The gate to be always locked with a padlock.
- The community be sensitized on the potential risk of drowning.
- Involvement of the whole community members in ensuring that the perimeter fence is maintained and not destroyed (encourage community policing).
- Employ a person to guard the Earth Dam/through the water users' association (WUA) ensure regular monitoring.

### 7.6.6 Impacts on River Regime and Downstream Users

The unnamed natural drainage, like all the drainage channels in the 3MB sub basin is ephemeral and only flows during the rains and a shortly thereafter. The construction of the Earth Dam will enable the harvesting of the flood water which would otherwise be lost, and use it for economic activity within the area. The development of the storage facility is therefore not expected to have an adverse impact on the river flow and the downstream community.

## 7.7 Negative Social and Economic Impacts

### 7.7.1 Outbreak of Livestock Diseases

Livestock converging in one watering point from different sites/regions increase the chance for the spread of livestock pest and diseases. If unchecked will lead to poor animal health, reduced livestock productivity and even livestock loss.

**Mitigation measures**

- Regular disease surveillance by the veterinary department and community.
- Sensitization of the community on disease spread, monitoring and control.
- A livestock disease management plan be put in place by the veterinary department to ensure disease incidences are promptly responded to and addressed.

### 7.7.2 Human health impacts e.g., Malaria and schistosomiasis, water borne diseases.

The presence of standing water provides good breeding ground for disease vectors especially with malaria and increase in schistosomiasis. Further, due to water scarcity in the area, the community may be tempted to use the Earth Dam water for drinking purposes without treatment. The two scenarios carries possibility of increasing diseases given malaria prevalence is at 46.9% in the county while diarrhoea and typhoid are at 7.6% (KNBS, 2018).

**Mitigation measures**

- Sensitize the community on malaria prevention through use of mosquito nets, local and indoor residual spraying and bush clearing near households.
- Malaria surveillance programme to be maintained.
- Establish community-based health education committee that facilitate malaria control programme facilitated and coordinated through public health department
- Sensitize the community on water purification methods.

### 7.7.3 Occupational Health and Safety Concerns

Various occupational health and safety concerns are likely to arise particularly in relation to the use of pesticides and agrochemicals in farming.

**Proposed mitigation**

Development of Integrated Pesticide Management Plan (IPMP) and to include;

- Train the farmers on agrochemical management and environmentally sound chemical management, pesticides and fertilizers.
- Training farmers on application of residues, waste from cleaning and proper irrigation practices.
- Management of agricultural chemicals and fertilizers as per material safety data sheet and avoid environmental safety risks.
- Provision of an environmental programme to monitor agriculture chemicals through the field.

- Emphasize on the use of organic manure by the farmers.

### 7.7.4 Water use related conflict

Low rainfall or failure may result in inadequate water supply to the Earth Dam. Unprecedented increase in land acreage under irrigation would also mean increase water demand for irrigation. Dependency on the Kapkurmat_Kamugele dam for domestic; irrigation and livestock may result on water use related conflicts.

**Mitigation measures**

- Develop and implement a community users' development plan in consultation and partnership with the local community and existing WRUAs
- Formulation of local by-laws to guide the use of water in the project area
- Sensitize the community/beneficiaries on efficient water use to avoid wastage.
- Raise community awareness on the benefits of the project for more cooperation.

### 7.7.5 Poor leadership and management problems

Poor leadership, lack of transparency and accountability would result in the mismanagement of the will result into the project not meeting its intended goals.

**Mitigation includes;**

- Training of PMC on water project management, financial management and promotion of accountability & accountability.
- Sensitization of project beneficiaries/community members on project management.

### 7.7.6 Child labour and school drop out

The irrigation project may attract to children to engage in the sale of crops produced in the area such as tomatoes. The children may engage in vending of the crops harvested interfering with their educations and their welfare and children rights beside exposing them to other social evils.

**Mitigation measure**

- Train village volunteer child monitors to work closely with the office of the chief and the department of children on issues of child protection
- Sensitize the community on child protection issues relating to the project.

## 7.8 Decommissioning phase

The proposed Kebenonin Earth Dam project is expected to operate for 20 years. After this period depending on the prevailing situation of the time, decommissioning

of the project could be undertaken. This could be due to various reasons such as a new bigger source of water being developed in the area therefore, the Earth Dam being abandoned, or the Earth Dam becoming completely silted or creating a risk to the community.

### 7.8.1 Positive Environmental and Social Impacts

The positive impacts associated with the decommissioning of the Earth Dam are direct employment for those involved in the demolition work, restoration of the land for other productive purposes and reduction in the risk associated with the Earth Dam.

### 7.8.2 Negative Environmental and Social Impacts

The main negative impacts of decommissioning are reduction in crop and livestock productivity, reduction in indirect employment opportunities, reduction in household income, the community and livestock to continue to walk for long distances in such of water and pasture, increased soil erosion and land degradation from the excessive run off and increased burden for the women to get water for households, increased in water borne diseases due to inadequate source of fresh water and increased poverty and reduced community adaptive capacity to climate change effects.

### 7.8.3 Mitigation Measures for the Decommissioning of the Earth Dam

Depending on the reason for the decommissioning the report recommends that an environment and social impacts assessment be undertaken with the terms based on the prevailing scenario and baseline conditions and the nature of the decommissioning. However, if the decommissioning will be because of the complete abandonment of the Earth Dam the land should be restored to its original state.

# 8. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

## 8.1 Introduction

The project proponent acknowledges that the proposed project activities will have some impacts on the biophysical environment, health and safety, and socio-economic well-being of Kebenonin Earth Dam Community and other community stakeholders. Thus, the main focus will be on reducing the negative impacts and maximizing the positive impacts associated with the project activities for continuous improvement. An environmental and social management plan has been developed to assist the proponent in mitigating and managing environmental and social impacts associated with the life cycle of the project. It is noteworthy that key factors and processes may change through the life of the project and considerable provisions have been made for dynamism and flexibility of the ESM&MP. As such, the ESM&MP should be subjected to periodic review for improvement purposes.

**Tables 8-1** form the core of this ESM&MP for the construction, operational and decommissioning phases of the proposed Construction of Kebenonin Earth Dam. In general, the tables outline the potential environmental, socio-economic, health and safety risks associated with the project and details all the necessary mitigation measures, their financial costs, as well as the persons responsible for their implementation and monitoring. The ESM&MP should be used as checklist in the initial environmental audit of the project.

It worth noting that the key responsibilities regarding compliance to the proposed ESM&MP during the construction period rest on the Contractor whereas those in operation stage will be the responsibility of the proponent. **The ESM&MP should be shared with the selected contractor(C-ESM&MP) for implementation.** It is important that the project proponent ensures adequate monitoring and evaluation for the Contractor for non-conformances and adequate resources are allocated for operational stage.

*Table 8:1: Environment and Social Management and Monitoring Plan4*

| Environment/ Social Impact | Proposed Mitigation Measure | Indicator | Responsibility | Means of Verification | Time Frame | Estimated cost (Kshs) |
|---|---|---|---|---|---|---|
| NEGATIVE ENVIRONMETAL IMPACTS IN THE CONSTRUCTION PHASE | | | | | | |
| **Temporal Restriction Access** | • Prior notice be given to community members through the local administration on the restriction access before commencing the work.<br>• The proponent and the contractor to consider alternative ways of executing the works to allow continued use of water in the Earth Dam such as draining of the water to temporal storage area.<br>• Consider an alternative source of water to the community for livestock use during the construction period such as water trucking. | • NO. of community members informed on restriction access<br>• NO. of water sources available to the community<br>• NO. of community members benefitting from water trucking | Contractor<br>Proponent<br>Department of water (Director)<br>CPCU | Reports<br>Attendance register | 4 months | **200,000 water trucking** |
| **Disturbance of vegetation** | • Site clearance to be limited to the project demarcated area and selective removal of vegetation or trimming of trees to be exercised where possible.<br>• Local community to be allowed to harvest areas of natural vegetation that are to be cleared prior to clearing.<br>• The proponent to support establishment of a community tree nursery for indigenous trees<br>• Compensatory planting of trees or other appropriate vegetation after construction works<br>• Construction workforce to be sensitized on environmental and ecological conservation | • Area cleared of vegetation<br>• Number of tree nursery established.<br>• Number sensitization meetings for workers held | Proponent<br>Supervising engineer/Contractor<br>PMC | M & E reports<br>Engineer's report<br>Photographs | 4 months | **150,000**<br>Tree nursery establishment |
| **Soil Erosion** | • Contractor to avoid construction during the wet season.<br>• Contractor to limit excavation to the marked boundaries of the project site.<br>• Contractor to ensure proper compaction where required.<br>• Contractor to provide designated routes for vehicles.<br>• Where possible the contractor to exercise selective removal of mature, indigenous trees.<br>• Compensatory planting of trees or other appropriate vegetation after construction<br>• Sensitization of construction workforce on environmental and ecological conservation and protection. | • Time of excavation<br>• Area of land excavated<br>• Designated site for stock pile available<br>• Number of compactions runs made<br>• Marked routes for vehicles available<br>• Number of sensitization meetings held | Contractor/supervising engineer<br>Proponent<br>Dept. of Agriculture<br>Dept. of Environment<br>Community | Engineers' reports<br>Photographs<br>Attendance register<br>Sectoral Field reports | 8 months | **Factored above** |

| | | | | | | |
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| **Noise and vibration generation** | • Avoid idling of machinery or engine when not in use.<br>• Restrict activities that create noise to daytime only.<br>• Workers to be provided with ear muffles.<br>• Contractor to ensure the use of well-maintained machineries and vehicles. | • Number of PPEs purchased.<br>• Number of workers using PPEs.<br>• Number of vehicles and machinery not on idling when not in use.<br>• Time of operation | Contractor/Supervising engineer/work manager | Local purchase orders<br>Reports<br>Receipts<br>Available servicing cards/receipts | 4 months | **10,000**<br>**Ear muffs** |
| **Air Pollution (Dust & Machinery and motor vehicle emissions)** | • Ensure that maintenance on all machinery is done regularly to avoid the emission of noxious gases.<br>• Drivers and machine operator to avoid unnecessary running of motor vehicle engines and machinery when not in use.<br>• Provision of dust masks to workers and ensure their use.<br>• Locating haul roads, tips, and stockpiles away from sensitive receptors, considering prevailing wind directions.<br>• Contractor to instruct the drivers to avoid unnecessary speeding near settlements in the project areas<br>• Contractor to make sure water sprays and mist are applied as dust suppression measures on loose soils and stockpiles. | • Frequency of machinery/ vehicle maintenance<br>• No / frequency of water sprays and mists<br>• No. of designated hauling/stockpiles areas<br>• No of PPEs procured/ Proportion of workers with requisite PPEs<br>• No of drivers trained/advised due diligence on machine/vehicle operation | Contractor/Supervising engineer/work foreman<br>NEMA | LPOs<br>Reports<br>Signed contracts between Contractor & employees | 4 months | **100,000**<br>**Water sprays** |
| **Oil spills** | • Proper maintenance of vehicles and other equipment (using petroleum products) to avoid fuels and lubricants spills at the project site.<br>• The contractor should properly handle, store, and dispose off oils and greases and their wastes during construction by ensuring that servicing is strictly done at designated servicing yard or external petroleum stations.<br>• Site staff to be sensitized on safety procedures for fuel storage and re-fueling should be well understood and implemented by site staff. | • Designated site for disposal of contaminated materials available<br>• Number of sensitization meetings held<br>• Number of motor vehicle servicing undertaken<br>• Number of vehicles serviced | Contractor/supervising engineer | Servicing receipts/cards<br>Reports<br>Attendance registers | 8 months | **30,000** |
| **Solid waste generation & accumulation** | • The contractor to exercise waste segregation and to ensure waste not reusable or recyclable is cleared from the project site and disposed off as per NEMA and County Government regulations<br>• Contractor to provide temporal waste disposal receptacles in site.<br>• Contractor to liaise with licensed waste collector to routinely collect and dispose the waste | • No of litter bins installed<br>• Licensed waste handler in place<br>• No of trainings on waste management<br>• NO. of bins for handling solid waste | Contractor/Project Manager | Receipts<br>Attendance Register<br>Photos | 4 months | **5,000**<br>**For bins** |
| **Excavated earth materials & desilted silt** | • Contractor to dump unused excavated materials and debris in designated places as directed by the supervising engineer. | • Presence of designated site for unreusable earth materials. | Contractor/Supervising engineer | Engineers report<br>Photos | 4 months | **10,000** |

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| | • Contractor to use excavated soil for the Earth Dam wall/embankment.<br>• Excavated silt can be incorporated with compost for use as potting media in the tree nursery. | • Volume of reused earth materials<br>• Volume of silt to be used in tree nursery | | | | |
| **NEGATIVE SOCIO-ECONOMIC IMPACTS IN THE CONSTRUCTION PHASE** | | | | | | |
| **Occupational Health and Safety (OHS)** | • The sites to be protected or fenced off from unauthorized intrusions and warning signs; barricades should be properly displayed and strictly adhered to.<br>• All workers to be provided with full protective gear (PPEs) and to use them<br>• Workers to be trained on first aid & a fully equipped First Aid Kit provided at site.<br>• The contractor to have Incident and Accident Registers on site for recording of injuries or any OHS incidence.<br>• Contractor to prepare an emergency management and preparedness plan for accident response & avail Emergency contacts for police, ambulance, etc.<br>• Contractor to appoint a qualified health and safety person to manage OSH issues.<br>• Tools and equipment to be placed in a safe place when not in use.<br>• Workers on contract to be insured | • No of Labels and warning signs installed<br>• No of workers using PPEs on use by those involved at the site<br>• No of staff/ workers trained on first-aid<br>• No of First-aid Kits installed<br>No of incidences/ accidents reported<br>• NO. of emergency plan for accident response in place<br>• Emergency contacts at the site<br>• No of persons insured | Contractor/Supervising engineer/work foreman Work foreman<br>Directorate of Occupational Health and Safety (DOSH) | Purchase receipts<br>Reports<br>Attendance register<br><br>Records of testimonials of drivers | 4 months | **50,000** |
| **Risk of Accidents to the community** | • Contractor to sensitize the community on the project and the project period and what caution to be taken by the community.<br>• Contractor to employ qualified drivers.<br>• Drivers to be instructed to observe required speed limits.<br>• Installation of warning sign boards at the construction site and identified risk areas. | • Number of drivers instructed<br>• No. of signage in identified risk areas<br>• No. of community sensitizations on project implementation, risks and safety measures | Contractor/Supervising engineer | Photographs<br>Attendance register<br>Site visits | 4 months | **15,000** |
| **Increase in incidences of HIV/AIDS and STIs** | • Contractor to sensitize workers and community members on HIV/AIDS and other communicable diseases.<br>• Contractor's Health and Safety Management Plan (CHSMP) to be enforced through the Directorate of Occupational Health & Safety (DOSH)<br>• Controlled access to Contractor's Workforce Camps by outsiders.<br>• Contractor to provide standard quality condoms at the construction site during the construction period. | • Number of worker and community sensitized<br>• No of condom dispensing equipment installed<br>• Number of meetings held for workers and community | Contractor<br>Proponent<br>Public Health | Attendance registers<br>Site visits | 8 months | **40,000** |
| **Labor risks including labor influx** | • Local community members will be given priority in employment opportunities, in casual and unskilled labour.<br>• Train the community on the project requirements and product. | • Number of trainings for PMC and Community policing of the project<br>• NO. of community members trained on project requirements | Contractor/<br>CPCU/ | Training reports<br>Workers register<br>local administration report on GBV incidences | 1 month | **50,000** |

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| | • Training of PMC and Community policing of the project | | | monitoring, assessment | | |
| **Risk of social conflict** | • The proponent adherence to national labour code and WB policies through incorporating the same in the Procurement and Contract Agreement document for implementation by the contractor.<br>• Contractor to sensitize the workers on code of conduct (COC)<br>• Develop and implement local hiring rules in consultation and partnership with the local community.<br>• Train workers and the project management committee and rank members on conflict management and resolution | • No of tenders with specific clause on WB policies such as equality in employment<br>• No of signed code of conduct by the workers<br>• Community user's development plan developed<br>• NO. of PM administration trained on GBV | Contractor/Works foreman<br>CPCU<br>Local Project management committee | Minutes<br>Reports<br>Attendance registers | 1 months | **10,000** |
| **Child labor and school dropout** | • The proponent to sensitize the community on national children welfare policies, children laws and World Bank policies on the protection of children and the importance of children being educated.<br>• The Proponent to ensure the Contractor complies with national and WB policies and rules on welfare of children.<br>• Control to ensure there is no child labour at the construction. This can be done by using Identification Cards to verify the age of the workers and casuals. | • No. of sensitizations on children welfare<br>• No of registered workers<br>• No of workers who have signed the code of conduct | CPCU | Signed agreements<br>attendance registers<br>copies of ID. Card No. of workers | Construction phase | **10,000** |
| **Gender-based Violence (GBV) at the community level** | • The contractor will implement provisions that ensure that GBV at the community level is not triggered by the Project, including:<br>• Effective and on-going community engagement and consultation, particularly with women and girls.<br>• Review of specific project components that are known to heighten GBV risk at the community level.<br>• The contractor shall develop specific plan for mitigating these known risks, e.g. sensitization employment.<br>• The contractor will ensure adequate referral mechanisms are in place if a case of GBV at the community level is reported related to project implementation. | • Number of engagements with women & girls<br>• Code of conduct prepared<br>• NO. of GBV risk factor identified<br>• NO. of plans to mitigate risks developed.<br>• NO. of Referral mechanisms in place. | Supervision Consultant<br>GBV Expert<br>Local NGO/CBO | GBV plans<br>Attendance registers<br>GBV action plans | 1 year | **100,000** |
| **Sexual Exploitation and Abuse by project workers against community members** | • Proponent to develop and implement a SEA action plan with an Accountability and Response Framework as part of the C-ESMP.<br>• The SEA action plan will include how the project will ensure necessary steps are in place for:<br>• Prevention of SEA through including Code of Conduct (CoC) and ongoing sensitization of staff on responsibilities related to the COC. | • NO. of SEA Action Plans<br>• NO. of workers signed COC<br>• Number of community members engaged on developing community-based complaint mechanism. | Supervision Consultant<br>GBV Expert | SEA action plan<br>Attendance registers | 1 year | **150,000** |

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| | • Response to SEA by including survivor-centered coordinated multi-sectoral referral and assistance to complainants according to standard operating procedures.<br>• Engagement with the community & development of confidential community-based complaints mechanisms discrete from the standard GRM.<br>• Integration of SEA in job descriptions, employments contracts, performance appraisal systems, etc.; development of contract policies related to SEA. | | | | | |
| **NEGATIVE ENVIRONMETAL IMPACTS IN THE OPERATION PHASE** | | | | | | |
| **Surface & Ground water pollution** | • The Earth Dam should be fenced as indicated in the BQ and having only one controlled entrance.<br>• The users should draw off water from the designated sites only.<br>• The Contractor to clear the site of all solid wastes, construction materials and any spills after completion of the construction works.<br>• The Proponent to ensure the construction of pit latrines in the site as provided in the BOQ at a safe distance from water sources.<br>• The Proponent to develop and implement (through sensitization of farmers) an ***Integrated Pest Management Plan*** (IPMP)<br>• Proponent to ensure regular monitoring of water quality. | • No of animals drinking from water troughs<br>• No of community members drawing water from communal drawing points constructed<br>• Acreage fenced<br>• NO. of pit latrines constructed<br>• NO. of IPMP developed & implemented<br>• NO. of farmers sensitized on IPMP<br>• Frequency of water quality testing. | Proponent<br>Dept. of Livestock and agricultural officers<br>Proponent<br>Community in catchment area | Designs & BQs<br>Reports<br>Photographs<br>Attendance Registers<br>Training manuals | 6 months | **150,000 IPMP development & implementation.** |
| **Soil erosion & Siltation** | • Construction of silt traps along the inlet water course as will be guided by the supervising engineer<br>• Regular maintenance of the check dam/silt traps by the community<br>• The embankment to be grown with suitable grass as outlined in the design plan.<br>• The proponent to ensure the implementation of the developed ***integrated sustainable land management (ISLM)*** plan.<br>• The catchment community to be sensitized on the ISLM & to be trained on farm SLM practices e.g. terracing, minimal tillage, agroforestry crop rotation, intercropping.<br>• Regular construction should be undertaken (removal of silt from the reservoir using manual labour can be periodically organized during the dry season).<br>• The proponent to consider piping water to other sites in future to avoid animal concentration and overgrazing in the project area.<br>• Sensitize the community on appropriate stock rate. | • No of silt traps constructed along the inlet water course<br>• Acreage of land under catchment management and conservation through SLM<br>• No of trainings on SLM<br>• Area of embankment planted with grass.<br>• NO. of additional cattle troughs.<br>• NO. of community members sensitized on stock rate.<br>• NO. of gabions constructed<br>• Frequency of desiltation. | PMC Proponent<br>Community<br>Director Department of agriculture | Designs & BQs<br>Training manuals<br>Attendance Registers<br>Photographs | 8 months | **75,000 sensitization** |

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| **Earth Dam breaking its walls and associated risks** | • The Proponent should develop the Kebenonin Earth Dam Crisis Action Plan (CAP). The CAP should contain the details for Earth Dam CAP as shown under Annex 9.<br>• A qualified Water Resource Professional should inspect the site every year and at least at the end of every rainy season.<br>• Undertake regular (continuous) monitoring and assessment of the Earth Dam and project site especially with the current climate change, before and after the rainy season.<br>• Proper inspection should be done once in 3 years to a maximum of once in 5 years by a qualified professional<br>• The inspection forms (see on annex 8) should be properly filled, maintained and action recommended.<br>• Train the project management committee and the local administration (local technical team) on scouting which will lead to early detection and responding to any risk situation.<br>• An Emergency Action Plan (EAP) should always be maintained by the operation and maintenance team and this should be done during the routine preventive maintenance by the local technical team (see the plan on annex 10).<br>• Undertake Environmental Audit for the Earth Dam annually as required by NEMA. | • CAP in place<br>• number of inspections conducted/ frequency of inspection.<br>• No of trainings for PMC<br>• No of annual inspections conducted by engineers<br>• Number of seasonal monitoring and assessment of the Earth Dam<br>• No of Environmental Audit for the Earth Dam annually<br>• Presence of Emergence Response Plan (ERP) | Local project management committee<br>Chief/Village Administrator<br>CPCU/County Government | Inspection reports<br>CAP<br>Training manuals<br>Attendance Registers<br>Audit Reports<br>ERP<br>Periodical M & E reports<br>Photographs | 1 year | **250,000** |
| **Solid waste generation** | • Sensitization of the farmers on the disposal of used agrochemical wrappings, containers and packages.<br>• Proponent to ensure wastes from farming activities are sorted before disposal<br>• Proponent to provide litter/waste bins in the project area for temporal storage of waste.<br>• Use of a NEMA registered waste collector, transporter and disposer. | • NO. of famers sensitized on agrochemical waste disposal<br>• NO. of waste bins provided.<br>• NO. of registered waste collectors engaged | Proponent<br>Director agriculture & livestock<br>CPCU | Attendance register<br>Training manuals<br>Reports | once | **40,000 training & waste bins** |
| **Drowning Risk** | • The risk has been significantly reduced through the proposed fencing and installation of a gate.<br>• The gate to be always locked with a padlock.<br>• The community be sensitized on the potential risk of drowning.<br>• Involvement of the whole community members in ensuring that the perimeter fence is maintained and not destroyed (encourage community policing).<br>• Employ a person to guard the Earth Dam/through the water users' association (WUA) ensure regular monitoring. | • Length of perimeter fence constructed<br>• No. of sensitized<br>• No. of entrances<br>• No. of persons responsible for policing | PMC | BQs<br>Reports<br>Photographs<br>Signed agreements with community policing team | 1 year | **60,000** |

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| **NEGATIVE SOCIO-ECONOMIC IMPACTS IN OPERATION PHASE** | | | | | | |
| **Outbreak of livestock diseases** | • Regular disease surveillance by the veterinary department and community.<br>• Sensitization of the community on disease spread, monitoring and control.<br>• A livestock disease management plan be put in place by the veterinary department to ensure disease incidences are promptly responded to and addressed. | • Number of disease surveillance<br>• No of Sensitization meetings held on disease control<br>• A livestock disease management plan put in place | CPCU | Surveillance reports<br>Training reports<br>Attendance Registers<br>Disease Management Plan | 1 year | **100,000** |
| **Human health impacts e.g. Malaria and schistosomiasis** | • Sensitize the community on malaria prevention through use of mosquito nets, local and indoor residual spraying and bush clearing near households.<br>• Malaria surveillance programme to be maintained.<br>• Establish community-based health education committee that facilitate malaria control programme facilitated and coordinated through public health department<br>• Sensitize the community on water purification methods. | • No/ Proportion of households with mosquito nets<br>• No of people trained on malaria & water borne diseases control<br>• Record of disease incidence<br>• No of households practicing safety rules | CPCU<br>Department of Public Health | Photographs<br>Attendance Registers | 2 weeks | **50,000** |
| **Occupational Health and Safety to use of agricultural chemicals** | • Development & implementation of Integrated Pesticide Management Plan (IPMP) | NO. of IPMP developed & implemented | CPCU<br>Proponent<br>Department of Agriculture | Reports | Quarterly | **150,000** |
| **Water use related conflict** | • Develop and implement a community users' development plan in consultation and partnership with the local community and existing WRUAs<br>• Formulation of local by-laws to guide the use of water in the project area<br>• Sensitize the community/beneficiaries on efficient water use to avoid wastage.<br>• Raise community awareness on the benefits of the project for more cooperation. | NO. of community water users plan developed & implemented<br>NO. of bylaws developed and implemented<br>NO. of community members educated on water conservation | CPCU<br>Proponent<br>WRA<br>Department of Water | Attendance register<br>Training manual<br>Reports | Quarterly | **75,000** |
| **Poor leadership and management problems** | • Training of PMC on water project management, financial management and promotion of accountability & accountability.<br>• Sensitization of project beneficiaries/community members on project management. | NO. of PMC trained<br>NO. of trainings<br>NO. of community members trained on project management. | CPCU<br>Proponent | Attendance register<br>Reports | Quarterly | **50,000** |
| **Child labour and school drop out** | • Train village volunteer child monitors to work closely with the office of the chief and the department of children on issues of child protection<br>• Sensitize the community on child protection issues relating to the project. | • NO. of village volunteer's child monitors trained.<br>• NO. of community members trained on child protection. | CPCU<br>Proponent<br>Chief | Attendance register<br>Reports | Quarterly | **25,000** |

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| **DECOMMISSIONING PHASE** | | | | | | |
| **Decommissioning Impacts** | • Proponent to undertake environmental and social impacts of the proposed decommissioning | Duration of investigation<br>NO. of Decommissioning Plans ESMP developed | Proponent | Decommissioning report<br>Decommissioning Plan ESMP | 1 months | **200,000** |
| **conflict Management** | • Proponent to notify all the Project Affected Persons (PAP) | NO. of methods of notification<br>NO. of PAPs notified | Proponent | Notification notice | 1 week | **30,000** |
| TOTAL | | | | | | **2,185,000** |

**NOTE:**

*This ESMP should be shared with the chosen Contractor to enable the development of the Contractor ESMP for easy follow up and monitoring of the proposed mitigation measures and response to other issue that might arise during the construction phase.*

## 8.2 Earth Dam Crisis Action Plan (CAP)

A crisis action plan for Kebenonin Earth Dam should be developed and would consist of:

- Contact names and telephone numbers (owner of the dam, authorities downstream, police and emergency services and others) to call if the dam is damaged, develops problems or is considered unstable.
- Information on possible areas likely to be affected downstream (estimated area of inundation) should the dam fail or significant amounts of water require immediate release from gates, drains or outlets. A map to illustrate various levels of inundation (with estimates of timings for any flood wave) should be prepared and be available.
- A list of names, addresses and telephone numbers (keep this up to date) of inhabitants living immediately downstream of the dam and within the estimated area of inundation.
- The CAP should be periodically updated to consider changes in land use downstream and any changes to the catchment upstream.
- Plans for warning and emergency evacuation, including the provision of safe routes to follow in case of flooding/ dam failure. Immediate evacuation should take priority over any other action should the stability of the Earth Dam be threatened.
- Information on resources to use and procedures to follow for emergency repairs. This should include a list of civil engineering contractors, equipment and materials' suppliers and engineers available locally.

### 8.2.1 Emergency Action Plan (EAP)

An Emergency Action Plan should always be maintained by the operation and maintenance team and this should be done during the routine preventive maintenance by the local technical team (see the EAP on appendix 13).

### 8.2.2 Community Training

As the Earth Dam will be owned by the community at least two members of the Earth Dam committee should receive basic training in operation and maintenance aspects of the Earth Dam. This training should concentrate on the following issues:

- Attending to minor problems which can be taken care of by the community itself, e.g., rain erosion on embankment slopes, repair of fences etc.;
- Identification of problems which require more specialized attention, e.g., erosion in spillway channel; and
- Establishment of communication channels between the representatives of the community (Earth Dam committee) and the responsible organization or administration at county level.

## 8.3 Risk Assessment

Earth Dams are considered to be a hazard as it may cause inundation, physical and environmental damage and loss of life. As such, classifying water structures into different hazard classes helps to define design speculations and acceptable risk associated with different scale of hazard. Based on table 8.3 below, this type of Earth Dam is a low to medium risk hence a crisis action plan is very necessary.

*Table 8:2: Class of Water Structures*

| Class of water structure/dam/Earth Dam | Maximum Depth of Water at NWL (m) | Impoundment and NWL (m3) | Catchment Area (km²) |
|---|---|---|---|
| A (Low Hazard) | 0-4.99 | <100,000 | <100 |
| B (Medium Hazard) | 5.00-14.99 | 100,000 to 1,000,000 | 100 to 1,000 |
| C (high Hazard) | >15.00 | >1,000,000 | >1,000 |

***Source (Practice Manual for Small Dams, Pans and Other Water Conservation Structures in Kenya)***

Based on the above criterion, Kapkurmat_Kamugele water structure falls in the Low hazard category since it has a depth of above 4 meters with a catchment area of less than 100 square kilometers.

## 8.4 Earth Dam Inspection

To ensure the safety of Kebenonin Earth Dam regular inspection will be undertaken. A qualified Water Resource Professional should inspect the site every year and at least at the end of every rainy season. The dam should also be continuously monitored especially with the current climate change, before and after the rainy season. However, Proper inspection should be done once in 3 years to a maximum of once in 5 years by a qualified professional.

The inspection forms (see on appendix 11 on inspection form) should be properly filled, maintained and action recommended. An emergency Action Plan should always be maintained by the operation and maintenance team and this should be done during the routine preventive maintenance by the local technical team (see plan on appendix 11).

# 9. CONCLUSION AND RECOMMENDATIONS

## 9.1 Conclusion

There was upmost acceptability and goodwill from the community living in the project area for the proposed project. There are major environmental and social issues both positive and negative associated with the construction, operation and decommissioning of the proposed project. Mitigation measures have been proposed in every negative impact raised in construction, operation and decommissioning under the environmental and social management plan (ESMP) for consideration in these various stages of the proposed project.

The ESIA and preparation of this comprehensive project report was carried out to fulfil legal requirements, as outlined in the Environmental Management and Co-ordination Act (1999), and the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015&2019. Mitigation measures for the potentially significant and/or adverse environmental and social impacts and safety risks have been provided as an integral part of this ESIA report.

There is need for rigorous implementation of the Environmental Management and Monitoring Plan which will facilitate the mitigation and/or prevention of potentially adverse environmental impacts.

The proposed ESMP should be followed fully by the contractor with the supervision from the proponent and environmental and social monitoring progress report be submitted quarterly. This will help to ensure success of EMP and that the recommended mitigation is implemented throughout construction, operational and decommissioning phases in order to avert any negative impacts.

## 9.2 Recommendations

The following are some of the recommendations made in order to minimize or mitigate for the adverse environmental and social impacts from the proposed Earth Dam.

a) **Implementation of Prescribed Mitigation and Community Measures:** The proponent and contractor are legally obligated to implement all mitigation measures detailed within this Comprehensive Project Report and its

Environmental and Social Management Plan (ESMP). This includes, but is not limited to, the specific measures derived from community consultation, such as:

- **Local Economic Inclusion:** Prioritizing the hiring of qualified individuals from the Kapkurmat_Kamugele community for unskilled and semi-skilled labor positions, sourcing skilled labor externally only when local expertise is unavailable.
- **Workforce Safeguards:** Supplying all personnel with certified Personal Protective Equipment (PPE) and ensuring mandatory registration and insurance for all workers under the Work Injury Benefits Act (WIBA).
- **Site and Community Safety:** Erecting secure perimeter fencing with controlled access, installing clear safety signage, and conducting community sensitization on construction hazards.
- **Resource Governance:** Developing transparent, enforceable water-use guidelines in partnership with the Water Users Association (WUA) to ensure equitable allocation for domestic, livestock, and irrigation needs.
- **Environmental Management:** Limiting vegetation clearance to the demarcated project footprint and implementing a post-construction revegetation plan for disturbed areas.

b) **Adherence to Approved Project Design and Ancillary Assessments:** All project activities, including design, construction, and operation, must be carried out in strict accordance with the specific engineering designs, specifications, and methodologies approved in this report. No deviations are permitted without prior review and authorization from the relevant authorities (NEMA, WRA, County Government). Furthermore, the proponent must undertake and obtain approval for separate, site-specific Environmental Impact Assessment studies for all proposed ancillary sites, such as borrow pits and areas for sourcing construction materials, before any related activities commence. It is recommended that the feasibility of installing a small upstream weir or check structure be assessed to help regulate inflow and reduce sediment entering the Earth Dam. Where a full weir is not practical, silt traps or gabion check dams within the upstream channel

should be considered as cost-effective alternatives for controlling siltation and prolonging the lifesdam of the Earth Dam.

c) **Mandatory Annual Compliance Audit:** A complete Environmental and Social Compliance Audit must be undertaken by the proponent and submitted to the National Environment Management Authority (NEMA) every year after the project's commissioning. This annual audit must independently verify that all proposed mitigation measures within the ESMP have been fully complied with and are effective.

d) **Addressing Social Impacts from Community Participation:** The proponent must ensure that the social impacts and concerns raised during community participation are actively followed, addressed, and documented. The annual audit stipulated in point (c) must include an evaluation of the management of these social impacts, confirming that community-raised issues have been resolved and that ongoing engagement mechanisms are functional and effective

In conclusion, the positive impacts outweigh the negative impacts. The listed negative impacts can be corrected with the proposed mitigation measures and it is also economically viable therefore the **project should be allowed to proceed.**

.

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# APPENDICES

## Appendix 1: Minutes of Public Participation

**MINUTES OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM IN BARINGO WEST SUB-COUNTY, BARTABWA WARD, NGORORA LOCATION, BARINGO COUNTY HELD ON 26TH FEBRUARY, 2026 AT KAPKURMATE / KAMUGELE VILLAGE - KEBENONIN DAM LOCATION AT 11:15 AM.**

See Attached:

### AGENDA

1. Introductions and opening remarks
2. Purpose of the meeting
3. Kebenonin Dam Project Brief and Background
4. Concerns, Questions, Recommendations, and Responses
5. A.O.B. & adjournment

### PRELIMINARY

The meeting began with an opening prayer from one of the community elders at 11:15 pm, after which the County Project Coordinator (Mr. Elphas Rutto) called the meeting to order. The present officials also introduced themselves which included the area chief, the Ward administrator and the County Director for the National Environmental Management Authority of Baringo County. The meeting was held at the proposed Kebenonin Dam location in Kapkurmate / Kamugele Village on 26th February, 2026. A total of 39 community members (3 Female, 36Male and 16 youth) attended the ESIA public meeting. The meeting started at 1115 hours.

### MIN. 1 - 26/02/2026: INTRODUCTION & OPENING REMARKS

The ESIA Consultants explained that the purpose of the meeting was to conduct public participation as part of the Environmental and Social Impact Assessment (ESIA) process for the proposed construction of the Kebenonin Dam. The Consultant emphasized that public participation is a legal requirement under the Constitution of Kenya and relevant environmental regulations, and that community views, concerns, and suggestions would be incorporated into the ESIA study.

### MIN. 2 – 26/02/2026: PROJECT BRIEF AND BACKGROUND

The ESIA Consultant started by briefing the community members about the proposed project. With the assistance of a translator who was one of the community members, he explained the project design and the expected activities during construction and operation. He also emphasized that the project will be owned by the community and called upon

members of the community to support the efforts of the project by imploring that they remain cooperative throughout the construction phase and also to ensure sustainability during the operation of the dam.

The ESIA expert requested a brief historical background about the water situation in the area and why they believed it was a great initiative for the dam to be constructed in the given location. A community member, briefly explained the challenges faced due to severe water shortages and how far they had to walk to get water, and many times lacked access to clean drinking water or water for domestic use. With the prolonged water shortages, a lot of livestock mortality has occurred, and many have suffered diseases due to the consumption of contaminated water. Children have also had to spend time away from school as they had to prioritise looking for water. The community members unanimously added that they have been unable to fully practice agriculture since they lack a reliable and close source of water which has inherently led to food insecurity in the area. They have heavily depended on a semi-permanent river (Toisaror River), which is 6km away.

The challenges stated above have left the community members to only hope for such a project to ease the burden they carry. The village elder stated that water availability means that they will be able to focus on productive activities like terrestrial farming and start learning about fish farming, as most of the old people like him are not employed. The young people stated that the construction of the dam will mean that they will spend less time fetching water, they will be able to groom more often and even not have to go far to graze their livestock. On that matter, they were actively looking to engage in the meeting, hoping to be fully aware of all impacts anticipated by the project and to share their opinions as well.

## MIN. 3 - 26/02/2026: PURPOSE OF THE MEETING

The consultant explained to the participants that consultation and public participation process is a requirement under Kenyan Constitution and a mandatory procedure stipulated in the Environmental Management and Coordination Act (EMCA) CAP 387 Section 58. According to section 59, and the second schedule of EMCA (Amendments 2019) new projects like the proposed construction of the Kebenonin dam, must undergo Environmental and Social Impact Assessment that includes conducting public meetings for the stakeholders, project affected persons, local community/ surrounding enterprises or interested and affected parties. The resulting Comprehensive Project Report must be submitted to the National Environment Management Authority (NEMA) for public and technical review, approval and subsequent issuance of relevant license to enable commencement of project implementation.

The main objective of the consultation meeting was to:

1. Gather comments, suggestions and concerns of the interested and affected parties in the proposed project, and incorporate them in the Comprehensive Project Report (CPR).
2. Disseminate and inform the public and stakeholders about the project with Special reference to its key components and description
3. Create awareness among the public on the need for the ESIA for the proposed project

The ESIA team Leader then welcomed the attendants to raise their comments, concerns and suggestions regarding the proposed earth dam project.

## MIN. 4 - 26/02/2026: POSITIVE IMPACTS ANTICIPATED BY MEMBERS FROM THE MEETING

The community welcomed the project. During the meeting, community members anticipated the following positive impacts arising from the proposed construction of the Kebenonin Dam:

1. **Improved water availability for domestic use:** The community stated that the dam will provide a reliable water source for households, reducing reliance on the semi-permanent Toisaror river.
2. **Enhanced livestock water supply:** The community stated that the dam construction will greatly support pastoral livelihoods by ensuring dry-season water access, reducing livestock mortality during droughts.
3. **Increased agricultural productivity:** Members of the community agreed that the availability of irrigation water may enable small-scale fish farming and crop diversification.
4. **Drought resilience and climate adaptation:** The community members mentioned that the reservoir will enhance water storage capacity, improving community resilience to prolonged drought periods common in ASAL areas.
5. **Employment opportunities during construction phase:** Most youth and women in the community stated that the construction dam will be a way of creation of direct and indirect jobs for local residents, boosting household incomes.
6. **Long-term operation and maintenance employment**: community members highlighted that since part of the sustainability of the dam is maintaince then the skilled and semi-skilled opportunities for dam management and maintenance will engage the community members as well.
7. **Reduced time spent fetching water:** the community stated that since women, young men and children, are typically responsible for water collection, will save time for education and economic activities.
8. **Stimulation of local economy**: As water will be easily and readily available then there will be increased business opportunities such as kiosks, transport services, and agri-based enterprises.
9. **Improved public health and sanitation:** the community members mentioned that with increased access to clean water may reduce waterborne diseases and improve hygiene standards as the dam intends to be sealed off from direct use and latrines and troughs will have different locations from the dam.
10. **Support for institutional facilities:** the community members stated that schools, health centres, and markets will benefit from improved water reliability as they will be able to invest in water storage facilities as well.

## MIN 5 - 26/02/2026: CONCERNS, QUESTION & ANSWER SESSION AND RESPONSES

The ESIA Consultant invited community members to raise questions, concerns, and comments regarding the proposed construction of the Kebenonin Dam and its anticipated environmental and social impacts. The following key issues were raised by the meeting participants, and responses were provided by the Client representatives and the ESIA Consultant as summarized below.

Table 1.1 Concerns by ESIA meeting attendants and Responses by Consultants

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| **Increased waterborne diseases (malaria, bilharzia)** | The community members shared their concerns on the Stagnant reservoir water may increase mosquitoes and snails, affecting children and livestock. | The ESIA consultant informed the community that a recommendation to Implement vector control program; periodic reservoir drawdown, public health sensitization; collaboration with the County Health Department. |
| **Siltation reducing dam storage capacity** | Community members raised concern on upstream erosion and flash floods may rapidly fill the reservoir with sediments. | The ESIA consultant recommended the development of a catchment management plan; promote afforestation and soil conservation; construct silt traps and gabions. |
| **Risk of dam failure or extreme flooding** | Community feared catastrophic flooding during intense rainfall events | The ESIA consultant assured that safe and strong construction will be done but for due diligence a recommendation for the contractor on site to design dam to international safety standards; incorporate Probable Maximum Flood (PMF) analysis; establish Emergency Preparedness and Response Plan (EPRP). |

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| **Loss of biodiversity and vegetation** | Community members noted that construction would require clearing of indigenous vegetation and disruption of habitats. | The ESIA expert and the NEMA director assured a recommendation to minimize clearing footprint; compensatory tree planting (1:3 ratio); and ensure biodiversity monitoring |
| **Climate Change Vulnerability** | Community expressed concern that prolonged droughts may reduce dam water levels, while extreme rainfall events may cause overtopping or structural stress. | The ESIA Expert is to recommend Integrate climate risk assessment in design; size spillway for extreme rainfall scenarios; incorporate drought contingency planning; promote integrated water resource management (IWRM); establish long-term hydrological monitoring; align project with Kenya's National Climate Change Action Plan (NCCAP). |
| **Groundwater table alteration** | The community members were highly concerned about possible drying or contamination of shallow wells and boreholes. | The ESIA expert is to highly recommend conducting a hydrogeological assessment; monitor groundwater; reservoir lining where necessary; protect community water points. |
| **Influx of workers and social risks** | With the contractor's team being new to the community members expressed fear of insecurity, GBV, and communicable diseases. | The ESIA expert recommended for workers' Code of Conduct; prioritize local hiring; HIV/AIDS and GBV awareness programs; grievance redress mechanism. |
| **Noise and vibration impacts** | Community members expressed concerns about disturbance to schools, homes, and livestock dung construction activities. | The ESIA expert promised to recommend restricting construction to daytime; notify community prior to blasting; use well-maintained equipment. |

| Key Issue | Stakeholder concerns | Technical Team Response |
|---|---|---|
| **Water contamination from construction activities** | Community members expressed further contamination from a risk of fuel spills, cement washout, and improper waste disposal | The ESIA expert recommended for the experts on the construction site to Implement Construction Environmental Management Plan (CEMP); banded fuel storage; spill response kits; proper waste handling. |
| **Dust and air pollution during construction** | Most women and older community members raised concerns on potential respiratory concerns due to dust from earthworks and trucks. | The ESIA expert is to recommend water sprinkling; speed control; PPE for workers; regular equipment maintenance |

## MIN 6 - 26/02/2026: SUGGESTIONS FROM MEMBERS IN ATTENDANCE

The community members were given the opportunity to share any recommendations for consideration to maximize the dam usage and ensure that they fully benefit from the project. The following were the discussed suggestions that they unanimously agreed on:

1. Agricultural productivity: Support smallholder farmers with irrigation training; establish water user associations; ensure equitable water allocation.
2. Drought resilience: Develop clear water rationing plans during drought periods; prioritize vulnerable households and institutions
3. Construction employment: Prioritize local youth and women for job opportunities; ensure transparent recruitment process
4. Reduced water-fetching burden: Locate water access points within safe walking distance; ensure proper lighting/security at water points
5. Public health improvement: Integrate sanitation facilities and hygiene awareness campaigns alongside the water project
6. Aquaculture development: Provide training and starter support for fish farming; ensure equitable access to fishing rights (Extension Services)
7. Improved infrastructure and access roads: Maintain access roads after construction; ensure roads benefit the wider community and not only the project site.
8. Groundwater recharge benefits: Monitor nearby water sources and protect them from contamination; share monitoring results with community.
9. Operation & maintenance jobs: Provide technical training to local residents to enable them qualify for skilled roles
10. Mental health awareness: Create awareness about Mental health issues and champion on suicide awareness to prevent any suicide cases in the dam.

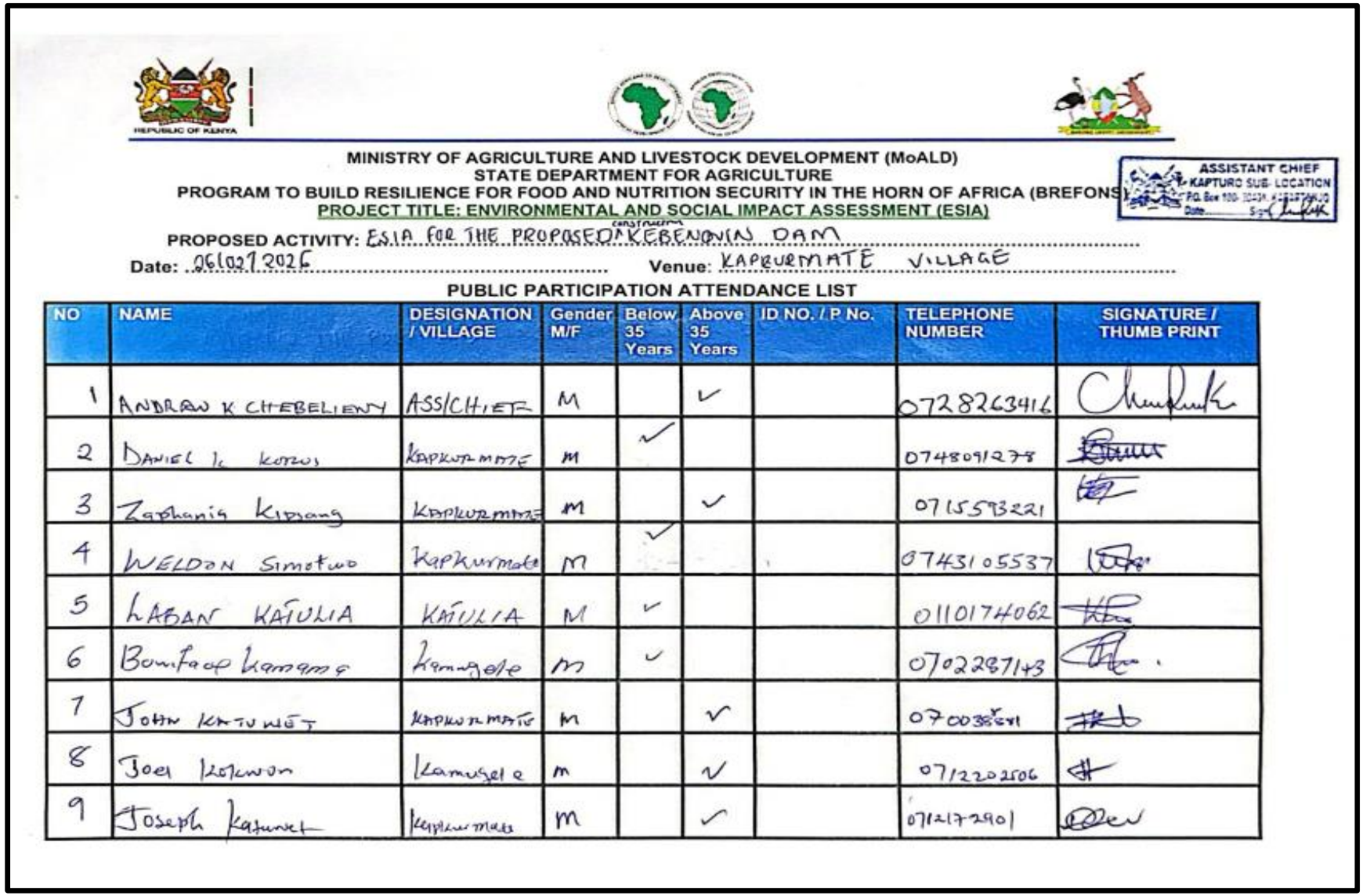
## MIN 7 – 26/02/2026: A.O.B AND ADJOURNMENT

The CPC thanked the community members for cooperation during the meeting and all their opinions shared. He requested for anyone to raise any issues since community was gathered in the presence of the chief and there being no other business, the meeting ended with a word of prayer from one of the community members at 1300hrs.

**Signatures for Authentication**

| Name/Title | Signature | Date |
|---|---|---|
| ERICK O. ORWA | | 27 FEBRUARY, |
| Lead Environmental Expert | _____ | _____ |
| _____ | | |

## Appendix 2: List of Attendance



MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)
STATE DEPARTMENT FOR AGRICULTURE
PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)
PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

ASSISTANT CHIEF
KAPTURO SUB LOCATION

PROPOSED ACTIVITY: ESIA FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM
Date: 26/02/2026 Venue: KAPKURMATE VILLAGE

PUBLIC PARTICIPATION ATTENDANCE LIST

| NO | NAME | DESIGNATION / VILLAGE | Gender M/F | Below 35 Years | Above 35 Years | ID NO. / P No. | TELEPHONE NUMBER | SIGNATURE / THUMB PRINT |
|---|---|---|---|---|---|---|---|---|
| 1 | ANDREW K CHEBELIENY | ASS/CHIEF | M | | ✓ | | 0728263416 | |
| 2 | DANIEL K KOTUS | KAPKURMATE | M | ✓ | | | 0748091278 | |
| 3 | Zephania Kipsang | KAPKURMATE | M | | ✓ | | 0715593221 | |
| 4 | WELDON SIMOTWO | Kapkurmate | M | ✓ | | | 0743105537 | |
| 5 | HABAN KAIULIA | KAIULIA | M | ✓ | | | 0110174062 | |
| 6 | Boniface Kamame | Kamugele | M | ✓ | | | 0702287143 | |
| 7 | JOHN KATUWET | KAPKURMATE | M | | ✓ | | 0700385691 | |
| 8 | Joel Kotwon | Kamugele | M | | ✓ | | 0712202506 | |
| 9 | Joseph Kasunet | Kapkurmate | M | | ✓ | | 0712172901 | |

REPUBLIC OF KENYA

**MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)**
**STATE DEPARTMENT FOR AGRICULTURE**
**PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)**
**PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)**

ASSISTANT CHIEF
KAPTURO SUB- LOCATION

**PROPOSED ACTIVITY:** ESIA FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM

**Date:** 26/02/2026 **Venue:** KAPKURMATE

**PUBLIC PARTICIPATION ATTENDANCE LIST**

| NO | NAME | DESIGNATION / VILLAGE | Gender M/F | Below 35 Years | Above 35 Years | ID NO. / P No. | TELEPHONE NUMBER | SIGNATURE / THUMB PRINT |
|---|---|---|---|---|---|---|---|---|
| 10. | Collins Kandanga | Kapkurmate | M | ✓ | | | 0721742615 | |
| 11. | Kiso cheruyo | Kapkurmate | M | | ✓ | | 0716628523 | |
| 12. | Lorazo Kipkoi | Ishakanin | M | ✓ | | | 0716428784 | |
| 13. | Alfred Yatich | Kapkormate | M | ✓ | | | 0705198169 | |
| 14. | FRANCIS CHERUP | KAPKURMATE | M | ✓ | | | 0726017995 | |
| 15. | DICKSON YATICH | Kapkormate | M | | ✓ | | 0715059011 | |
| 16. | Ezekiel Kokwon | Kamugel | M | | ✓ | | 0719720695 | |
| 17. | Sylas Kokworr | Ishakanin | M | ✓ | | | 0754835181 | |
| 18 | Isaac Kokwon | Kamugelo | M | | ✓ | | 0726244285 | |

REPUBLIC OF KENYA

**MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)**
**STATE DEPARTMENT FOR AGRICULTURE**
**PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)**
**PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)**

ASSISTANT CHIEF
KAPTURO SUB- LOCATION
P.O. Box 130- 30401, KABARNET
Date ... Sign ...

**PROPOSED ACTIVITY:** ESIA FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM

**Date:** 26/02/2026 **Venue:** KAPKURMATE

**PUBLIC PARTICIPATION ATTENDANCE LIST**

| NO | NAME | DESIGNATION / VILLAGE | Gender M/F | Below 35 Years | Above 35 Years | ID NO. / P No. | TELEPHONE NUMBER | SIGNATURE / THUMB PRINT |
|---|---|---|---|---|---|---|---|---|
| 28 | Symon Kimuge | Kamukele | M | ✓ | | | 0715320576 | |
| 29 | Japhet Sulit | Kapkurmate | M | | ✓ | | 0727743278 | |
| 30 | Evans Yatich Kipkoro | Kapkurmate | M | ✓ | | | 0702331861 | |
| 31 | Elphas K. Rutto | ADA | M | | ✓ | | 0721579150 | |
| 32 | Peter Kipsekomen | Kapkomobe | m | | ✓ | | 0726344315 | |
| 33 | Benson Sotik | Kapkomat | M | | ✓ | | 0710ffc3145 | |
| 34 | Lydia Kiptoon | Kapkurmate | f | | ✓ | | 0743890055 | |
| 35 | faith kiptoo | Kapkurmate | f | | ✓ | | 0795252932 | |
| 36 | Jonathan Cholanya | Sitek | M | ✓ | | | 0716743373 | |

REPUBLIC OF KENYA

**MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)**
**STATE DEPARTMENT FOR AGRICULTURE**
**PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)**
**PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)**

ASSISTANT CHIEF
KAPTURO SUB- LOCATION
P.O. Box 100-30401 KAPTURO

**PROPOSED ACTIVITY:** ESIA FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM

**Date:** 26/02/2026 **Venue:** KAPKURMATE VILLAGE

**PUBLIC PARTICIPATION ATTENDANCE LIST**

| NO | NAME | DESIGNATION / VILLAGE | Gender M/F | Below 35 Years | Above 35 Years | ID NO. / P No. | TELEPHONE NUMBER | SIGNATURE / THUMB PRINT |
|---|---|---|---|---|---|---|---|---|
| 37 | Kiroi Amdanf | W/A | M | | ✓ | | 0725104058 | |
| 38 | Hesbon Monda | Director NEMA-Baringo | M | | ✓ | 0060/NEMA/07 | 0727561832 | |
| 39 | Erick Ogada | EIA EXPERT | M | ✓ | | | 0700033598 | |
| 40 | Suti Athman | ESIA EXPERT | F | ✓ | | | 0796247461 | |
| 41 | Erick O. Ogwa | LEAD EXPERT | M | | ✓ | | 0721178524 | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |

REPUBLIC OF KENYA

**MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)**
**STATE DEPARTMENT FOR AGRICULTURE**
**PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)**
**PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)**

ASSISTANT CHIEF
KAPTURO SUB- LOCATION

**PROPOSED ACTIVITY:** ESIA FOR THE PROPOSED CONSTRUCTION OF KEBENONIN DAM

**Date:** 3611021202G **Venue:** KAPKURMATE

**PUBLIC PARTICIPATION ATTENDANCE LIST**

| NO | NAME | DESIGNATION / VILLAGE | Gender M/F | Below 35 Years | Above 35 Years | ID NO. / P No. | TELEPHONE NUMBER | SIGNATURE / THUMB PRINT |
|---|---|---|---|---|---|---|---|---|
| 19. | Kokwon Chulat | Kamukele | M | | ✓ | | | |
| 20. | Francis Chebon | Kamukele | M | | ✓ | | 0707497355 | |
| 21 | Daniel Moroko | Kapkurmate | M | ✓ | | | 0727340284 | |
| 22. | Cornelius Sotl | Kapkurmate | M | ✓ | | | 0710279133 | |
| 23. | David Chemosong | Kapkurmate | M | | ✓ | | 0711135428 | |
| 24. | Dismus Kachumo | Kapkurmate | M | ✓ | | | 0703586318 | |
| 25 | Jacob Tekew | Kapkurmate | M | | ✓ | | 0728444600 | |
| 26. | Cheruiyot Amelung | Kakomole | M | | ✓ | | . | |
| 27. | Kipyokomen Kokwon | Kamukele | M | | ✓ | | 0713460456 | |

## Appendix 3: Sample of Filled Questionnaires

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)– KENYA COMPONENT

PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED PROJECT ACTIVITIES IN BARINGO COUNTY

Specific Site Activity: ESIA for the proposed construction of Kebenonin Dam in Baringo County

Pursuant to the provisions of the Environmental Management and Co-ordination Act (1999), and the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015. African Development Bank (AfDB) Environmental & Social Safeguards that encompass rigorous Environmental and Social Assessments, Stakeholder Engagement, development of Environmental and Social Management Plans (ESMPs), establishment of Grievance Redress Mechanisms, Continuous Monitoring and Evaluation, Capacity Building, And Knowledge Sharing which are applicable in the Sub-Project, Public Health Act and Legal Supplement 2003 an Environmental and Social Site Assessment (or EIA/ ESMP is being conducted for the **PROPOSED PROJECT.**

**Please note that these details are required for the purpose of authenticity in relation to the proposed project**

Respondent

Name: K. Nyakamen Kakwan

Phone Number: 0713 460 456

Village: Kamukele Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - water available for fish farming
   - business will come closer because of water
   - Less time will be spent getting water.
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Soil erosion
   - Land prcase by gauerment
   - diseases from stagnant water
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the project.

Signature/ Thump Print: ....

Date: 26/02/2026

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

STATE DEPARTMENT FOR AGRICULTURE

PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)– KENYA COMPONENT

PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED PROJECT ACTIVITIES IN BARINGO COUNTY

**Specific Site Activity:** ESIA for the proposed construction of Kebenonin Dam in Baringo County

Pursuant to the provisions of the Environmental Management and Co-ordination Act (1999), and the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015. African Development. Bank (AfDB) Environmental & Social Safeguards that encompass rigorous Environmental and Social Assessments, Stakeholder Engagement, development of Environmental and Social Management Plans (ESMPs), establishment of Grievance Redress Mechanisms, Continuous Monitoring and Evaluation, Capacity Building, And Knowledge Sharing which are applicable in the Sub-Project, Public Health Act and Legal Supplement 2003 an Environmental and Social Site Assessment (or EIA/ ESMP is being conducted for the **PROPOSED PROJECT.**

**Please note that these details are required for the purpose of authenticity in relation to the proposed project**

**Respondent**

Name: Jacob Terow

Phone Number: 0728444600

Village: Kapkurmet Sub-County: Baring West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

1) Water for Domestic use
2) Water for livestock
3) Water for farming

4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

1) Malaria, typhoid.
2) Human-wildlife conflict
3) Drowning.

5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the project.

The project is good

Signature/ Thump Print: ....

Date:

26/02/2026

REPUBLIC OF KENYA

**MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)**

**STATE DEPARTMENT FOR AGRICULTURE**

**PROGRAM TO BUILD RESILIENCE FOR FOOD AND NUTRITION SECURITY IN THE HORN OF AFRICA (BREFONS)– KENYA COMPONENT**

**PROJECT TITLE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED PROJECT ACTIVITIES IN BARINGO COUNTY**

**Specific Site Activity:**
Environmental and social impact Assessment for the proposed construction of Kebenonin Dam in Baringo County

Pursuant to the provisions of the Environmental Management and Co-ordination Act (1999), and the Environmental (Impact Assessment and Audit) Regulations (2003) revised in 2015. **African Development Bank (AfDB)** Environmental & Social Safeguards that encompass rigorous Environmental and Social Assessments, Stakeholder Engagement, development of Environmental and Social Management Plans (ESMPs). establishment of Grievance Redress Mechanisms, Continuous Monitoring and Evaluation, Capacity Building. And Knowledge Sharing which are applicable in the Sub-Project, Public Health Act and Legal Supplement 2003 an Environmental and Social Site Assessment (or EIA/ ESMP is being conducted for the **PROPOSED PROJECT.**

**Please note that these details are required for the purpose of authenticity in relation to the proposed project**

**Respondent**
Name: Cornelius Salit
Phone Number: 0710278133
Village: Kapkormoi Sub-County: Baringo west

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Water for use
   - boost of business around.
   - Availability of water for animals
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - diseases from mosquitoes
   - Lack of a proper access road.
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**

Signature/ Thump Print: [signature]

Date: 21/02/2026

REPUBLIC OF KENYA

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**Respondent**
Name: Lydia Kiptoon
Phone Number: 0714.594066
Village: Kapkurmate Sub-County: Baringo west

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   water for domestic use
   water for irrigation
   water for fishing
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   air pollution during constration
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   —

Signature/ Thump Print:

Date: 26/2/2026

REPUBLIC OF KENYA

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**Respondent**

Name: Faith Kiprop

Phone Number: 0794282932

Village: Kapkurmate Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   There will be water for domestic use
   Water for farming land
   Water for irrigation

4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   Mosquito breed
   The surrounding land will be unproductive

5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**

   —

Signature/ Thump Print: ...

Date: 26/2/2026

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**Respondent**

Name: Alfred Yatich

Phone Number: 0705 198 169

Village: Kapkormate Sub-County: Baring West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - It helps the community in their domestic uses.
   - The water can be used for small irrigation.
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - It encourages mosquitoes in the area.
   - Some residents can ~~into the~~ ~~we~~ drown into the water.
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   The project can generally assist the community at large.

Signature/ Thump Print: .....

Date: 26/2/2026

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**Respondent**
Name: Daniel Chemosong
Phone Number: 0711131128
Village: Kapkurmat Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   Water will be available for domestic use and farming

4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   Mosquito breeds

5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**

   I suggest fence poles to be Concrete

Signature/ Thump Print: ....

Date:
26/02/2026

MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT (MoALD)

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**Respondent**
Name: Yeldon Simotwo
Phone Number: 0743105537
Village: Kapkurmate Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   1) Water available for livestock
   2) Water available for domestic use
   3) Water for irrigation.
   4) Water for sanitation.

4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

   1) Drowning
   2) Waterborne diseases
   3)

5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the project.

Signature/ Thump Print: [signature]

Date:
26/02/2026

REPUBLIC OF KENYA

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**Respondent**

Name: Daniel Kwos Kotonio

Phone Number: 0748091838

Village: Kapkurmate Sub-County: Baringo west

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   Reduce Swarming of bees leaving our home steads
   Water for domestic use
   Improve the livelihoods for by having a water for the area like vegetable farming
   Reduce competition for water with wild animals during dry season
   Increased area under forest
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   Erosion may if no proper fencing of the proposed project (dam)
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**

Signature/ Thump Print: ..

Date: 26/02/2026

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**Respondent**
Name: Evans Yatul Kiprono
Phone Number: 0702331861
Village: Kapkurmate Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   Reliable water for domestic use
   Agricultural water for farming
   Fishing farm
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   Water borne diseases
   Air pollution during construction due to dust
   Malaria due to mosquito breeding zone
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**

Signature/ Thump Print: ...

Date: 26/02/26

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**Respondent**
Name: Francis Chebon Kiplukot
Phone Number: 0707497355
Village: Kamugele Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Water will be available for livestock
   - Water will be available for farming
   - Water will be available for domestic use and consumption
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Theft
   - Breakage of the dam.
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   None.

Signature/ Thump Print: .....

Date: 26/02/2026

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**Respondent**
Name: DANIEL M TOPEN
Phone Number: 0727340284
Village: KAPKURMATE Sub-County: BARINGO WEST

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Water available for fish farming.
   - Development of the area
   - Water for drinking will be available.
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   - Vector borne diseases
   - Water borne diseases
   - theft.
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the **project.**
   None

Signature/ Thump Print: DM

Date:

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Respondent
Name: Lakan Kotulia
Phone Number: 0110174062
Village: Kapkurmate Sub-County: Baringo west

1. Do you support the proposed project in the area Yes (✓ No ( )
2. Within the area are there similar projects Yes ( ) No (✓
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   * more social interactions
   * closer distance to water access
   * less death of livestock
4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?
   * falling and breaking of dam
   * Drowning of young children
   * theft
5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the project.
   build the dam with cement

Signature/ Thump Print: ...

Date: 26/02/2026

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**Respondent**

Name: Zaphania Kipsang

Phone Number: 0715 59 3221

Village: Kapkurmalte Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (✓) No ( )
2. Within the area are there similar projects Yes ( ) No (✓)
3. What Potential Positive Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?

   1) Water for Irrigation
   2) Water for Rainfall

4. What Potential Negative Environmental and Socio-Economic impacts do you anticipate the project's implementation will generate?

   1) Drowning
   2) Conflicts

5. In your general opinion, should the project be implemented on the proposed site? Yes (✓) No ( )
6. Kindly give any other comments or suggestions you may have about the project.

Signature/ Thump Print: .....

Date:

26/2/2026

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Respondent
Name: Jonathan Chelangat
Phone Number: 0716743373
Village: Silek Sub-County: Baringo West

1. Do you support the proposed project in the area Yes (—) No ( )
2. Within the area are there similar projects Yes ( ) No (—)
3. What **Potential Positive Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

1) Water available for livestock
2) Water available for domestic use

4. What **Potential Negative Environmental and Socio-Economic** impacts do you anticipate the project's implementation will generate?

1) Increase in waterborne diseases
2) Human-wildlife conflict.

5. In your general opinion, should the project be implemented on the proposed site? Yes (—) No ( )
6. Kindly give any other comments or suggestions you may have about the project.

Signature/ Thump Print: .....

Date:

26/2/2026

## Appendix 4: Land Agreement / Title/ Search

**COMMUNITY LAND RESOLUTION FORM – BARINGO COUNTY**

Community Resolution on Identification/ Selection of structure sites i.e.

.....KEBUNONIN WATER DAM.....

We, the beneficiaries of ....KAPTURO SUBLOCATION Have discussed and agreed that .....KEBUNONIN.....will be the site for the proposed construction of .....KEBUNONIN WATER DAM..... in .....BARINGO NORTH..Sub County. .....BARTABWA... Ward. .....NGORORA... Location. .....KAPTURO..... Sub-location. Coordinates [0°54'16.4"N 35°48'49.0"E]

We, on behalf of the beneficiaries (beneficiaries' representatives) confirm the above information be true.

(Names of three (NO) Beneficiaries' representatives)

| S/NO. | NAME | ID/NO. | SIGNATURE |
|---|---|---|---|
| | SIMON KIMOI CHE | 32767548 | |
| | Jacob Tekar | 7092111 | |
| | Lydia KIPTOOM | 37791744 | |
| | Faith KIPROP | 42401977 | |

Witnessed By: ....Elphas K. Rutich - BOREHOLE PROJECT COORDINATOR.

Chief office (Stamped)

ASSISTANT CHIEF KAPTURO SUB- LOCATION P.O. Box 180-30401 KABARNET Date.....

| NAME | P/NO. | DESIGNATION | SIGNATURE |
|---|---|---|---|
| ANDREW CHEBELIEN | 223039103S | ASST CHIEF | |

CDA'S OFFICE (Stamped)

| NAME | P/NO. | DESIGNATION | SIGNATURE |
|---|---|---|---|
| Vincent Ruge | 20060724 | CDA | |

County Government (Stamped)

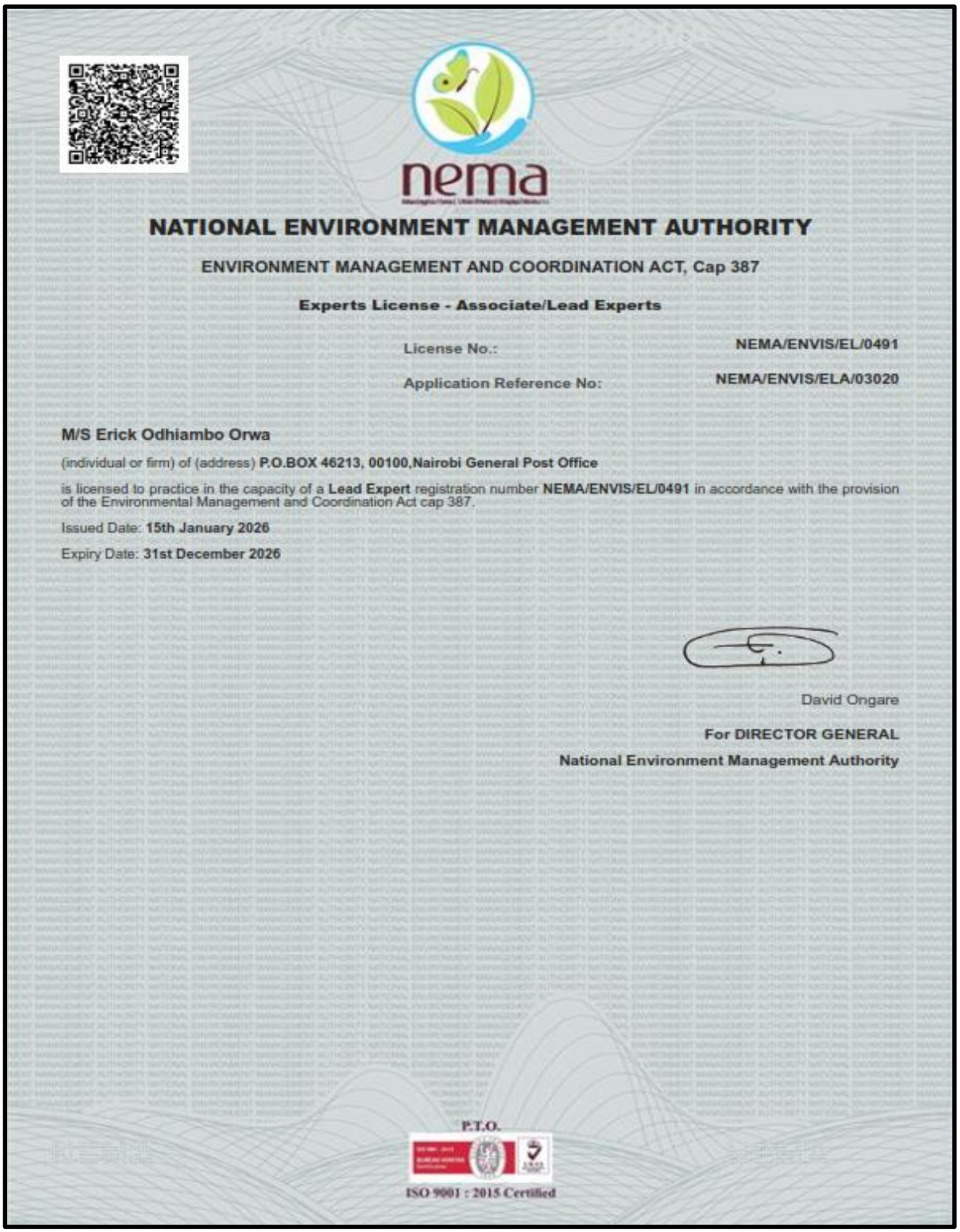
(County Executive for Agriculture / Livestock)

| NAME | ID/NO. | SIGNATURE |
|---|---|---|
| Rispen Chepkony | 9779873 | |

(NB: Please add any other relevant information)

Scanned with CamScanner

## Appendix 5: Expert's Nema Practicing License



nema

**NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY**

**ENVIRONMENT MANAGEMENT AND COORDINATION ACT, Cap 387**

**Experts License - Associate/Lead Experts**

License No.: **NEMA/ENVIS/EL/0491**

Application Reference No: **NEMA/ENVIS/ELA/03020**

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Issued Date: **15th January 2026**

Expiry Date: **31st December 2026**

David Ongare

**For DIRECTOR GENERAL**

**National Environment Management Authority**

P.T.O.

ISO 9001 : 2015 Certified

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Issued Date: **5th January 2026**

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For DIRECTOR GENERAL

National Environment Management Authority

P.T.O.

ISO 9001 : 2015 Certified

## Appendix 6: Photo Gallery

| | |
|---|---|
| | |
| Public participation meeting at Kapkurmat and Kamugele Village | CDE Nema Addressing the community |
| | |
| The area vegetation during the ESIA study. | Access Road to the site |
| | |
| Project site (ground; the area is in between two villages) | Terrain of the site |

## Appendix 7: Chance Find Procedure

### 1. Purpose of the chance find procedure

The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation. A Chance Find Procedure, is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

### 2. Scope of the chance find procedure

This procedure is applicable to all activities conducted by the personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

### 3. Induction/Training

All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

### 4. Chance find procedure

If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;

2. Immediately notify a foreman. The foreman will then notify the Resident/Supervising Engineer and the Environment Officer (EO)/Environmental Manager (EM);

3. Record details in Incident Report and take photos of the find;

4. Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;

5. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;

6. Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule

of the Contractor. The results of all archaeological work must be reported to the National Museums of Kenya (NMK), once completed.

7. In case of significant find the National Museums of Kenya (NMK) should be informed immediately and in writing within 7 days from the find.

8. The onsite archaeologist provides the NMK with photos, other information as relevant for identification and assessment of the significance of heritage items.

9. The NMK must investigate the fact within 2 weeks from the date of notification and provide response in writing.

10. Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

11. Construction works could resume only after permission is granted from the responsible authorities.

12. In case no response received within the 2 weeks' period mentioned above, this is considered as authorization to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photo log, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports - kept.

**5. Additional information**

**Management options for archaeological site**

a) ***Site avoidance.*** If the boundaries of the site have been delineated attempt must be made to redesign the proposed development to avoid the site. (The fastest and most cost-effective management option)
b) ***Mitigation.*** If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. (The most expensive and time-consuming management option.)
c) ***Site Protection.*** It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of high visibility fencing around the site or covering the site area with a geotextile and then capping it with fill. The exact prescription would be site- specific.

**Management of replicable and non-replicable heritage**

Different approaches for the finds apply to replicable and non-replicable heritage.

**Replicable heritage**[1]

[1] Replicable cultural heritage is defined as tangible forms of cultural heritage that can themselves be moved to another location or that can be replaced by a similar structure or natural features to which the cultural values can be transferred by appropriate measures. Archaeological or historical sites may be considered replicable where the particular eras and cultural values they represent are well represented by other sites and/or structures.

Where tangible cultural heritage that is replicable and not critical is encountered, mitigation measures will be applied. The mitigation hierarchy is as follows:

a) Avoidance;
b) Minimization of adverse impacts and implementation of restoration measures, in situ;
c) Restoration of the functionality of the cultural heritage, in a different location;
d) Permanent removal of historical and archaeological artefacts and structures;
e) Compensation of loss - where minimization of adverse impacts and restoration not feasible.

**Non-replicable heritage[2]**

Most cultural heritage is best protected by in situ preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage. Nonreplicable cultural heritage must not be removed unless all of the following conditions are met:

a) There are no technically or financially feasible alternatives to removal;
b) The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and
c) Any removal of cultural heritage must be conducted using the best available technique advised by relevant authority and supervised by archaeologist.

**Human Remains Management Options**

The handling of human remains believed to be archaeological in nature requires communication according to the same procedure described above. There are two possible courses of action:

a) ***Avoid.*** The development project is redesigned to completely avoid the found remains. An assessment should be made as to whether the remains may be affected by residual or accumulative impacts associated with the development, and properly addressed by a comprehensive management plan.
b) ***Exhume.*** Exhumation of the remains in a manner considered appropriate by decision makers. This will involve the predetermination of a site suitable for the reburial of the remains. Certain ceremonies or procedures may need to be followed before development activities can recommence in the area of the discovery.

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[2] Nonreplicable cultural heritage may relate to the social, economic, cultural, environmental, and climatic conditions of past peoples, their evolving ecologies, adaptive strategies, and early forms of environmental management, where the (i) cultural heritage is unique or relatively unique for the period it represents, or (ii) cultural heritage is unique or relatively unique in linking several periods in the same site. Examples of non-replicable cultural heritage may include an ancient city or temple, or a site unique in the period that it represents.

## Appendix 8: ESIA Inspection form

| EARTH DAM NAME: | | DATE | |
|---|---|---|---|
| MONITORED BY: | | WATER LEVEL: | |
| ITEM | CONDITION | ACTION REQUIRED | BY WHOM |
| CATCHMENT AREA | | | |
| Erosion | | | |
| EMBANKMENT (cracks, vegetation, erosion, slumps, leaks, animals) | | | |
| Crest | | | |
| Downstream slope | | | |
| Upstream slope | | | |
| Lining Material | | | |
| SPILLWAY (debris, vegetation, erosion) | | | |
| Sill Area | | | |
| Culverts under Road | | | |
| Channel | | | |
| River confluence | | | |
| DRAW-OFF WORKS | | | |
| Status of Pump and Meter | | | |
| WATER QUALITY | | | |
| Color/turbidity | | | |
| Smell | | | |
| Chemical Analysis required? | | | |
| ENVIRONMENT | | | |
| Details of Any Animals | | | |
| Details of Any Plants | | | |
| Accessibility to Dam | | | |
| SIGNED BY | | | |

## Appendix 9: Kebenonin Earth Dam Crisis Action Plan (CAP)

A crisis action plan for Kebenonin Earth Dam should be developed and should consist of:

1. Contact names and telephone numbers (owner of the Kebenonin Earth Dam, authorities downstream, police and emergency services and others) to call if the dam is damaged, develops problems or is considered unstable.

2. Information on possible areas likely to be affected downstream (estimated area of inundation) should the dam fail or significant amounts of water require immediate release from gates, drains or outlets. A map to illustrate various levels of inundation (with estimates of timings for any flood wave) should be prepared and be available.

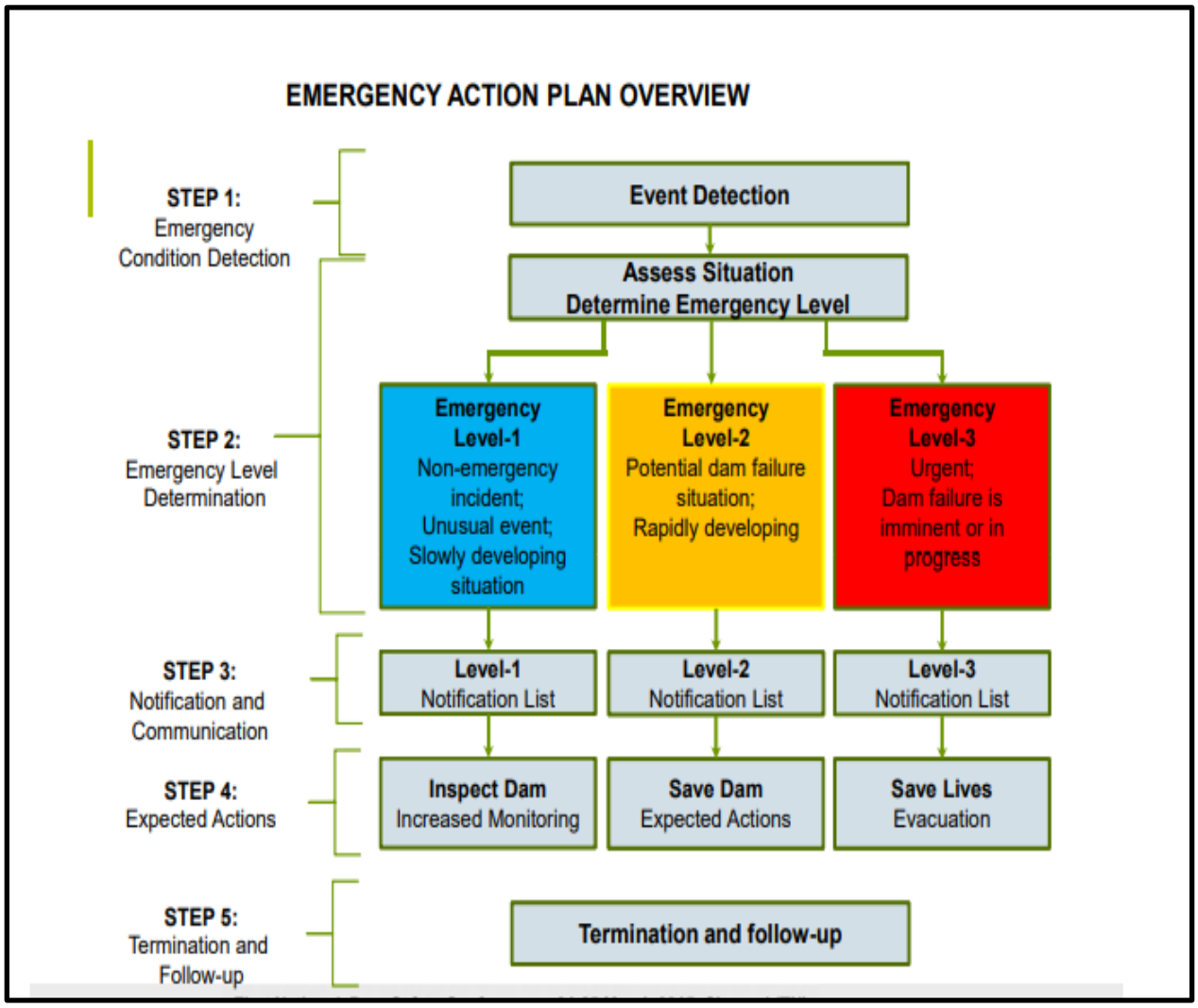
3. A list of names, addresses and telephone numbers (keep this up to date) of inhabitants living immediately downstream of the dam and within the estimated area of inundation.

4. The CAP should be periodically updated to consider changes in land use downstream and any changes to the catchment upstream.

5. Plans for warning and emergency evacuation, including the provision of safe routes to follow in case of flooding/dam failure. Immediate evacuation should take priority over any other action should the stability of the dam be threatened.

6. Information on resources to use and procedures to follow for emergency repairs. This should include a list of civil engineering contractors, equipment and materials' suppliers and engineers available locally.

## Appendix 10: Overview of Emergency Action Plan that will apply to the Dam




*Source EGIS*

## Appendix 11: Design Layout Drawings

# ATTACHED